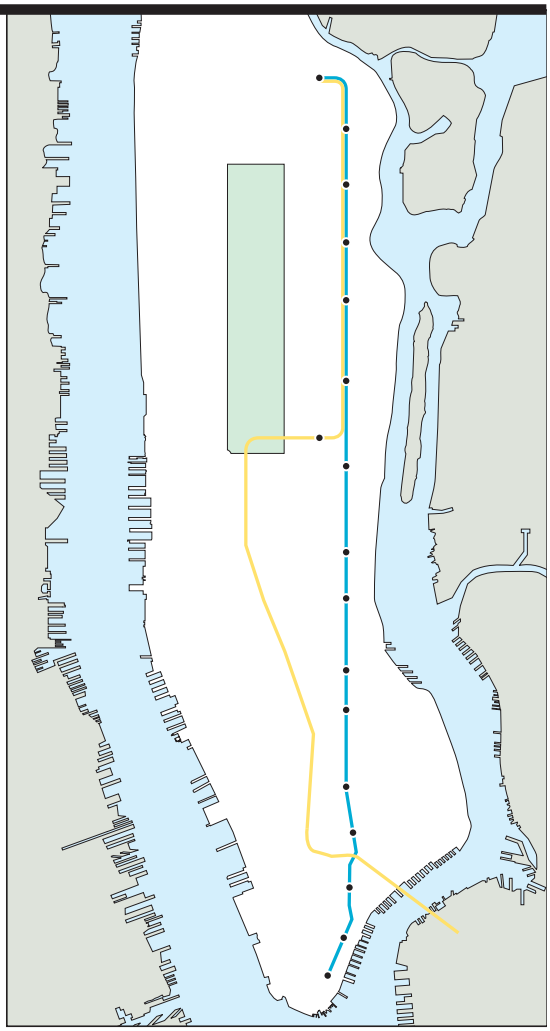
MTA New York City Transit

Second Avenue Subway



Supplemental Environmental Assessment to the Second Avenue Subway Final Environmental Impact Statement: Phase 2

July 2018

United States Department of Transportation
Federal Transit Administration

Metropolitan Transportation Authority
State of New York

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S.1 INTRODUCTION

Following the recent opening of Phase 1 of the Second Avenue Subway Project (the Project) in Manhattan, the Metropolitan Transportation Authority (MTA) is now advancing Phase 2 of the Project, the portion of the new subway between 96th Street and 125th Street. Phase 2 will provide three new stations on the Second Avenue Subway line: 106th Street Station, 116th Street Station, and 125th Street Station. MTA Capital Construction (MTACC) is responsible for the planning, design, and construction of the Project and related public outreach, and MTA New York City Transit (NYCT) will operate and maintain the service. This *Supplemental Environmental Assessment to the Second Avenue Subway Final Environmental Impact Statement: Phase 2* (Supplemental EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) for the Federal Transit Administration (FTA) as lead agency to evaluate potential impacts related to the advancing design of Phase 2.

The Second Avenue Subway will be constructed in four phases and, when complete, will provide new subway service from 125th Street to Lower Manhattan. A Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) were issued in 2004 for the full-length Project to evaluate its impacts as required by NEPA. The 2004 FEIS and ROD concluded that the Project would result in temporary but significant adverse impacts during construction. Once complete, the Project would result in overall benefits but would also cause some permanent adverse impacts.

Temporary adverse construction impacts identified in the 2004 FEIS applicable to Phase 2 of the subway included traffic, parking displacement, service disruptions to Metro-North Railroad and the Lexington Avenue (4/5/6) subway line, the potential for dust and air pollutant emissions, construction noise and vibration, visual appearance of construction sites, modified access to and diminished visibility of buildings, temporary displacements of building occupants for up to 12 months for certain properties at the southwest corner of Second Avenue and 125th Street, potential accidental damage to historic resources, potential impacts to buried archaeological resources (to be determined closer to construction), and potential exposure of contaminated materials during ground disturbance. MTA developed extensive measures to mitigate these impacts, as detailed in the technical chapters of this Supplemental EA.

The 2004 FEIS concluded that once complete, the new subway would have largely beneficial impacts as a result of enhanced transit service, which would expand transit options for travelers, alleviate crowding on the Lexington Avenue (4/5/6) subway line, and reduce automobile dependency and associated air emissions. Adverse permanent impacts identified in the 2004 FEIS relevant to Phase 2 included full and partial property acquisitions (and associated residential and business displacements) for subway entrances and ancillary facilities, and an adverse impact to the historic Metro-North Harlem-125th Street Station as a result of a direct subsurface connection from the new subway. Displacements and relocation were to be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) and the New York State Eminent Domain Procedure Law (EDPL). Impacts to the historic railroad

station were to be addressed pursuant to a Programmatic Agreement executed under Section 106 of the National Historic Preservation Act.

The 2004 FEIS was prepared based on conceptual design; at this time, design for Phase 2 is advancing. Each technical chapter of this Supplemental EA evaluates whether the advanced design for Phase 2 (the "Modified Design") would change the conclusions of the 2004 FEIS. As demonstrated in each chapter, the overall impacts of Phase 2 would remain consistent with those described in the 2004 FEIS. Station entrances and required ancillary buildings would be larger than described in the 2004 FEIS (see Chapter 2, "Description of Phase 2 Modified Design") and therefore would require greater property acquisitions and displacements (see Chapter 6, "Displacement and Relocation"), but displacements, relocations, and appropriate compensation would continue to be conducted in accordance with the Uniform Act and the EDPL. In some cases, construction impacts would be reduced, particularly along 125th Street where the subway tunnel would be deeper than originally planned. The deeper tunnel would require less surface-level disruption and less potential for disruption to Metro-North Railroad and the Lexington Avenue (4/5/6) subway line. In addition, the direct connection to the historic Metro-North Harlem-125th Street Station has been removed, thereby eliminating the adverse impact to the historic structure.

Pursuant to 23 CFR § 771.130, FTA's procedures for conducting supplemental environmental review, the Modified Design has been evaluated in accordance with NEPA to determine if it would alter the conclusions of the 2004 FEIS. FTA, in consultation with MTA, determined that the Modified Design should be evaluated in a Supplemental EA.

This Supplemental EA evaluates each of the environmental impact areas considered in the 2004 FEIS to determine whether the Modified Design would result in any new adverse impacts not disclosed in the 2004 FEIS or require mitigation measures not identified in the 2004 FEIS. Following public review of this Supplemental EA, and consideration of all public comments, if FTA determines that no new or different significant adverse impacts would result, a Finding of No Significant Impact (FONSI) would be issued. If new or different significant adverse impacts would occur as a result of the Modified Design, a Supplemental EIS would be required.

S.2 PROJECT BACKGROUND

In 2004, an FEIS and ROD were issued in accordance with NEPA for the proposed full-length Second Avenue Subway. The full-length Second Avenue Subway will extend about 8.5 miles on Manhattan's East Side from Hanover Square in Lower Manhattan to 125th Street in Harlem (see **Figure S-1**). The new subway will be a two-track heavy rail rapid transit line in two new parallel tunnels generally following the alignment of Second Avenue. The full Project will include 16 new stations, mostly with center island platforms between the two tracks. The Second Avenue Subway will expand and tie into the existing NYCT system. The Second Avenue Subway will be constructed in four phases:

- **Phase 1 (opened in January 2017):** Extends the Broadway (Q) subway line along Second Avenue from about 63rd Street to 96th Street, with new stations at 72nd, 86th, and 96th Streets;
- **Phase 2 (the subject of this Supplemental EA):** Will extend the existing Second Avenue Subway (Q) service north to 125th Street, with new stations at 106th, 116th, and 125th Streets;

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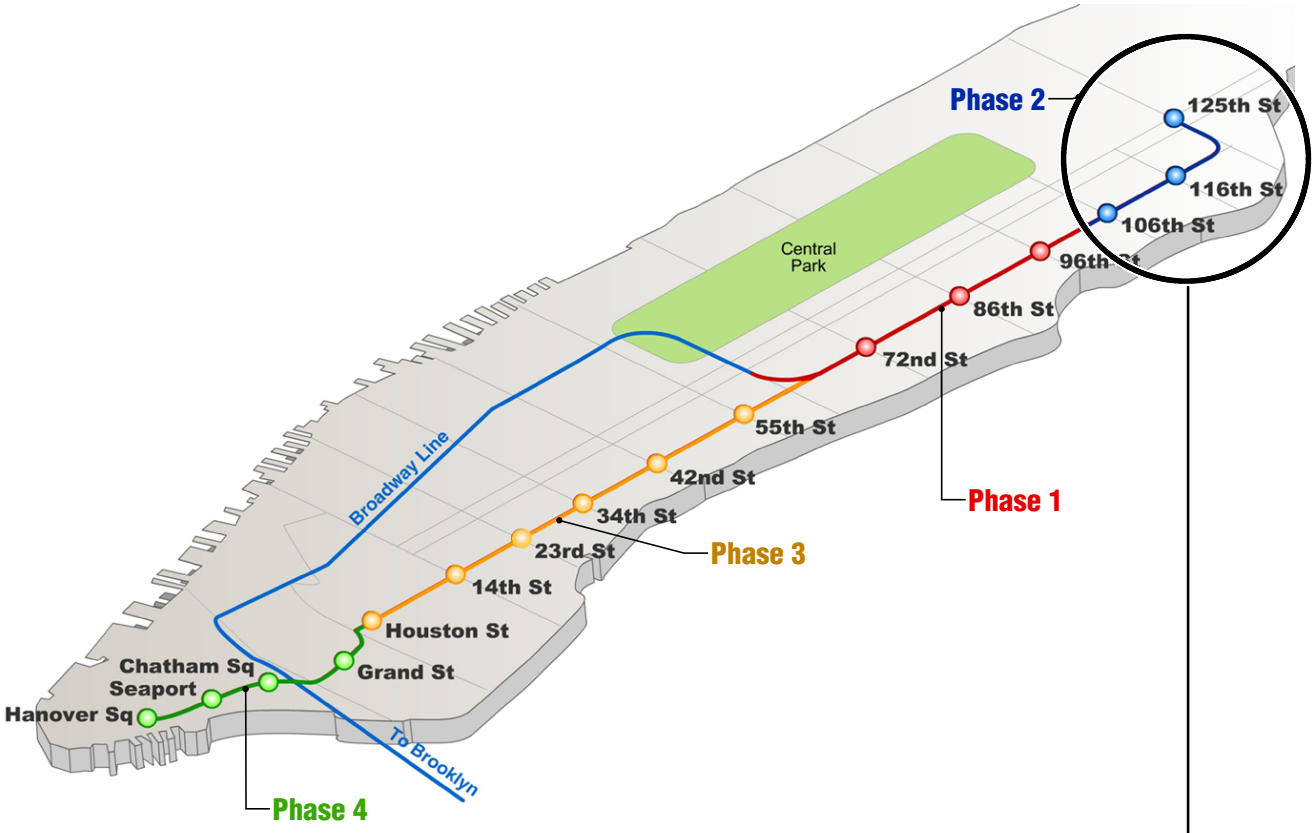
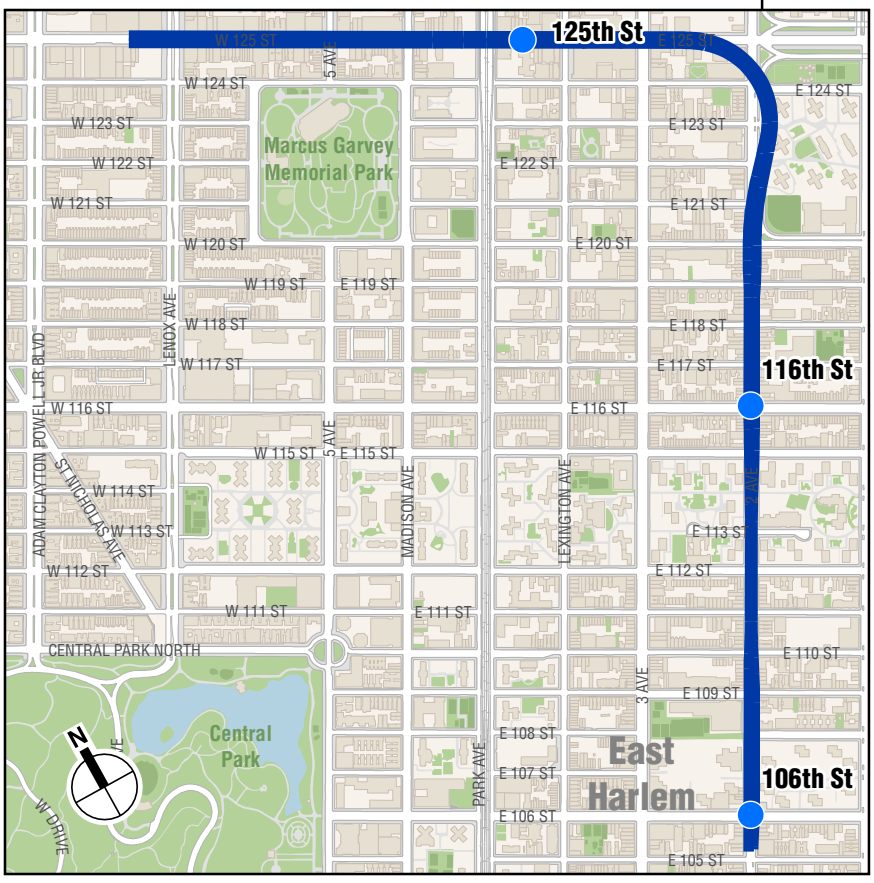




SECOND AVENUE SUBWAY PHASE 2

Project Location
Figure S-1

- **Phase 3:** Will extend the Second Avenue Subway south of Phases 1 and 2 from the 72nd Street Station/63rd Street area to Houston Street, with new stations at Houston, 14th, 23rd, 34th, 42nd, and 55th Streets. The entire line will also become designated as the T subway line; and
- **Phase 4:** Will extend the Second Avenue Subway (T) service farther south from Houston Street to Lower Manhattan, with new stations at Hanover Square, Seaport, Chatham Square, and Grand Street.

With the recent opening of Phase 1, preliminary engineering for Phase 2 has advanced. Details of the Phase 2 design are provided in Section S.3 below and Chapter 2 of this Supplemental EA.

S.2.1 PLANNING FOR THE FULL-LENGTH SUBWAY

The purpose of the full Second Avenue Subway Project, as defined in the 2004 FEIS, is to "address the problems and deficiencies in access and mobility associated with an overburdened transit infrastructure that is struggling to accommodate existing customers and the continuing growth on Manhattan's East Side." Phase 2 of the Second Avenue Subway will provide incremental progress toward achieving the Project's purpose.

The Project's purpose statement was derived based on a number of needs identified in the corridor, which, in summary, relate to the high population and density of Manhattan's East Side and its limited rapid rail transit services. Together, these result in overcrowding, overtaxing, and reduced levels of service on the existing subway and bus services. East Harlem, where Phase 2 will be located, is currently only served by one rapid rail transit line (the Lexington Avenue, 4/5/6 subway line). East Harlem is also served by a number of bus routes, but these services are also plagued with overcrowding and resultant delays.

During the planning and alternatives development for the Second Avenue Subway, three goals, along with supporting objectives, were developed for the full-length Project to meet the Project's purpose statement:

- Goal 1: Improve Mobility on the East Side of Manhattan
- Goal 2: Achieve Economic Feasibility and Cost-Effectiveness
- Goal 3: Maintain or Improve Environmental Conditions

As the 2004 FEIS was being developed, MTA and its design consultants also developed preliminary engineering for the full-length subway, through an interactive process combining transportation planning, preliminary engineering, environmental analysis, and community outreach. Design criteria were developed to guide the preliminary engineering for the full-length subway, as follows:

- The system should deliver fast, reliable service to provide an attractive alternative to the Lexington Avenue line and relieve overcrowding on that line.
- All new facilities, including tracks and termini, must generally be able to accommodate up to 30 trains per hour[1] in each peak direction (for the full-length subway once all four phases are complete).

[1] Once the full-length subway is complete.

- The already built segments of the Second Avenue Subway should be used, if practicable. These are located on Second Avenue between 120th and 110th Streets, on Second Avenue between 105th and 99th Streets, and on the Bowery between Canal and Pell Streets.
- The Second Avenue Subway should use the existing bellmouths[2] constructed as part of the 63rd Street Tunnel to provide a West Side service and to facilitate future connections between the 63rd Street line and the Second Avenue line.
- Enclosed transfer connections should be provided to existing stations and other public transit facilities wherever practicable—in other words, when they can be provided at a reasonable cost and when the expected benefits to passengers outweigh the expected adverse impacts.
- The system should be built so as not to preclude, and where possible, accommodate, future connections or extensions to other boroughs in New York City.
- The system should be designed to provide flexibility in its construction methods and contracting process.
- The system should be designed to achieve a balance between ease of construction and passenger convenience in terms of both tunnel depth (a very deep tunnel might be easier to construct, but passenger access time to and from the street would increase), and a balance between speed of operation and passenger convenience in terms of station spacing (having fewer stations allows faster service for those already on the train, but also means pedestrians may need to walk farther to reach a station entrance).
- The system should be designed to minimize environmental and community impacts to the extent practicable and should be reasonably responsive to community concerns. This goal affects construction techniques selected as well as the basic design of the system in terms of station placement and alignment.
- The system must comply with passenger safety requirements, including the National Fire Protection Association (NFPA); all applicable codes; and with the Americans with Disabilities Act (ADA).
- All new facilities should respond to sustainable/green design criteria.

These design criteria were the basis for the preliminary engineering conducted for the full-length subway. This design phase identified the alignment for the new subway (including its depth, or vertical alignment) as well as the specific locations of new subway stations, including station shells and platforms. The level of design provided information on potential construction methodologies and anticipated permanent subway features to support the environmental review (the 2004 FEIS) and to allow an estimate of potential operations, ridership benefits, capital costs, and ongoing operational and maintenance costs. This included initial identification of general characteristics, sizing, and locations for station entrances and above-ground ancillary structures. The 2004 FEIS described the general characteristics of the station features, based on the design that was available at that time, and noted that these features would evolve as the design advanced.

[2] A bellmouth is a widened tunnel area. Bellmouths are often constructed at the terminus of a tunnel to allow for future extensions from that point.

S.2.2 DESIGN DEVELOPMENT AND CONSTRUCTION: PHASE 1

Following completion of the 2004 FEIS and ROD in 2004, MTA continued to advance preliminary engineering and design for Phase 1 of the Second Avenue Subway. The advanced preliminary engineering for Phase 1 resulted in better definition of Project elements. During final design and construction, further modifications were made to the design and construction staging for Phase 1 based on additional information collected in the field, a review of constructability and cost considerations, community comments, and other factors.

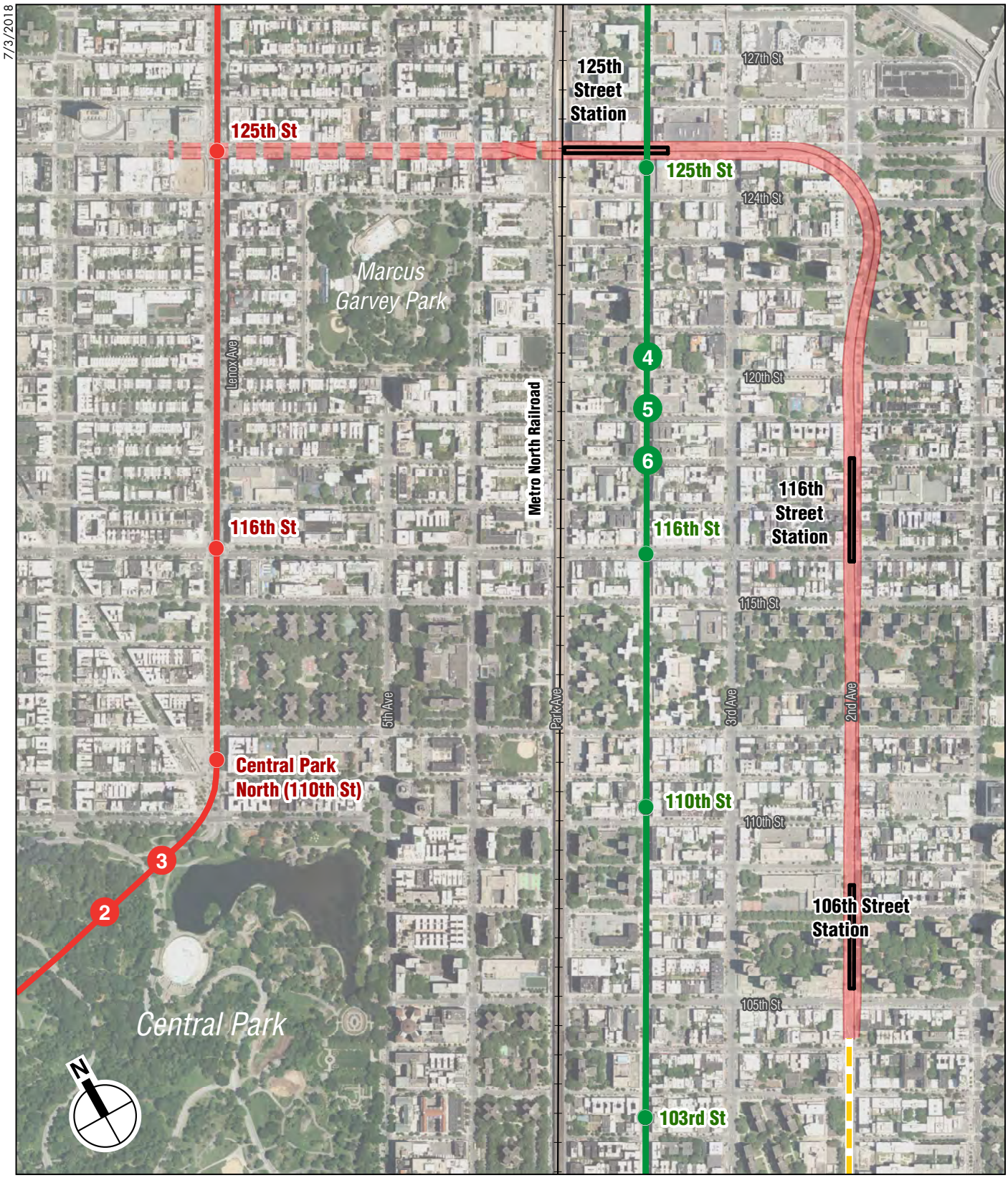
S.2.3 DESIGN DEVELOPMENT: PHASE 2

To advance the design for Phase 2 beyond what was completed in 2004, MTA and its design consultant are now developing more detailed designs for the alignment, tunnel and station structures, ancillary facilities, including their components (substations, pump stations, signal rooms, communications rooms, fan plants, emergency exits, etc.), and other systems involved in subway operation. The design process for Phase 2 of the Second Avenue Subway was established to advance the original preliminary engineering design that was developed for the 2004 FEIS and update it by incorporating changes in background conditions, advanced preliminary engineering design, and updated construction methods. In addition, MTA and its design consultants also used the experience gained during final design and construction of Phase 1 to make additional modifications to the design for Phase 2. In this way, design engineers sought to improve the Phase 2 design to improve constructability and the efficiency of future train operations, similar to the design modifications made for Phase 1 after the 2004 FEIS.

S.3 PHASE 2 MODIFIED DESIGN

At this time, MTA and its design consultants are developing advanced preliminary engineering for Phase 2 of the Second Avenue Subway, which will extend new subway service along Second Avenue from the 96th Street Station to a new terminal on 125th Street. Based on the engineering conducted to date, the preliminary design of Phase 2 has been changed from the design presented in the 2004 FEIS (the 2004 FEIS Design). The primary reasons for design modifications are: 1) changes in background conditions; 2) advanced preliminary engineering where further site-specific reconnaissance and additional analyses have been conducted; and 3) updated construction methods where attempts have been made to further support one of the Project's objectives to "minimize community disruption during construction." More information on the reasons for these modifications is provided in Chapter 2, "Description of Phase 2 Modified Design" of this Supplemental EA. The revised design, referred to as the Modified Design, is described below and summarized in **Table S-1** toward the end of this chapter.

The overall alignment of Phase 2 with the Modified Design remains similar to that presented in the 2004 FEIS Design. Phase 2 would extend from 105th Street (the terminus of Phase 1's storage tracks) to about 120th Street, where the tracks would curve to 125th Street and end near Lenox Avenue (see **Figure S-2**). Like the 2004 FEIS Design, the Modified Design would have three new stations: at 106th Street and Second Avenue, 116th Street and Second Avenue, and 125th Street between Lexington and Park Avenues. The 125th Street Station would provide direct transfers to the existing Lexington Avenue (4/5/6) subway line and connections to Metro-North Railroad at the Metro-North Harlem-125th Street Station at Park Avenue. All three new stations would be accessible in compliance with the Americans with Disabilities Act (ADA).



SECOND AVENUE SUBWAY PHASE 2

Proposed Second Avenue Subway - Phase 2

Figure S-2

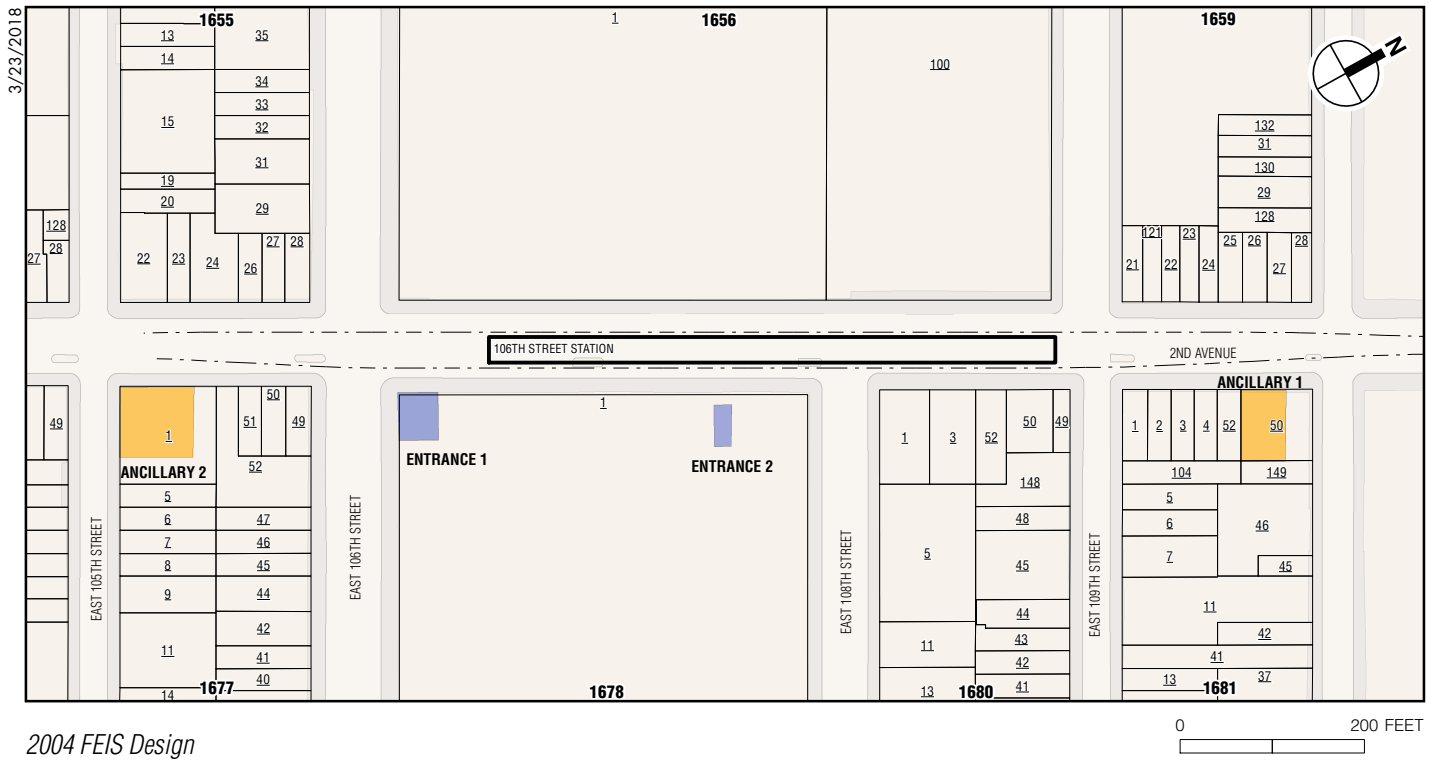
Consistent with the 2004 FEIS Design, each new station would include at least two entrances and two above-ground ancillary buildings that house ventilation, electrical, and mechanical equipment. However, as design has advanced and because of changes in background conditions, engineering standards, and constructability considerations learned during construction of Phase 1, the entrances and ancillary facilities in the Modified Design would be larger than those shown in the 2004 FEIS Design. Some proposed ancillary facilities and entrances would also be on different sites than the preliminary sites identified in the 2004 FEIS, to align with other revisions made to the stations or because new private developments and other constructability considerations have made previous sites no longer feasible (see **Figures S-3 through S-7**).

The Modified Design would be about 20 feet deeper beneath the street beginning at the tunnel curve at 125th Street. In addition, the new 125th Street Station would be slightly farther west. This modification was made to reduce the construction impacts associated with building the new tunnel and station at the curve and beneath 125th Street, consistent with one of the Project's objectives of minimizing construction impacts. Whereas the 2004 FEIS Design proposed cut-and-cover construction (i.e., excavation from the surface) along 125th Street between Third Avenue and Park Avenue for the 125th Street Station, the Modified Design would involve deeper construction in rock, which would be done with a Tunnel Boring Machine (TBM). This would greatly reduce surface construction impacts along this highly commercial corridor and important crosstown roadway. The modification would also reduce disruption to the Lexington Avenue line and to the private properties on the southwest corner of Second Avenue at 125th Street during construction.

In addition, with the Modified Design, the underground storage tracks west of the new terminal station at 125th Street would extend farther west than anticipated in the 2004 FEIS Design, and would end either just east or just west of Lenox Avenue, depending on the design option selected. A new ancillary facility would be constructed on the south side of 125th Street at the end of the tracks. The 2004 FEIS Design included possible additional storage tracks under Second Avenue from 125th to 129th Street with an ancillary building along those tracks, but these storage tracks are no longer proposed with the Modified Design.

S.4 COMPARISON OF IMPACTS BETWEEN 2004 FEIS DESIGN AND MODIFIED DESIGN

While the overall Phase 2 alignment remains generally consistent between the 2004 FEIS Design and the Modified Design, there have been some design modifications and there have been changes in background conditions since the 2004 FEIS. **Table S-2** at the end of this chapter provides a summary of impacts of the Modified Design in comparison to the 2004 FEIS Design. Expanded discussions of potential changes in impacts are provided in the following technical chapters of this Supplemental EA.

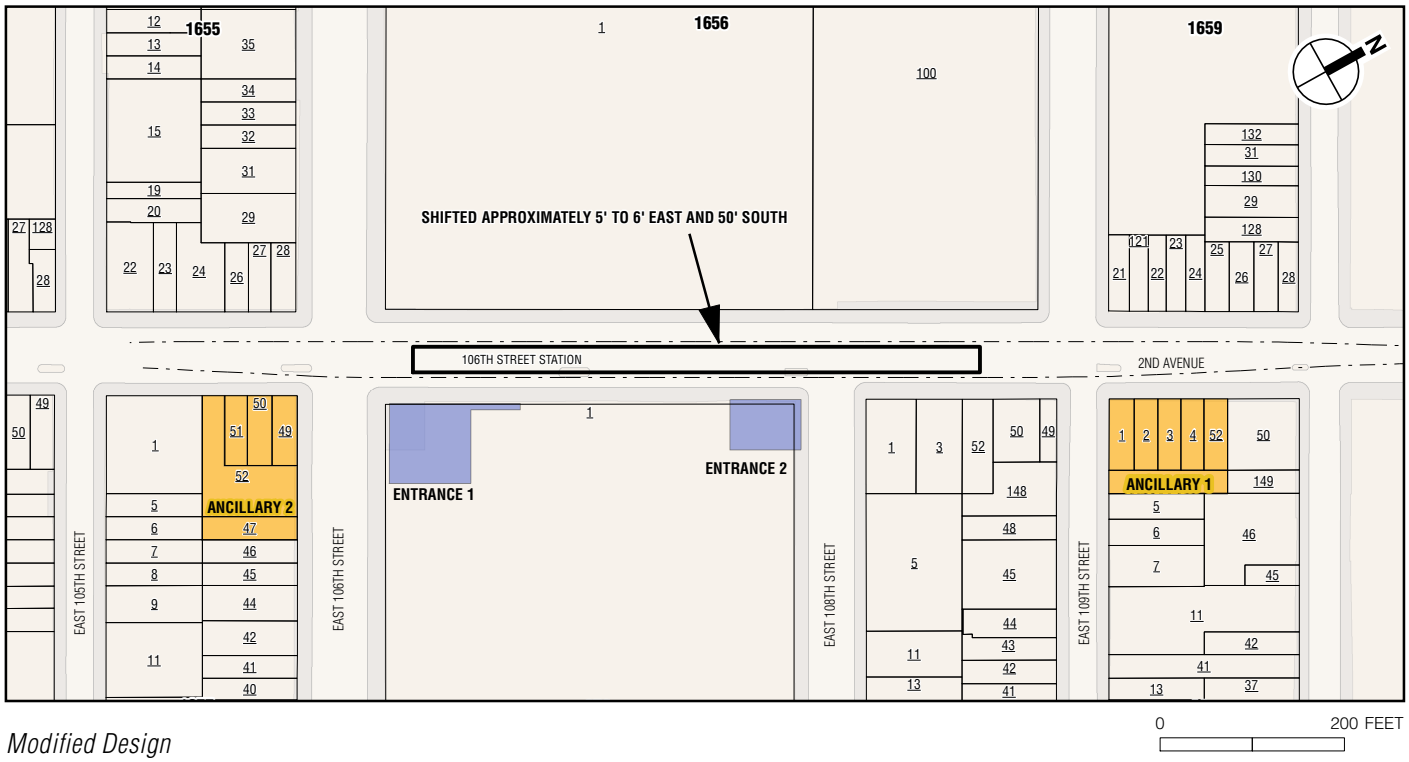


2004 FEIS Design

Entrance

Ancillary

Station Platform



Modified Design

Entrance

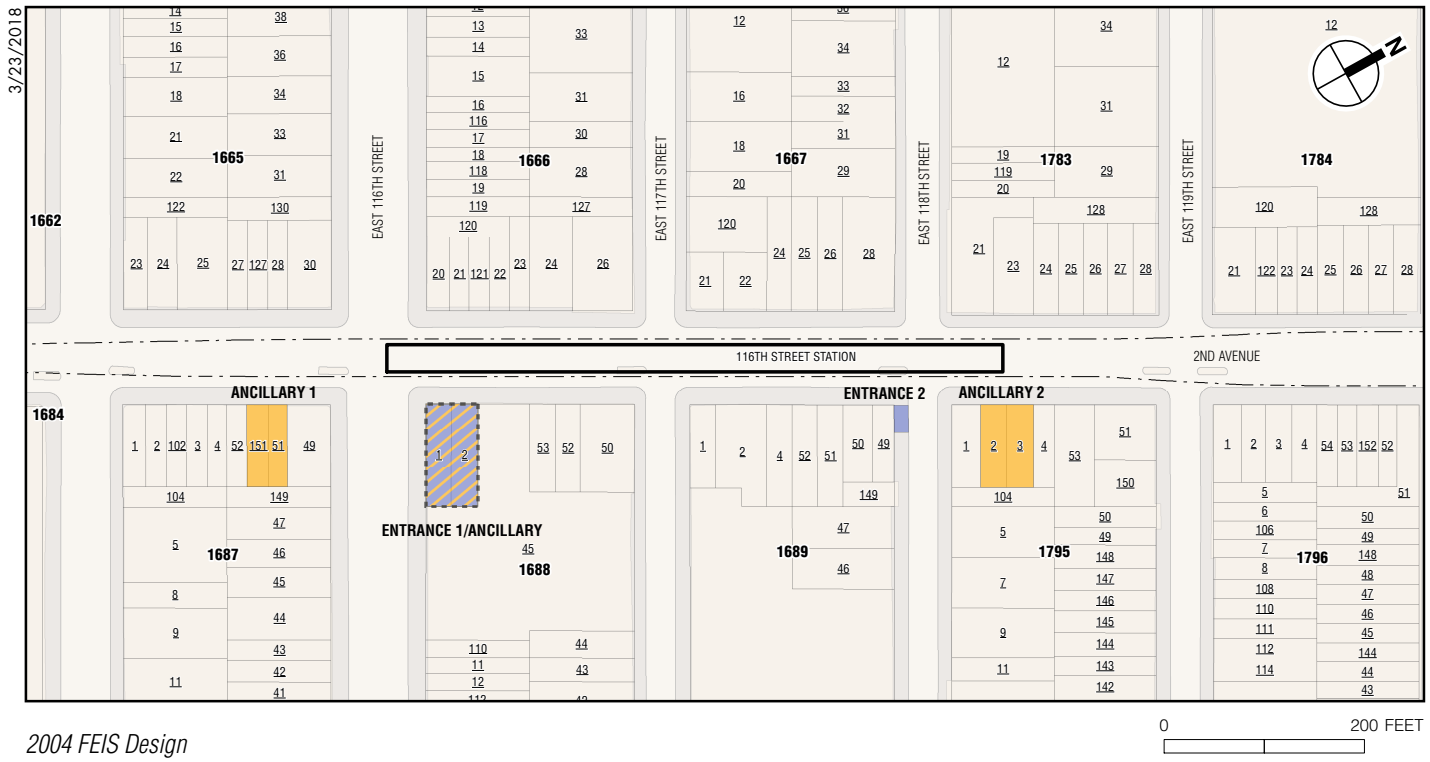
Ancillary

Station Platform

Comparison of 2004 FEIS Design and Modified Design
106th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure S-3



2004 FEIS Design

Ancillary

Entrance/Ancillary

Station Platform

Modified Design

Entrance

Ancillary

Station Platform

Comparison of 2004 FEIS Design and Modified Design
116th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure S-4

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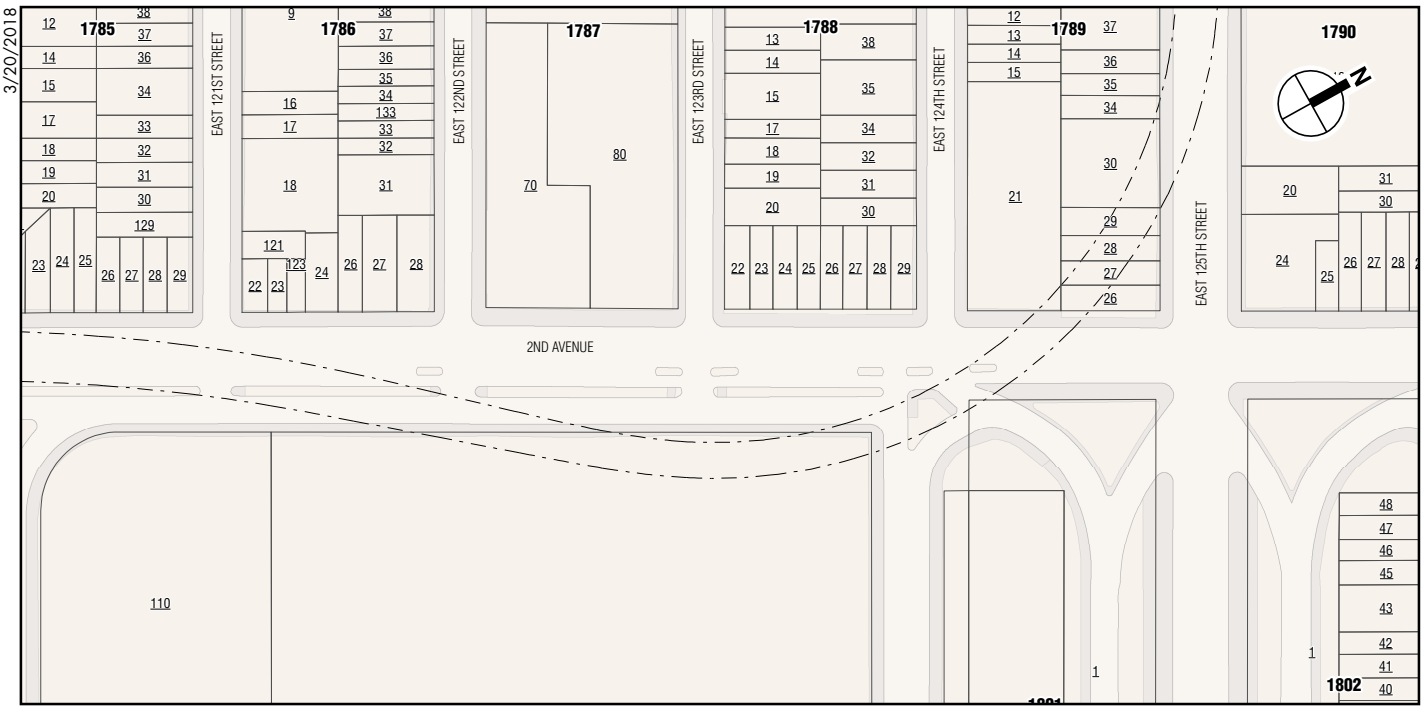
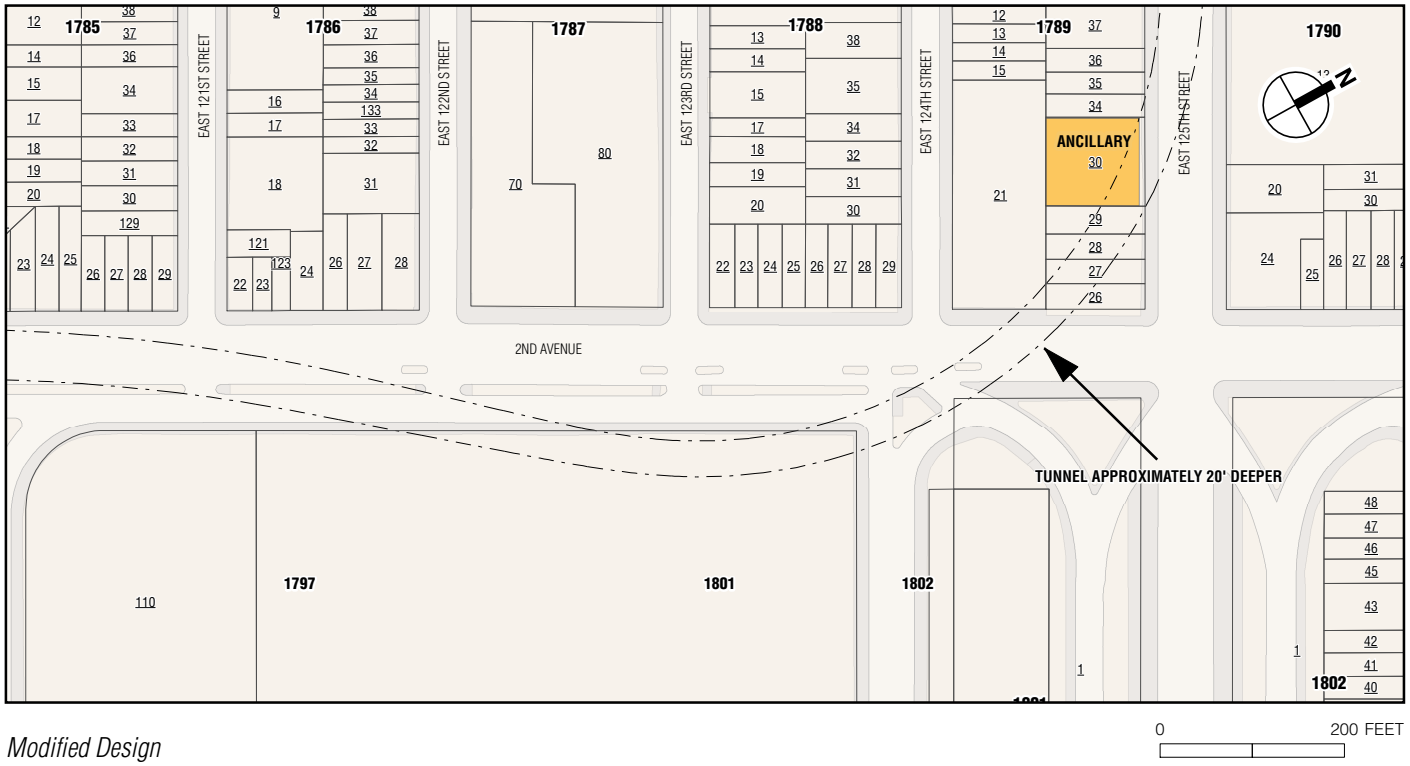


2004 FEIS Design



Modified Design

Ancillary

Comparison of 2004 FEIS Design and Modified Design
125th Street Curve

SECOND AVENUE SUBWAY PHASE 2

Figure S-5

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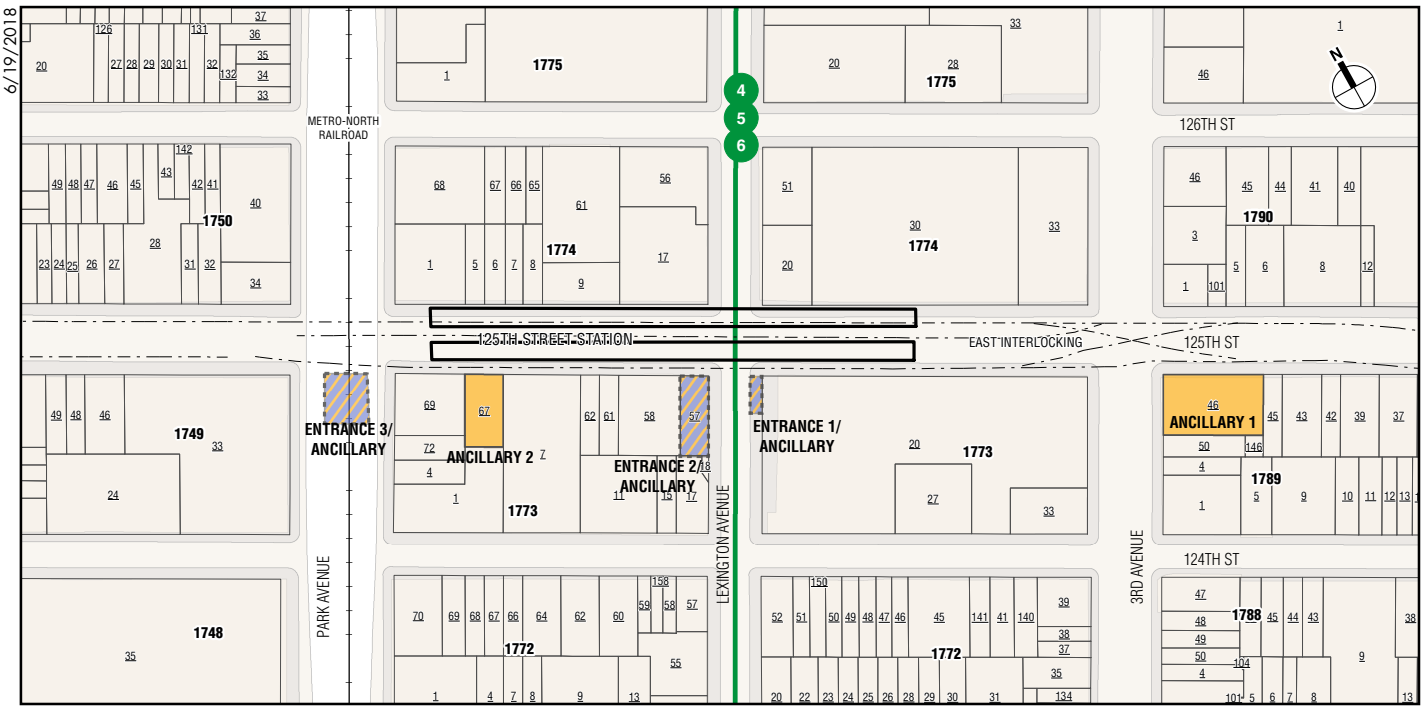


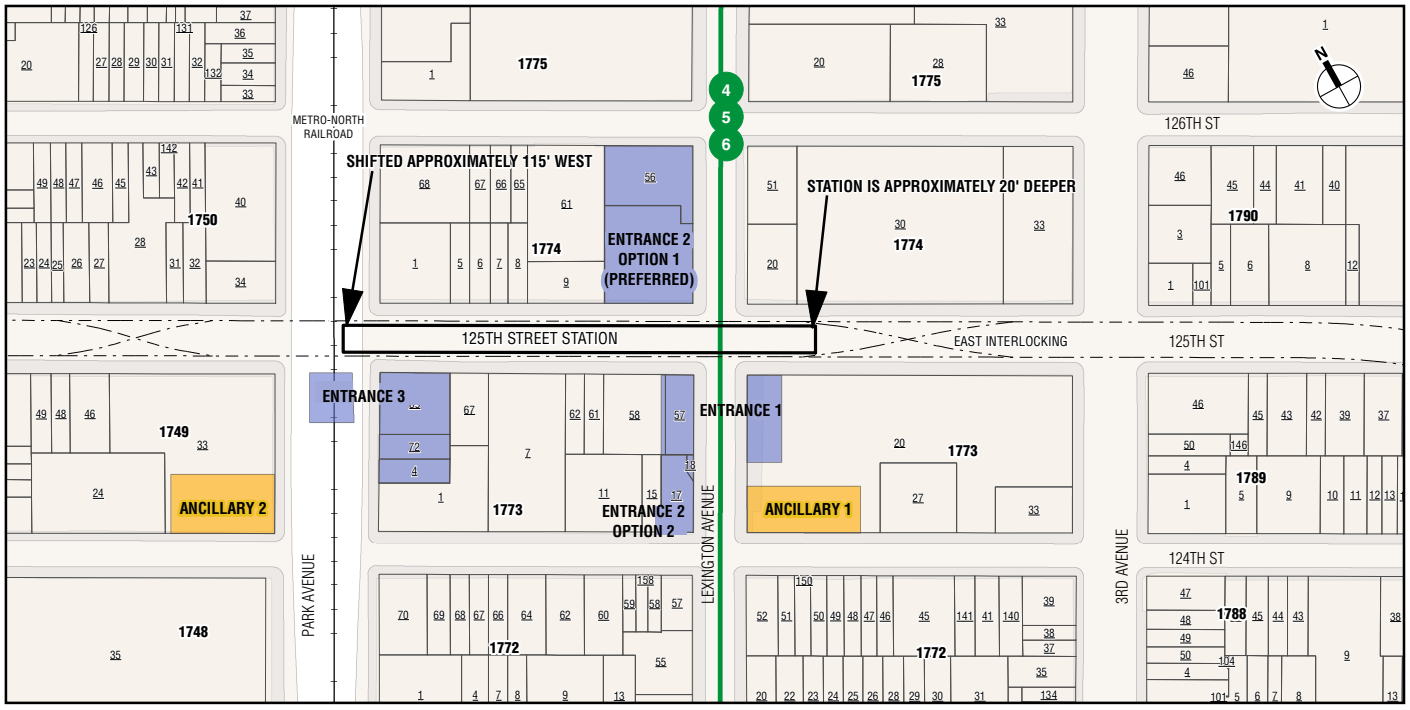
2004 FEIS Design

0 200 FEET

Ancillary

Entrance/Ancillary

Station Platform



Modified Design

0 200 FEET

Entrance

Ancillary

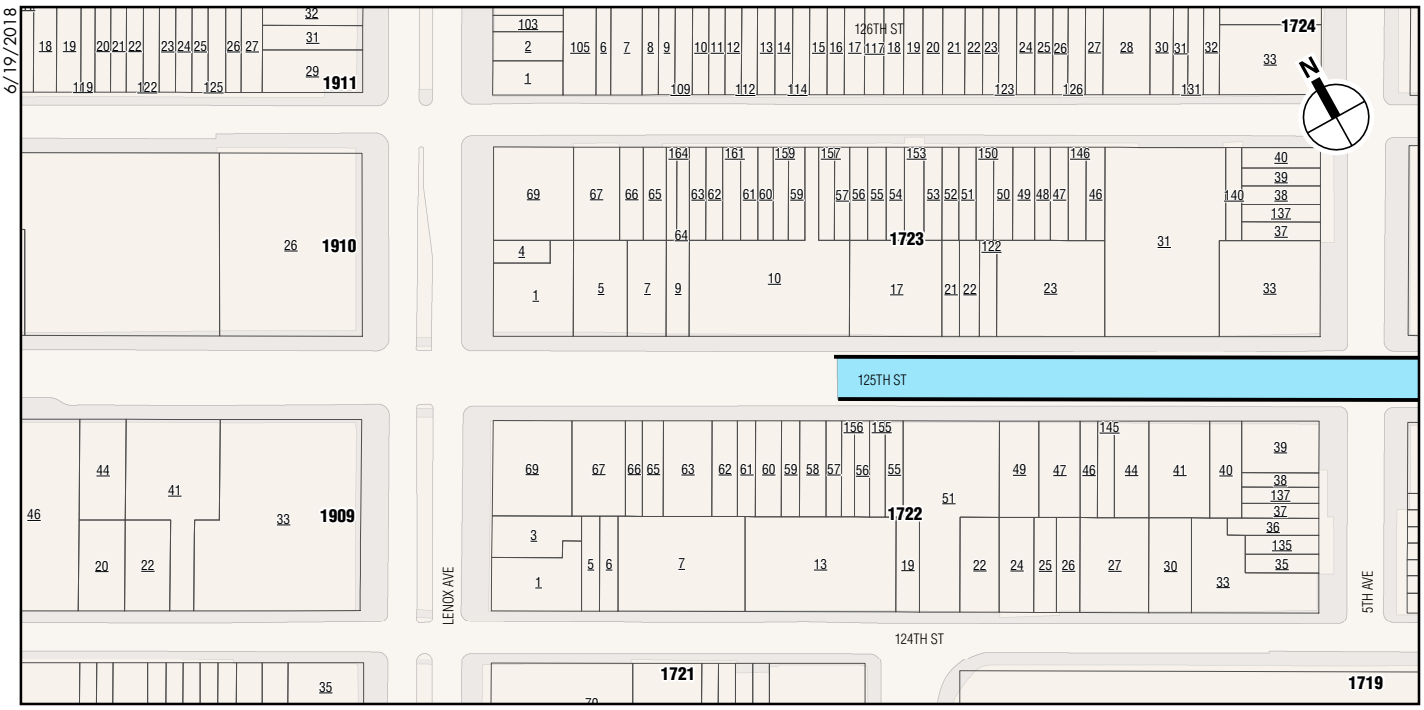
Station Platform

Comparison of 2004 FEIS Design and Modified Design
125th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure S-6

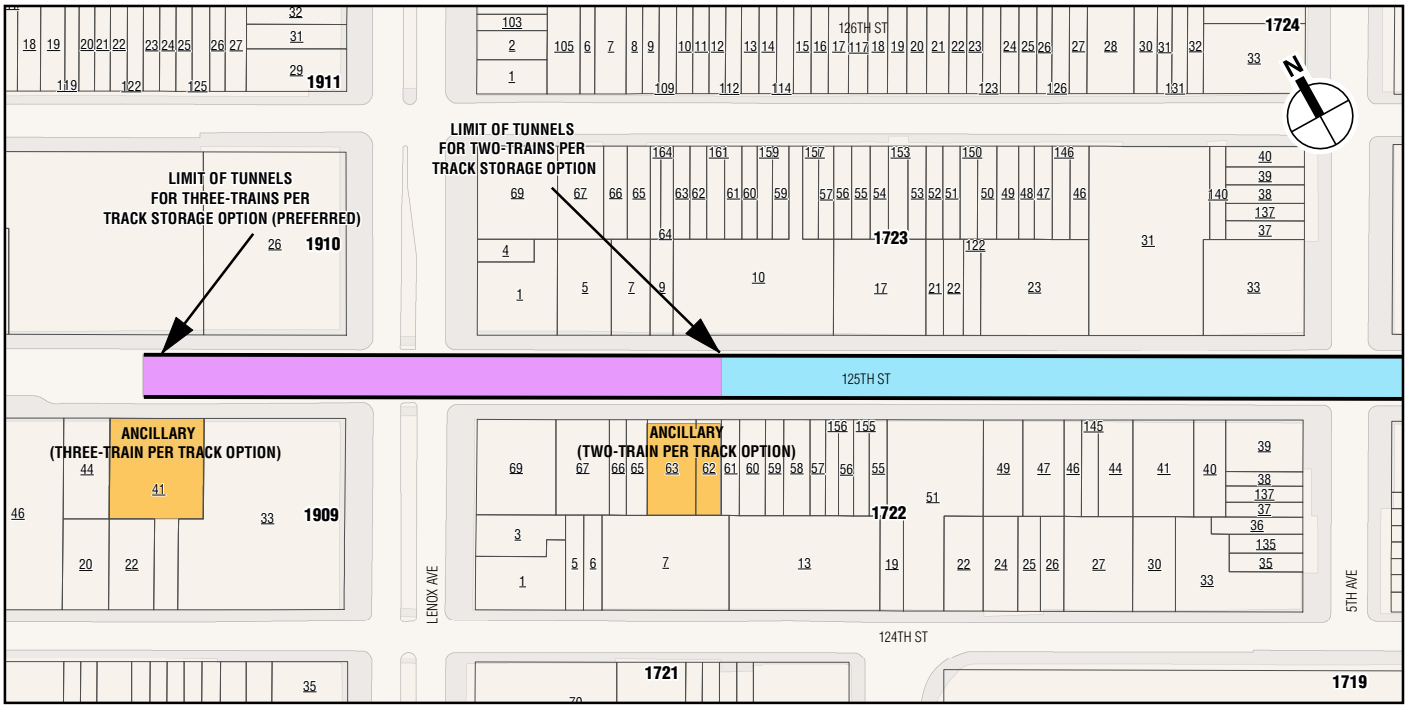
6/19/2018



2004 FEIS Design

Note: The 2004 FEIS also included potential storage tracks along Second Avenue from 122nd Street to 129th Street

0 200 FEET



Modified Design

Entrance

Ancillary

Note: The potential storage tracks along Second Avenue to 129th Street have been eliminated with the Modified Design

0 200 FEET

Comparison of 2004 FEIS Design and Modified Design
125th Street Tail Tracks

SECOND AVENUE SUBWAY PHASE 2

Figure S-7

Table S-1
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
106th Street Station (See Figure 2-1a)				
Station/ Platform	Shifted about 5-6 feet east	N/A	N/A	*Shifted east to reduce impacts to Empire City Subway duct bank utility line along west side of Second Avenue.
	Shifted about 50 feet south	N/A	*Shifted south to accommodate modified station entrances and connections to ancillary facilities.	N/A
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
Entrance 2	Larger	N/A	*Larger entrance required to provide an elevator and acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
	Shifted slightly	N/A	N/A	*Shifted closer to street corner to avoid recent utility connections for adjacent residences.
Ancillary 1	Relocated	*Relocated to avoid displacement of new six-story school on previous site.	Relocated to better meet ventilation needs by being closer to the proposed platform.	
	Larger	*Larger to accommodate more functions above-ground as updated flood protection standards (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment. Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
106th Street Station (See Figure 2-1a)- Cont'd				
Ancillary 2	Relocated	*Relocated to avoid new seven-story residential and commercial development on previous site.	Relocated to better meet ventilation needs of subway structure by providing a more direct connection to the relocated station box.	N/A
	Larger	*Larger to accommodate more functions above-ground as updated flood protection standards (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment. Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A
116th Street Station (See Figure 2-2a)				
Station/ Platform	Shifted about 30 feet north	N/A	*Shifted to meet revised alignment geometry and location of bellmouth structure.	N/A
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
Entrance 2	Larger	N/A	*Larger entrance required to provide an elevator and acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
	Relocated	N/A	Relocated to better align with the end of the platform.	N/A
Ancillary 1	Relocated	*Relocated to avoid newly designated historic structure (Banca Italiana Commerciale) adjacent to previous site.	Relocated to better meet ventilation needs of the subway structure by providing a more direct connection to the station box.	N/A

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
116th Street Station (See Figure 2-2a)- Cont'd				
Ancillary 1 (Cont'd)	Larger	*Larger to accommodate more functions above-ground such as updated flood protection standards that (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide lower maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A
Ancillary 2	Relocated	N/A	*Relocated to better meet ventilation needs of the subway structure by providing a more direct connection to the station box. New location provides a staging area for the tunnel boring machines (TBMs) operations.	N/A
	Larger	*Larger to accommodate more functions above-ground such as updated flood protection standards that (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide lower maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging for station, bellmouth, and tunnel boring machine (TBM), and would consolidate construction activities, limit work area within Second Avenue, limit costly and timely remobilization activities, limit risk to adjacent buildings, and allow space to support TBM operations.	N/A

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	**Advanced Preliminary Engineering[2]**	**Updated Construction Methods[3]**
125th Street Curve (See Figure 2-3a)				
Bellmouth Structure and TBM Launch Box	Shifted from original location at 120th-122nd Street to new location at 118th-120th Street	N/A	N/A	*Shifted to reduce surface construction impacts by allowing bellmouth structure to be connected with 116th Street Station structure, which also allows for a more compact (i.e., narrower) structure, further reducing cut-and-cover construction needs.
Ancillary	New to project	N/A	*Added to provide intermediate ventilation and emergency egress point, if required. Located on site already identified as construction staging site.	N/A
Tunnel	Modified ground stabilization techniques – use of grouting rather than underpinning	N/A	N/A	*To reduce surface construction impacts and potentially reduce or avoid temporary displacements by conducting ground stabilization from the construction staging site.
	Lowered about 20 feet	N/A	Lowered to connect with lowered 125th Street Station (discussed below) with appropriate track grades.	*Lowered to reduce substantial construction impacts associated with excavation along 125th Street, a heavily traveled commercial corridor, by allowing mined construction instead of cut-and-cover.
Optional Storage Tracks Beneath Second Avenue to 129th Street	Removed from project	N/A	*****Removed optional storage tracks that were considered in 2004 FEIS since advanced operations analysis concluded that the location of these storage tracks is not compatible with the efficient dispatching of trains from storage into revenue service and, therefore is not needed.	N/A
125th Street Station (See Figure 2-4a)				
Station Tunnel Alignment	Lowered 20 feet and shifted 115 feet west	N/A	N/A	*Lowered and shifted west to allow mined construction in bedrock to substantially reduce disruptive cut-and-cover construction impacts otherwise associated with excavation along 125th Street and to reduce impacts with intersection of existing Lexington Avenue (4/5/6) subway line.
Track Configuration	Modified from 3-track to 2-track station	N/A	Modified to facilitate double crossover interlocking system on both sides of station for greater operational flexibility.	*Modified to reduce excavation needs and reduce surface construction impacts along 125th Street.

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Station (See Figure 2-4a) – Cont'd				
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates.	N/A
Entrance 2 – Option 1 *(preferred)*	New to project	N/A	*Could provide higher capacity transfer connection between new subway and existing Lexington Avenue (4/5/6) line. Final option will be selected as design advances.	N/A
Entrance 2 – Option 2 *(Original 2004 Location)*	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates. Larger to accommodate vertical circulation elements required to access deeper station and for transfers between the new subway and existing Lexington Avenue (4/5/6) line.	N/A
Entrance 3	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates. Expanded station to accommodate vertical circulation elements for deeper station and to avoid conflicts with the existing Metro-North Railroad Park Avenue viaduct structure and a Comfort Station, which is a contributing element of the historic Metro-North Harlem-125th Street Station.	N/A
Ancillary 1	Relocated	N/A	N/A	*Relocated west to align with shifted station box. Relocated from 125th Street to 124th Street to shift construction impacts away from busy commercial corridor.

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Station (See Figure 2-4a) – Cont'd				
Ancillary 1 (Cont'd)	Larger	N/A	*Mined station box reduces excavation but provides less volume for ancillary functions. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to facilitate station cavern excavation and structural lining, which require multiple, large work areas to provide contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations.	N/A
Ancillary 2	Relocated	N/A	N/A	*Relocated west to align with the shifted station box. Relocated from 125th Street to 124th Street to shift construction impacts away from busy commercial corridor.
	Larger	N/A	*Mined station box reduces excavation but provides less volume for ancillary functions. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to facilitate station cavern excavation and structural lining, which require multiple, large work areas to provide contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations.	N/A

Table S-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Tail Tracks (See Figure 2-5a)				
Alignment	Two options now considered	N/A	Two options are being considered, pending further operations and planning analysis: - Option 1: two-train per track storage (four trains total) - Option 2 *(preferred)*: three-train per track storage (six trains total)	N/A
	Both options extend farther west to just east or west of Lenox Avenue	N/A	*Extended farther west as a result of advanced operations planning for rail storage needs and to accommodate shift west of 125th Street Station and reconfiguration of station from 3-track to 2-track.	N/A
Ancillary	New to project	N/A	*Extension of tail tracks farther west require an ancillary facility for emergency ventilation and egress, whereas tail tracks under the 2004 FEIS Design were anticipated to be served by ancillary facilities at the 125th Street Station.	N/A

Notes:

1 **Changes in Background Conditions:** Includes changes in updated flood protection standards that require electrical and other critical equipment to be at higher elevations. Includes changes in site conditions where previously identified real estate is no longer suitable or available (i.e., new developments are typically larger and deconstruction would result in increased displacements and additional project costs). Includes consideration of the East Harlem Historic District centered along 116th Street that was designated in 2017.

2 **Advanced Preliminary Engineering:** Subsequent to the 2004 FEIS, site-specific reconnaissance, further engineering, and advanced operations planning, including new ridership modeling and pedestrian flow studies, have been conducted for Phase 2, which resulted in some refinements to the preliminary engineering design. In addition, experience gained from previous NYCT major capital projects have been incorporated into the design and construction methods.

3 **Updated Construction Methods:** To further support one of the Project's goals and objectives to "Minimize community disruption during construction," as stated in the 2004 FEIS, efforts have been undertaken to reduce surface construction impacts, particularly along 125th Street, which is a major commercial center for the area and has seen extensive development in the past decade. The 2004 FEIS Design proposed cut-and-cover construction along much of this corridor, which would have required substantial surface disruption, whereas the Modified Design proposes primarily mined construction within bedrock, thus minimizing surface construction impacts.

*** Indicates primary reason for the change.**

Table S-2

Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Transportation		
Construction • RAIL: Temporary disruptions to Lexington Avenue (4/5/6) subway line; Limited subway platform closures; Temporary speed reductions on Metro-North Railroad service. • TRAFFIC/PARKING: Road detours near construction zones and displaced curbside parking. • SURFACE TRANSIT: Temporary relocation of bus stops on Second Avenue; Potential delays in service from traffic congestion. • PEDESTRIANS: No adverse impacts. **Permanent** • RAIL: No adverse impacts. Beneficial impact from enhanced transit service. • TRAFFIC/PARKING: No adverse impacts. Beneficial impacts from improved transit accessibility. • SURFACE TRANSIT: No adverse impacts. • PEDESTRIANS: Two crosswalk impacts, to be mitigated through crosswalk restriping and widening.	• New protected bicycle lane along Second Avenue. • New Select Bus Service (SBS) on Second Avenue and 125th Street.	**Construction** • RAIL: Deeper 125th Street Station greatly reduces temporary impacts to Metro-North Railroad and Lexington Avenue (4/5/6) subway services. • TRAFFIC/PARKING: No new adverse impacts. • SURFACE TRANSIT: No change with respect to bus services. The new bicycle lane would have temporary detours. • PEDESTRIANS: No new adverse impacts. **Permanent** • RAIL: No new adverse impacts. • TRAFFIC/PARKING: No new adverse impacts. • SURFACE TRANSIT: No new adverse impacts. • PEDESTRIANS: Two additional crosswalk impacts identified, to be mitigated through crosswalk restriping and widening, as with the 2004 FEIS Design.
Social and Economic Conditions		
Construction • Temporary significant adverse impacts due to large construction work zones and related noise, appearance, and modifications to building access. • Mitigation to include extensive community outreach and measures to reduce noise, lighting, and other disruptive elements of construction to the extent practicable. **Permanent** • No adverse impacts. Beneficial impacts related to enhanced transit supporting economic growth and vitality.	• Substantial new residential and commercial development in East Harlem, much of which was predicted in 2004 FEIS. • 2008 Rezoning of 125th Street Corridor, leading to uptick in development. • 2017 Rezoning of East Harlem; encourages greater density along avenues and in transit-rich corridors (including the proposed Second Avenue Subway); modifies the Special Transit Land Use Districts to better align with the Phase 2 Modified Design.	**Construction** • No new adverse impacts. Some entrance and ancillary facilities have been relocated and are larger due to advancements in preliminary engineering and new larger developments on sites previously identified for these facilities. Mitigation measures would be consistent with 2004 FEIS. • Reduced cut-and-cover construction, particularly along 125th Street, would reduce surface impacts. **Permanent** • No new adverse impacts. The Modified Design is compatible with recent land use policy initiatives (e.g., East Harlem Rezoning and current New York City comprehensive plan, *OneNYC*)

Table S-2 (Cont'd)
Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Public Open Space		
Construction • Potential temporary adverse impacts from noise, dust, and access limitations at 11 open space resources in proximity to construction areas. • Adverse noise impacts at Wagner Houses Playground, Wagner Houses Pool, Crack is Wack Playground, Harlem River Drive Park, and Triboro Plaza. • Potential adverse impact to 127th Street greenstreet. **Permanent** • No adverse impacts.	• One new recreational area and five community gardens have been created within one block of the Phase 2 alignment.	**Construction** • Reduced impacts. Modified Design avoids previous noise impacts at parks by eliminating potential storage tracks along Second Avenue to 129th Street. **Permanent** • No new adverse impacts.
Acquisitions, Displacements, and Relocations		
Construction • Potential temporary but long-term (up to 12 months) displacement of 11 properties (278 residents and 35 employees) at 125th Street tunnel curve. • A construction staging site would have required demolition of a building at the curve, displacing 21 residents and an auto repair business. **Permanent** • 12 full and 4 partial acquisitions (estimated displacement of 57 residents, 63 employees). • Compensation and displacement to be conducted in accordance with New York State Eminent Domain Procedure Law (EDPL) and federal Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (Uniform Act).	• Some sites previously identified for acquisition have new or planned larger developments.	**Construction** • Potentially reduced impacts. Updated construction plans would potentially reduce or avoid temporary displacements at the 125th Street curve, pending further advancement of design. • Construction staging site remains, but would now house an ancillary facility for the Modified Design. **Permanent** • 36* to 39 full and 4 to 5* partial acquisitions (estimated displacement of 170 residents, 157 to 505* employees) - Asterisks (*) denotes preferred design option. • While the number of property acquisitions and displacements would be greater under the Modified Design, compensation and displacements would continue to be conducted in accordance with the EDPL and Uniform Act.

Table S-2 (Cont'd)

Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Visual and Aesthetic Resources		
Construction • Temporary adverse impacts due to appearance and visibility of construction activities. Mitigation to include measures to reduce visual impacts, such as high-quality design of sidewalk sheds. **Permanent** • No adverse impacts. Ancillary facility dimensions were estimated at about 25 to 40 feet wide (depending if combined with an entrance), 75 feet wide, 75 feet deep. They were to be designed to be compatible with surrounding urban context, with consultation with the local community.	• Substantial new residential and commercial development in East Harlem.	**Construction** • No new adverse impacts. **Permanent** • No new adverse impacts. Entrances and ancillary facilities would be larger, but would continue to be designed to be compatible with the urban design of the surrounding areas. Ancillary facility heights would range from 45 to 75 feet tall along 125th Street and 90 to 140 feet tall along Second Avenue.
Historic and Archaeological Resources		
Construction • Potential adverse effect to the State and National Register (S/NR)-eligible Metro-North Harlem-125th Street Station from direct connection from new subway. • Potential accidental effects to historic resources during construction. Construction Protection Plans (CPPs) were to be developed to establish protective measures. • Potential adverse effects to archaeological resources, to be confirmed as design advances. • Programmatic Agreement executed among FTA, MTA NYCT, and SHPO. NYC Landmarks Preservation Commission (LPC) is a consulting party for the PA. **Permanent** • Unlikely for any significant contextual effects to occur. However, if above-ground elements of the new subway do change the setting or context of architectural resources, permanent effects could occur, and design would be conducted in consultation with SHPO. • Effects to archaeological resources would have occurred during construction.	• East Harlem Historic District established in 2017 centered along East 116th Street. • Some other historic resources along the Phase 2 alignment have been determined S/NR-eligible. • General archaeological sensitivity zone has been established in the area bounded by East 124th Street, Second Avenue, East 127th Street, and a point east of First Avenue associated with two now-redeveloped cemeteries: the Reformed Dutch Church of Harlem Cemetery and the Harlem African Burial Ground. • The Modified Design requires some modifications to the Area of Potential Effect (APE), which also incorporates some additional potential architectural and archaeological resources.	**Construction** • Physical connection to Harlem-125th Street Station has been removed. Other potential construction effects remain consistent with the 2004 FEIS and would be addressed with CPPs. • A Supplemental Phase 1A Archaeological Study was prepared to evaluate the revised APE and identified mitigation measures consistent with the 2004 FEIS and PA. **Permanent** • No known historic resource or any resource contributing to the new East Harlem Historic District would be affected. • Entrances and ancillary facilities would be larger than in the 2004 FEIS Design, but would be designed to be compatible with the surrounding areas. As with the 2004 FEIS, design elements that could affect historic resources would continue to be coordinated with SHPO.

Table S-2 (Cont'd)
Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Air Quality		
Construction • No adverse impacts related to carbon monoxide (CO) or particulate matter of 10 micrometers or less (PM_{10}). Adjacent to major construction sites, $PM_{2.5}$ could have exceeded interim thresholds in place at that time. • A rigorous mitigation program to reduce emissions and dust was to be developed and incorporated in the Project's Construction Environmental Protection Plan (CEPP). **Permanent** • No adverse impacts. Beneficial impacts from improved transit access and reduced reliance on automobiles.	• 1-hour nitrogen dioxide (NO_2) standard established in 2010, but methodology for evaluated has not yet been implemented. • Blasting activities during construction of Phase 1 of the Second Avenue Subway resulted in odors and emissions that raised community concerns. MTA undertook several studies to assess adequacy of the contractor's Community Air Monitoring Plan and improve its efficacy as a warning system to take corrective action.	**Construction** • Reduced cut-and-cover construction, particularly along 125th Street, would reduce surface construction activities and associated emissions. Reduced excavation needs at the 125th Street Station would reduce truck traffic to remove spoils. • While 1-hour NO_2 projections are not possible based on existing methods and data, exceedances could occur. To mitigate, land-based non-road diesel-powered vehicles and construction equipment rated Tier 3 or higher would be used where conforming equipment is available, as practicable. • The CEPP would incorporate latest air quality mitigation measures. **Permanent** • No new adverse impacts.
Greenhouse Gas Emissions		
• No greenhouse gas (GHG) emissions analysis was conducted in 2004 FEIS as it was not required or typically performed at that time.	• Legal precedent has established that environmental documents should include an assessment of GHG emissions.	**Construction** • As with any large construction project, construction activities of the Modified Design would generate GHG emissions. Use of lower-carbon and renewable materials, reducing travel distances for materials transport, and using biodiesel or renewable energy can reduce GHG emissions. The use of biodiesel blends (B20) will be recommended for future Project contractors. Materials with recycled content, such as slag and flyash used in cement mixes, may be used during construction. The Modified Design would also comply with MTA and NYCT's latest sustainability guidelines. **Permanent** • Transit projects generally provide a benefit with respect to GHG emissions by providing a more energy-efficient means of travel.

Table S-2 (Cont'd)
Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Noise and Vibration		
Construction • Temporary adverse noise impacts were predicted at all stations and shaft sites/spoils removal due to proximity to sensitive uses. Noise from pile-driving would be most severe, but would be for relatively short periods of time (about 3 months) at any location. • Mitigation measures were to include barriers, use of quieter equipment where possible, and time-of-day restrictions, to the extent practicable. Measures were to be incorporated in the CEPP. **Permanent** • No adverse impacts.	• In 2006, FTA issued updated noise and vibration guidance, *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06).	**Construction** • No new adverse impacts. Some construction activities would be relocated due to changes in proposed sites of entrances and ancillary facilities, but would not substantially alter the location of construction work. • Reduced cut-and-cover construction, particularly along 125th Street, would reduce surface level construction and associated noise. Some construction traffic would also be redirected from 125th Street (to avoid this busy corridor) to 124th Street. While associated noise would occur along the new routes, impacts would similar to those identified in the 2004 FEIS and mitigation measures consistent with the 2004 FEIS would continue to be implemented. **Permanent** • No new adverse impacts.
Infrastructure and Energy		
Construction • No adverse impacts. Utilities would be protected or relocated as needed, with service outages minimized to the extent practicable. Utility work would also be conducted in coordination with the NYC Department of Environmental Protection (NYCDEP) and any other applicable agencies and service providers. **Permanent** • No adverse impacts. Utilities would have been restored once the Project is operational. Some utilities would benefit from new infrastructure.	• No substantial changes.	**Construction** • No new adverse impacts. The Modified Design incorporates measures to reduce utility impacts, such as making minor shifts to avoid the Empire City Subway (ECS) utility duct along Second Avenue. The deeper tunnel at 125th Street would also reduce potential conflicts with utilities. • The construction work zones have been modified and incorporate some adjacent areas along side streets. Utility protection and relocation measures, consistent with the 2004 FEIS, would continue to be implemented. • An early utility relocation program would be implemented to address utility issues in advance of station and tunnel construction. **Permanent** • No new adverse impacts.

Table S-2 (Cont'd)
Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Contaminated Materials		
Construction • A preliminary Environmental Site Assessment (ESA) conducted for the full-length Second Avenue Subway identified 21 sites along the Phase 2 alignment recommended for further analysis. Areas to be disturbed were to be further evaluated closer to initiation of construction. Health and Safety Plans (HASPs) were to be developed to protect worker and public safety. All disturbed materials would be handled and disposed of in accordance with all applicable regulations. **Permanent** • No adverse impacts. Hazardous materials associated with operation of the new subway would conform to all applicable regulations and NYCT standards.	• A Contaminated Material Screening Assessment was prepared in November 2017, identifying 29 sites recommended for further investigation.	**Construction** • No new adverse impacts. Phase I ESAs are recommended on all property acquisitions sites, which will determine the need for any further investigations (e.g., Phase II investigations). **Permanent** • No new adverse impacts.
Natural Resources		
Construction • No adverse impacts to geological or soils conditions, terrestrial or aquatic vegetation or wildlife, surface water resources, or groundwater resources. Stormwater runoff would be managed in accordance with a Stomwater Pollutant Discharge Elimination System (SPDES) permit issued by the NYS Department of Environmental Conservation (NYSDEC). **Permanent** • No adverse impacts. The Phase 2 alignment would be within 100- and 500-year floodplains, but would not increase flooding in these areas.	• Floodplain boundaries have been modified following Hurricane Sandy in 2012. NYCT flood protection measures have also been updated. • Peregrine falcon, a state-listed endangered species, was documented within ½-mile from the Phase 2 alignment.	**Construction** • No new adverse impacts. Storm risk management plans for construction zones would adhere to current flood protection standards. **Permanent** • No new adverse impacts. Revised floodplain boundaries and flood protection standards have informed the Modified Design, but the Phase 2 alignment would not affect these floodplains.

Table S-2 (Cont'd)

Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Safety and Security		
Construction • No adverse impacts. HASPs were to be prepared to protect worker and public safety, and construction was to be conducted in accordance with NYCT safety standards, and U.S. Occupational Safety and Health Administration (OSHA) and Mine Safety and Health Administration (MSHA) regulations, as applicable. **Permanent** • No adverse impacts. Subway operations were to comply with NYCT safety protocols, and subway facilities were incorporate applicable safety features and emergency exits.	• No substantial changes.	**Construction** • No new adverse impacts. **Permanent** • No new adverse impacts.
Environmental Justice		
• Phase 2 alignment is within environmental justice communities. However, no disproportionately high and adverse effects would result from the Project, as impacts would be experienced along the full subway alignment in environmental justice and non-environmental justice communities. The new subway would provide a benefit to these communities through enhanced transit services.	• No substantial changes.	• No new disproportionately high and adverse effects. Reduced cut-and-cover construction, particularly along 125th Street would reduce surface construction impacts in this area.
Section 4(f) Evaluation		
• Required use of the S/NR-eligible Metro-North Harlem-125th Street Station for a direct physical connection from the new subway.	• The East Harlem Historic District was established in 2017, centered along East 116th Street, and several new historic resources have been determined S/NR-eligible along the Phase 2 alignment, and several new open space resources have been identified (see "Historic and Archaeological Resources" and "Public Open Space" above).	• No use of any Section 4(f) properties would occur with the Modified Design. The use of the Harlem-125th Street Station has been removed, and no new historic or parkland resources would be affected. Consistent with the 2004 FEIS and PA, consultation with SHPO would be conducted to ensure design elements are compatible with historic and architectural qualities of resources near the Modified Design alignment.

Table S-2 (Cont'd)
Comparison of Impacts of Phase 2 of the Second Avenue Subway: 2004 FEIS Design versus Modified Design

Summary of Impacts of 2004 FEIS Design for Phase 2 of the Project	Notable Changes in Background Conditions for Phase 2	Changes in Impacts of Modified Design for Phase 2
Coastal Zone Consistency		
• The Project was found to be consistent with the policies of the New York City Waterfront Revitalization Program (WRP).	• Revisions to WRP policies were implemented in 2011, primarily related to incorporating sea-level rise considerations. • Coastal Zone Boundary Maps were revised following Hurricane Sandy in 2012, now incorporating portions of the Phase 2 alignment.	• An assessment of consistency with the updated WRP policies was conducted for the Modified Design (see **Appendix D**) and Phase 2 remains consistent with these policies.

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Chapter 1: Project Overview

1.1 INTRODUCTION

Following the recent opening of Phase 1 of the Second Avenue Subway Project (the Project) in Manhattan, the Metropolitan Transportation Authority (MTA) is now advancing Phase 2 of the Project. MTA Capital Construction (MTACC) is responsible for the planning, design, and construction of the Project and related public outreach, and New York City Transit (NYCT) will operate and maintain the service.[1]

A Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) were issued for the full-length Second Avenue Subway in 2004 by the Federal Transit Administration (FTA) in accordance with the National Environmental Policy Act of 1969 (NEPA). The ROD stipulates that following Phase 1, before considering a grant for construction of any segment after the first, MTA and NYCT will conduct a re-evaluation of the FEIS so that FTA can determine whether its conclusions remain valid. In addition, the ROD also requires that MTA and NYCT, in cooperation with FTA, shall initiate a supplemental environmental review of the Project whenever (1) Substantial changes to the Project would result in significant environmental impacts that were not evaluated in the FEIS; (2) new information or circumstances relevant to environmental concerns and bearing on the Project or its impacts would result in significant environmental impacts not evaluated in the FEIS; or (3) where the significance of new impacts is uncertain. As required by the ROD, MTA prepared a preliminary Re-Evaluation for Phase 2 of the Second Avenue Subway Project for review by FTA. After reviewing the Re-Evaluation document, FTA requested that MTA prepare a Supplemental Environmental Assessment (Supplemental EA) for Phase 2.

This Supplemental EA has been prepared in accordance with NEPA and FTA's NEPA implementing regulations at 23 CFR Part 771 to support FTA's review of the proposed design modifications for Phase 2 of the Second Avenue Subway Project, to allow a determination of whether the conclusions of the 2004 FEIS remain valid. This Supplemental EA includes information on the proposed design modifications as well as information on changes to background conditions that have occurred since completion of the 2004 FEIS.

This chapter of the Supplemental EA provides an overview of the full-length Second Avenue Subway Project and its development process (Section 1.2) as well as a review of additional design conducted for Phase 1 of the subway (Section 1.3). Chapter 2 of this Supplemental EA, "Description of Phase 2 Modified Design," provides descriptions of the preliminary design presented in the 2004 FEIS, as well as a detailed description of design modifications now proposed for Phase 2. An evaluation of potential changes in social, economic, and environmental impacts from what was disclosed in the 2004 FEIS are provided in Chapters 3 through 19.

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[1] The Metropolitan Transportation Authority (MTA) and its subsidiary agencies New York City Transit (NYCT) and MTA Capital Construction (MTACC) are hereinafter referred to as MTA.

1.2 PROJECT BACKGROUND: FULL ALIGNMENT

The full-length Second Avenue Subway that was analyzed in the 2004 FEIS would extend about 8.5 miles along Manhattan's East Side, from 125th Street in Harlem to Hanover Square in Lower Manhattan. As described in the 2004 FEIS, given the Project's total capital cost, the Project is to be constructed in four phases, as described below and illustrated in **Figure 1-1**:

- **Phase 1 (constructed and currently in revenue service):** Extends the Broadway (Q) subway line along Second Avenue from about 63rd Street to 96th Street, and includes new stations at 72nd, 86th, and 96th Streets and improvements to the existing Lexington Avenue/63rd Street station that also serves the Sixth Avenue (F) subway line. Revenue service on Phase 1 began in January 2017.
- **Phase 2 (the subject of this Supplemental EA):** Will extend the existing Second Avenue Subway (Q) service north to 125th Street, with new stations at 106th, 116th, and 125th Streets. Anticipated completion in 2029.
- **Phase 3:** Will extend the Second Avenue Subway south of Phases 1 and 2 from the 72nd Street Station/63rd Street area to Houston Street with new stations at Houston, 14th, 23rd, 34th, 42nd, and 55th Streets. Completion date is unknown, depending on availability of funding. The entire line will also become designated as the T subway line.
- **Phase 4:** Will extend the Second Avenue Subway (T) service farther south from Houston Street to Lower Manhattan with new stations at Hanover Square, Seaport, Chatham Square, and Grand Street. Completion date is unknown, depending on availability of funding.

As described in the 2004 FEIS, Phase 2 will be located primarily within the East Harlem neighborhood of Manhattan (see **Figure 1-2**).

1.2.1 PROJECT PURPOSE AND NEED

The purpose of the full Second Avenue Subway Project, as defined in the 2004 FEIS, is to "address the problems and deficiencies in access and mobility associated with an overburdened transit infrastructure that is struggling to accommodate existing customers and the continuing growth on Manhattan's East Side." Phase 2 of the Second Avenue Subway will provide incremental progress toward achieving the Project's purpose.

The Project's purpose statement was derived based on a number of needs identified in the corridor, which, in summary, relate to the high population and density of Manhattan's East Side and its limited rapid rail transit services. Together, these result in overcrowding, overtaxing, and reduced levels of service on the existing subway and bus services. East Harlem, where Phase 2 will be located, is currently only served by one rapid rail transit line (the Lexington Avenue 4/5/6 subway line). East Harlem is also served by a number of bus routes, but these are subject to traffic congestion.

1.2.2 PROJECT GOALS AND OBJECTIVES

During the planning and alternatives development for the Second Avenue Subway, goals and objectives were developed for the full-length Project to meet the Project's purpose statement. These goals and objectives were constructed with input from a Technical Advisory Committee that included a broad range of governmental agencies, a Public Advisory Committee, an MTA internal working group, the Long-Range Planning Framework, and various civic and community

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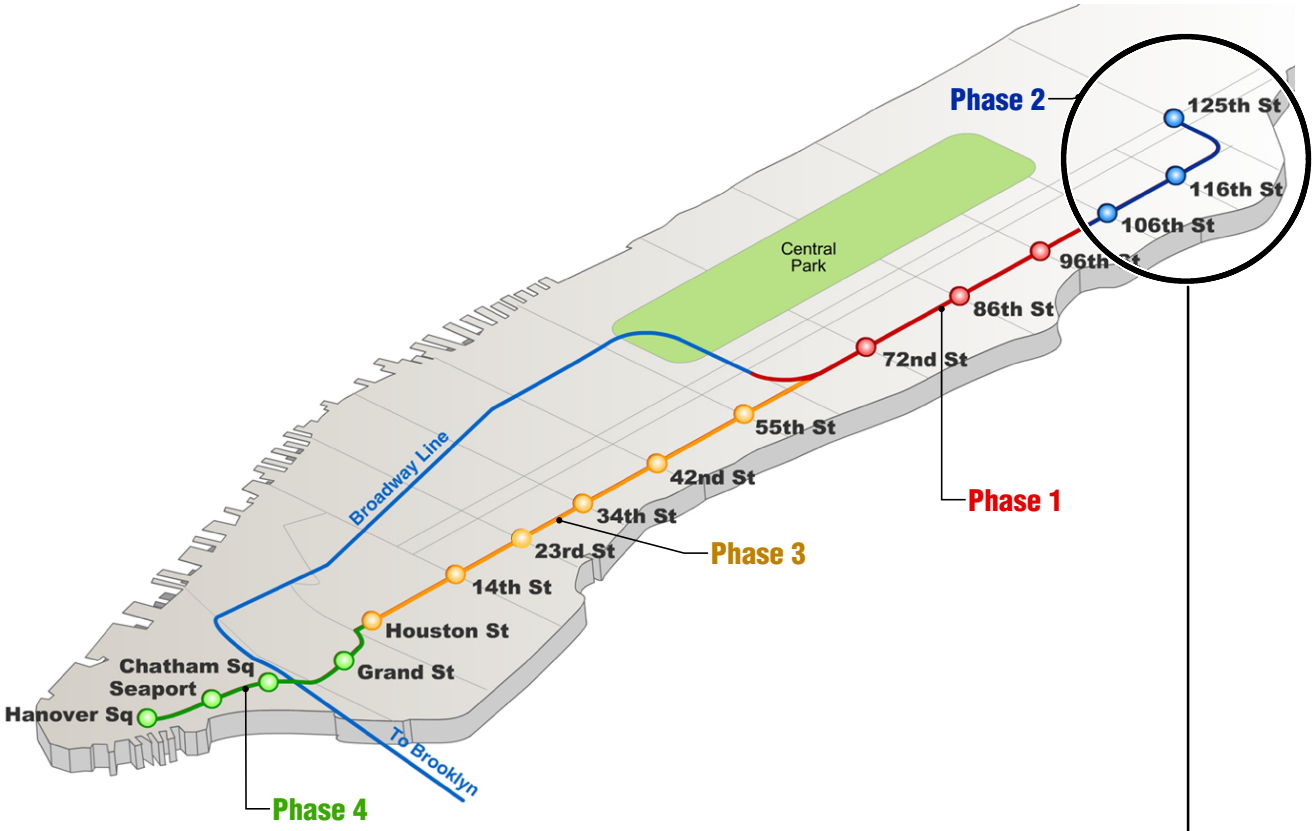
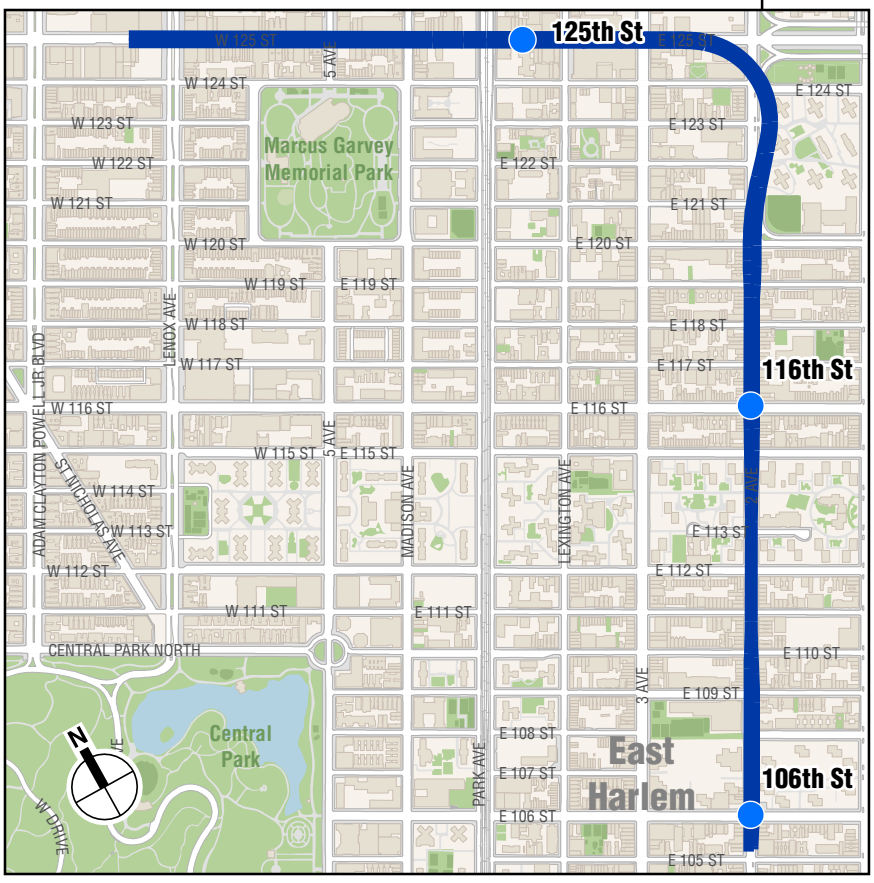
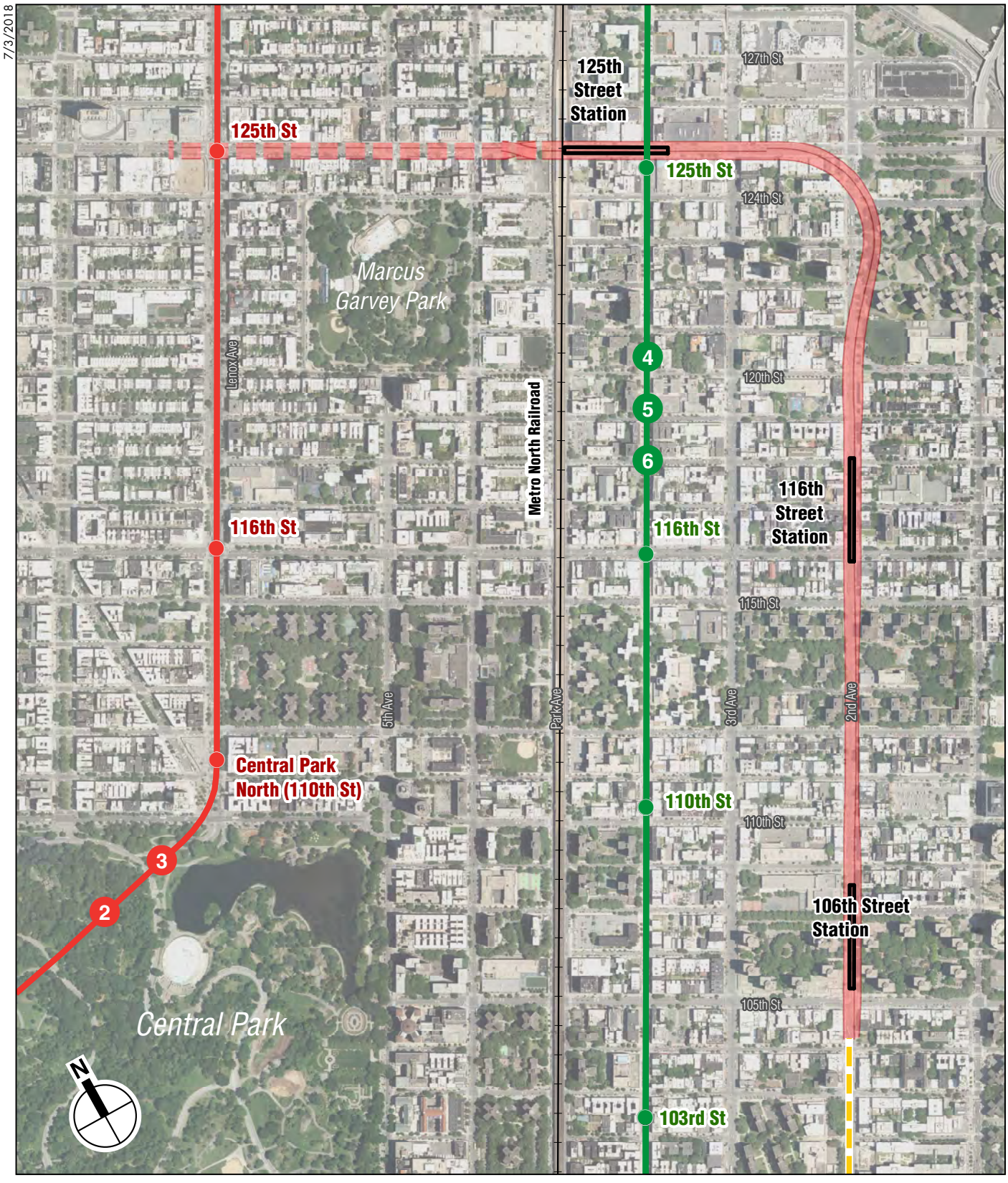




SECOND AVENUE SUBWAY PHASE 2

Project Location
Figure 1-1



SECOND AVENUE SUBWAY PHASE 2

Proposed Second Avenue Subway - Phase 2

Figure 1-2

groups. These goals and objectives were used to develop and evaluate alternatives studied for the Project. The Project's three goals and their supporting objectives were as follows:

- Goal 1: Improve Mobility on the East Side of Manhattan
  - Reduce overcrowding and congestion of current transit lines, particularly the Lexington Avenue line.
  - Improve accessibility to East Harlem, the Upper East Side, East Midtown, the Lower East Side, and Lower Manhattan, focusing on the easternmost areas that are of considerable distance from existing north-south subway service.
  - Extend existing transit routes where appropriate to accommodate transit demands.
  - Accommodate projected future ridership.
  - Improve reliability of existing transit services.
  - Improve integration with other metropolitan-area system programs.
  - Minimize transit delays.
  - Maximize transit safety.
  - Maximize use of transit.
  - Reduce travel time.
  - Reduce traffic congestion.
  - Improve pedestrian conditions.
  - Improve intermodal (bicycle, pedestrian, bus, subway, express bus, limited-stop buses) connections.
- Goal 2: Achieve Economic Feasibility and Cost-Effectiveness
  - Maximize operating and capital cost-effectiveness.
  - Stimulate appropriate economic development and jobs.
  - Maximize off-peak ridership.
  - Support staging and upgrade initiatives.
  - Choose alternatives that can be implemented with available resources.
- Goal 3: Maintain or Improve Environmental Conditions
  - Reduce air pollution—Reduce non-transit vehicle-miles traveled.
  - Reduce energy consumption—Reduce non-transit vehicle-miles traveled.
  - Minimize noise impacts.
  - Minimize property takings and other displacements.
  - Maintain character, and compatibility with land use.
  - Maintain character, and compatibility with neighborhood.
  - Support existing and planned economic activities.
  - Minimize community disruption during construction.
  - Create aesthetically pleasing transit alternatives.
  - Protect historic and archaeological resources, parklands, and environmentally sensitive areas.
  - Develop and monitor sustainable or environmental-friendly design solutions.
  - Minimize impacts on water quality and flooding.
  - Maximize rider security and comfort.
  - Minimize community disruption during construction.

1.2.3 PRELIMINARY ENGINEERING FOR FULL ALIGNMENT

As described in the 2004 FEIS (see FEIS page 2-6), after selection of the full-length Second Avenue Subway alternative, the conceptual design for the Project was developed and refined through an interactive process combining transportation planning, preliminary engineering, environmental analysis, and community outreach. Design criteria were developed to guide the preliminary engineering for the full-length subway, as follows:

- The system should deliver fast, reliable service to provide an attractive alternative to the Lexington Avenue line and relieve overcrowding on that line.
- All new facilities, including tracks and termini, must generally be able to accommodate up to 30 trains per hour[2] in each peak direction.
- The already built segments of the Second Avenue Subway should be used, if practicable. These are located on Second Avenue between 120th and 110th Streets, on Second Avenue between 105th and 99th Streets, and on the Bowery between Canal and Pell Streets.
- The Second Avenue Subway should use the existing bellmouths[3] constructed as part of the 63rd Street Tunnel to provide a West Side service and to facilitate future connections between the 63rd Street line and the Second Avenue line.
- Enclosed transfer connections should be provided to existing stations and other public transit facilities wherever practicable—in other words, when they can be provided at a reasonable cost and when the expected benefits to passengers outweigh the expected adverse impacts.
- The system should be built so as not to preclude, and where possible, accommodate, future connections or extensions to other boroughs in New York City.
- The system should be designed to provide flexibility in its construction methods and contracting process.
- The system should be designed to achieve a balance between ease of construction and passenger convenience in terms of both tunnel depth (a very deep tunnel might be easier to construct, but passenger access time to and from the street would increase), and a balance between speed of operation and passenger convenience in terms of station spacing (having fewer stations allows faster service for those already on the train, but also means pedestrians may need to walk farther to reach a station entrance).
- The system should be designed to minimize environmental and community impacts to the extent practicable and should be reasonably responsive to community concerns. This goal affects construction techniques selected as well as the basic design of the system in terms of station placement and alignment.
- The system must comply with passenger safety requirements, including the National Fire Protection Association (NFPA); all applicable codes; and with the Americans with Disabilities Act (ADA).
- All new facilities should respond to sustainable/green design criteria.

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[2] Once the full-length subway is complete.

[3] A bellmouth is a widened tunnel area. Bellmouths are often constructed at the terminus of a tunnel to allow for future extensions from that point.

These design criteria were the basis for the preliminary engineering conducted for the full-length subway. This design phase identified the alignment for the new subway (including its depth, or vertical alignment) as well as the specific locations of new subway stations, including station shells and platforms. It also identified the preliminary track layout, including the locations of crossovers and storage tracks. The level of design provided information on potential construction methodologies and anticipated permanent subway features to support the environmental review (the 2004 FEIS) and to allow an estimate of potential operations, ridership benefits, capital costs, and ongoing operational and maintenance costs. The preliminary design evaluated in the 2004 FEIS is referred to throughout this Supplemental EA as the 2004 FEIS Design.

The 2004 FEIS stated (see page 2-17 of the FEIS) that detailed designs for stations along the Second Avenue Subway will continue to be developed during preliminary engineering and final design, but basic concepts for each stations were developed for consideration in the 2004 FEIS. This included initial identification of locations for station entrances and above-ground ancillary structures (provided in Chapter 8 of the FEIS). The 2004 FEIS described that the specific location of station entrances would depend on anticipated passenger demand, so that larger entrances could be located where higher ridership demand was expected; proximity to bus transfers; maximizing geographic distribution of station entrances along the alignment; and minimizing environmental impacts related to the station entrances and ancillary facilities. The 2004 FEIS described the general characteristics of the station features, based on the design that was available at that time, and noted that these features would evolve as the design advanced.

1.3 DESIGN DEVELOPMENT AND CONSTRUCTION: PHASE 1

Following completion of the FEIS and ROD in 2004, MTA continued to advance preliminary engineering and design for Phase 1 of the Second Avenue Subway. The advanced preliminary engineering for Phase 1 resulted in better definition of Project elements. In addition, modifications were made to reduce overall construction impacts and costs of Phase 1.

After completion of preliminary engineering, FTA approved Phase 1 for final design followed by construction. During final design and construction, further modifications were made to the design and construction staging for Phase 1 based on additional information collected in the field, a review of constructability and cost considerations, community comments, and other factors. These modifications were analyzed in accordance with NEPA in supplemental environmental documents, including NEPA re-evaluations and one NEPA Supplemental EA related to station entrances for the 72nd Street and 86th Street Stations.

1.4 DESIGN DEVELOPMENT: PHASE 2

In 2017, Phase 1 of the Second Avenue Subway opened and MTA began to advance the design for Phase 2 beyond the preliminary design completed for the 2004 FEIS (the 2004 FEIS Design).

For all new capital projects, MTA follows an established planning and design process when evaluating alternatives and updating designs. The design process for Phase 2 of the Second Avenue Subway was established to advance the original preliminary engineering design that was developed for the 2004 FEIS and update it by incorporating changes in background conditions, advanced preliminary engineering design, and updated construction methods.

Updates to the 2004 FEIS Design were conducted in a workshop format, with participants from the design consultant, MTA, and NYCT. Working groups focused on specific aspects of the

design, and discipline leaders developed lists of design elements that required initial review and further consideration as the design progressed. Working groups during design development included:

- Civil working group
- Utility working group
- Station architecture working group
- Structural working group
- Mechanical working group
- Electrical working group
- Communications working group

The working groups include representatives of appropriate departments, including NYCT Department of Subways and Maintenance of Way, NYCT Capital Program Management, NYCT Operations Planning, MTA Real Estate, and others as needed. Working group meetings are ongoing and are used to ensure that all proposed design alternatives are reviewed internally through MTA's established design process. Additional working groups may be formed during ongoing engineering for Phase 2.

To advance the design for Phase 2 beyond what was completed in 2004, MTA and its design consultant are developing more detailed designs for the alignment, tunnel and station structures, ancillary facilities, including their components (substations, pump stations, signal rooms, communications rooms, fan plants, emergency exits, etc.), and other systems involved in subway operation. The design incorporates the latest New York State building code requirements, industrial standards, NYCT design criteria, NYCT design guidelines and specifications, utility agency requirements, and considerations related to NYCT operations.

During advanced preliminary engineering conducted for Phase 2, MTA and its design consultant collected current, updated information on conditions along the proposed alignment, including locations that the 2004 FEIS Design identified as possible sites for station entrances and ancillary facilities. In some cases, the updated information required changes to the design. For example, some potential sites identified in the 2004 FEIS have new larger developments and are no longer appropriate. To identify new potential sites, MTA is using the site selection process outlined in Chapter 8 of the 2004 FEIS. For more information on this site selection process, see Section 2.2.2, "Station Planning," in Chapter 2 of this Supplemental EA.

In addition, MTA and its design consultants also used the experience gained during final design and construction of Phase 1 to make additional modifications to the design for Phase 2. In this way, design engineers sought to improve the Phase 2 design to improve constructability and the efficiency of future train operations, and to reduce costs and impacts, similar to the design modifications made for Phase 1 after the 2004 FEIS. ✷

Chapter 2: Description of Phase 2 Modified Design

2.1 INTRODUCTION

This chapter provides an overview of the preliminary engineering design for Phase 2 of the Second Avenue Subway that was evaluated in the Final Environmental Impact Statement (FEIS) published in May 2004, and a description of the proposed design modifications for Phase 2 based on advanced preliminary engineering that has been conducted following completion of Phase 1. The preliminary design evaluated in the 2004 FEIS is referred to in this Supplemental Environmental Assessment (Supplemental EA) as the 2004 FEIS Design. The proposed design for Phase 2 based on the advanced preliminary engineering is referred to throughout this Supplemental EA as the Modified Design.

2.2 OVERVIEW AND DEVELOPMENT OF 2004 FEIS DESIGN

2.2.1 SUBWAY ALIGNMENT

The design for Phase 2 of the Second Avenue Subway that was presented in the 2004 FEIS included a two-track alignment beneath Second Avenue from about 105th Street (where the Phase 1 tracks north of 96th Street Station end) to about 124th Street, where the tracks curved west to continue beneath 125th Street. West of the terminal station at 125th Street, storage tracks (referred to as "tail tracks") extended to about midway between Fifth Avenue and Lenox Avenue (or 525 feet west of Fifth Avenue). An additional option for storage tracks extended north along Second Avenue from about 122nd Street to about 129th Street near the Harlem River.

In the 1970s, two tunnel segments were constructed beneath Second Avenue between 99th Street and 105th Street and between 110th Street and 120th Street in anticipation of the new subway planned at that time. However, construction activities were halted due to financial constraints. The 2004 FEIS Design incorporated these tunnel segments into its tunnel alignment, consistent with design criteria established for the Project during its planning phases (see Section 1.2.3 in Chapter 1, "Project Overview," of this Supplemental EA).

The 2004 FEIS Design included three new stations as part of Phase 2, located at 106th Street, 116th Street, and 125th Street between Lexington and Park Avenues. The 125th Street Station provided direct transfers to the existing Lexington Avenue (4/5/6) subway line and a connection to the existing Metro-North Railroad, which runs above Park Avenue, via a subsurface connection to the Harlem-125th Street Station. Each new station included at least two entrances and two ancillary facilities. Preliminary locations for those station entrances and ancillary facilities were described in the 2004 FEIS.

2.2.2 STATION PLANNING

As described in the 2004 FEIS (see FEIS page 2-17), the 2004 FEIS Design included conceptual designs for each station; detailed designs for the stations were to be developed during future design stages. All stations would accessible in accordance with the Americans with Disabilities Act

(ADA) and all would meet life-safety standards of the National Fire Protection Association (NFPA). As described in the 2004 FEIS, entrances to the new Second Avenue Subway stations would consist of a combination of elevators, escalators, and stairs, with every station served by at least one elevator. In addition, each entrance would be covered; this could consist of locating the entrance in the interior of a building or beneath a canopy. The features of the new stations would vary, depending on the volumes of passengers expected at the station and the number of tracks.

In addition to tracks and stations, the new subway line would also require ancillary facilities, such as ventilation facilities, substations, pump rooms, maintenance rooms, fan plants, and emergency access points. The 2004 FEIS said (see FEIS page 2-22) that at each station, new above-ground structures would house the tunnel and station ventilation functions, including fresh air intake, exhaust, emergency smoke exhaust, and relief of air pressure build-up caused by the movement of trains (the "piston" effect). According to the 2004 FEIS, most ventilation structures would also provide emergency egress from the station below and, in some cases, a station entrance could also be included in the same building.

The 2004 FEIS also described the potential size, shape, and design concepts for new station entrances and ancillary facilities, while noting that the specific design of these features were still being developed and were subject to change. The 2004 FEIS described that the specific location of station entrances would depend on anticipated passenger demand, so that larger entrances could be located where higher ridership demand was expected; proximity to bus transfers; maximizing geographic distribution of station entrances along the alignment; and minimizing environmental impacts related to the station entrances and ancillary facilities.

To accommodate the station entrances, ancillary facilities, and emergency exits, the 2004 FEIS described that easements or property acquisitions would be required at every station. Chapter 8 of the 2004 FEIS presented a preliminary list of the specific properties identified for that purpose and noted that "These locations are not final; it is possible that some will shift during continuing engineering from their currently proposed locations to other similar locations in the same vicinity, and/or that additional, similar properties could be required" (FEIS page 8-8).

Chapter 8 of the 2004 FEIS also described the process MTA used to identify the preliminary locations for station entrances and ancillary facilities for the 2004 FEIS Design (see FEIS page 8-9). That section of the 2004 FEIS stated:

> When entrance and ancillary space can be placed in an existing large building, it would occupy portions of the basement and lower levels. In existing small and/or older buildings, however, use of lower-level space could be impractical without acquisition of the entire building because of structural considerations. Typically, it would be necessary to acquire one or several adjacent small buildings to accommodate the necessary subway functions.
>
> The various entrances and ancillary facilities will each pose unique requirements in terms of their dimensions, quantity, and locations. Moreover, the project must comply with all relevant federal, state, and local codes for both station entrances and emergency egresses, and for the venting facilities and other structures. Therefore, the first steps in identifying locations where acquisitions would be needed were to 1) identify the area and/or volume needed for each required system component; 2) use ridership modeling to determine where the anticipated peak demand would occur; and 3) conduct a

> detailed survey of each station area to identify potential properties for acquisition that would best meet the project needs while minimizing the impact to the surrounding neighborhood.
>
> The selection of individual properties required for either full or partial acquisition seeks to limit the impacts to the community and environment by minimizing the need for residential and business displacement to the extent practicable, and to avoid impacts to such community facilities as schools, parks, houses of worship, or libraries to the extent practicable.

Chapter 8 of the 2004 FEIS described the specific site selection process used to identify possible locations for station entrances, ancillary facilities, and emergency exits. That information is presented below.

2.2.2.1 SITE SELECTION PROCESS FOR STATION ENTRANCES

Station entrances would be provided at locations where the largest numbers of passengers are expected, based on ridership modeling information; at or close to major cross streets and destinations; and to facilitate transfers to other subway lines and bus routes. The 2004 FEIS identified preliminary locations for station entrances for the full Project, based on ridership projections and other information available at that time. As part of the 2004 FEIS and preliminary engineering process, for each station entrance location, surveys were conducted to identify any plazas, arcades, vacant properties, and underdeveloped sites that might be appropriate for a new entrance location. Locational constraints were also identified, such as major utilities that might interfere with station elements, and vertical and horizontal alignment constraints governing the location of the station. Existing, pending, and possible future Special Transit Land Use District (STLUD) zoning easements were used wherever they met the Project's needs in terms of volume and location.

The STLUD was established in 1974 along Second Avenue to support construction of the Second Avenue Subway as proposed at that time. The district was mapped on Second Avenue where the future Second Avenue Subway stations were to be located in the 1970s. By encouraging transit entrances off of the sidewalk, it was intended to ease pedestrian flows, provide light and air to underground transit facilities, encourage development that promotes needed pedestrian amenities, coordinate present and future relationship of land uses within the district, and conserve the value of land and buildings. At locations in the mapped special district, developers of new buildings must coordinate with the New York City Department of City Planning and MTA to determine whether MTA wishes to obtain a transit easement, and if so, the developer must provide that easement. MTA has obtained several easements in buildings that were developed after the special district was mapped. However, the 2004 FEIS Design was not the same as the previous, 1970s plan for the new subway, so the STLUD areas were not consistently located in appropriate places for the new subway's stations.

Based on surveys and identified constraints, a preliminary list of possible entrance locations was prepared for the 2004 FEIS Design, with possible locations ranked in descending order of priority as follows:

- Existing STLUD easements (if available);
- Pending and future STLUD easements;
- Vacant lots and buildings;

- Plazas and arcades;
- Possibilities for joint developments (i.e., new construction accommodating an entrance within a larger building being developed for some non-transit use); and
- Open spaces such as parks, where no other feasible and prudent alternative is available, and using all practicable measures to minimize harm to the open spaces.

Where no such sites were available, the use of portions of existing structures with street-level retail facilities was next considered. Any such properties were examined to determine whether portions of the retail spaces could be used without requiring relocation of the entire business. If the dimensions of the space were such that the entire use, and potentially any uses above the retail space, would have to be displaced (typically in older, less structurally solid buildings), acquisition of the entire building and relocation of its occupants was assumed. Acquisition and relocation of buildings containing residential occupants was only considered after all other possibilities were exhausted. Use of historic resources, public open spaces, or community resources was avoided unless no feasible or prudent alternatives were available. To the extent that such properties were considered, additional alternatives analyses were conducted, and a preliminary assessment of impacts was conducted.

During this process, when acquisition of residential or commercial properties would be required because of the absence of other suitable sites, MTA generally sought first to identify large, modern buildings where construction could occur in the buildings' lobbies, basements, or storefronts without requiring displacement of the residents or workers above. If such structures were not available, the smallest buildings (typically 5 stories or smaller) were then identified. Because of the smaller lot size (typically 25 feet wide), age, and structural condition of these buildings, generally it is not possible to use only a portion of the structure while leaving other existing uses in place. Therefore, when sites on small lots were identified, the entire building was identified for acquisition.

2.2.2.2 SITE SELECTION PROCESS FOR ANCILLARY FACILITIES

While locating suitable properties for ancillary facilities allows for more flexibility than station entrances, there are still a number of constraints regarding their siting. For example, the tunnel ventilation facilities must be located within a certain limited distance from each end of the station platform. As part of the 2004 FEIS and preliminary engineering process, the preliminary selection of properties for the Project's ancillary facilities was made to account for these constraints.

As with station entrances and emergency egress facilities, site selection for ancillary facilities consisted first of conducting site surveys within the various station areas. According to New York City's Zoning Resolution at that time, the easement volumes provided under the STLUD could be used only for station access and pedestrian circulation purposes. Therefore, STLUD easements were not considered for ancillary facilities that did not provide a pedestrian amenity. Generally, the site selection process for ancillary facilities considered use of the following types of properties in descending order of priority:

- Vacant lots;
- Vacant or deteriorated building sites;
- Open spaces (non-parkland);
- Plazas and arcades;

- Retail or commercial properties; and
- Residential properties or community resources.

As with station entrances, use of historic resources, parkland, religious institutions, and other community facilities was avoided unless no feasible or prudent alternatives were available. An effort was also made to minimize residential displacements within the locational constraints of siting these ancillary facilities. Consideration was also given to whether the site could be redeveloped after construction of the ancillary facility space for residential, commercial, or some other use in addition to the transit use.

2.2.2.3 SITE SELECTION PROCESS FOR EMERGENCY EGRESS

In addition to regular station entrances, the 2004 FEIS noted that emergency staircases would be provided for evacuation of stations and tunnels and to allow access by emergency services personnel in emergency situations. The number and location of emergency egress facilities is largely governed by federal, state, and city codes. Generally, site selection for emergency egress facilities included considering use of the following types of properties in descending order of priority:

- Pending and future STLUD easements, or existing STLUD easements that have agreements allowing such use;
- Incorporation in property acquired for entrances or ancillary facilities; and
- Plazas and arcades.

2.2.3 CONSTRUCTION METHODS AND ACTIVITIES

2.2.3.1 OVERVIEW

The 2004 FEIS described the activities associated with construction of the new subway through a variety of geological conditions. As described in Chapter 3 of the 2004 FEIS ("Description of Construction Methods and Activities"), the primary activities would be a combination of tunneling with Tunnel Boring Machines (TBMs), mining underground, and cut-and-cover excavation from the surface.

2.2.3.1.1 Excavation with TBM

Where possible, the new subway would be conducted using underground methods, primarily through the use of TBMs to drill the new tunnel through Manhattan's hard bedrock. The use of TBMs for tunnel excavation would greatly reduce the amount of construction activity at the surface in comparison to an open excavation. For this type of tunnel, a large shaft would be excavated and the TBM (or TBMs) would be assembled in the shaft. From that point, the TBM would tunnel forward through rock, with the excavated material being removed behind the machine through the shaft. The TBM shaft site would serve as a major construction support site during the tunneling activity, with excavated materials (referred to as spoils) being removed from the tunnel, workers entering and exiting the tunnel, and construction materials being delivered to the tunnel at that location.

2.2.3.1.2 Mining

In some locations, excavation would occur underground through mining rather than by using a TBM. For example, mining would be used to excavate rock to create some station areas. It could

also occur for short tunnel segments, where use of a TBM is not economical. Mining can include hard rock mining using controlled drill and blast methods and soft ground mining with ground improvement:

- Hard rock mining usually involves the use of controlled drilling and blasting, in which a grid of small holes is drilled and explosives are inserted and then detonated sequentially. After each blast, the fragmented rock is removed and the perimeter walls may be supported by a combination of rock bolts, welded wire fabric, steel, and/or sprayed shotcrete (a type of concrete).
- Soft ground mining typically involves the use of mechanical excavators rather than drilling and blasting. Generally, the soil is first hardened, typically through the injection of grout or through temporary freezing, to maintain its stability during excavation. This process of hardening the soil is often referred to as "ground improvement."

2.2.3.1.3 Cut-and-Cover Excavation

In some locations where the tunnel would not be in bedrock, cut-and-cover construction would be used to excavate the subway tunnel or stations. This type of construction involves excavating from the surface, with a temporary deck above the excavation area to allow the affected area of roadway or sidewalk to continue to be used while work is under way below ground. Once the tunnel is complete, the area above would be permanently backfilled, and the road and sidewalk restored to their permanent condition.

For areas that are excavated in soil, support walls would be constructed along the edges of the excavation. Typically, these would be either slurry walls or walls constructed of secant piles:

- Slurry walls are reinforced concrete walls constructed using a slurry (wet mix) of bentonite, a natural, clay-like liquid material. This involves excavating a trench where the wall will be, filling it with slurry, lowering a large cage of reinforcing steel into the slurry-filled trench, and then piping concrete into the trench that displaces the slurry. Construction of slurry walls requires a slurry plant near the construction site where the bentonite is mixed, pumped, stored, and cleaned for reuse.
- Secant pile walls are constructed by drilling piles that interlock to form a continuous wall. This process also involves the use of steel reinforcing cages and concrete as the wall is constructed.

Cut-and-cover construction involves establishing a construction zone over and around the excavation area, with workers and materials accessing the excavation from the surface in that zone. The decking placed above the excavation can be moved to create a larger open area, when needed, and then replaced. The 2004 FEIS noted (FEIS page 3-10), "Because of the disruption that cut-and-cover construction can cause, it would only be used in areas where this is inadequate cover [i.e., soil above the tunnel] to allow safe and stable underground mining."

2.2.3.1.4 Utility Relocation

For areas that are excavated from the surface rather than mined, construction would begin with relocation of utilities. Buried utilities within the excavation zone would either be supported in place or moved to an area outside the excavation area. This would require excavation of trenches within the street and sidewalk to allow connection to existing utilities and laying of new pipes, cables, etc.

2.2.3.1.5 Stations

At all new subway stations for the Second Avenue Subway, including those that are mined and those that are excavated using cut-and-cover construction, construction activities would occur at the surface to create openings for the new entrances, and to construct station entrance buildings and ancillary buildings. At station construction sites, construction zones would be established where workers would move into and out of the station, deliveries would be made, and excavated materials would be removed. In addition, existing buildings adjacent to excavated areas may need to be supported while construction is occurring nearby (see FEIS page 3-16).

2.2.3.1.6 Construction Zones

As described in the 2004 FEIS (see FEIS page 3-22), construction zones would be established at each station and around shaft sites where the TBMs would be inserted and removed. At the staging areas, construction machinery and other equipment and materials would be delivered, stored, and operated. At each staging area, conveyors, trucks, substations, exhaust fans, sidewalk sheds, construction fencing, traffic lane closures, and other similar equipment are likely to result in noise, air emissions, traffic, and aesthetic effects on their surroundings.

Where construction is occurring beneath the street, the construction zone would be located across half the width of the street, and would extend for a block past the station's limits on either end. The 2004 FEIS noted that if off-street areas can be identified for staging areas, it is possible that less space on the street would be required (see FEIS page 3-25). In addition, the 2004 FEIS noted (FEIS page 3-12) that during construction it might be necessary to close off portions of side streets to through traffic adjacent to the station construction zones. This would accommodate limited construction on these side streets for retaining walls, and would allow portions of these streets to be used if needed to store construction materials that are trucked to the site, accommodate worker support areas, accommodate utility diversions, and other similar activities. On all side streets adjacent to station construction, areas of up to 100 feet in length could be required for staging and construction activities. On streets where entrances would be constructed, the 2004 FEIS said that this construction zone might extend farther, typically up to 200 feet.

In the construction zones, sidewalk widths on each side of the street would also typically be reduced, but pedestrian circulation would be maintained and temporary signage highlighting entrances to stores, businesses, or other activities would be provided.

At all construction locations for the Second Avenue Subway, a Maintenance and Protection of Traffic (MPT) Plan would be developed in coordination with the New York City Department of Transportation (NYCDOT) to maintain traffic flow near the construction zones and to ensure that a seven-foot sidewalk is maintained at all times. The MPT Plans may entail the use of parking lanes, and potentially the use of portions of the sidewalk for moving traffic, so as to allow traffic to be rerouted around the construction zone.

The 2004 FEIS and Record of Decision set forth noise mitigation requirements that construction contractors would be required to meet. As stated in the 2004 FEIS (FEIS page 12-51), techniques that may be implemented to meet these requirements may include enclosing areas where spoils from tunnel operations would be loaded into trucks, or at station locations where spoils removal would take place for long durations during the daytime or at night; and placing some equipment or operations below grade in shielded locations.

2.2.3.1.7 Schedule

Total construction duration for the Project was estimated at 16 years. It was anticipated that construction of each phase could overlap with the previous phase(s), depending on the availability of funding. Phase 1 was estimated at seven years, Phase 2 at seven years, Phase 3 at nine years, and Phase 4 at seven years. At each new station, construction was estimated to affect a three- to five-block area for three to five years.

2.2.3.2 EAST HARLEM ALIGNMENT

The 2004 FEIS Design involved construction of the new Second Avenue Subway alignment from the end of the tunnels constructed in Phase 1 under Second Avenue at approximately 105th Street to a new terminus under 125th Street approximately 525 feet west of Fifth Avenue. The new alignment under Second Avenue in East Harlem would make use of the existing tunnel segments built in the 1970s, which are located between 99th and 105th Streets and between 110th and 120th Streets. The segment between 99th and 105th Streets was completed with tracks as part of Phase 1 and is currently being used for train storage north of the 96th Street Station.

From 105th Street to about 122nd Street, the new tunnel in the 2004 FEIS Design would have been constructed by cut-and-cover construction, using the existing 1970s tunnel segment where possible. This would involve excavation of the 106th Street station area and adjacent tunnel from 105th to 110th Street, reuse of the existing tunnel from 110th to 115th Street, construction of the new 116th Street Station from 115th to 119th Street within the existing tunnel segment (including demolition and reconstruction of the existing tunnel structure), and cut-and-cover excavation north of the 116th Street Station from 120th to 122nd Street. The existing tunnel segment is not deep enough to make use of a TBM feasible for the new tunnel sections in this area.

In the 2004 FEIS Design, the curve between Second Avenue and 125th Street (referred to as the 125th Street curve) would have been constructed by a TBM operating beneath the existing buildings that were at the southwest corner of the Second Avenue and 125th Street. As described in the 2004 FEIS (see FEIS page 3-35), the TBM would have been inserted through a shaft within 125th Street at about Third Avenue and removed from the cut-and-cover excavation area in Second Avenue generally located between 120th Street and midway between 121st and 122nd Street. Spoils would have been removed from the tunnel via the Third Avenue shaft. Because the 125th Street curve was to be in soil beneath existing structures, protective measures, such as ground improvement by injection of grouting, was anticipated in this area to increase the strength and decrease the permeability of the soil.

On 125th Street from Third Avenue (where the 125th Street curve ended) to just west of Fifth Avenue, the 2004 FEIS Design would have involved use of a TBM to excavate the tunnel, in combination with cut-and-cover construction for the 125th Street Station itself (from Third Avenue to Park Avenue). This combination was proposed to reduce the amount of cut-and-cover construction required on 125th Street (see FEIS page 3-35). This TBM would have been removed from a shaft in 125th Street at the end of the storage tracks, approximately 525 feet west of Fifth Avenue.

The 2004 FEIS Design involved constructing the new 125th Street Station using cut-and-cover techniques beneath and beside the existing Lexington Avenue line 125th Street station. The new station would be perpendicular to the existing station, with a new mezzanine level and new platform and track level beneath the existing station. The 2004 FEIS stated that this work would

be done using a combination of cut-and-cover and traditional mining techniques. Escalators and stairs were to be constructed from the new mezzanine up through the lower level Lexington Avenue line station platforms, and escalators were also to be built from the new mezzanine to the upper level of the Lexington Avenue line station. As much of this construction was going to occur immediately under existing, active tracks, the 2004 FEIS stated that subway service disruptions would occur, including track outages (i.e., track closures where subway service would not operate) and limited platform area closures. The 2004 FEIS stated that construction work for the new 125th Street Station would affect service on the Lexington Avenue line on selected nights and weekends for approximately two years.

In addition, the cut-and-cover construction activity for the new 125th Street Station in the 2004 FEIS Design would have involved underpinning the Park Avenue viaduct structure at the Metro-North Harlem-125th Street Station. This might have required speed reductions for Metro-North commuter rail service.

The 2004 FEIS Design also included possible storage tracks (tail tracks) under Second Avenue from about 125th Street to 129th Street. If these were included, they would have been constructed using cut-and-cover methods.

2.3 MODIFIED DESIGN FOR PHASE 2

In 2017, Phase 1 of the Second Avenue Subway opened and MTA began to advance the design for Phase 2 beyond the preliminary design completed for the 2004 FEIS. As discussed in Chapter 1 (see Section 1.4), MTA followed its planning and design process for capital projects to review and update the design. The design process for Phase 2 of the Second Avenue Subway was established to advance the original preliminary engineering design that was developed for the 2004 FEIS and update it by incorporating changes in background conditions, advanced preliminary engineering design, and updated construction methods.

As a result, MTA is now proposing some modifications to the Phase 2 design from what was presented in the 2004 FEIS. This modified design for Phase 2, referred to throughout this Supplemental EA as the Modified Design, is described below. **Table 2-1** at the end of this chapter provides a summary of Phase 2 design modifications.

This section of the Supplemental EA describes the reasons for the design refinements (Section 2.3.1), and the design refinements proposed for the overall Phase 2 alignment of the 2004 FEIS Design as part of the Modified Design, beginning at the south (Section 2.3.2). Following this section, Section 2.3.3 describes design refinements to ancillary facilities and station entrances, also beginning at the south (106th Street Station). Finally, Section 2.3.4 describes changes in construction methods proposed for the Modified Design.

2.3.1 REASONS FOR PROPOSED DESIGN CHANGES

Based on the design and planning process described in Chapter 1, the preliminary design of Phase 2 of the Second Avenue Subway that was presented in the 2004 FEIS (the 2004 FEIS Design) has been refined. There were three primary reasons for modifications to the preliminary engineering:

- **Changes in Background Conditions:** Since the 2004 FEIS and Record of Decision were completed, some background conditions have changed. Following Hurricane Sandy in 2012, NYCT flood protection design standards were updated and now require critical transit-related

equipment to be located at higher elevations;[1] some sites previously identified for entrances and ancillary facilities have been or are planned to be developed with new, larger buildings, which would result in more displacements and complexities in demolition than the previous design anticipated; a rezoning of the 125th Street corridor went into effect in 2008, which encouraged and resulted in large commercial development; an area-wide rezoning of East Harlem was approved in November 2017; and the New York State Office of Parks, Recreation and Historic Preservation has identified a new East Harlem Historic District, centered along East 116th Street from Park Avenue to the FDR Drive, as eligible for listing on the State and National Register of Historic Places (S/NR). These changes in background conditions are described in the subsequent environmental chapters of this Supplemental EA.

- **Advanced Preliminary Engineering:** Subsequent to the 2004 FEIS, site-specific reconnaissance, further engineering, and advanced operations planning (including updated ridership modeling and pedestrian flow studies) have been conducted for Phase 2. The advanced preliminary engineering also incorporates experience gained from other NYCT major capital projects, including construction of Phase 1 of the Second Avenue Subway, the South Ferry terminal station on the No. 1 subway line, and extension of the No. 7 train to the new 34th Street–Hudson Yards Station. These projects have provided valuable experience for continually improving efficiency and cost-effectiveness of construction means and methods, and for informing design of the subway alignment and its ancillary components.
- **Updated Construction Methods:** During the advanced preliminary engineering, and building on the experience developed during construction of Phase 1, MTA has identified modifications to the Phase 2 design to reduce the Project's impacts during construction. This is consistent with the overall goal of minimizing community disruption during construction and with the design criterion of minimizing community and environmental impacts (see Chapter 1, Section 1.2.3). During development of the 2004 FEIS Design, MTA's design engineers sought to reduce the amount of cut-and-cover construction along 125th Street to reduce construction impacts (see FEIS page 3-35) and therefore proposed TBM construction of the tunnel beneath 125th Street in combination with the cut-and-cover excavation for the new station. The Modified Design includes design refinements to further reduce surface construction activity on 125th Street, which is a growing retail and office corridor for East Harlem, Harlem, and Morningside Heights that has been the focus of several New York City initiatives intended to spur commercial growth (see discussion in Chapter 4, "Social and Economic Conditions," Section 4.3). It is also an important crosstown (east-west) traffic route that connects to the RFK Bridge and Henry Hudson Parkway. This wide, two-way street is used by many NYCT bus routes (M100, M101, M103, Bx15, and the M60 Select Bus Service). Recognizing that the 2004 FEIS Design's cut-and-cover construction for the 125th Street Station would have had substantial impacts, MTA explored alternative construction means and methods that could avoid it. As design has advanced, the engineering team has further attempted to avoid or minimize cut-and-cover construction and has made refinements that would allow for mining for the full 125th Street corridor (except for above-ground elements, such as entrances and ancillary facilities) (see Section 2.3.4, "Changes in Construction Methods and Activities," of this chapter for more information).

[1] NYCT Flood Resiliency Design Guidelines (DG312), Issue 7, was most recently updated in July 2017.

2.3.2 OVERVIEW OF CHANGES IN THE PHASE 2 ALIGNMENT

The overall Phase 2 alignment in the Modified Design is generally consistent with the 2004 FEIS Design. As with the 2004 FEIS Design, the Modified Design would include two tracks beneath Second Avenue that would extend from the existing Phase 1 tail tracks at about 105th Street and continue to about 120th Street, where the alignment would curve west to 125th Street. The alignment would continue beneath 125th Street and would have tail tracks extending past the terminal station from about Park Avenue to near Lenox Avenue (see **Figure 1-2** in Chapter 1, "Project Overview"). The exact terminus of the tail tracks depends on design options for storage and operational needs, as discussed in Section 2.3.2.5, "125th Street Tail Tracks," of this chapter.

Like the 2004 FEIS Design, the Modified Design would have three new stations: at 106th Street and Second Avenue, 116th Street and Second Avenue, and 125th Street between Lexington and Park Avenues. The 125th Street Station would provide direct transfers to the existing Lexington Avenue (4/5/6) subway line and provide connections to Metro-North Railroad at the Metro-North Harlem-125th Street Station at Park Avenue. All three new stations would be accessible in compliance with the Americans with Disabilities Act (ADA).

Each alignment segment is illustrated in **Figures 2-1a through 2-5a** and corresponding **Figures 2-1b through 2-5b** provide photographs of entrance and ancillary facility locations that support the discussions in later sections.

2.3.2.1 106TH STREET STATION

As in the 2004 FEIS Design, the Modified Design for the 106th Street Station would include a two-track island platform with a mezzanine level above the track level. The platform and mezzanine level would be located north of 106th Street to avoid major utility lines that run beneath 106th Street. The Modified Design includes the following refinements from the 2004 FEIS Design:

- The proposed island platform has been shifted approximately five to six feet east of the Second Avenue centerline as a result of updated construction methods to reduce impacts to the existing Empire City Subway duct bank (utility line) that runs along the west side of Second Avenue.
- The station has been shifted approximately 50 feet south to accommodate modified station entrances and connections to ancillary buildings, discussed in Section 2.3.3 (see **Figure 2-1a**).
- Station entrances are larger, and ancillary facilities have been shifted and are larger (see Section 2.3.3).

2.3.2.2 116TH STREET STATION

Consistent with the 2004 FEIS Design, the running tracks and the 116th Street Station in the Modified Design would use an existing tunnel box segment—referred to as "Section 13"—which was constructed in the 1970s as part of an earlier plan for a Second Avenue Subway that was subsequently halted as a result of financial constraints. The existing Section 13 tunnel box is located under Second Avenue between 110th and 120th Streets. It includes space for three tracks, originally providing for a storage and inspection track as well as a northbound and southbound track. The 1970s plan for the Second Avenue Subway did not include a 116th Street Station, however, so this track section was not constructed to accommodate a station. Consistent with the 2004 FEIS Design, this space will now be used for the 116th Street Station with a two-track island platform. Therefore, a portion of the existing Section 13 tunnel segment would be demolished and

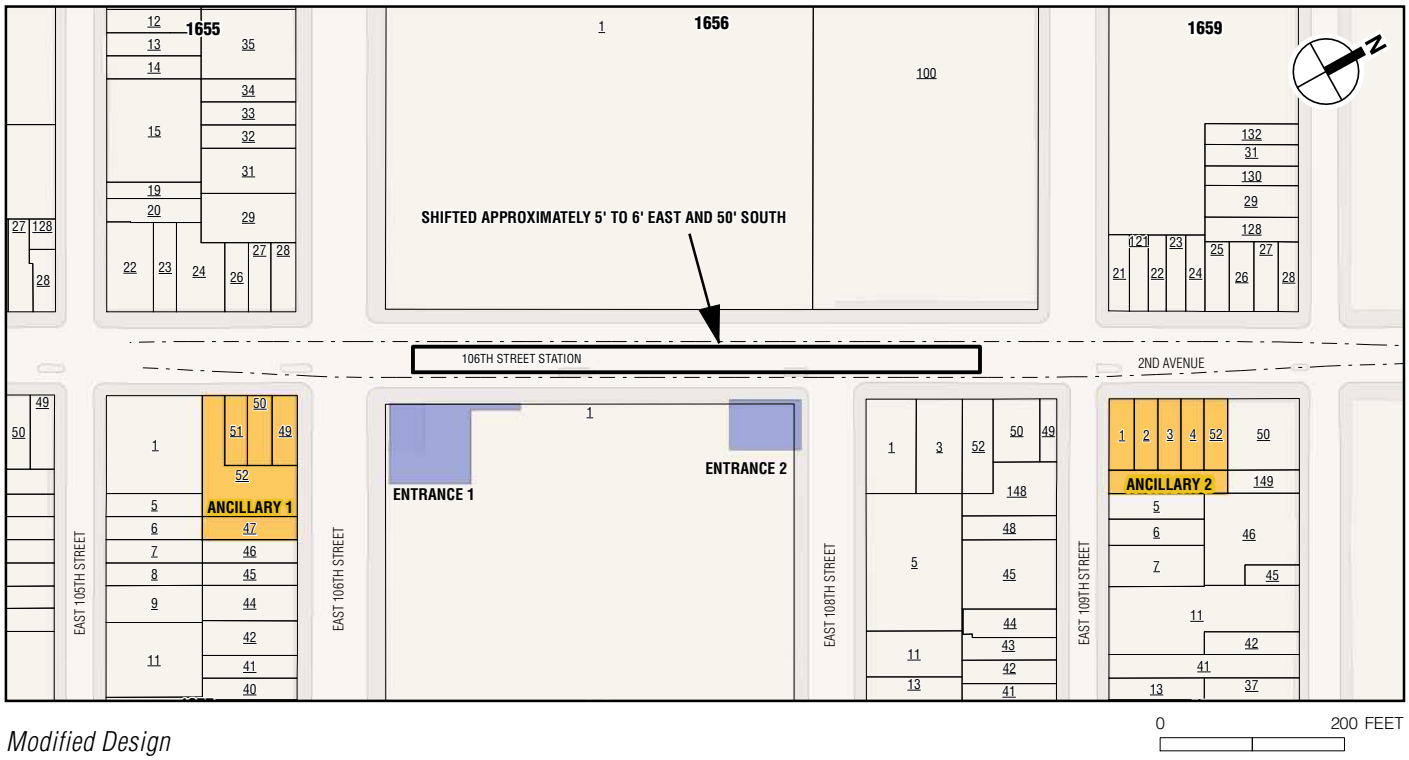
6/20/2018

2004 FEIS Design

Entrance

Ancillary

Station Platform



Modified Design

Entrance

Ancillary

Station Platform

Comparison of 2004 FEIS Design and Modified Design
106th Street Station
Figure 2-1a

SECOND AVENUE SUBWAY PHASE 2

3.19.18

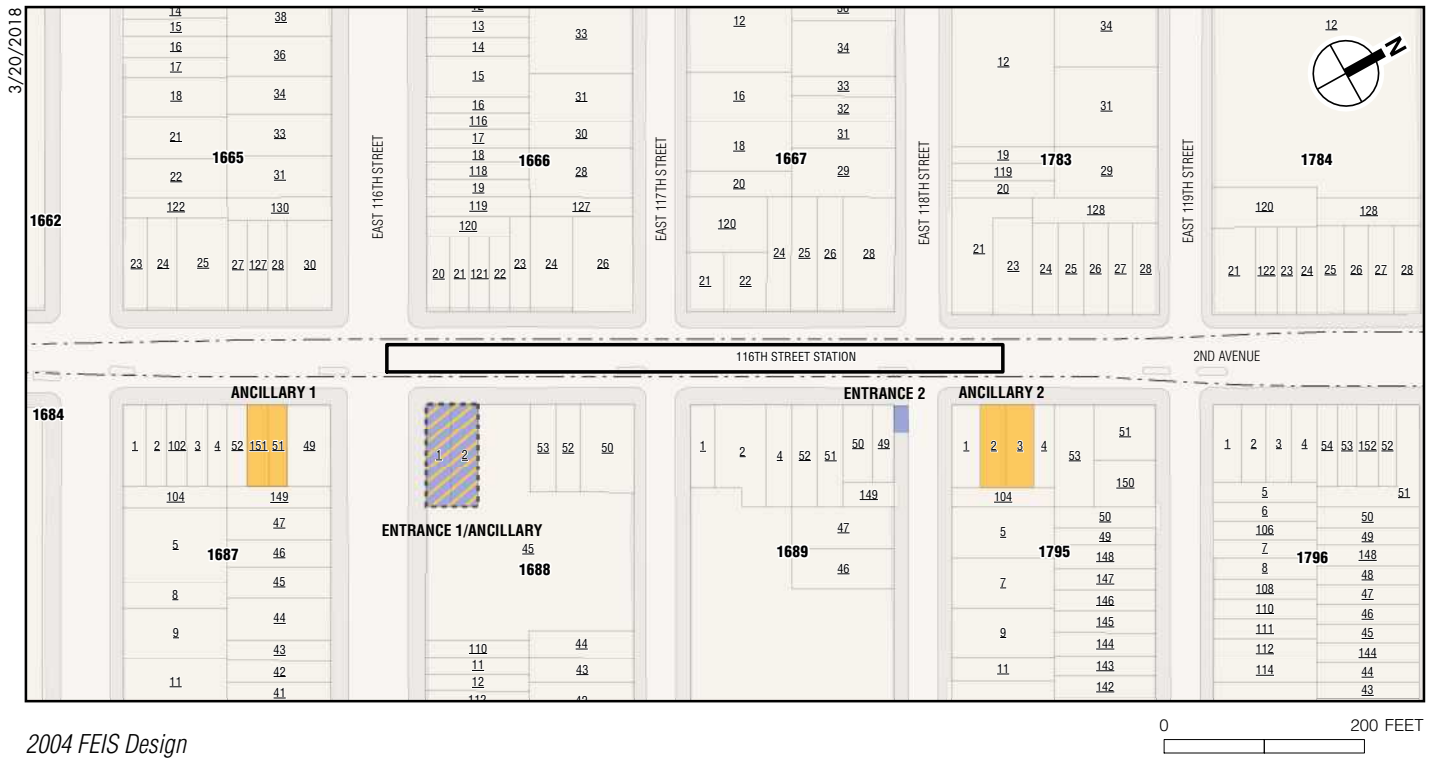
Ancillary Facility 1

Ancillary Facility 2

Entrance 1

Entrance 2

106th Street Station
Entrance and Ancillary Facility Sites
Figure 2-1b

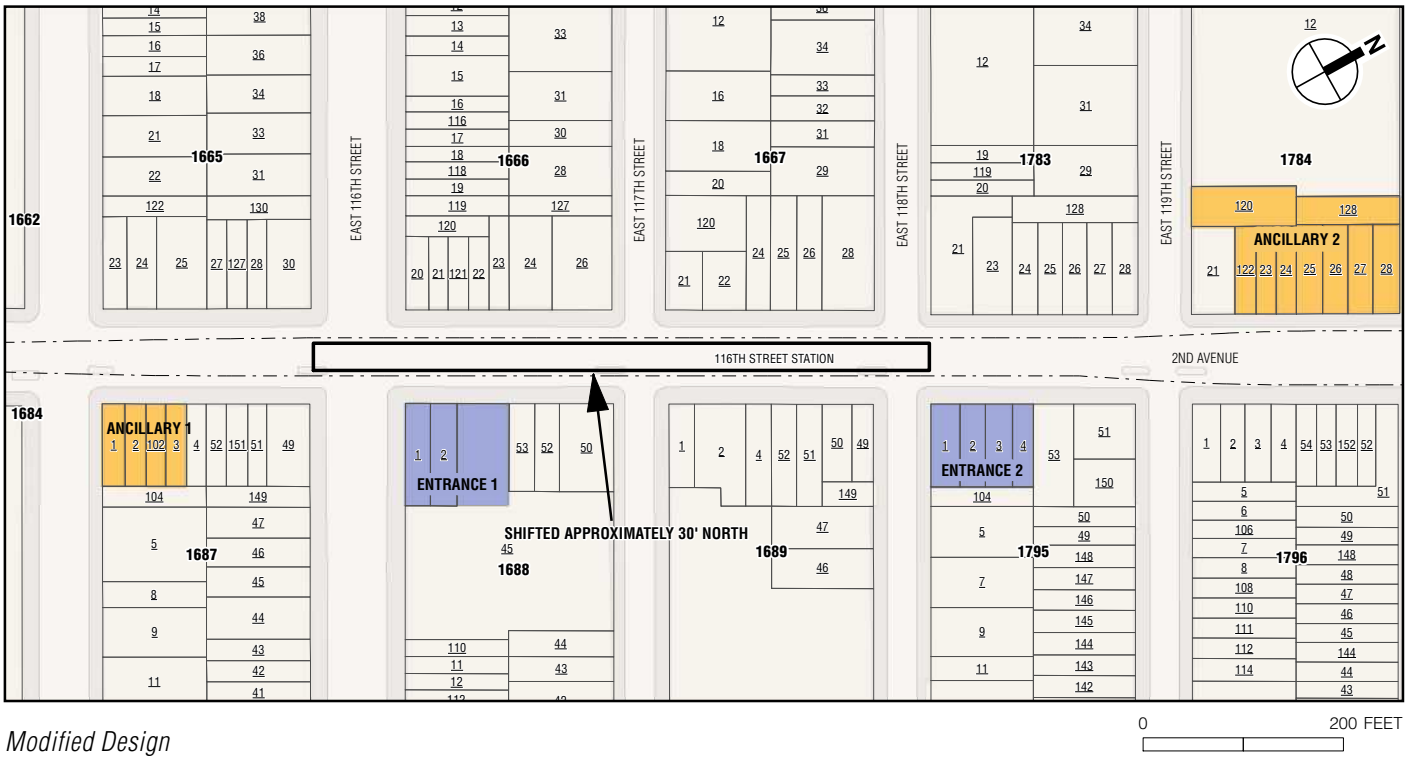


2004 FEIS Design

Ancillary

Entrance/Ancillary

Station Platform



Modified Design

Entrance

Ancillary

Station Platform

Comparison of 2004 FEIS Design and Modified Design
116th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure 2-2a

3.19.18

Ancillary Facility 1

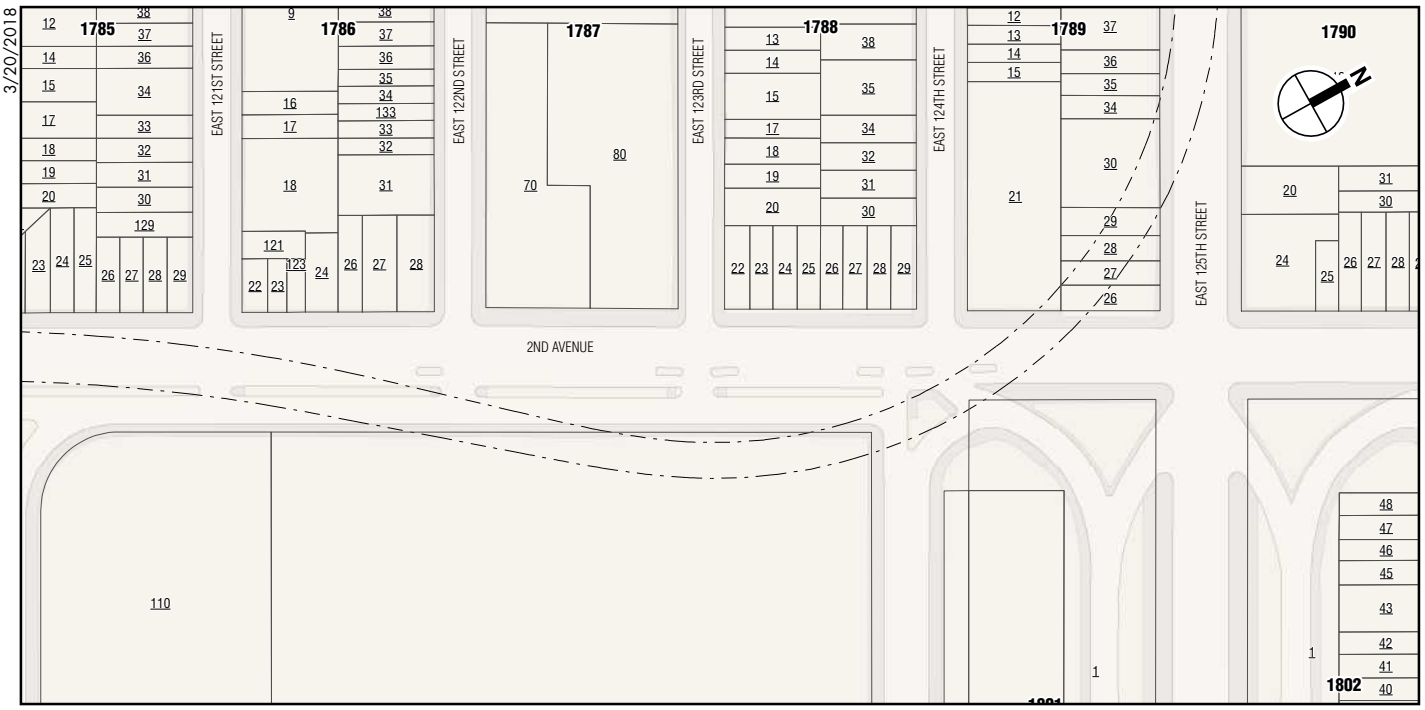
Ancillary Facility 2

Entrance 1

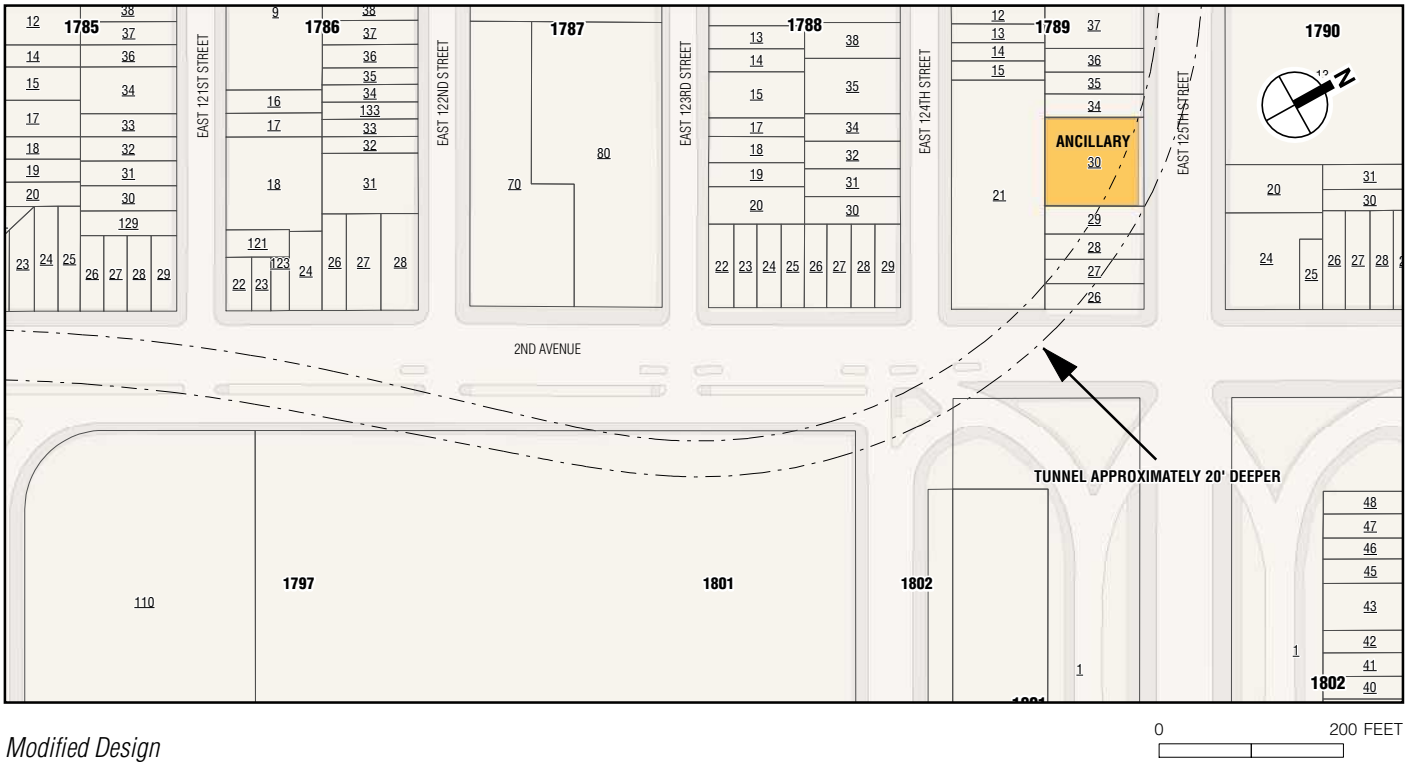
Entrance 2

116th Street Station
Entrance and Ancillary Facility Sites
Figure 2-2b

3/20/2018



2004 FEIS Design



Modified Design

Ancillary

Comparison of 2004 FEIS Design and Modified Design
125th Street Curve

SECOND AVENUE SUBWAY PHASE 2

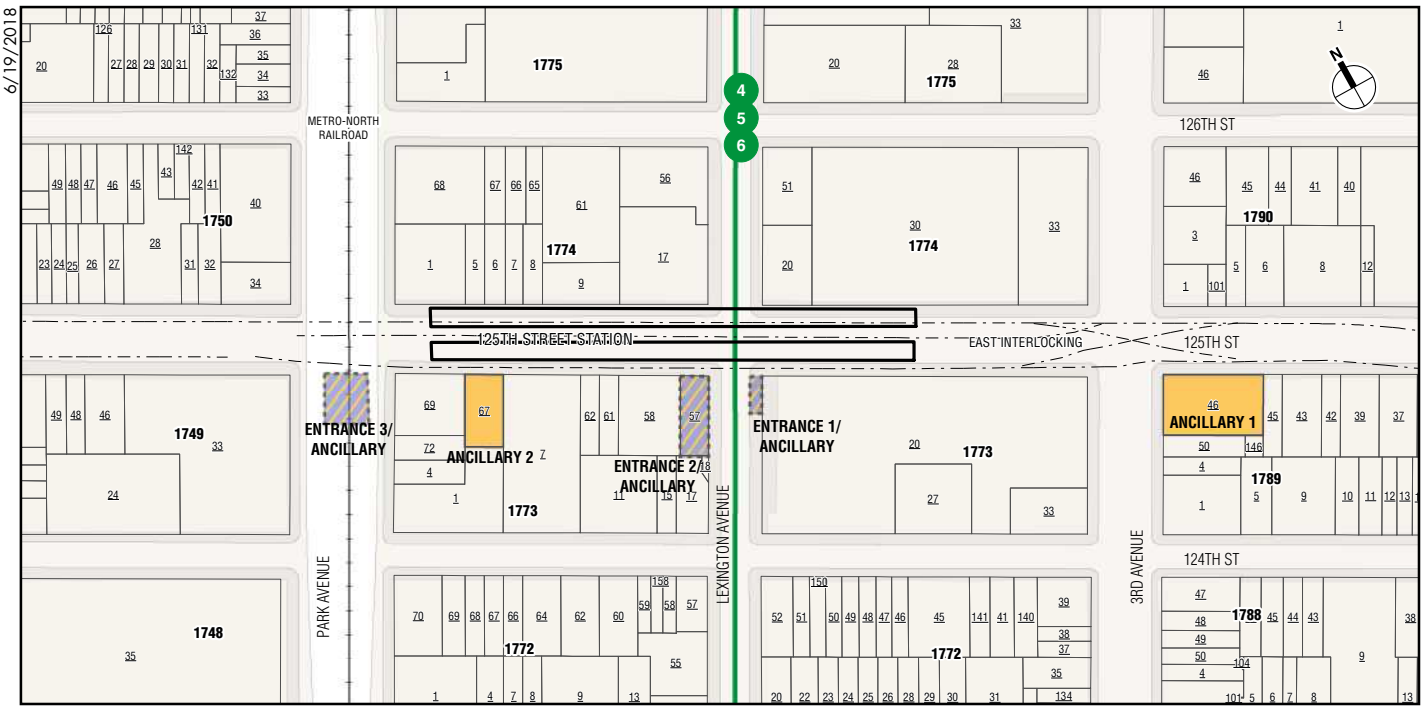
Figure 2-3a

Ancillary Facility

125th Street Curve - Ancillary Facility Site

Figure 2-3b

6/19/2018



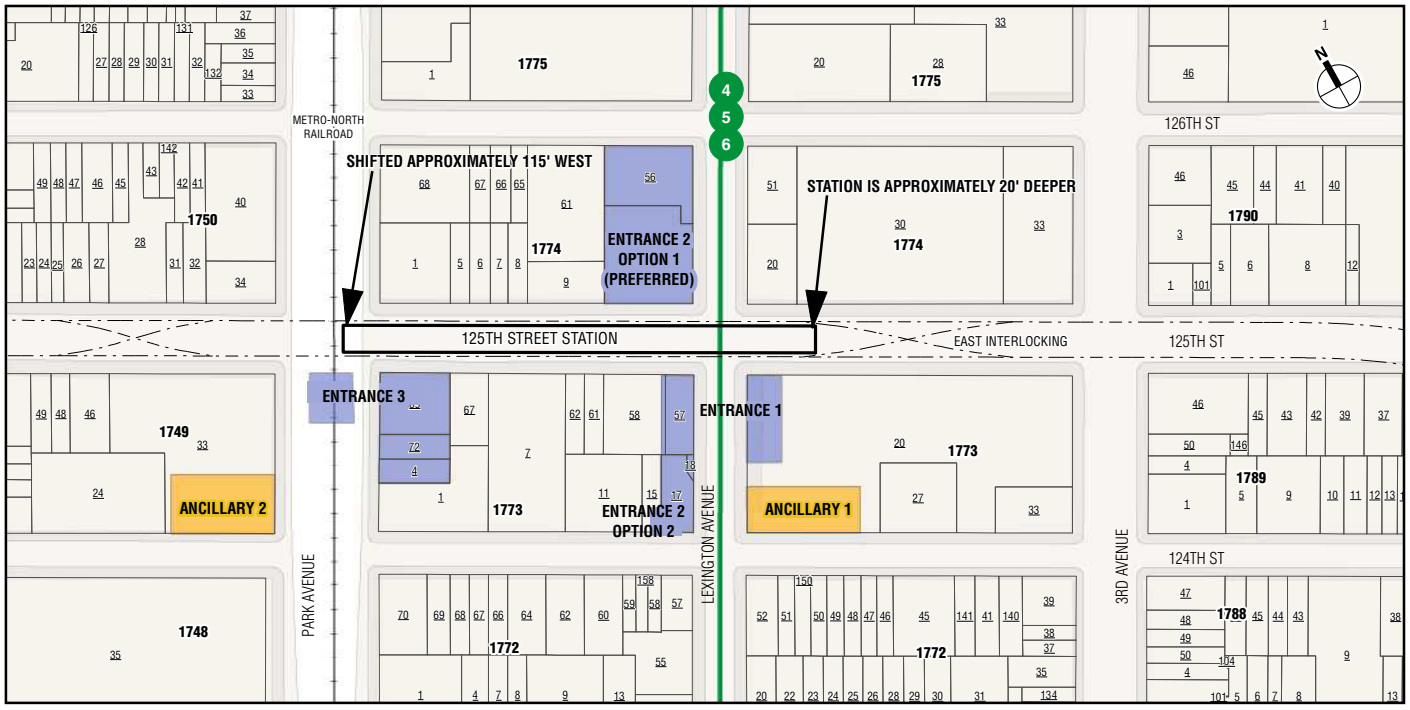
2004 FEIS Design

0 200 FEET

Ancillary

Entrance/Ancillary

Station Platform



Modified Design

0 200 FEET

Entrance

Ancillary

Station Platform

Comparison of 2004 FEIS Design and Modified Design
125th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure 2-4a

6.19.18

Ancillary Facility 1

Ancillary Facility 2

Entrance 1

Entrance 2 Option 1 (Preferred)

Entrance 2 Option 2

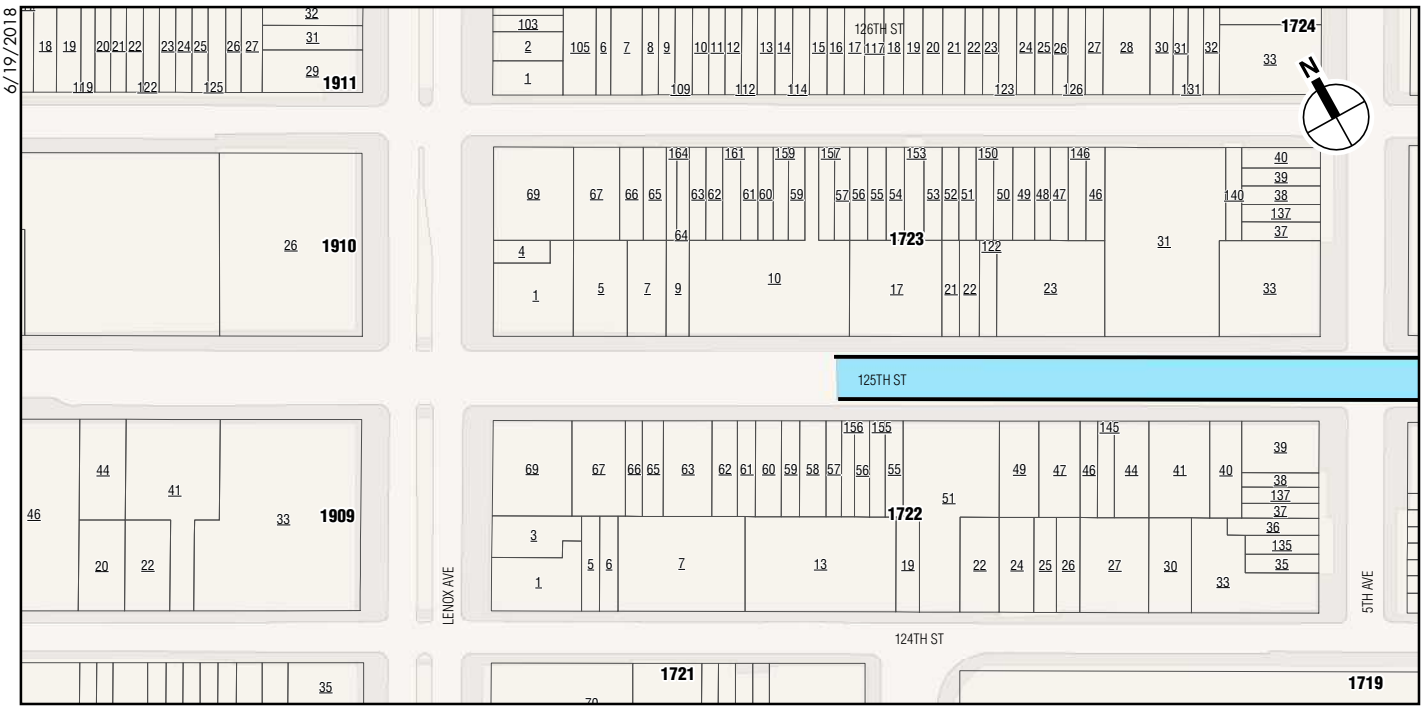
Entrance 3

Entrance 3

SECOND AVENUE SUBWAY PHASE 2

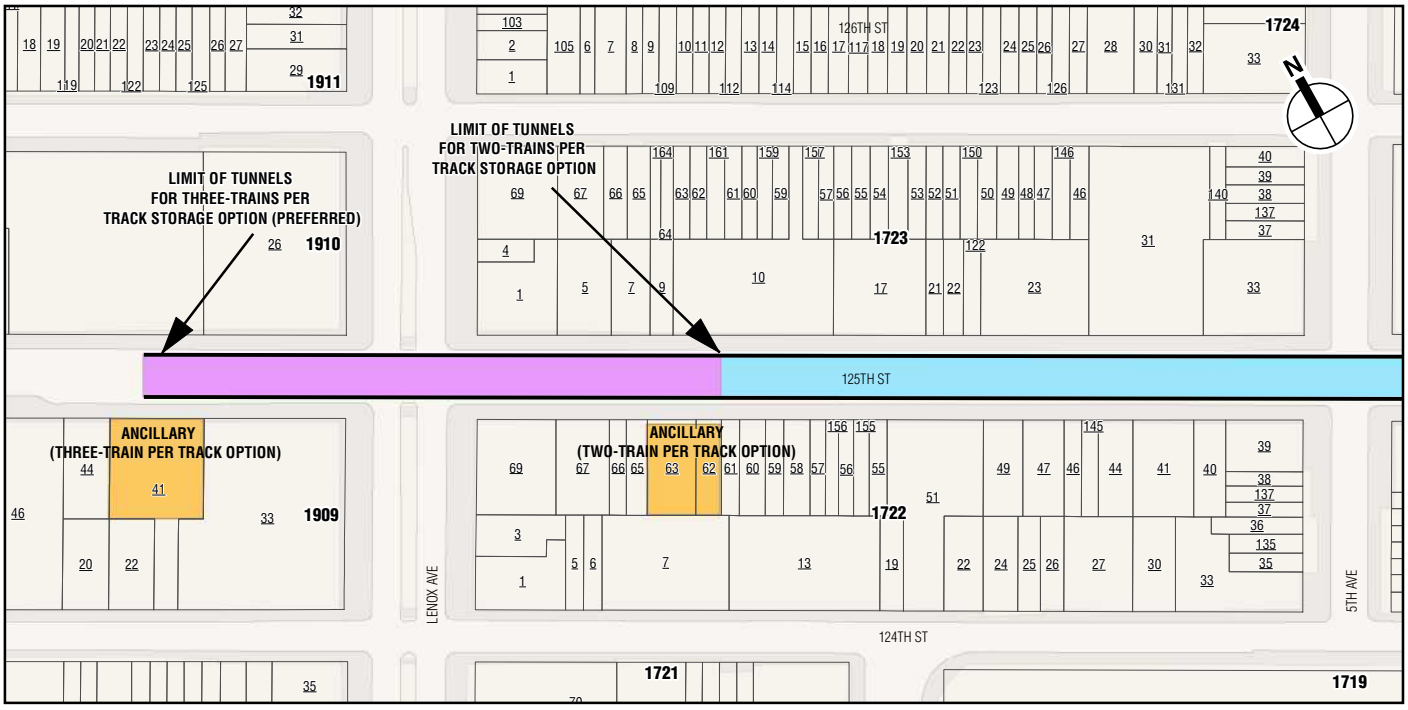
125th Street Station
Entrance and Ancillary Facility Sites
Figure 2-4b

6/19/2018



2004 FEIS Design

Note: The 2004 FEIS also included potential storage tracks along Second Avenue from 122nd Street to 129th Street



Modified Design

Entrance

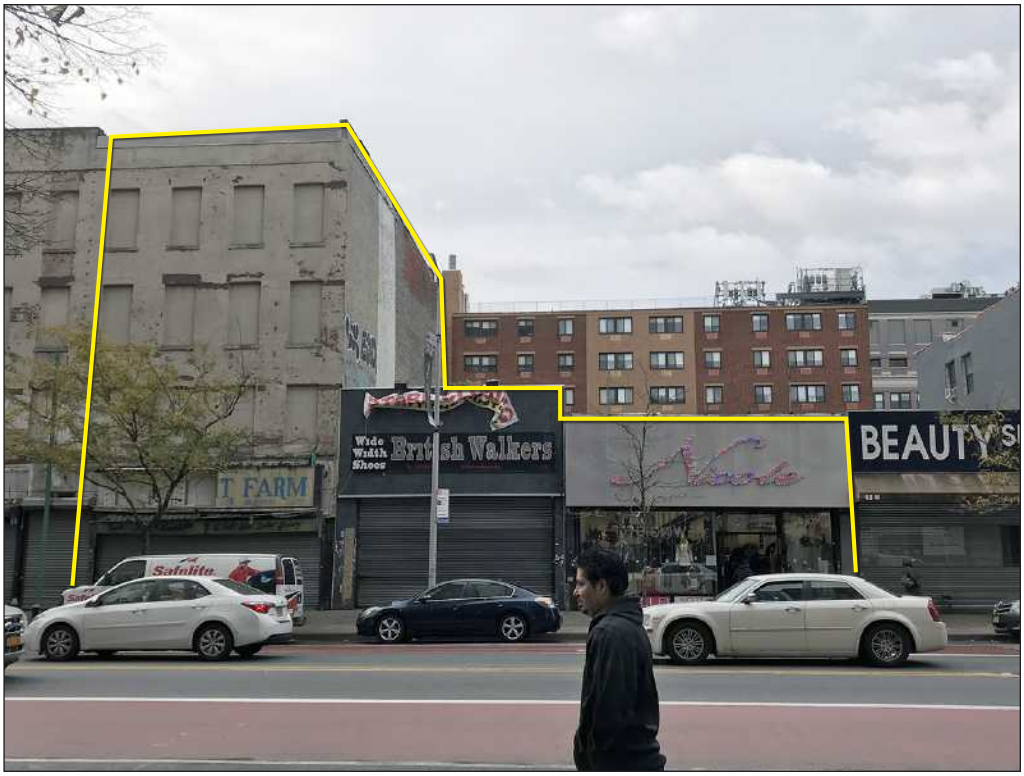
Ancillary

Note: The potential storage tracks along Second Avenue to 129th Street have been eliminated with the Modified Design

Comparison of 2004 FEIS Design and Modified Design
125th Street Tail Tracks

SECOND AVENUE SUBWAY PHASE 2

Figure 2-5a



Two-Train per Track Option

Three -Train per Track Option (Preferred)

125th Street Tail Tracks
Figure 2-5b

the subway structure would be reconstructed to accommodate a full station, including a mezzanine level. The Modified Design includes the following refinement from the 2004 FEIS Design:

- The platform has been shifted about 30 feet north from the 2004 FEIS Design as preliminary engineering has advanced, to accommodate revised horizontal and vertical alignments (see **Figure 2-2a**).The revised platform location eliminates the need for a curve at the south end of the platform, which might have created compliance issues with ADA requirements. Eliminating the curve would also retain more of the existing 1970s tunnel structure on the south end of the station.
- Station entrances are larger, Entrance 2 has been shifted, and ancillary facilities are larger and have been shifted (see Section 2.3.3).

2.3.2.3 125TH STREET CURVE

The 2004 FEIS Design alignment curved from Second Avenue to 125th Street at about Third Avenue, with two possible scenarios for the tunnel alignment. One scenario included a bellmouth (a widened tunnel area) from about 120th Street to 122nd Street to remove the TBM used for the curved tunnel and to allow for a potential future extension to the Bronx.[2] A second scenario also involved removing the TBM near 122nd Street and included potential storage tracks extending north beneath Second Avenue from about 122nd Street to 129th Street at the Harlem River Drive, which could also facilitate a future extension to the Bronx. The Modified Design includes the following modifications from the 2004 FEIS Design:

- The potential storage tracks beneath Second Avenue to 129th Street have been eliminated, as well as an associated ancillary facility that was proposed along Second Avenue near 127th Street. Updated operations analysis conducted during advanced preliminary engineering has concluded that the location of these storage tracks is not compatible with the efficient dispatching of trains from storage into revenue service and, therefore, these tracks are not needed.
- The bellmouth structure where the 125th Street curve would terminate at Second Avenue has been shifted south from the original location at 120th-122nd Streets to 118th-120th Streets, connecting with the existing bulkhead of the Section 13 tunnel box and the north end of the 116th Street Station structure. This revised bellmouth structure would be more compact (i.e., narrower), which would reduce the amount of surface construction, and its new location would eliminate about two blocks of cut-and-cover construction for the new tunnel. The bellmouth would still allow for a future extension to the Bronx, with space for two outer tracks that would continue to the 125th Street Station and two inner tracks that would allow for the extension. This revised alignment and track configuration is a result of updated design and proposed construction methods.
- The vertical alignment (i.e., depth) of the tunnel at the curve has been lowered approximately 20 feet as a result of updated design and proposed construction methods to reduce the amount of cut-and-cover construction along 125th Street in comparison to the 2004 FEIS Design by (1) allowing the tunnel to be deep enough to be located in bedrock at the 125th Street Station location; (2) providing greater separation from foundations of buildings above the tunnel in

[2] Bellmouths are often constructed at the terminus of a tunnel to allow for future extensions from that point.

the 125th Street curve portion of the alignment; and (3) achieving the first two items while maintaining the required track operational grades, avoiding steep ascents/descents (see **Figure 2-3a**). Reduced surface-level construction impacts are discussed in Section 2.3.4, "Changes in Construction Methods and Activities."

- An ancillary facility has been added at the curve at a previously (and still) proposed construction staging site (see Section 2.3.3).

2.3.2.4 125TH STREET STATION

Consistent with the 2004 FEIS Design, the Modified Design would include a new 125th Street Station between Lexington and Park Avenues. This station would provide direct transfers to the existing Lexington Avenue (4/5/6) line subway station and provide connection to the Metro-North Harlem-125th Street Station. The 2004 FEIS Design included a three-track configuration with an island platform and a side platform at the 125th Street Station with an interlocking east of the station. The Modified Design includes the following modifications from the 2004 FEIS Design:

- The station would be shifted approximately 115 feet west and would be about 20 feet deeper as a result of updated design and construction methods, so that it would be located in bedrock rather than soil (see **Figure 2-4a**). This would allow for mining construction techniques, which would substantially reduce surface-level disruption along 125th Street and reduce construction disruption to the Lexington Avenue line (see Section 2.3.4, "Changes in Construction Methods and Activities").
- The connections between the new 125th Street Station on the Second Avenue line and the existing 125th Street station on the Lexington Avenue line would be reconfigured from what was proposed in the 2004 FEIS Design. The Modified Design has been developed to provide for additional transfer capacity and also optimized to better distribute those transfers along both the Second Avenue Subway mezzanine and the Lexington Avenue line platforms.
- The track configuration has been changed from a three-track configuration to a two-track, center island platform as a result of advanced preliminary engineering. At the time of the 2004 FEIS, NYCT generally considered three-track configurations to be preferable for new terminal stations, to provide expanded rail storage capacity and operational flexibility, and to facilitate schedule recovery. However, as several capital projects progressed since 2004 (e.g., the new South Ferry Station on the No. 1 subway line and extension of the No. 7 subway line to a new terminus), these terminal stations were revised to two-track configurations to reduce costs and to reduce impacts (i.e., constructability impacts to Battery Park for South Ferry Station and construction risks associated with an unprecedented 100-foot-wide rock cavern for the No. 7 subway station). During design development for those stations, MTA used train simulations to conclude that a two-track configuration would provide acceptable levels of service.

  Based on that advanced operations analysis, MTA determined that a two-track configuration at the 125th Street terminal station for the Second Avenue Subway would be adequate. With a narrower cavern than a three-track station (and a deeper vertical alignment, as noted above), a two-track station would be suitable for construction via mining and tunnel boring rather than cut-and-cover construction. This would meet one of the Project objectives of minimizing construction impacts (discussed in Section 2.3.4, "Changes in Construction Methods and Activities"). Additionally, the two-track configuration would provide an operational advantage by allowing a double crossover interlocking system on the east and west end of the station that would give greater flexibility for moving trains in and out of the storage tracks.

- Station entrances are larger and an additional option for Entrance 2 has been added. Ancillary facilities are larger and have been shifted (see Section 2.3.3).

2.3.2.5 125TH STREET TAIL TRACKS

The 2004 FEIS Design included two storage tracks extending west of the 125th Street Station to about midway between Fifth and Lenox Avenues (525 feet west of Fifth Avenue), accommodating two trains each. Storage for an additional (fifth) train during off-peak hours was provided on a third track at the 125th Street Station. As discussed above, additional potential storage tracks were considered in the 2004 FEIS beneath Second Avenue from about 122nd Street to 129th Street. The Modified Design includes the following modifications from the 2004 FEIS Design:

- The third storage track at the 125th Street Station has been eliminated (as noted above).
- The storage tracks beneath Second Avenue from about 122nd Street to 129th Street have been eliminated.
- Two tail tracks are still included west of the station, but two options are now being considered, pending further operations and planning analysis (see **Figure 2-5a**):
  - One option would accommodate two trains per track (four trains total), with tail tracks that would extend to between Fifth and Lenox Avenues (about 325 feet east of Lenox Avenue), or about 100 feet west of the 2004 FEIS Design's terminus. This storage option would reduce the amount of storage space by one train compared to the 2004 FEIS Design, since the 125th Street Station would be shifted westward relative to the 2004 FEIS Design alignment.
  - The second option would accommodate three trains per track (six trains total), with tail tracks that extend to about 275 feet west of Lenox Avenue, approximately 730 feet farther west than in the 2004 FEIS Design. This option would incorporate storage space for one additional train compared to the 2004 FEIS Design, which would introduce additional flexibility for train operations.

  With both options, the new tunnels would be built using mined construction rather than cut-and-cover construction, the same construction methodology as in the 2004 FEIS Design. This would help meet one of the Project's objective of minimizing construction impacts (discussed in Section 2.3.4, "Changes in Construction Methods and Activities"). An off-street TBM retrieval site would be located at the end of the tail tracks.
- An ancillary facility has been added for the tail tracks, which would use the same site as would be used for the TBM retrieval and be located just west or just east of Lenox Avenue, depending on the design option (see Section 2.3.3).

2.3.2.6 PROTECTION FROM FLOODING

In 2012, Hurricane Sandy caused extreme flooding and damage throughout New York City, including in East Harlem. As a result, NYCT has updated its flood protection design standards.[3] The design standards set the specific flood elevation that must be used for design purposes for all transit infrastructure located in a flood zone; they also identify other guidelines for critical infrastructure to protect it from flooding.

[3] NYCT Flood Resiliency Design Guidelines (DG312), Issue 7, was most recently updated in July 2017.

The 106th Street Station would be located in the 100-year floodplain mapped by the Federal Emergency Management Agency (FEMA) and the 116th Street Station would be within FEMA's mapped 500-year floodplain (for more information, see Chapter 14, "Natural Resources"). Both stations would be designed to be consistent with NYCT's updated flood design standards. Most importantly, critical electrical and ventilation equipment will be located above the design flood elevation. In addition, the Modified Design will include providing watertight structures around elevator headhouses and canopy entrances to stations, watertight equipment hatches and manholes, and flood gates or deployable barriers for station entrances. The sidewalk gratings present in Second Avenue above the tunnel built in the 1970s will be eliminated and no new sidewalk gratings will be installed.

2.3.3 CHANGES IN ANCILLARY FACILITIES AND STATION ENTRANCES

Consistent with the 2004 FEIS Design, each new station would include at least two entrances and two ancillary facilities to house ventilation, electrical, and mechanical equipment. However, based on design development and assessment of changes in background conditions, engineering standards, and constructability considerations identified during construction of Phase 1, the ancillary facilities and entrances proposed under Phase 2 would be larger than those shown in the 2004 FEIS Design. In addition, some proposed ancillary facilities and entrances would also be on different sites than the preliminary sites shown in the 2004 FEIS, because the previous sites are no longer appropriate, due to constructability considerations related to the advanced design or because the sites are now occupied by new, larger private development that was not present when the 2004 FEIS was completed.

2.3.3.1 DESIGN OF ANCILLARY FACILITIES

Each subway station would include two ancillary buildings, one at each end of the station. As described in the 2004 FEIS (see FEIS page 2-21), many subway support functions, such as ventilation facilities, substations, pump rooms, maintenance rooms, and fan plants, would be within the envelope of the new stations, but certain facilities would have to be located away from the station shells above street level. The 2004 FEIS said that ongoing engineering would focus on how to provide ventilation, climate control, and emergency egress for the new stations and tunnels, and, where practicable, these three functions would be housed in shared structures.

Specific dimensions and appearance of ancillary facilities were not known at the time of the 2004 FEIS, but a general massing and scale was provided and the 2004 FEIS stated that the ancillary would be designed to blend with the urban fabric of the surrounding neighborhood. According to the 2004 FEIS, ancillary facilities were anticipated to be similar in size to a typical rowhouse, ranging from about 25 to 40 feet wide (depending on whether the facility is combined with an entrance), 75 feet deep, and up to about 75 feet tall (7 to 8 stories). The 2004 FEIS stated that this general sizing assumed that most operation and maintenance "back-of-house" needs could be accommodated within the station shells. This general sizing was used for purposes of analysis in the 2004 FEIS for the full-length Second Avenue Subway, as design for each Project phase was not yet advanced and site-specific requirements were not yet known.

However, based on more advanced design for Phase 2, more space would be required for the ancillary facilities. For the three stations in Phase 2, the ancillary buildings would house electrical distribution equipment, station cooling equipment, emergency egress, which must be provided with separate corridors from other room access corridors to meet code requirements, and vertical

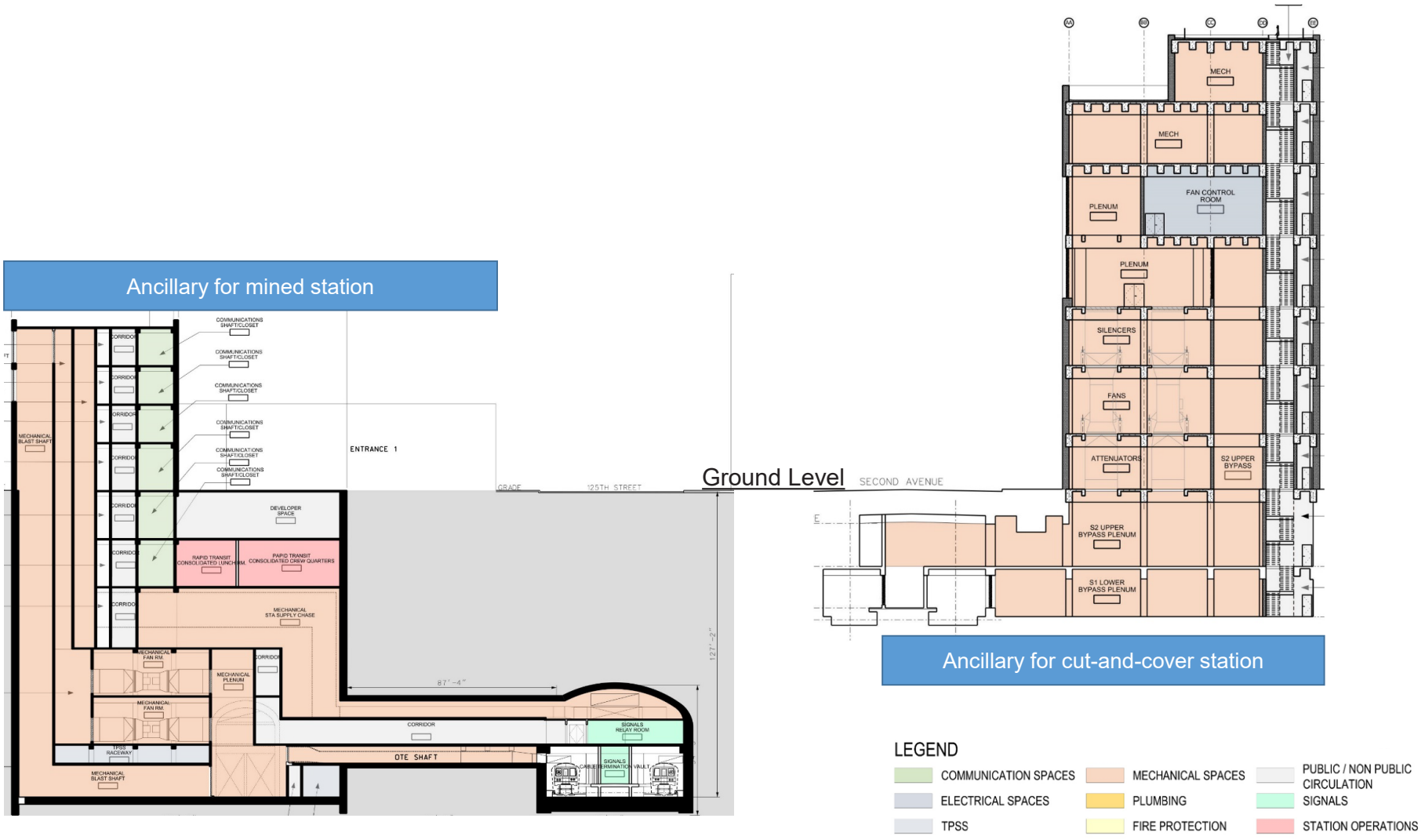
fans for emergency smoke management, which should be above the electrical distribution equipment. In addition, for Phase 2, ground-level retail space is proposed for the ancillary structures to enliven the streetscape and maintain the existing neighborhood context.

Construction of Phase 1 of the Second Avenue Subway provided valuable experience for construction of this large and complex capital project. For example, during design of Phase 1, some ancillary facilities needed to be relocated or enlarged from the 2004 FEIS Design to accommodate features such as additional maintenance spaces and meet specific NYCT design requirements. As preliminary engineering has advanced, measures based on this experience have been incorporated into the Modified Design to improve efficiency and cost-effectiveness of construction for Phase 2. This is reflected in the design for the ancillary facilities in Phase 2.

Based on advanced preliminary engineering, the proposed ancillary facilities in the Modified Design would be approximately 80 to 100 feet wide, 80 to 110 feet deep, and would range in height depending on location. In and around 125th Street, where the station would be farther below the street, the above-grade portion of the ancillary facilities would range in height from between 45 and 75 feet (equivalent to 5 to 8 stories). Along Second Avenue, where the stations would be relatively shallow beneath the street, the above-grade portion of the ancillary buildings would range from 90 to 140 feet tall (equivalent to 9 to 14 stories). **Figure 2-6** provides an illustration of typical ancillary facilities for the two shallow stations (106th Street and 116th Street Stations) and the deep station at 125th Street.

The ancillary facilities would be larger than in the 2004 FEIS Design for the following reasons:

- The 106th and 116th Street Stations would be relatively shallow to align with the existing tunnel segments that were constructed during the 1970s. The station shells would also be limited in height because of the many utilities located within Second Avenue above the tunnel depth. This would limit the amount of underground space at the stations that can be used for equipment related to operations and maintenance. While the 2004 FEIS Design provided one potential set of dimensions for all the ancillary facilities along the 8.5-mile-long alignment, the 106th and 116th Street Stations would not have the same amount of underground space as other, deeper stations along the alignment, and therefore more ancillary space would have to be outside the station shell and above grade.
- The 106th and 116th Street Stations would both be in or near FEMA-designated flood zones (see Chapter 14, "Natural Resources"), and therefore they must comply with NYCT's flood protection requirements, which have been updated since Hurricane Sandy in 2012. To meet these requirements, more of the equipment in the ancillary facilities must be above grade, which would protect it from flooding. This includes electrical and ventilation equipment.
- The 125th Street Station would require additional ancillary space to support functions of a terminal station. The station would be deeper than the 106th and 116th Street Stations and is not located within a flood zone, so unlike the 106th Street and 116th Street Stations, some of the ancillary functions at the 125th Street Station could be accommodated below ground. However, with the mined station now proposed to reduce construction impacts (discussed in Section 2.3.4, "Changes in Construction Methods and Activities"), the station shell for the 125th Street Station would be smaller in overall volume than in the 2004 FEIS Design. This would limit the available space for ancillary functions. Overall, therefore, the above-ground structures for the ancillary facilities at the 125th Street Station would larger than in the 2004 FEIS Design.



General Profile of Ancillary Facilities for Phase 2

Figure 2-6

- The Modified Design includes a different cooling system for the stations than was envisioned for the 2004 FEIS Design or was constructed in Phase 1. The 2004 FEIS Design incorporated station cooling using chilled water, with cooling towers on the roofs of the station ancillary buildings. The Modified Design would use an updated system, to reduce the operations and maintenance demands of the system, as well as the noise attenuation requirements for the cooling towers. With the new system, dry coolers would be used. These would not have rooftop cooling towers, but would have more equipment indoors instead.
- To meet the Project objectives of maintaining neighborhood character and creating transit facilities that are aesthetically pleasing and compatible with neighborhood character, the proposed ancillary facilities in the Modified Design would accommodate ground floor-retail spaces. Retail uses in these buildings would result in street-level activity and visual interest, but require additional space not originally contemplated in the 2004 FEIS Design.
- During construction of Phase 1, the limited sizes of staging areas led to construction difficulties. The limited off-street space for storing materials and equipment and coordinating construction activities required staging areas to be located within the street. As construction progressed along the alignment, these on-street staging areas required multiple lengthy and costly relocations and remobilizations of construction activities, whereas a larger off-street staging area would provide a longer-term designated space for delivery of equipment, storing of materials, and labor for the stations and systems work.

  In addition, during construction of Phase 1, working within small staging sites to limit the acquisition of private property also posed high construction risks because of the close proximity to adjacent buildings. The proximity of construction sites for ancillary buildings to adjacent buildings led to the need for extensive efforts to rehabilitate, underpin, support, stabilize, and structurally strengthen adjacent buildings. Based on this experience, the advanced preliminary engineering for the Modified Design proposes larger areas for ancillary facilities to save substantial costs and avoid unnecessarily prolonged construction activities and impacts to adjacent buildings.

As design proceeds from advanced preliminary engineering to final design, opportunities to reduce property acquisitions will be identified, if practicable. In the event that property required for construction staging is no longer needed for permanent Project operation, excess property would be used or disposed of in accordance with MTA real estate procedures and will adhere to all pertinent federal regulations. Property that is sold would be subject to underlying zoning regulations.

In addition, there may be an opportunity to include other development in combination with some ancillaries and/or entrances, within the envelope permitted by the zoning. No such overbuild or other development projects are being proposed at this time. However, it should be noted that, in conformance with FTA joint development guidelines, ancillary and entrance sites may be considered for private co-development as the Phase 2 advances. Any such development or overbuild proposal(s) would be subject to additional NEPA re-evaluation(s).

2.3.3.2 DESIGN OF STATION ENTRANCES

The Modified Design includes revisions to the station entrances from those shown in the 2004 FEIS Design. The 2004 FEIS Design generally included stations with primary entrances supported by smaller secondary entrances on properties near street corners or within sidewalk spaces at street

corners. For the 106th Street and 116th Street Station entrances, the Modified Design includes the following changes to the station entrances:

- To correspond with modifications to the alignment and location of station platforms, the station entrances were shifted so that connections could still be made to the shifted station mezzanines.
- The philosophy for station entrances has been modified to better balance passenger flows. Rather than having a large primary entrance and a smaller secondary entrance, the entrances would be similar in size.
- To comply with the ADA requirement that at least 60 percent of the station entrances be ADA accessible, the Modified Design would include elevators at each end of the 106th and 116th Street Stations.
- Entrances have been designed for greater visibility and access along Second Avenue, rather than side streets.
- In the Modified Design, the entrances would serve a larger portion of emergency egress passenger loads, so that NYCT code requirements are met without the need to provide additional emergency access points that might require additional property at other locations near the station.
- Similar to the ancillary facilities, the sites for some proposed entrances have been expanded to provide sufficient space to build the entrances while minimizing impacts to and structural reinforcement needs for adjacent buildings.

For the 125th Street Station, modifications were made to station entrances to enhance connectivity for transfers to the Lexington Avenue (4/5/6) subway line and Metro-North Railroad, as follows:

- Similar to the 2004 FEIS Design, the Modified Design includes two entrances at 125th Street and Lexington Avenue—one at the southeast corner of the intersection and one on the west side of Lexington Avenue, at either the northwest or southwest corner. For the entrance on the west side of Lexington Avenue, the 2004 FEIS Design included an entrance at the southwest corner. The Modified Design includes a new entrance option at the northwest corner that would provide better transfer connections between the Lexington Avenue (4/5/6) subway line and the Second Avenue platforms, eliminating a chokepoint that would exist in the 2004 FEIS Design. Constructability, cost, and environmental considerations are being evaluated to determine the final location for this entrance. In the Modified Design, both entrance options (the southwest and northwest corner) would provide additional capacity than was accounted for in the 2004 FEIS Design; this additional capacity was added to meet NYCT level of service criteria for passenger loads that were implemented after the 2004 FEIS Design.
- Similar to the 2004 FEIS Design, the Modified Design includes access to the Second Avenue Subway at 125th Street and Park Avenue, adjacent to the Metro-North Harlem-125th Street Station. In the Modified Design, the entrance that was originally planned in the Park Avenue median under the Metro-North Railroad viaduct would be expanded to incorporate the property at the southeast corner of 125th Street and Park Avenue. This change was made to address passenger load demands and constructability considerations related to the foundations of the viaduct and the historic Comfort Station building located nearby (as discussed in Section 2.3.3.4.4, “125th Street Station”). As design advances, additional evaluation of the viaduct structure may result in the need to place the entrance entirely on the southeast corner of 125th Street and Park Avenue.

2.3.3.3 LOCATIONS OF ANCILLARY FACILITIES AND STATION ENTRANCES

In addition to modifications in their design, with the Modified Design some ancillary facilities and station entrances have been relocated because the original site is not large enough to accommodate the larger facility now needed, because of the shifts in the station platform locations, or because the sites originally proposed for these facilities in the 2004 FEIS Design are no longer appropriate (for example, because they are now developed with new, larger buildings than were present in 2004). In seeking new locations for the ancillary facilities, MTA sought to minimize acquisitions and displacements while also minimizing constructability risk related to adjacent buildings, providing sufficient construction staging space, and allowing flexibility in the final configuration of the ancillary buildings as design advances.

MTA is using the site selection criteria outlined in the 2004 FEIS for identifying new sites when ancillary facilities and station entrances must be relocated. Those criteria are described in Section 2.2.2 of this chapter. As noted there, sites for station entrances and ancillary facilities are selected to limit the need for displacement of residents or businesses where possible. This is accomplished by choosing potential easements in existing or planned buildings, vacant lots and buildings, plazas and arcades, and open areas before occupied buildings.

As noted in Section 2.2.2, the site selection process described in the 2004 FEIS prioritized the use of easements obtained through the Special Transit Land Use District (STLUD) established by New York City zoning, where possible. Prior to completion of the 2004 FEIS, MTA had obtained several easements in buildings that were developed after the special district was mapped. However, the 2004 FEIS Design did not include station entrances in entirely the same locations as the previous, 1970s plan for the new subway, so the STLUD areas were not consistently located in appropriate places for the new subway. As part of the recently enacted East Harlem Rezoning, the New York City Department of City Planning coordinated with MTA to revise the STLUDs mapped along Second Avenue to align with current plans for the Second Avenue Subway. STLUD overlays are now mapped in the locations of the 106th Street, 116th Street, and 125th Street Stations. In addition, the text of the New York City Zoning Resolution was revised as relates to the STLUD so that (1) floor area provided for any subway transit-related uses such as subway entrances and ancillary facilities is not considered to be zoning floor area, and therefore is not counted against the total amount of development allowed on a site; and (2) greater flexibility is available in transit easement volumes to accommodate entrances and/or ancillary facilities that meet ADA requirements, ventilation and access requirements. The STLUD text also allows MTA to obtain transit easements on vacant lots that are needed for development of the subway.

Changes in the ancillary facility and entrance locations for each new station are described below and are shown on **Figures 2-1a through 2-5a**. Photos of the planned entrance and ancillary facility sites are shown on **Figures 2-1b through 2-5b**. The required property acquisitions are discussed in Chapter 6, "Displacement and Relocation."

2.3.3.4 PROPOSED MODIFICATIONS

2.3.3.4.1 106th Street Station

Figure 2-1a provides a comparison of the entrance and ancillary facility locations proposed for the 106th Street Station in the 2004 FEIS Design and in the Modified Design. These include the following:

- **Entrance 1**: There would be no change in location, but as a result of advanced preliminary engineering, the footprint would be expanded to better accommodate passenger demand and emergency egress. The entrance would remain within a street corner sidewalk plaza that was provided by New York City zoning requirements to accommodate the future subway entrance (see **Figure 2-1b**).
- **Entrance 2**: Entrance 2 would remain in the same general location, but to address changes in background conditions, it would be shifted slightly north, closer to the corner of 108th Street to avoid the recently constructed utility connections for the Franklin Plaza Apartments. In addition, to address advanced preliminary engineering considerations (see Section 2.3.3.2), Entrance 2 would be expanded from a small sidewalk entrance with only a stair to a larger entrance with escalators and an elevator to provide a greater level of service for the projected passenger demand and better accessibility for the station. The area of Entrance 2 is currently part of a parking lot for the Franklin Plaza Apartments, with approximately 14 spaces within the entrance footprint (see **Figure 2-1b**).
- **Ancillary 1**: The original location identified in the 2004 FEIS was vacant when the 2004 FEIS was completed, but is now the site of a new six-story school building. Therefore, using this site for Ancillary 1 would result in displacement of this school, as well as complicated demolition and additional project costs. As a result of this change in background conditions, Ancillary 1 would be relocated to the northern end of the same block, where several two- and four-story mixed commercial and residential buildings (partially vacant) are located (see **Figure 2-1b**). Several lots have been identified for acquisition because they are occupied by a single business.

  The new location of Ancillary 1 would also allow for improved connection to the south end of the station box and more efficient ventilation functions because of its location closer to the proposed platform. The revised location of the ancillary facility, immediately south of 106th Street, would provide direct back-of-house connections within the station structure.

  The site of Ancillary 1 would be used for construction staging before the ancillary facility is built. To minimize occupation of the Second Avenue right-of-way and limit the level of costly remobilization efforts, this site would be used to consolidate construction activities, and likely be used for a slurry plant to install the support walls for the excavation; storage space for excavated soils (referred to as muck); laydown of construction materials; contractor operations; and other related activities.
- **Ancillary 2**: The location identified for Ancillary 2 in the 2004 FEIS was occupied by a one-story commercial building at that time, but this site has since been redeveloped with a seven-story residential building with ground-floor retail space. Therefore, using this site for Ancillary 2 would involve substantial displacements, complicated demolition, and additional project costs. Consequently, Ancillary 2 would be shifted south on the same block, where several smaller four-story mixed commercial and residential buildings are located (see **Figure 2-1b**).

  The new location would also result in a better ventilation connection with the subway structure by being closer to the end of the platform. This site would also allow the ancillary building to have two exterior, exposed facades, providing an efficient separation between emergency exhaust louvers and fresh air intake louvers. This would prevent short circuiting of exhaust gases and smoke being drawn back into the station or ancillary rooms during an emergency event. Having two street facades would also provide separation between the exhaust louvers

and adjacent buildings, thereby minimizing restrictions on operable windows at those locations.

The site of Ancillary 2 would be used for construction staging prior to construction of the new building, but with more limited activity than Ancillary 1.

2.3.3.4.2 116th Street Station

Figure 2-2a provides a comparison of the entrance and ancillary facility locations proposed for the 116th Street Station in the 2004 FEIS Design and in the Modified Design. These include the following:

- **Entrance 1**: There would be no change in location, but the footprint would be expanded to better accommodate passenger demand and emergency egress. Entrance 1 was originally combined with ancillary functions in addition to a separate ancillary facility. With the Modified Design ancillary functions would be shifted from this entrance and consolidated into one ancillary facility (Ancillary 1, described below).
- **Entrance 2**: The original planned entrance was a small secondary sidewalk entrance. In the Modified Design, this entrance would be expanded to provide greater capacity and balance passenger loadings, and to provide an elevator for station access. Entrance 2 would be relocated from the southeast corner to the northeast corner of Second Avenue and 118th Street to better align with the end of the platform. A portion of this location was previously planned for an ancillary facility, but the ancillary would be relocated (see Ancillary 2, below).
- **Ancillary 1**: Ancillary 1 would be shifted south on the same block to provide a better ventilation connection with the subway structure by being closer to the end of the station box and to avoid potential construction risks to the Banca Commerciale Italiana building (Block 1687, Lot 49), a newly designated historic structure adjacent to the previous location. The site of Ancillary 1 would be used for construction staging prior to construction of the new building, but for more limited activity than Ancillary 2 (described below).
- **Ancillary 2**: Ancillary 2 would be relocated about one block north of the original location on Second Avenue to provide a better ventilation connection to the station box and tunnel section. This site, on the west side of Second Avenue between 119th and 120th Streets, would also provide a staging area for the TBM operation. This new site includes multiple vacant structures (see **Figure 2-2b**).

  In the Modified Design, the site of Ancillary 2 would be used for a number of construction staging activities, including construction of the 116th Station structure, the bellmouth structure at the end of the tunnel, and the TBM operations that would continue northward from the end of this station. This area would require a large footprint to handle excavated materials from both the station and the two bored tunnels (that would serve the two subway tracks), which would require cranes, conveyors, and space to route and stage trucking. The two bored tunnels would be permanently lined with precast concrete segments, which would be installed as the tunnel excavation proceeds. Therefore, the precast segments would need to be located near the TBM launch point. (The subway tunnels constructed in Phase 1 did not include precast concrete segments, because of the tunnels' location in hard rock).

  To accommodate this staging activity, a site suitable for this activity was selected. All of the buildings on this site are in common ownership and appear vacant. It is not anticipated that all the lots identified on **Figure 2-2a** would be required for the footprint of the ancillary facility; instead, they are conservatively incorporated to allow flexibility in the design. As design

advances, opportunities will be investigated to reduce property acquisitions, if practicable. In the event that property required for construction staging is no longer needed for permanent project operation, excess property would be used or disposed of in accordance with MTA real estate procedures and will adhere to all pertinent federal regulations. Property that is sold would be subject to underlying zoning regulations.

2.3.3.4.3 125th Street Curve

The 2004 FEIS Design did not include any ancillary facilities or station entrances at the 125th Street curve but included two prospective construction staging sites (Block 1789, Lots 25 and 30—Lot 25 is now merged with Lot 21) and demolition of the building on Lot 30. The Modified Design would still incorporate Lot 30 as a potential staging site but would now also include an ancillary facility at that location (see **Figures 2-3a and 2-3b**). This facility would serve as an intermediate tunnel ventilation and emergency egress point. As a staging site, it would provide a location to service and support the tunneling operations, as well as an access point for workers to perform ground stabilization measures (see Section 2.3.4, "Changes in Construction Methods and Activities").

2.3.3.4.4 125th Street Station

Figure 2-4a provides a comparison of the entrance and ancillary facility locations proposed for the 125th Street Station in the 2004 FEIS Design and in the Modified Design. These include the following:

- **Entrance 1**: Entrance 1 on the southeast corner of 125th Street and Lexington Avenue would be expanded from a small sidewalk entrance to a larger entrance (with escalators) and would include a portion of an adjacent property. This site is part of a former Pathmark superstore (see **Figures 2-4a and 2-4b**), which was in operation at the time of the 2004 FEIS but is now vacant and the subject of a private development interest. MTA will coordinate with the developer as design advances so that this entrance can be incorporated within the new building.
- **Entrance 2**: MTA is evaluating two entrance options for Entrance 2 on the west side of Lexington Avenue. Option 1, the preferred option for Entrance 2, is being evaluated on the northwest corner of 125th Street at Lexington Avenue (see **Figure 2-4a**). Option 2 is the 2004 FEIS Design's entrance location at the southwest corner of 125th Street and Lexington Avenue, which would be expanded in the Modified Design to accommodate escalators and other vertical circulation elements that are required for the transfer connections between the Second Avenue Subway and existing Lexington Avenue (4/5/6) subway line.

  To accommodate anticipated passenger demand, MTA anticipates a need for at least three escalators at Entrance 2, two for the peak direction and one for the opposing direction. Option 1 on the northwest corner would adequately accommodate these escalators. Option 2 on the southwest corner is not large enough to accommodate the escalator core for three escalators to serve this deep station, and expanding into the adjacent property to the west could result in impacts to a historic bank on that site that is listed on the State and National Register of Historic Places. Therefore, an entrance at the southwest corner (Option 2) could accommodate only two escalators.

  In addition, Option 1 could potentially provide a higher capacity transfer connection between the Second Avenue Subway and Lexington Avenue (4/5/6) subway line. Option 1 would provide a transfer point at the northern end of the Lexington Avenue (4/5/6) subway platform

in addition to the transfer point at the southern end of the platform provided by Entrance 1. This would allow greater distribution of passengers for the expected heavy use of this station. Conversely, with Option 2, the transfer point would be only at the southern end of the platform, thereby concentrating passenger movements in a smaller area. These two options are being evaluated to determine optimal connectivity and distribution of transfer passengers, and the final option will be selected as design advances.

- **Entrance 3**: The 2004 FEIS Design included an entrance to the subway within the Park Avenue median under the Metro-North Railroad viaduct, but as a result of updated passenger estimates and advanced design that identified greater spatial needs to accommodate passenger demand and vertical circulation elements, the entrance has been expanded to include the property at the southeast corner of 125th Street and Park Avenue. In addition, the area within the Park Avenue median is constrained by the foundations and superstructure of the railroad viaduct, as well as a Comfort Station (currently unused) building that is a historic structure as a contributing element of the historic Metro-North Harlem-125th Street Station. Therefore, Entrance 3 would have a shallow street-level entrance within the Park Avenue median, with deeper vertical circulation elements to the mezzanine and platform levels constructed below the southeast corner of 125th Street and Park Avenue. While these elements would be below grade, they would require the demolition of the existing building (partially vacant) on this corner to avoid challenges with maintaining its structural integrity, as was encountered during the construction of Phase 1. As design advances, additional evaluation of the viaduct structure may result in the need to place the entrance entirely on the southeast corner of 125th Street and Park Avenue rather than in the Park Avenue median.
- **Ancillary 1**: The 2004 FEIS Design included an ancillary facility at 125th Street and Third Avenue. However, with the Modified Design, the 125th Street Station cavern is shifted farther west to allow it to be mined in bedrock, and this shift requires relocation of the ancillary facility farther west as well. With the Modified Design, Ancillary 1 would use a portion of the same lot as Entrance 1, thereby consolidating subway facilities, and similarly potentially integrating with a proposed private development, pending coordination with the developer. Ancillary 1 would be sited along 124th Street rather than 125th Street, which would preserve the street frontage on 125th Street, where the City of New York seeks to encourage a retail and commercial corridor. The shift to 124th Street would also allow some construction traffic to be routed on 124th Street, which would reduce construction impacts on the heavily traveled 125th Street.

  The site shown on **Figure 2-4a** that comprises Ancillary 1, Entrance 1, and an associated area of permanent subsurface easement would be used for station cavern excavation and structural lining. These operations require multiple large work areas to provide contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations. Following construction, the area shown as permanent subsurface easement would no longer be needed for the project at the ground level. The subsurface easement would be associated with subsurface corridors connecting Ancillary 1 to the station.
- **Ancillary 2**: The 2004 FEIS Design included an ancillary facility on 125th Street just east of Park Avenue. Similar to Ancillary 1, with the Modified Design, Ancillary 2 would be shifted farther west to better align with the station that would also be shifted west, and it would be sited along 124th Street to reduce construction impacts on 125th Street, similar to Ancillary 1. The new site of Ancillary 2 is currently vacant. Like the site of Ancillary 1 and Entrance 1,

this site has been the subject of a private development interest, and MTA will coordinate with the prospective developer, as needed, as design advances.

The site of Ancillary 2 would function similarly to the site of Ancillary 1 during construction, providing an area for contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations. Following construction, the area shown in **Figure 2-4a** as permanent subsurface easement would no longer be needed for the project at the ground level. The subsurface easement would be associated with subsurface corridors connecting Ancillary 2 to the station.

2.3.3.4.5 125th Street Tail Tracks

Like the 2004 FEIS Design, the Modified Design includes tail tracks extending west from the 125th Street Station. The 2004 FEIS Design did not include an ancillary facility for the proposed tail tracks west of the 125th Street Station. The Modified Design, however, extends the tail tracks farther west to provide greater storage capacity and as a result, an ancillary facility would be required to provide emergency ventilation and emergency egress for the longer tail tracks. The ancillary facility location would also be used as the location where the TBM used to construct the tunnel beneath 125th Street is retrieved. The two possible tail track options in the Modified Design (discussed in Section 2.3.2, "Overview of Changes in the Phase 2 Alignment") would each include an ancillary facility, as follows (and shown on **Figure 2-5a**):

- For the two-train per tail track storage option, an ancillary facility would be located on the south side of 125th Street, about 325 feet east of Lenox Avenue.
- For the three-train per tail track option, an ancillary facility would be located on the south side of 125th Street about 275 feet west of Lenox Avenue.

The buildings currently on the two sites are shown on **Figure 2-5b**. The tail track ancillary facility would likely be smaller than the ancillary facilities at the stations.

2.3.4 CHANGES IN CONSTRUCTION METHODS AND ACTIVITIES

For Phase 2, the 2004 FEIS Design anticipated a seven-year construction period and included a combination of cut-and-cover construction and mining, as discussed in Section 2.2.3. The Modified Design remains largely consistent with the construction techniques proposed for the 2004 FEIS Design. This includes:

- Use of the existing, already constructed tunnel box between 110th and 120th Streets for the new tunnel.
- Cut-and-cover construction of the 106th Street Station. At this station, off-street staging areas would be created on the sites of the future ancillary buildings, to reduce disturbance within Second Avenue.
- Cut-and-cover construction of the 116th Street Station, with demolition and reconstruction of the existing tunnel box there. At this station, off-street staging areas would be created on the sites of the future ancillary buildings, to reduce disturbance within Second Avenue.
- Mining of the 125th Street curve using a TBM. With the Modified Design, this TBM would be launched from a staging area along Second Avenue rather than from Third Avenue at 125th Street as in the 2004 FEIS Design.
- Mining of the 125th Street tunnel and tail tracks with a TBM. This would be the same TBM as used for the 125th Street curve, rather than a separate TBM run launched from Third

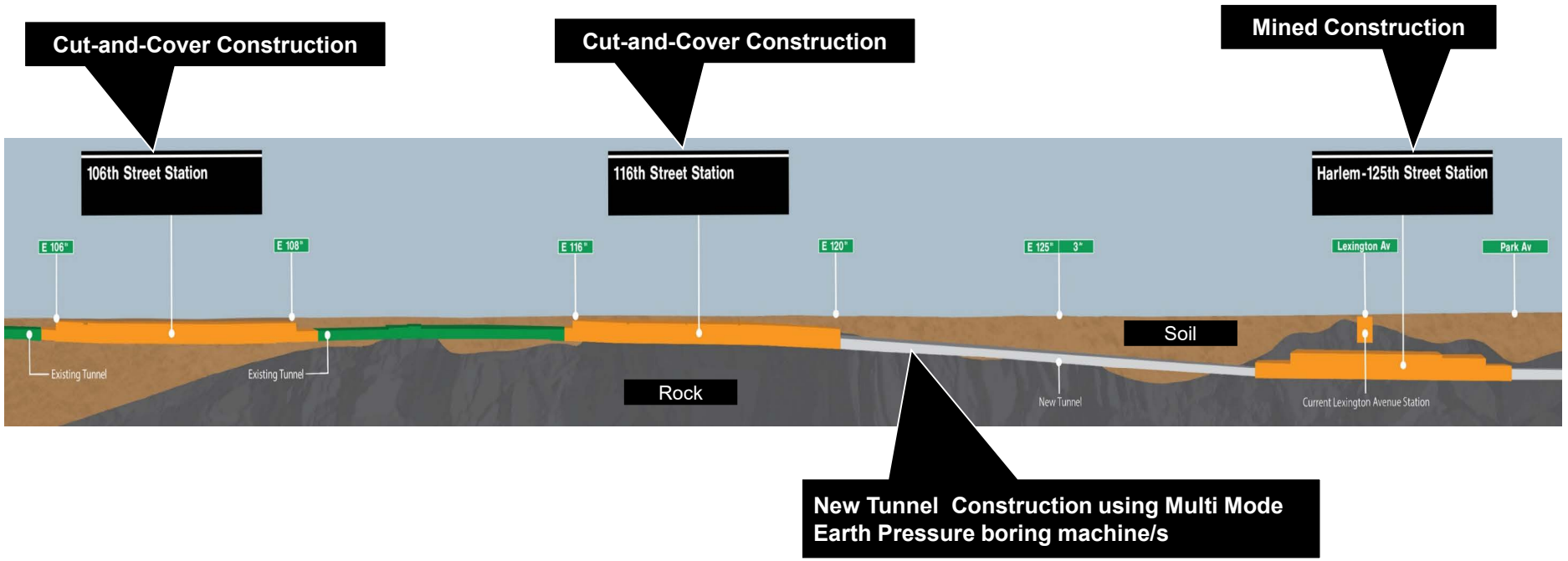
Avenue as in the 2004 FEIS Design. The TBM would be retrieved at a shaft beside 125th Street at the end of the tail tracks; whereas with 2004 FEIS Design it would have been retrieved from a shaft within the street.

However, as a result of updated design and proposed construction methods to help meet one of the Project's objectives of minimizing construction impacts, the Modified Design would reduce construction impacts where possible, particularly at the 125th Street curve and 125th Street Station. **Figure 2-7** illustrates the overall construction methods for the Modified Design, and these modifications are discussed below.

With the Modified Design, the construction period is estimated at nine years, including utility relocation in advance of the rest of the construction activities. Based on the current schedule, assuming a construction start in mid-2019, Phase 2 construction would be complete in 2029.

Modifications to construction methods with the Modified Design include the following:

- The potential **storage tracks under Second Avenue** from about 122nd Street to 129th Street that were included in the 2004 FEIS Design are no longer proposed. This eliminates the need for cut-and-cover construction in this area and the need for an ancillary facility along Second Avenue at approximately 127th Street.
- To expedite construction, based on experience gained during construction of Phase 1 and other major transit projects, MTA intends to implement an early utility relocation program to address a portion of the utility relocation work needed to prepare for the upcoming heavy construction. By performing some major utility relocations along Second Avenue in advance of the underground station shells and tunnel construction, unanticipated complications can be resolved in advance, thereby reducing the risk of construction delays in the follow-on contracts.
- To reduce impacts to the neighborhood associated with lane and sidewalk closures and to limit the need for costly remobilization of staging sites, the sites of ancillary facilities at the 106th and 116th Street Stations would be used as off-street staging areas before the ancillary structures are built. This would shift construction activity from the street to off-street sites.
- The **bellmouth structure under Second Avenue** near the 125th Street curve has been shifted south (from 120th-122nd Streets to 118th-120th Streets) and therefore the area to be excavated there would be reduced. With the 2004 FEIS Design, the cut-and-cover construction for the 116th Street Station would have been extended northward to about 122nd Street to incorporate a shaft where the TBM could be removed. With the Modified Design, the limit of cut-and-cover excavation for TBM activities would be about a block south, near 120th Street. At the off-street staging area developed on the future site of Ancillary 2, the TBM for the tunnels at the 125th Street curve and beneath 125th Street would be launched and excavated materials would be removed from behind the TBM. The 2004 FEIS Design included only a short TBM segment here for the 125th Street curve, and it assumed that the TBM would be launched from a staging site on the south side of 125th Street close to Third Avenue and would finish tunneling and be removed from the ground at an excavated area on Second Avenue near 121st Street. Shifting this excavated area a block south for the Modified Design introduces tunnel construction activity, including removal of tunnel spoils, to this site and removes that activity from the site at Third Avenue and 125th Street. In addition, this change requires portions of the existing Section 13 tunnel and bulkhead to be demolished, which was not the case with the 2004 FEIS Design. However, these modifications combine the construction of the 116th Street



Construction Overview
Figure 2-7

Station, bellmouth structure, and TBM launch site into one continuous structure, and allow for a more compact track design for the bellmouth. As a result, the overall amount of cut-and-cover construction is reduced. These modifications also optimize the TBM construction for the tunnel.

- At the **125th Street tunnel curve**, risk to buildings above the curve would be reduced. The deeper profile of the tunnel would provide greater separation from building foundations. In addition, modified ground stabilization techniques are being investigated that would reduce or avoid potential temporary displacements at properties above the tunnel curve identified in the 2004 FEIS during construction (see Chapter 6, "Displacement and Relocation"). These measures include conducting ground improvement activities (e.g., injection of grout to harden and stabilize the soil) from the proposed construction staging site at the curve, which would potentially avoid the need to access the tunnel from building basements (to be determined during final design).
- For the **tunnel under 125th Street**, including at the 125th Street curve and at the 125th Street Station, excavation would be accomplished by mining with a TBM rather than mining for the tunnel in combination with cut-and-cover construction for the station in the 2004 FEIS Design. In the Modified Design, this tunnel segment would have a deeper alignment so that construction could occur within bedrock in this area rather than soil. This change in construction methods would substantially reduce surface-level impacts. The 2004 FEIS Design included cut-and-cover construction for the length of the station box (from about Third Avenue to Park Avenue) and for track crossover areas, which would have resulted in substantial surface disruption.
- The **125th Street Station** would be deeper than in the 2004 FEIS Design and would be mined rather than excavated through cut-and-cover construction. Cut-and-cover construction would be limited primarily to the station entrances and ancillary building connection locations. The Modified Design would reduce the construction-period impacts to the Lexington Avenue line at the 125th Street Station in comparison to the 2004 FEIS Design, because the Modified Design would involve mining the new tunnel and station farther below the existing station rather than excavating from the surface to build a new station directly beneath and around the existing station, as was proposed for the 2004 FEIS Design. Construction-related risk and the potential need for track outages would be greatly reduced. With the Modified Design, construction impacts to the Lexington Avenue line would be limited to the areas where the new connections are made. These would be at the two new entrances on Lexington Avenue, the two new transfer stairs to the lower platform level, and stair modifications between the lower and upper platform levels. The work would involve structural modifications to provide for new openings into the subway station structure, underpinning of the existing lower level columns where the new transfer stairs are located, and structural reframing for the stair modifications. The modification from a three-track, cut-and-cover station to a two-track, mined station would reduce excavation at the new 125th Street Station by approximately 315,000 cubic yards of spoils—from approximately 465,000 cubic yards of spoils to about 150,000 cubic yards of spoils. This would substantially reduce the above-ground construction activity, including truck traffic, for the new station.

- The **125th Street tail tracks** would involve tunnel construction continuing farther west than in the 2004 FEIS Design. However, similar to the 2004 FEIS Design, mining of the tail tracks would involve minimal surface disruption. With the Modified Design, an off-street shaft site would be used to retrieve the TBM and would then be used as the site of an ancillary facility. The 2004 FEIS Design included retrieval of the TBM from a cut within 125th Street and did not include an end-of-track ancillary facility.

For the Modified Design, as for the 2004 FEIS Design and for Phase 1, the construction contractor will be required to comply with the noise mitigation requirements outlined in the 2004 FEIS and Record of Decision. As stated in the 2004 FEIS, this may include enclosing areas where spoils from tunnel operations would be loaded into trucks, or at station locations where spoils removal would take place for long durations during the daytime or at night; placing some equipment or operations below grade in shielded locations; changing construction sequencing to reduce noise impacts by combining noisy operations to occur in the same time period or by spreading them out; avoiding nighttime activities; prohibiting blasting after 8 PM or on holidays; and using alternative construction methods, such as avoiding impact pile installation in sensitive areas, using special low noise emission level equipment, and selecting and specifying quieter demolition methods. If the construction contractor encloses areas where spoils are removed to reduce impacts to nearby areas, similar to what was done at certain locations for Phase 1, these enclosures would remain in place for the duration of the spoils removal operation.

2.4 SUMMARY OF THE MODIFIED DESIGN

The design modifications described in this chapter are summarized in **Table 2-1**. The primary reason for each design modification is indicated by an asterisk (*).

Table 2-1
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	**Advanced Preliminary Engineering[2]**	**Updated Construction Methods[3]**
106th Street Station (See Figure 2-1a)				
Station/ Platform	Shifted about 5-6 feet east	N/A	N/A	*Shifted east to reduce impacts to Empire City Subway duct bank utility line along west side of Second Avenue.
	Shifted about 50 feet south	N/A	*Shifted south to accommodate modified station entrances and connections to ancillary facilities.	N/A
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
Entrance 2	Larger	N/A	*Larger entrance required to provide an elevator and acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
	Shifted slightly	N/A	N/A	*Shifted closer to street corner to avoid recent utility connections for adjacent residences.
Ancillary 1	Relocated	*Relocated to avoid displacement of new six-story school on previous site.	Relocated to better meet ventilation needs by being closer to the proposed platform.	
	Larger	*Larger to accommodate more functions above-ground as updated flood protection standards (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment. Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
106th Street Station (See Figure 2-1a)- Cont'd				
Ancillary 2	Relocated	*Relocated to avoid new seven-story residential and commercial development on previous site.	Relocated to better meet ventilation needs of subway structure by providing a more direct connection to the relocated station box.	N/A
	Larger	*Larger to accommodate more functions above-ground as updated flood protection standards (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment. Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A
116th Street Station (See Figure 2-2a)				
Station/ Platform	Shifted about 30 feet north	N/A	*Shifted to meet revised alignment geometry and location of bellmouth structure.	N/A
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
Entrance 2	Larger	N/A	*Larger entrance required to provide an elevator and acceptable passenger level of service and emergency egress based on updated ridership estimates.	N/A
	Relocated	N/A	Relocated to better align with the end of the platform.	N/A
Ancillary 1	Relocated	*Relocated to avoid newly designated historic structure (Banca Italiana Commerciale) adjacent to previous site.	Relocated to better meet ventilation needs of the subway structure by providing a more direct connection to the station box.	N/A

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
116th Street Station (See Figure 2-2a)- Cont'd				
Ancillary 1 (Cont'd)	Larger	*Larger to accommodate more functions above-ground such as updated flood protection standards that (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide lower maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to consolidate construction activities, limit work area within Second Avenue right-of-way, limit costly and timely remobilization activities, and limit risk to adjacent buildings.	N/A
Ancillary 2	Relocated	N/A	*Relocated to better meet ventilation needs of the subway structure by providing a more direct connection to the station box. New location provides a staging area for the tunnel boring machines (TBMs) operations.	N/A
	Larger	*Larger to accommodate more functions above-ground such as updated flood protection standards that (largely as a result of Hurricane Sandy in 2012) require more critical equipment to be at higher elevations.	Larger above-ground facility to account for shallow tunnel alignment, which limits space in the station box. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide lower maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging for station, bellmouth, and tunnel boring machine (TBM), and would consolidate construction activities, limit work area within Second Avenue, limit costly and timely remobilization activities, limit risk to adjacent buildings, and allow space to support TBM operations.	N/A

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Curve (See Figure 2-3a)				
Bellmouth Structure and TBM Launch Box	Shifted from original location at 120th-122nd Street to new location at 118th-120th Street	N/A	N/A	*Shifted to reduce surface construction impacts by allowing bellmouth structure to be connected with 116th Street Station structure, which also allows for a more compact (i.e., narrower) structure, further reducing cut-and-cover construction needs.
Ancillary	New to project	N/A	*Added to provide intermediate ventilation and emergency egress point, if required. Located on site already identified as construction staging site.	N/A
Tunnel	Modified ground stabilization techniques – use of grouting rather than underpinning	N/A	N/A	*To reduce surface construction impacts and potentially reduce or avoid temporary displacements by conducting ground stabilization from the construction staging site.
	Lowered about 20 feet	N/A	Lowered to connect with lowered 125th Street Station (discussed below) with appropriate track grades.	*Lowered to reduce substantial construction impacts associated with excavation along 125th Street, a heavily traveled commercial corridor, by allowing mined construction instead of cut-and-cover.
Optional Storage Tracks Beneath Second Avenue to 129th Street	Removed from project	N/A	*****Removed optional storage tracks that were considered in 2004 FEIS since advanced operations analysis concluded that the location of these storage tracks is not compatible with the efficient dispatching of trains from storage into revenue service and, therefore is not needed.	N/A
125th Street Station (See Figure 2-4a)				
Station Tunnel Alignment	Lowered 20 feet and shifted 115 feet west	N/A	N/A	*Lowered and shifted west to allow mined construction in bedrock to substantially reduce disruptive cut-and-cover construction impacts otherwise associated with excavation along 125th Street and to reduce impacts with intersection of existing Lexington Avenue (4/5/6) subway line.
Track Configuration	Modified from 3-track to 2-track station	N/A	Modified to facilitate double crossover interlocking system on both sides of station for greater operational flexibility.	*Modified to reduce excavation needs and reduce surface construction impacts along 125th Street.

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Station (See Figure 2-4a) – Cont'd				
Entrance 1	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates.	N/A
Entrance 2 – Option 1 *(preferred)*	New to project	N/A	*Could provide higher capacity transfer connection between new subway and existing Lexington Avenue (4/5/6) line. Final option will be selected as design advances.	N/A
Entrance 2 – Option 2 *(Original 2004 Location)*	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates. Larger to accommodate vertical circulation elements required to access deeper station and for transfers between the new subway and existing Lexington Avenue (4/5/6) line.	N/A
Entrance 3	Larger	N/A	*Larger entrance required to provide acceptable passenger level of based on updated ridership and transfer estimates. Expanded station to accommodate vertical circulation elements for deeper station and to avoid conflicts with the existing Metro-North Railroad viaduct structure and a Comfort Station, which is a contributing element of the historic Metro-North Harlem-125th Street Station.	N/A
Ancillary 1	Relocated	N/A	N/A	*Relocated west to align with shifted station box. Relocated from 125th Street to 124th Street to shift construction impacts away from busy commercial corridor.

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Station (See Figure 2-4a) – Cont'd				
Ancillary 1 (Cont'd)	Larger	N/A	*Mined station box reduces excavation but provides less volume for ancillary functions. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to facilitate station cavern excavation and structural lining, which require multiple, large work areas to provide contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations.	N/A
Ancillary 2	Relocated	N/A	N/A	*Relocated west to align with the shifted station box. Relocated from 125th Street to 124th Street to shift construction impacts away from busy commercial corridor.
	Larger	N/A	*Mined station box reduces excavation but provides less volume for ancillary functions. Modified Design includes dry-cooler system within the building interior, rather than rooftop cooling towers. Dry coolers provide less maintenance, reduce noise, and eliminate rooftop equipment Modified Design incorporates ground floor retail space to enhance integration with surrounding neighborhood. Larger to accommodate construction staging to facilitate station cavern excavation and structural lining, which require multiple, large work areas to provide contractor access into the cavern, storage of muck, routing of trucks, storage of construction materials, and concrete operations.	N/A

Table 2-1 (Cont'd)
Summary of Phase 2 Design Modifications

Phase 2 Component	Description of Change(s)	Primary Reasons for Design Changes		
		Changes in Background Conditions[1]	Advanced Preliminary Engineering[2]	Updated Construction Methods[3]
125th Street Tail Tracks (See Figure 2-5a)				
Alignment	Two options now considered	N/A	Two options are being considered, pending further operations and planning analysis: - Option 1: two-train per track storage (four trains total) - Option 2 *(preferred)*: three-train per track storage (six trains total)	N/A
	Both options extend farther west to just east or west of Lenox Avenue	N/A	*Extended farther west as a result of advanced operations planning for rail storage needs and to accommodate shift west of 125th Street Station and reconfiguration of station from 3-track to 2-track.	N/A
Ancillary	New to project	N/A	*Extension of tail tracks farther west require an ancillary facility for emergency ventilation and egress, whereas tail tracks under the 2004 FEIS Design were anticipated to be served by ancillary facilities at the 125th Street Station.	N/A

Notes:

1 **Changes in Background Conditions:** Includes changes in updated flood protection standards that require electrical and other critical equipment to be at higher elevations. Includes changes in site conditions where previously identified real estate is no longer suitable or available (i.e., new developments are typically larger and deconstruction would result in increased displacements and additional project costs). Includes consideration of the East Harlem Historic District centered along 116th Street that was designated in 2017.

2 **Advanced Preliminary Engineering:** Subsequent to the 2004 FEIS, site-specific reconnaissance, further engineering, and advanced operations planning, including new ridership modeling and pedestrian flow studies, have been conducted for Phase 2, which resulted in some refinements to the preliminary engineering design. In addition, experience gained from previous NYCT major capital projects have been incorporated into the design and construction methods.

3 **Updated Construction Methods:** To further support one of the Project's goals and objectives to "Minimize community disruption during construction," as stated in the 2004 FEIS, efforts have been undertaken to reduce surface construction impacts, particularly along 125th Street, which is a major commercial center for the area and has seen extensive development in the past decade. The 2004 FEIS Design proposed cut-and-cover construction along much of this corridor, which would have required substantial surface disruption, whereas the Modified Design proposes primarily mined construction within bedrock, thus minimizing surface construction impacts.

*** Indicates primary reason for the change.**

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Chapter 3: Transportation

3.1 INTRODUCTION

This chapter evaluates the effects of the Modified Design on transportation, including subway and commuter rail, vehicular traffic and parking, surface transit, and pedestrian conditions, in comparison to the effects described in the 2004 FEIS. The 2004 FEIS concluded that significant adverse impacts would occur to transportation services during construction of the Project. The completed Project would result in beneficial impacts on transportation services. The Modified Design of Phase 2 would not change the conclusions of the 2004 FEIS. However, the deeper tunnel along 125th Street with the Modified Design would substantially reduce surface-level construction activities along 125th Street and the related traffic impacts during construction. The deeper tunnel would also reduce potential service disruption impacts to Metro-North Railroad and the Lexington Avenue (4/5/6) subway line during construction.

3.2 FEIS FINDINGS

3.2.1 CONSTRUCTION IMPACTS

3.2.1.1 SUBWAY AND COMMUTER RAIL

The 2004 FEIS described that construction of the Second Avenue Subway would result in temporary disruptions to other subway service and commuter rail service at locations where the new subway would be in proximity to those services. In East Harlem, construction activity for the 2004 FEIS Design would affect the Metro-North Harlem-125th Street Station, where the work for the 2004 FEIS Design would involve underpinning the existing station's viaduct structure and construction of new escalators, elevators, and stairways for the subway station. During underpinning of the viaduct, the construction work might have required speed reductions for Metro-North commuter rail service; during other construction, street-level access to the Metro-North station could be affected but access was to be maintained at all times.

Also in East Harlem, the 2004 FEIS Design involved constructing the new Second Avenue Subway beneath and perpendicular to the existing Lexington Avenue line 125th Street station, including a new mezzanine level and new platform and track level beneath the existing station. The 2004 FEIS stated that this work would be done using a combination of cut-and-cover and traditional mining techniques. Escalators and stairs were to be constructed from the new mezzanine up through the lower level Lexington Avenue line station platforms, and escalators were also to be built from the new mezzanine to the upper level of the Lexington Avenue line station. As much of this construction was going to occur immediately under existing, active tracks, the 2004 FEIS stated that subway service disruptions would occur, including track outages (i.e., track closures where subway service would not operate) and limited platform area closures. The 2004 FEIS stated that construction work for the new 125th Street Station would affect service on the Lexington Avenue line on selected nights and weekends for approximately two years.

3.2.1.2 VEHICULAR TRAFFIC AND PARKING

In Chapter 5D, "Transportation—Vehicular Traffic," the 2004 FEIS described that construction of the new subway could result in significant traffic impacts due to lane closures along the alignment, diversion of through traffic away from congested construction areas, and an increase of traffic from construction vehicles. It stated that lane closures would be expected at station construction locations and at shaft/access sites, which may include spoils handling and removal enclosures, that may be constructed within or adjacent to Second Avenue. The 2004 FEIS described that up to half of the Second Avenue roadway width would be needed at station locations to accommodate subway construction activities, which would reduce the width of Second Avenue adjacent to construction zones to three 12-foot lanes in most locations. It also described that where stations are constructed on two-way streets, such as 125th Street, the roadway would be narrowed to one travel lane per direction, with two travel lanes at some locations. With the 2004 FEIS Design, the length of the station construction and staging area would be four to five block lengths at each location. On the major cross streets, generally all six travel lanes would remain open for traffic, but during specific short-term construction operations, a minimum of one lane in each direction would be open for traffic. It noted that for minor cross streets that intersect a construction zone, at least two of the three east/west travel lanes would generally remain open for traffic.

The 2004 FEIS also described the construction activities required for insertion of Tunnel Boring Machines (TBMs) and at shafts where tunnel spoils are removed and construction materials are supplied, and identified a site at 125th Street and Third Avenue in East Harlem that would be used to insert the TBMs used for the curved tunnel between Second Avenue and 125th Street. The TBM was to be removed from a shaft in Second Avenue at around 122nd Street.

The 2004 FEIS also noted that in addition to lane closures, the Second Avenue Subway construction would generate substantial truck traffic through the East Side of Manhattan for spoils removal from, and materials delivery to, the construction sites.

A detailed analysis of traffic impacts that would result from those lane closures in combination with the construction traffic expected at station sites was prepared (see Chapter 5D of the 2004 FEIS, "Transportation—Vehicular Traffic"). The 2004 FEIS evaluated traffic conditions during construction at six representative construction zones along the subway's 8.5-mile-long alignment, selected for analysis as representative, worst-case locations for construction impacts. Each selected analysis location included both a potential shaft site/spoils removal area and a new subway station, and therefore would result in a longer construction duration, potentially larger construction area, and more trucking activity than other sites.

One of the selected analysis locations was the 125th Street Station and Second Avenue spoils removal area. In this area, the 2004 FEIS analysis considered intersections between 124th and 128th Streets, between Madison and First Avenues. In the 125th Street Station construction area, the 2004 FEIS Design included cut-and-cover construction along 125th Street, including for the 125th Street Station, which would have required closing lanes on 125th Street. The 2004 FEIS analysis assumed that 125th Street would be narrowed to one travel lane per direction from Third to Park Avenue to accommodate the construction of the 125th Street Station. Also, Second Avenue between 126th and 127th Streets would be narrowed to three travel lanes southbound and one travel lane northbound in order to accommodate the construction of two underground storage tracks. For each of these construction zones, it was assumed that curbside parking, stopping, and bus stops within the construction areas along Second Avenue and 125th Street would be prohibited during the construction phase. Taxis that currently queue on 125th Street at Park Avenue, near the

Metro-North Harlem-125th Street Station, would therefore have to be relocated temporarily. The 2004 FEIS also identified a spoils removal site, at 125th Street and Third Avenue, that was predicted to bring additional truck traffic to this area associated with removing excavated materials from the 125th Street curve.

The 2004 FEIS concluded that significant adverse traffic impacts would occur during construction at all station construction sites. Impacts in the 125th Street Station area could largely be mitigated using standard mitigation measures such as signal timing changes, lane restriping, or parking restrictions. At 125th Street and Lexington Avenue and at 125th Street and Second Avenue, the 2004 FEIS also recommended restriping the streets to allow for additional travel lanes.

The mitigation identified in the 2004 FEIS consisted of measures that could be implemented during the construction period; however, a final determination of appropriate measures would have been made as the design advanced. The 2004 FEIS committed to a comprehensive area-wide traffic management and mitigation plan that would identify specific mitigation measures throughout construction. As is typically the case, MTA would prepare such a plan that would then be reviewed by an Interagency Traffic Management Task Force comprised of affected and responsible agencies (e.g., MTA/NYCT, the New York City Department of Transportation (NYCDOT), New York State Department of Transportation (NYSDOT), MTA Bridges and Tunnels). The Interagency Traffic Management Task Force would also consult with local Community Boards. The plan would typically include a comprehensive traffic monitoring program to evaluate traffic conditions continually so that traffic detours and mitigation measures could respond as effectively as possible to traffic patterns as they changed.

During the construction of Phase 1, MTA continuously coordinated with NYCDOT, other transportation agencies, and the Community Board to develop, implement, and monitor an area-wide traffic management and mitigation plan.

The 2004 FEIS also described the loss of parking that would occur at each station location during construction activities. As noted in the 2004 FEIS, curbside parking spaces would be lost during construction on 125th Street, Second Avenue, and on side streets nearby. The 2004 FEIS analysis determined that available capacity exists throughout the area for displaced parkers in off-street parking garages and lots, and that an adequate parking supply would remain to meet demand, although it might not be as convenient as curbside spaces.

3.2.1.3 SURFACE TRANSIT

The 2004 FEIS stated that bus service along Second Avenue (the M15 bus route) would be adversely affected the most by the Second Avenue Subway construction. This would include potential bus stop relocations outside of construction zones and delays to southbound service because of traffic congestion through the construction zones. Similarly, bus stops along 125th Street would need to be relocated outside of construction zones. In addition, the 2004 FEIS noted that congestion on Second Avenue might divert some motorists and bus riders to Lexington Avenue. As a result, additional delays may be experienced by Lexington Avenue buses due to the additional traffic and diverted riders from Second Avenue. The additional riders from Second Avenue would increase boarding and alighting times at bus stops, increase bus occupancy levels, and possibly increase travel times along this route.

3.2.1.4 PEDESTRIAN CONDITIONS

The 2004 FEIS stated that sidewalks at least five feet wide would be maintained throughout the construction zones. Based on analysis methods at that time, the 2004 FEIS predicted that no impacts would have occurred if fewer than 650 pedestrians passed through the sidewalk location during a 15-minute period. The 2004 FEIS found that none of the sidewalk locations within the Phase 2 construction zones would be adversely impacted by construction of Phase 2 with the 2004 FEIS Design.

3.2.2 PERMANENT IMPACTS

3.2.2.1 SUBWAY AND COMMUTER RAIL

The 2004 FEIS described the benefits of the new Second Avenue Subway as a new transit service. As discussed in the 2004 FEIS, the new subway would greatly improve transit access for and provide links between communities on the Far East Side of Manhattan, from East Harlem to the Financial District. In addition, it noted, in East Harlem the extension of the Q service via the Second Avenue line would create for the first-time a one-seat ride from East Harlem to West Midtown. The new service would also help to reduce crowding on the Lexington Avenue line as transit riders, including Metro-North commuters, switch to the new line.

The 2004 FEIS predicted that one of the highest volume transfer movements on the new Second Avenue line would occur at the 125th Street Station, where a total of about 12,700 passengers were predicted to transfer between the Lexington Avenue line and the Second Avenue line in the AM peak hour. It noted that while transfer connections on the new system would be designed to achieve satisfactory conditions, one possible exception was the transfer at the new 125th Street Station, where most of the transferring passengers (nearly 11,800) would transfer from the Lexington Avenue line to the Second Avenue Subway line in the AM peak hour. The 2004 FEIS noted that the constraints of the existing Lexington Avenue line platform width, stair layout, and uneven bi-directional flow may make it difficult to achieve better than borderline satisfactory conditions, although the transfer will be made as attractive as possible.

3.2.2.2 VEHICULAR TRAFFIC AND PARKING

The 2004 FEIS did not include a quantitative traffic analysis for the operational condition. The 2004 FEIS predicted that traffic operations would be the same or slightly better with the subway than without it due to improved transit accessibility.

The 2004 FEIS noted that once the Second Avenue Subway is operating, there would be little if any change to the number of curb spaces available throughout the Project corridor, except potentially some minor loss of curb spaces immediately adjacent to new subway station locations. At the 116th Street Station, it was noted that a secondary station entrance at the southeast corner of Second Avenue and 118th Street could be widened into the parking lane on 118th Street and displace three to four curbside parking spaces, which could also potentially displace three to four spaces on the southwest corner in order to channelize eastbound 118th Street traffic.

3.2.2.3 SURFACE TRANSIT

The 2004 FEIS noted that once the Second Avenue Subway is operational, bus services would continue in the corridor but bus ridership on the north-south bus routes would be reduced with the faster, higher-capacity subway service in place.

3.2.2.4 PEDESTRIAN CONDITIONS

The 2004 FEIS examined pedestrian elements at representative station locations along the 8.5-mile long Project alignment. The analysis locations were selected because they either represented stations with higher street entrance/exit volumes, or would be located in areas with existing on-street pedestrian conditions that were likely to be impacted by additional pedestrian volumes. In East Harlem, the 125th Street Station was evaluated for effects on pedestrian conditions, including pedestrian elements on 125th Street at both Lexington Avenue and Park Avenues. The 2004 FEIS analysis concluded that pedestrian conditions would improve at corners and crosswalks at the 125th Street and Lexington Avenue intersection, but adverse impacts would result at the north and south crosswalks of 125th Street and Park Avenue. The specific impacts and recommended mitigation measures were identified as follows:

- North crosswalk of 125th Street across southbound Park Avenue during the AM peak hour. This impact could be mitigated by widening the painted striped crossing zone by four feet to provide more designated space for safe pedestrian crossing.
- South crosswalk of 125th Street across southbound Park Avenue during the AM and PM peak hours. This impact could be mitigated by widening the painted striped crossing zone by six feet to provide more designated space for safe pedestrian crossing.

The 2004 FEIS committed to ongoing coordination in the planning of station entrances as follows:

- As preliminary engineering continues, MTA will discuss specific entrance locations with the community.
- Planning for station entrance locations was to consider on-street pedestrian conditions before any station plans were finalized, and if adverse impacts were predicted, MTA was to consider a variety of potential mitigation measures, including widening the striped area of designated crosswalks, relocating street furniture, and creating sidewalk bump-outs.

3.3 UPDATE OF BACKGROUND CONDITIONS

Since the 2004 FEIS, East Harlem has seen substantial new development, much of which was predicted in the 2004 FEIS. An Environmental Impact Statement (EIS) was prepared by New York City in 2017 for an area-wide rezoning in East Harlem. To support the traffic analyses conducted for that EIS, the City of New York's traffic consultants collected updated background information with respect to traffic. MTA and the City established an agreement to share these data for purposes of the updated traffic analyses in this Supplemental EA (as discussed in Section 3.4 below).

Also since the 2004 FEIS, MTA has opened Phase 1 of the Second Avenue Subway and has implemented its Select Bus Service (SBS) program, which includes the M15 route along First and Second Avenues and the M60 route that operates on 125th Street between Columbia University and LaGuardia Airport. NYCDOT has rapidly expanded bicycle routes through the city, including a protected bicycle lane along Second Avenue. In addition, Citi Bike, New York City's provider of bike-sharing infrastructure, announced in September 2017 a planned expansion from 96th Street to 130th Street in East Harlem.

3.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

3.4.1 CONSTRUCTION IMPACTS

3.4.1.1 SUBWAY AND COMMUTER RAIL

With the Modified Design, the temporary disruptions to other subway service and commuter rail service would be reduced in comparison to those of the 2004 FEIS Design.

At the Metro-North Harlem-125th Street Station, the potential for disruptions to Metro-North service on the Park Avenue viaduct would be reduced with the Modified Design, because the Modified Design would not involve cut-and-cover construction directly beneath the viaduct and would not require underpinning or support of its columns.

The Modified Design would also reduce the construction-period impacts to the Lexington Avenue line at the 125th Street Station in comparison to the 2004 FEIS Design, because the Modified Design would involve mining the new tunnel and station farther below the existing station rather than excavating from the surface to build a new station directly beneath and around the existing station as was proposed for the 2004 FEIS Design. Construction-related risk and the potential need for track outages would be greatly reduced. With the Modified Design, construction impacts to the Lexington Avenue line would be limited to the areas where the new connections are made. These would be at the two new entrances on Lexington Avenue, the two new transfer stairs to the lower platform level, and stair modifications between the lower and upper platform levels. The work would involve structural modifications to provide for new openings into the subway station structure, underpinning of the existing lower level columns where the new transfer stairs are located, and structural reframing for the stair modifications.

3.4.1.2 VEHICULAR TRAFFIC AND PARKING

A new traffic analysis has been prepared to evaluate conditions during the construction of Phase 2 of the Second Avenue Subway with the Modified Design. Whereas the 2004 FEIS looked only at representative worst-case locations near the 125th Street Station area, the new analysis considers locations near all three Phase 2 stations—106th Street, 116th Street, and 125th Street. Traffic counts were conducted in May 2017, and information from the *East Harlem Rezoning Draft Environmental Impact Statement* (April 2017) was used to project future 2024 conditions, which is considered the midpoint of the construction period. Detailed information on this analysis is included in **Appendix A** and summarized below.

As described in Chapter 2, "Description of Phase 2 Modified Design," the Modified Design would primarily use mining techniques to construct the 125th Street Station, as opposed to the cut-and-cover construction proposed for the 2004 FEIS Design. There would be some trucking activity to remove spoils from this area, but with a substantial reduction in excavation, this would be a less disruptive operation than was predicted in the 2004 FEIS.

Because of the changed background conditions, changes in projected future growth, and changes in analysis methodologies and software, it is not practical to compare the results on an intersection by intersection basis. The analysis conducted for the Modified Design considers 16 locations near the Phase 2 stations. The analysis identifies six intersections that would be adversely impacted during construction. Standard measures would mitigate these impacts to the extent feasible, but it

may not be possible to fully maintain traffic levels of service at the same levels as without construction (i.e., No Build conditions) at some locations.

MTA remains committed to a comprehensive area-wide traffic management and mitigation plan during construction of Phase 2. The plan will identify the specific means to mitigate construction period traffic impacts, and the implementation of the plan will be coordinated with NYCDOT, NYSDOT, and MTA Bridges and Tunnels. The plan will include a comprehensive traffic monitoring program, to continually evaluate traffic conditions so that traffic detours and mitigation measures respond effectively to traffic patterns as they change.

3.4.1.3 SURFACE TRANSIT

MTA will maintain bus service on 125th Street and Second Avenue during construction of Phase 2 (including the Select Bus Service routes that have been implemented since 2004), but it may need to relocate bus stops to nearby sidewalk areas to avoid certain construction zones. Extension of the tail tracks farther west along 125th Street with an associated ancillary facility in the Modified Design may require relocation of an additional bus stop during construction. However, use of mining techniques along 125th Street with the Modified Design rather than previously planned cut-and-cover construction would reduce surface-level impacts in this corridor and reduce construction-related impacts to bus services. Construction of Phase 2 would necessitate the temporary closure of sections of the protected bicycle lane on Second Avenue, which was created since 2004. MTA would coordinate this closure with NYCDOT to provide alternate routes or facilities for cyclists.

3.4.1.4 PEDESTRIAN CONDITIONS

MTA will maintain sidewalks of at least five feet wide through the Phase 2 construction zones, which would be sufficient at most locations to accommodate pedestrian flows. On 125th Street between Park and Lexington Avenues, projected pedestrian flows require a wider sidewalk to avoid a potential impact to pedestrians flow. In this area, MTA will provide a minimum of seven feet of width, which would avoid an adverse impact.

3.4.2 PERMANENT IMPACTS

3.4.2.1 SUBWAY AND COMMUTER RAIL

Overall, with either the 2004 FEIS Design or the Modified Design, Phase 2 of the new Second Avenue Subway would introduce a new transit service that would provide access and transit options in a community that currently has only one rapid transit option. All stations would be fully accessible in accordance with the Americans with Disabilities Act (ADA), with elevators and escalators at each station within the entrance buildings.

Like the 2004 FEIS Design, the 125th Street Station in the Modified Design would provide direct transfers to the existing Lexington Avenue (4/5/6) subway station and provide connection to the Metro-North Harlem-125th Street Station. The Modified Design has been developed to provide for the additional capacity, and optimized to better distribute those transfers along both the Second Avenue Subway mezzanine and the Lexington Avenue line platforms. As described in Chapter 2 of this EA, "Description of Phase 2 Modified Design," Section 2.3.3.4.4, MTA is evaluating two possible configurations for passenger transfer between the new 125th Street Station and the Lexington Avenue line 125th Street station and will select the final option as design advances.

3.4.2.2 VEHICULAR TRAFFIC, PARKING, AND SURFACE TRANSIT

Operation of the Modified Design for Phase 2 of the Second Avenue Subway would not meaningfully alter traffic, parking, or surface transit conditions in the study area. Therefore, a traffic analysis is not warranted and was not prepared.

3.4.2.3 PEDESTRIAN CONDITIONS

A new pedestrian analysis was prepared to assess conditions upon completion of Phase 2 with the Modified Design. The analysis considers the effects of subway passengers entering and leaving the new subway stations on pedestrian flows on sidewalks and at corners and crosswalks near the proposed station entrances. The volumes of existing pedestrians at these locations were observed and counted in May 2017. In addition, future conditions were projected assuming the development projected to occur as a result of the East Harlem Rezoning is in place, based on information from *the East Harlem Rezoning Draft Environmental Impact Statement* (April 2017). As noted earlier, the new station entrances would include escalators, stairs, and elevators within the off-street entrances. Sidewalk entrances, including elevators in the sidewalks, are not proposed.

Since the 2004 FEIS, NYCDOT has installed curb extensions at Park Avenue and 125th Street. The curb extensions increase curb space and shorten the length of the adjacent crosswalks. This improves safety conditions by decreasing the distance that pedestrians must cross. However, the reduction in crosswalk area decreases the space available for pedestrians in terms of square footage per pedestrian in the crosswalk.

Based on the updated pedestrian analysis, the Modified Design would result in adverse impacts to pedestrian flows at four crosswalks—two near the 106th Street Station and two near the 125th Street Station:

- East crosswalk of Second Avenue across East 106th Street during the AM, midday, and PM peak hours;
- East crosswalk of Second Avenue across East 108th Street during the AM and PM peak hours;
- North crosswalk of 125th Street across southbound Park Avenue during the AM and PM peak hours; and
- South crosswalk of 125th Street across southbound Park Avenue during the AM, midday, and PM peak hours.

Similar to the impacts identified in the 2004 FEIS, these impacts could be mitigated by widening the painted striped crossing zone to provide more designated space for safe pedestrian crossing.

MTA remains committed to ongoing coordination in the planning of station entrances, as described in the 2004 FEIS. In particular, as design advances, MTA will discuss specific entrance locations with the community. In addition, planning for station entrance locations will consider on-street pedestrian conditions before any station plans are finalized, and if adverse impacts will result, MTA will implement mitigation measures to reduce pedestrian crowding, potentially including widening the painted area designated for crosswalks, relocating street furniture, and creating sidewalk bump-outs to increase pedestrian space.

3.5 CONCLUSIONS

The Modified Design would decrease construction impacts on Metro-North Railroad commuter service and Lexington Avenue line subway service that would have occurred for the 2004 FEIS Design. Consistent with the 2004 FEIS, construction of Phase 2 would result in temporary traffic impacts near the construction zone, which could be mitigated partially or fully in some cases; curbside parking spaces would be displaced temporarily near the construction zones, but parking capacity is available in nearby lots and garages; bus service, with some temporary modifications, would be maintained; and while the protected bicycle lane on Second Avenue did not exist in 2004, temporary closures and detours near the construction zone would be provided in coordination with NYCDOT. Conclusions of the updated pedestrian analysis are also consistent with the findings of the 2004 FEIS and five- to seven-foot-wide crosswalks would be provided near the construction zones to maintain pedestrian flow.

Also consistent with the 2004 FEIS, the Modified Design would not result in adverse impacts to traffic, parking, or surface transit once the subway is operational. As with the 2004 FEIS Design, the Modified Design would result in pedestrian flow impacts at several intersections, which would be mitigated by widening the painted crosswalk to increase the area for safe pedestrian crossing.

As a result of the Phase 2 Modified Design, there would not be any new significant adverse impacts to transportation not previously identified in the 2004 FEIS and Record of Decision. ✷

Chapter 4: Social and Economic Conditions

4.1 INTRODUCTION

Consistent with the 2004 FEIS, social and economic conditions for purposes of this Supplemental EA are defined as those components of a community that influence its character. These conditions include its population, economic base, land uses and the zoning and public policies that support those land uses, important community and municipal facilities and parks, urban design, street grid and other structural features, and those elements, examined in other chapters in this Supplemental EA, such as traffic, pedestrian conditions, and noise, which also contribute to neighborhood conditions.

The introduction of a major new transit line (i.e., the Second Avenue Subway) will affect many of these components of neighborhood character, either temporarily (during construction) or permanently (during operation). This chapter describes the conclusions of the 2004 FEIS with respect to social and economic conditions (see Section 4.2), discusses the changes that have occurred to background conditions (Section 4.3), and describes any changes in conclusions that would result from the Modified Design (Section 4.4). The potential impacts related to residential and business displacement are described in Chapter 6 of this Supplemental EA, "Displacement and Relocation."

The 2004 FEIS concluded that construction of the Project would result in significant adverse impacts on social and economic conditions, and that once the Project is completed, it would result in beneficial impacts on social and economic conditions. The Modified Design of Phase 2 would not change the overall conclusions of the 2004 FEIS. However, with the Modified Design, the construction of the new subway tunnel using a Tunnel Boring Machine (TBM) rather than the previously planned cut-and-cover construction activities would substantially reduce surface level impacts in this area.

4.2 FEIS FINDINGS

The 2004 FEIS examined social and economic conditions for the full-length of the Second Avenue Subway, with the discussion divided into seven study areas based on overall neighborhoods. As described in the 2004 FEIS, East Harlem is a moderate-density, largely residential area with some industrial uses concentrated at its northern end and a growing commercial area concentrated on 125th Street. The housing structures vary from four- to six-story tenements and rowhouses built on narrow lots to high-rise public housing developments built on superblocks surrounded by open areas. The spaces throughout the superblocks and the predominance of lower-height buildings elsewhere give a general feeling of openness with substantial views of the sky and promote a high level of activity. Neighborhood commercial uses and ground-floor retail space line the north-south avenues and the major crosstown (east-west) streets at 96th, 106th, 116th, and 125th Streets.

The 2004 FEIS stated that the southern portion of East Harlem, focused on 106th Street, is considered Spanish Harlem and many retail stores in the area cater to this ethnic community. In contrast, the northeastern corner of East Harlem contains mostly transportation and industrial uses,

including bus facilities and surface parking lots, with little pedestrian traffic. The 2004 FEIS also described that this corner of East Harlem has several transportation arterials, including approaches to the Willis and Third Avenue Bridges, numerous approaches to the Triborough Bridge (now the Robert F. Kennedy Bridge), the Harlem River Drive, and the FDR Drive along the riverfront.

The 2004 FEIS noted signs of new residential development and commercial investment that were occurring in 2004, with some derelict buildings, vacant ground-floor retail spaces, and empty lots being replaced by, or proposed for, new development. Through 2025, the 2004 FEIS projected over one million square feet of new development, primarily retail and residential uses, including up to 4,000 new residential units. It also noted that East 125th Street had seen a major retail revitalization in recent years, with the addition of several large retail stores including national chains.

The 2004 FEIS described the zoning in place in the East Harlem study area, including a Special Transit Land Use District (STLUD) that was established in 1974 along the length of Second Avenue to support construction of the Second Avenue Subway. The district was mapped on Second Avenue where the future Second Avenue Subway stations were to be located in the 1970s design. By encouraging transit entrances off of the sidewalk, it was intended to ease pedestrian flows, provide light and air to underground transit facilities, encourage development that promotes needed pedestrian amenities, coordinate present and future relationship of land uses within the district, and conserve the value of land and buildings. At locations in the mapped special district, developers of new buildings were required to coordinate with the New York City Department of City Planning and MTA to determine whether MTA wished to obtain a transit easement, and if so, the developer had to provide that easement. MTA obtained several easements in buildings that were developed after the special district was mapped. However, the 2004 FEIS Design did not include station entrances in entirely the same locations as the previous, 1970s plan for the new subway, so the STLUD districts were not consistently located in appropriate places for the new subway.

4.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS noted that for all four phases of construction of the Second Avenue Subway, potential temporary significant adverse impacts to land use and economic conditions could occur during construction because of temporary disruption or modification of access to buildings, altered viewscapes, limited visibility of businesses, and inconveniences for business deliveries. The 2004 FEIS stated that in the worst-case scenario, if a substantial number of businesses in an area were to close during construction, leaving street-level retail space vacant for an extended period, the character of the neighborhood could also be adversely affected. In most cases, safe access to buildings, including street-level businesses, was to be maintained throughout the construction period. However, the 2004 FEIS predicted that pedestrian and vehicular access may be altered at certain locations using sidewalk sheds and the removal of curbside parking and/or closure of travel lanes. The 2004 FEIS stated that retail establishments with outdoor activities on the sidewalk could be particularly affected. Further, whereas East Harlem is the site of substantial growth and development, the 2004 FEIS concluded that some developers may delay initiating projects in the area to avoid conflicts with the subway construction, thereby temporarily slowing commercial redevelopment. However, the 2004 FEIS anticipated that the Project would ultimately strengthen the area's attractiveness for businesses and development following completion of construction, resulting in a long-term benefit.

The 2004 FEIS noted that where properties would be acquired, and businesses or residences displaced temporarily, public sector revenues generated by those properties (e.g., real estate taxes, water and sewer payments, etc.) would decrease. It concluded that this would result in adverse fiscal effects that would be temporary, since these properties would likely be reoccupied after completion of construction. In fact, according to the 2004 FEIS, the areas are likely to become more desirable locations for business due to the presence of the subway and the resulting improvements in transit service.

Specific to each station area for Phase 2, the following potential impacts were identified:

- **106th and 116th Street Station Areas**: The area between 105th and 110th Streets (including the proposed 106th Street Station) consists of a mix of low-rise buildings and large, high-rise residential complexes. Cut-and-cover construction work was identified for this area, which was to result in temporary land use and neighborhood character impacts. This was also to be true for the area around the 116th Street station. While there would be access limitations and alterations in these areas, the Project was to develop plans to ensure that access to businesses and residents are maintained throughout the construction period.
- **125th Street Curve:** Tunneling activities were to be below ground, but some construction activities were to still be visible and disruptive due to the potential need to reinforce several buildings at the curve. A construction staging area was also identified in the 2004 FEIS at the 125th Street curve.
- **125th Street Station Area**: This is an area that sees substantial commercial activity and depends on high levels of pedestrian activity. The 2004 FEIS noted that cut-and-cover construction in this area was to result in limited pedestrian and vehicular access, which was to be communicated to businesses in advance. Cut-and-cover construction was anticipated along portions of 125th Street from Park Avenue to Third Avenue for up to five years. The 2004 FEIS identified that community facilities, such as a nursing home on 125th Street near Park Avenue and the Manhattan Eye, Ear, and Throat Hospital on 125th Street between Park and Madison Avenues, would need to have access maintained. MTA was to coordinate with each facility to develop access plans. Construction could also limit economic revitalization efforts of local Business Improvement Districts (BID), such as the 125th Street BID. MTA was to work closely with the BID and other related business organizations, as well as other community groups to disseminate information about construction activities and receive input.
- **125th Street Tail Tracks**: The tunnel for the 125th Street tail tracks from Park Avenue to west of Fifth Avenue was to be excavated with a TBM, but some cut-and-cover construction was to potentially be needed for a TBM retrieval shaft within the 125th Street right-of-way.

The 2004 FEIS disclosed the potential economic benefits of subway construction for all construction phases. As a result of direct expenditures, the direct employment from construction activities of the full-length subway was an estimated 22,500 person-years of employment, based on an overall construction cost of $13.0 billion in 2003 dollars. Specific to East Harlem, the neighborhood was predicted to benefit from a large construction worker population in the area, bringing new spending potential, which could result in additional sales for local businesses. The completed Second Avenue Subway would result in greater economic activity due to increased accessibility; however, the construction period would likely cause some temporary decline in business for the area, particularly for businesses that rely on high visibility and steady pedestrian and vehicular traffic.

The 2004 FEIS reported that potential adverse effects to neighborhood character during construction would include disruptions to access of residential and commercial buildings and travel patterns, as well as increases in truck traffic, noise, vibration, and dust. At the time of the 2004 FEIS, the specific duration of construction had not been determined. In several locations, longer term construction activities were identified in places where staging and managing of the construction of the Project's below-ground tunnels would occur, including locations along Second Avenue north of 125th Street to the Harlem River for the potential storage tracks, and along 125th Street between Park and Third Avenues. Temporary visual effects from barriers and construction equipment (including nighttime lighting) were also expected to adversely affect the neighborhood character and visual environment of the surrounding area during construction. To address potential rodent infestation, a rodent control program was to be incorporated into construction contract documents.

The 2004 FEIS described a variety of measures that would be employed during construction to mitigate the adverse impacts on social and economic conditions associated with the project's construction activities. These included the following:

- An extensive community outreach program with meetings, newsletters, and a web site. In addition, the 2004 FEIS called for a project office to be established at one or more locations along the alignment with a 24-hour telephone hotline;
- A community task force to provide citizen input on construction effects;
- The posting of subway construction information, possibly including detailed maps showing locations where pedestrian, bicycle, or wheelchair access might be difficult;
- Promoting high-quality design of sidewalk sheds, such as the addition of windows, better lighting, and good store signage at the subway's construction sites;
- Coordination with businesses to address access/delivery issues and provide special loading and unloading areas on nearby side streets to locations where access would be curtailed in front of buildings during construction, which might result in the prohibition of parking on the designated side streets;
- Limiting certain disruptive activities, such as vertical blasting, at night;
- Temporarily relocating spaces for displaced park activities, or other appropriate mitigation for open spaces, as appropriate.
- Erecting screens to limit nighttime lighting from construction areas; and
- Managing trucking activities at construction sites to avoid unnecessary queues.

4.2.2 PERMANENT IMPACTS

The 2004 FEIS did not identify any significant adverse impacts along the Phase 2 alignment to land use and economic conditions, neighborhood character, or populations that would result from the completed Second Avenue Subway. It identified beneficial effects relating to supporting economic growth as a result of improved transit access to East Harlem, as well as improved transit access from East Harlem to other employment centers throughout the city.

4.3 UPDATE OF BACKGROUND CONDITIONS

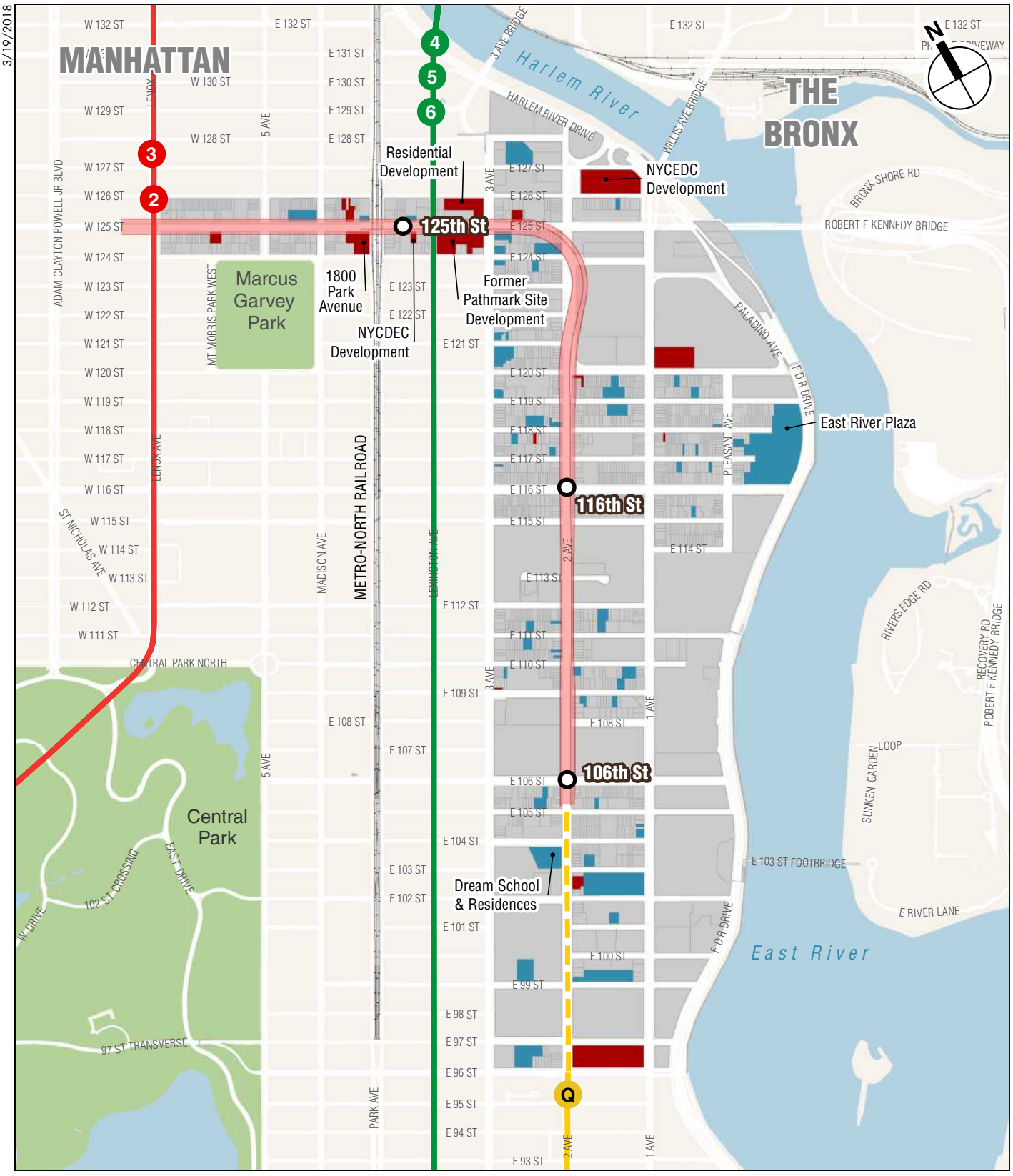
Much of the development predicted in the 2004 FEIS has occurred, and there have also been many completed or planned developments that were not foreseen in the 2004 FEIS. The 125th Street

corridor, in particular, has been and continues to be a focus of much of the new development and continues to strengthen its position as a retail and economic hub in Harlem. In 2008, New York City implemented a rezoning of the 125th Street corridor between Broadway and Second Avenue, which allowed for large commercial development to enhance 125th Street's viability as a retail hub within Harlem. As a result of that rezoning, new retail development occurred along 125th Street, including the introduction of stores housing national retailers.

Figure 4-1 shows areas of new and planned development near the proposed alignment of Phase 2. Major development has included a mix of mid- and high-rise residential buildings; large commercial developments, such as the East River Plaza along the FDR Drive at 116th Street; and institutional uses, such as the Dream School on Second Avenue at 104th Street and the Harlem Children's Zone & Promise Academy on 125th Street at Madison Avenue. Despite this development, the overall land use pattern in East Harlem has not changed substantially but the new residential and commercial development has resulted in population growth and increased density. Current land use within the East Harlem neighborhood is shown in **Figure 4-2**.

In conjunction with the new development, East Harlem has experienced population growth. As shown in **Table 4-1**, the area's population as reported in the 2004 FEIS (based on the 2000 U.S. Census) was about 116,000. The population has increased approximately 4.4 percent to about 122,000 today (based on American Community Survey [ACS] 2011-2015 5-Year Estimates). **Table 4-1** also provides a comparison of socioeconomic characteristics of the neighborhood between the 2004 FEIS and today. The population of East Harlem is 86.1 percent minority (compared to 92.8 percent in 2000) and 31.4 percent of the population is identified as low-income (compared with 35.5 percent in 2000).

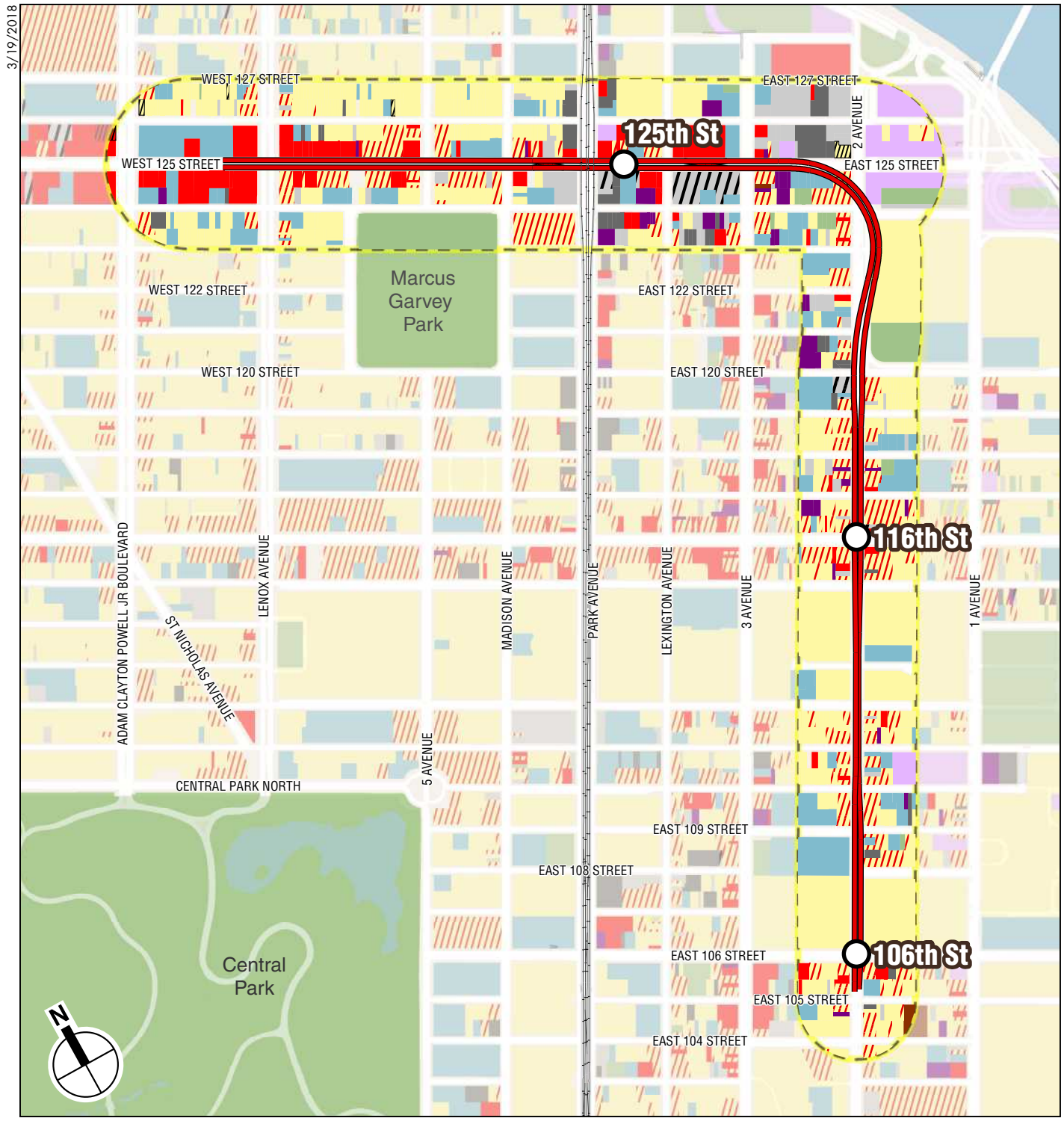
Continued population growth and new development is expected in East Harlem. As shown on **Figure 4-1**, major projects include a large residential and commercial structure at 1800 Park Avenue between 124th and 125th Streets; a large development at Lexington Avenue and 125th Street (at the site of a former, now vacant, Pathmark superstore); a large residential development along 126th Street between Lexington Avenue and Third Avenue; a commercial building under construction on 125th Street between Lenox Avenue and Adam Clayton Powell, Jr. Boulevard; a redevelopment sponsored by the New York City Economic Development Corporation (NYCEDC) of the full block between 126th and 127th Streets east of Second Avenue; and the conversion of a former firehouse between Park and Lexington Avenues into a new headquarters for the Caribbean Cultural Center African Diaspora Institute, also sponsored by NYCEDC. NYCDOT, in conjunction with NYCEDC and the New East Harlem Merchants Association, will implement the Park Avenue/125th Street Public Realm Project, which involves urban design and safety elements in the area around the Metro-North Harlem-125th Street Station.



SECOND AVENUE SUBWAY PHASE 2

New Developments Post 2004 FEIS

Figure 4-1



- SAS Phase 2 Alignment
- Proposed Station
- Land Use Study Area
- Residential Under Construction
- Res. / Comm. Under Construction
- Commercial Under Construction
- Commercial and Office Buildings
- Hotels
- Industrial and Manufacturing
- Open Space and Outdoor Recreation
- Parking Facilities
- Public Facilities and Institutions
- Residential
- Residential with Commercial Below
- Transportation and Utility
- Vacant Land
- Vacant Building

SECOND AVENUE SUBWAY PHASE 2

Existing Land Use

Figure 4-2

Table 4-1
Comparison of Population and Income Characteristics in the Study Area, 2004 FEIS vs. Current Conditions

Study Area	Population							Income Profile		
		Race and Ethnicity (Percent)								
	Total	Non-Hispanic and Hispanic White[1]	Non-Hispanic and Hispanic Black[1]	Non-Hispanic and Hispanic Asian[1]	Non-Hispanic and Hispanic Other[1,2]	Hispanic[3]	Total Minority[4]	Number of House-holds	Median Household Income ($2017)	House-holds Below Poverty (Percent)[5]
East Harlem (2011-2015)	121,669	27.8	34.4	7.5	31.3	46.5	86.1	46,870	$31,837	31.4
East Harlem (2000)	*116,357*	*25.3*	*40.9*	*2.8*	*31.0*	*52.4*	*92.8*	*43,525*	*$33,881*	*35.5*
Manhattan (2011-2015)	1,629,507	56.4	15.0	11.7	16.9	25.8	52.9	750,419	$74,904	15.6
Manhattan (2000)	*1,537,195*	*54.4*	*17.4*	*9.4*	*18.9*	*27.2*	*54.2*	*739,167*	*$71,163*	*16.6*
New York City (2011-2015)	8,426,743	43.3	24.5	13.5	18.7	28.9	67.5	3,113,535	$54,862	19.4
New York City (2000)	*8,008,278*	*44.7*	*26.6*	*9.8*	*18.9*	*27.0*	*65.0*	*3,022,477*	*$57,943*	*19.7*

Notes:

1 White, Black, Asian, and Other population may also be Hispanic (see note 3).

2 "Other" includes residents of American Indian, Alaska Native, Native Hawaiian and Other Pacific Islander descent, as well as those respondents who did not identify with any listed racial groups (white, black, Asian), or who indicated that they are of more than one race than the census defines.

3 The Hispanic category consists of those respondents who classified themselves in one of the several Hispanic Origin categories in the American Community Survey. People of this ethnic group may be any race.

4 The total minority population includes all those who are not non-Hispanic White.

5 Percent of households with incomes below established poverty level. The U.S. Census Bureau using its established income thresholds for poverty levels defines poverty levels.

Sources: U.S. Department of Commerce, Bureau of Census, *American Community Survey 2011-2015 5-Year Estimates; Second Avenue Subway FEIS.*

More recently, an area-wide rezoning and related land use actions for East Harlem were approved in November 2017. The purpose of these public actions is to encourage the development of affordable housing and new commercial and manufacturing space that supports job creation, while preserving existing neighborhood character and improving the pedestrian experience. The rezoning is intended to encourage growth in areas where there is ample transit accessibility, including the planned Second Avenue Subway. The area that was rezoned extends along Second, Third, Lexington, and Park Avenues between 104th and 128th Streets, on 125th Street near Park Avenue, along 116th and 124th Streets between Second and Park Avenues, and in an area near Madison Avenue between 126th and 132nd Streets. The Final Environmental Impact Statement (FEIS) published for the East Harlem Rezoning in September 2017 reported that by 2027, existing background growth, planned projects, and new development spurred by the rezoning will result in an additional 6,600 apartments and 16,000 new residents in East Harlem, an increase of 12 percent. This area will also see an additional 523,000 square feet of new retail space and 245,000 square feet of commercial office space, bringing 3,800 new employees to East Harlem (an increase of 9 percent).

As part of the East Harlem Rezoning, the New York City Department of City Planning coordinated with MTA to revise the STLUDs mapped along Second Avenue to align with current plans for the Second Avenue Subway. STLUD overlays are now mapped in the locations of the 106th Street, 116th Street, and 125th Street Stations. In addition, the text of the New York City Zoning Resolution was revised as relates to the STLUD so that (1) floor area provided for any subway transit-related uses such as subway entrances and ancillary facilities is not considered to be zoning floor area, and therefore is not counted against the total amount of development allowed on a site; and (2) greater flexibility is available in transit easement volumes to accommodate entrances and/or ancillary facilities that meet ADA requirements, ventilation and access requirements. The STLUD text also allows MTA to obtain transit easements on vacant lots that are needed for development of the subway.

4.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

4.4.1 CONSTRUCTION IMPACTS

The Modified Design includes ancillary facilities and entrances that would be larger than presented in the 2004 FEIS Design, for a number of design and constructability considerations, as discussed in Chapter 2, "Description of Phase 2 Modified Design."

The Modified Design also reflects efforts to reduce surface construction impacts through reduced cut-and-cover construction, particularly along 125th Street (as detailed in Chapter 2). Ancillary facilities have also been relocated from 125th Street to 124th Street, which can serve as staging areas and spoils removal sites during construction, and would also reduce construction vehicle traffic along 125th Street, minimizing disruption to traffic and retail activities along this corridor. Similar to what was described in the 2004 FEIS, these ancillary facilities would be designed to blend into the surrounding urban context of the area.

As with the 2004 FEIS Design, construction activities of Phase 2 with the Modified Design would be disruptive to the community. Construction of Phase 2 would require staging areas, cut-and-cover construction for the 106th Street and 116th Street Stations, and truck traffic. For the Modified Design, the sites of ancillary facilities would be used as construction staging sites to reduce the disruption associated with using the street above the tunnel alignment for construction staging as anticipated in the 2004 FEIS Design. While construction activities for some ancillary facilities and entrances would be relocated with the Modified Design and these facilities would be larger than what was presented in the 2004 FEIS, they would be in the same general vicinity as indicated in the 2004 FEIS and would result in similar temporary impacts to land use and accessibility to buildings. Temporary adverse impacts to businesses and residences during construction of Phase 2 would be similar to those analyzed in the 2004 FEIS and similar mitigation measures would be implemented. Therefore, no changes in adverse impacts with respect to land use and economic conditions have been identified. In addition, modification of construction means and methods from cut-and-cover to mining, particularly along 125th Street, would substantially reduce surface impacts and disruption during construction to land uses and businesses in this corridor.

MTA undertook extensive community outreach during the construction of Phase 1, and it will apply the experience gained from that process as part of the planning and implementation of construction for Phase 2. The reduced cut-and-cover construction required for the 125th Street Station would reduce potential temporary impacts to neighborhood character along 125th Street.

Additionally, the modified bellmouth structure at Second Avenue and 118th Street and elimination of tail tracks along Second Avenue north to 129th Street would eliminate cut-and-cover construction in this area. However, the Modified Design would involve more intensive construction at Second Avenue near 120th Street for the new TBM staging site proposed there. Reduced cut-and-cover construction would result in less surface disruption and fewer impacts to traffic and pedestrian mobility.

While some changes in design have been proposed, no new adverse impacts to community facilities, population, or employment have been identified. Along Second Avenue, impacts would remain similar to those described in the 2004 FEIS, and the new locations of ancillaries would still be compatible with the overall urban context of the existing neighborhood character. MTA remains committed to the construction mitigation measures outlined in the 2004 FEIS and described above. A preliminary outreach plan has been developed to engage the public prior to construction, as well as during the construction period (see Chapter 20, "Public Outreach").

4.4.2 PERMANENT IMPACTS

With the Modified Design, specific locations of some proposed entrances and ancillary facilities have been revised due to constructability considerations or recent (or planned) development of larger structures on previous sites that would increase displacements, complexity of construction, and cost (see Chapter 2, "Description of Phase 2 Design Modifications"). While these locations are different than shown in the 2004 FEIS Design, they would be in the same general locations and continue to be designed to blend in with the surrounding urban context of the neighborhood. Additionally, the recent rezoning and modifications of the STLUDs along the Phase 2 alignment seeks to encourage development that is compatible with, and accommodating to, the new Second Avenue Subway facilities.

4.5 CONCLUSIONS

As a result of the Phase 2 Modified Design, there will not be any new or different significant adverse impacts on social and economic conditions not previously identified in the 2004 FEIS and ROD. Consistent with the 2004 FEIS Design, construction activities would be disruptive and result in adverse impacts to community character and may temporarily modify building access near the construction zones. Mitigation measures, as outlined in the 2004 FEIS, would be implemented to reduce adverse impacts.

While some new station entrances and ancillary facilities would be in different locations than anticipated in the 2004 FEIS, they would still be in similar locations to those previously proposed and set within the context of the urban environment of East Harlem, consistent with the conclusions of the 2004 FEIS. The Project also remains consistent with and supportive of recent local policy documents. ✷

Chapter 5: Public Open Spaces

5.1 INTRODUCTION

This chapter describes the potential adverse impacts to public recreational and park spaces that could occur for the Modified Design, in comparison to those described for Phase 2 of the Second Avenue Subway in the 2004 FEIS. For projects requiring federal funding or approval from the U.S. Department of Transportation (USDOT), including its subsidiaries (such as the Federal Transit Administration, FTA), parks and recreation areas are also protected by Section 4(f) of the USDOT Act of 1966. A Section 4(f) Evaluation for the Modified Design is included in Chapter 17 of this Supplemental EA.

The 2004 FEIS concluded that temporary adverse impacts would occur to public open spaces during construction along the Phase 2 alignment. The 2004 FEIS did not identify any permanent adverse impacts once the Project is complete and operational. The Modified Design would not change the conclusions of the 2004 FEIS. Elimination of the potential storage tracks along Second Avenue to 129th Street with the Modified Design eliminates potential temporary construction impacts to open space resources in that area.

5.2 FEIS FINDINGS

5.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS identified six public parks and open space areas between 105th and 125th Streets adjacent to or in construction areas that would have the potential to be affected by construction activities during Phase 2. An additional five parks were identified within one block of the project area for Phase 2. Construction activities were not planned to occur within any parks, but the 2004 FEIS described that parks close to surface construction activities could experience adverse impacts resulting from access limitations or construction disturbances (such as increased noise and dust) and increased visual disturbances related to construction equipment and activities. Potential temporary noise impacts were identified at the Wagner Houses Playground, Wagner Houses Pool, Crack is Wack Playground, Harlem River Drive Park, and Triboro Plaza, where construction noise levels might exceed FTA's construction noise criteria with the 2004 FEIS Design.

The 2004 FEIS committed to measures to reduce the construction impacts on adjacent parklands. It noted that park space would not be used for construction activities in East Harlem and barrier walls were to be erected between construction areas and adjacent sensitive uses. In addition, the 2004 FEIS described that MTA would construct light screens, employ best management practices to control dust, and use specially quieted construction equipment wherever practicable to separate parks from construction activities.

Despite efforts to screen adjacent parks from construction activities, the Wagner Houses Playground located along the alignment was expected to experience increased noise and dust because of its location near surface construction activities. Extensive efforts were to be made to keep this park free of construction debris and excessive dust during construction. The Harlem

River Drive Park, Crack is Wack Playground, and Wagner Houses Pool located adjacent to proposed construction were not expected to be adversely affected because these facilities do not depend on a quiet setting.

Trees in both active and passive recreational spaces adjacent to construction were identified as potentially experiencing stress from dust or soil settlement resulting from underground construction. The health of all trees in parks adjacent to construction were to be monitored and (to the extent practicable) maintained, and ongoing coordination with the New York City Department of Parks and Recreation (NYC Parks) was to continue throughout the construction phase.

The 2004 FEIS also identified a Greenstreet along 127th Street and Second Avenue that could be affected because of the construction of the proposed storage tracks north of 125th Street in Phase 2. To the extent that this occurred, such closures would be considered a temporary adverse impact.

5.2.2 PERMANENT IMPACTS

The 2004 FEIS did not identify any permanent impacts to recreational or parkland resources along the Phase 2 alignment once the Second Avenue Subway is operational. Any parks affected by construction would be restored in coordination with NYC Parks.

5.3 UPDATE OF BACKGROUND CONDITIONS

As shown in **Figure 5-1**, one new recreation area and five community gardens have been identified within one block from the proposed Phase 2 alignment since the 2004 FEIS. None of these open space resources are immediately adjacent to the Phase 2 alignment.

5.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

5.4.1 CONSTRUCTION IMPACTS

Construction activities would not occur within any of the newly identified open space resources, but as described in the 2004 FEIS, open space resources in proximity to construction activities may experience temporary adverse impacts resulting from access limitations or construction disturbances (such as increased noise and dust) and increased visual disturbances related to the construction equipment and activities. Similar to Phase 1 construction, work zone fences would be wrapped with noise blankets to reduce noise levels.

With the elimination of the potential storage tracks along Second Avenue to 129th Street under the Modified Design, previously identified impacts on the Harlem River Drive Park, Crack is Wack Playground, Triboro Plaza, and Greenstreet along 127th Street are also eliminated. **Figure 5-1** depicts the parks that were previously, but are no longer, anticipated to be affected.

5.4.2 PERMANENT IMPACTS

The Modified Design would not result in any new permanent adverse impacts to recreational or parkland resources. Parks affected during construction would be restored to their previous condition, in coordination with NYC Parks.

Open Space Resources

SECOND AVENUE SUBWAY PHASE 2

Figure 5-1

5.5 CONCLUSIONS

The Modified Design would result in temporary construction impacts on fewer parks along the Phase 2 alignment than was predicted in the 2004 FEIS. MTA would continue to implement the mitigation measures outlined in the 2004 FEIS at any parks adjacent to the construction zones, and would continue to coordinate with NYC Parks, as was done during construction of Phase 1. The Phase 2 Modified Design would not result in any new or different significant adverse impacts to public open spaces not previously identified in the 2004 FEIS and ROD. ✷

Chapter 6: Displacement and Relocation

6.1 INTRODUCTION

This chapter summarizes the displacement and relocation impacts previously identified in the 2004 FEIS and then evaluates the residential and commercial displacement that would be required for the Modified Design.

As described in Chapter 2, "Description of Phase 2 Modified Design," the Modified Design includes relocation or change in size of some entrances and ancillary facilities for Phase 2 due to changes in background conditions and advanced preliminary engineering. As discussed in Chapter 1, "Project Overview," selection of new sites for entrances and ancillary facilities has followed the established overall siting criteria for the Second Avenue Subway Project and been conducted in accordance with the purpose and need, and goals and objectives of the Project.

The 2004 FEIS concluded that potential significant adverse impacts would occur during construction due to the possible need for temporary but long-term (up to 12 months) displacements during construction. It also concluded that significant adverse impacts would occur because of permanent property acquisitions required for the Project's new subway entrances and ancillary facilities and the permanent displacements that would occur as a result. This would be the same with the Modified Design. However, the Modified Design may reduce or avoid the temporary displacements during construction, pending further engineering analysis. With respect to permanent impacts, the Modified Design would result in the need for additional displacements and relocations as compared to the 2004 FEIS Design. These displacements would be similar in nature and extent as those required for the 2004 FEIS Design, and compensation and relocations would be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (Uniform Act) and New York State Eminent Domain Procedure Law (EDPL), as described in the 2004 FEIS.

6.2 FEIS FINDINGS

6.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS discusses the possible residential and business displacement and relocation that could be required for the full 8.5-mile-long Second Avenue Subway in FEIS Chapter 8, "Displacement and Relocation." It stated that the new subway was designed to follow the public right-of-way of city streets so as to minimize the need to disrupt use of private property or to acquire private property for the Project, but even so, some property acquisition would be required. The 2004 FEIS stated that information on property impacts was based on the preliminary engineering conducted at that time and would be further evaluated as the design developed; it also noted that while the final locations of properties to be acquired may shift during continuing design and engineering, the nature and extent of impacts that would result would be similar.

As described in the 2004 FEIS, construction of the Second Avenue Subway would require some short-term access limitations during construction as well as possible longer term displacement for construction activities.

The 2004 FEIS said that throughout most of the alignment, access would be maintained to residential and commercial buildings and retail businesses at all times, but in limited areas, there could be temporary disruption to access to protect public safety or where access to building entrances may be blocked during construction. As stated in the 2004 FEIS, this would generally occur for only a few hours at a time, but in a few instances, disruptions could extend for up to 6 months. The 2004 FEIS also noted that disruptions to access would be most likely for locations in close proximity to the subway construction, where measures to support and protect existing structures would be implemented (such as grouting, underpinning, and the installation of internal bracing or star bolts). In some of these locations, construction might also need to occur within basements of some buildings, or potentially within other portions of the buildings' interiors. In addition, for buildings with access to basements through doors in the sidewalk that are adjacent to cut-and-cover activity, access to those doors would also be restricted at times.

The 2004 FEIS Design required possible temporary but long-term displacement for occupants of buildings at the southwest corner of Second Avenue and 125th Street, where the curved tunnel would be excavated beneath the buildings. In this area, the 2004 FEIS described that nine occupied buildings could be temporarily affected for up to 12 months. The 2004 FEIS estimated that a total of 107 apartments with 278 residents would be affected, as well as an estimated 10 ground-floor businesses, a religious facility, and a commercial printer (with an estimated total of 35 employees in all of those businesses). The buildings would not have been demolished, but the occupants might have been relocated to other spaces for up to 12 months to avoid extensive disruption during construction. In addition, the 2004 FEIS Design would also have used a vacant lot on Second Avenue and a two-story building on 125th Street with an auto repair business on the ground floor and residential apartments (estimated to have eight apartments with 21 total residents) as construction staging sites for the curved tunnel. This would have required demolition of the occupied building.

In addition, the 2004 FEIS noted that some properties would be acquired permanently, to serve as the sites of subway components such as stations or ancillary facilities. While this would be a permanent effect of the Project rather than a temporary, construction-related effect, the displacement and acquisition would occur prior to or during the construction period, to allow the new elements to be built (see Section 6.2.2 for the discussion of permanent displacement for the 2004 FEIS Design).

The 2004 FEIS stated that the Project would also require permanent below-ground easements beneath private property in a number of locations for new subway tunnels and other subway-related facilities (including stations), or to provide necessary structural support during excavation. In some cases, these easements would be within the building's basement or foundation, potentially resulting in a direct effect to the structure.

The 2004 FEIS also noted that temporary subsurface easements would be needed beneath a number of properties throughout the alignment to install rock bolts, but that these would have no structural effects on buildings or affect property owners' use of the sites.

For all displacement, whether temporary or permanent, the 2004 FEIS stated that MTA and NYCT would provide compensation and relocation assistance for owner-occupants or tenants needing to

be relocated in accordance with applicable legal procedures and federal guidelines. The 2004 FEIS stated that for any locations where it would not be feasible for the Project to maintain reasonable access to businesses, MTA would compensate the landlords for diminution of rental value and, where applicable, provide relocation payments to displaced tenants. Residents temporarily displaced would have been offered alternative accommodations or some equivalent measure of compensation. The 2004 FEIS stated that compensation and displacements would be conducted in accordance with the New York State Eminent Domain Procedure Law (EDPL) and the federal Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (Uniform Act).

6.2.2 PERMANENT IMPACTS

The 2004 FEIS described that easements and property acquisitions would be required at each new station to accommodate the Second Avenue Subway's new station entrances, ancillary facilities, and emergency exits. The 2004 FEIS described the potential size, shape, and design concepts for the new station entrances and ancillary facilities, while noting that the specific design of these features were still being developed and were subject to change. The 2004 FEIS described that the specific location of station entrances would depend on anticipated passenger demand, so that larger entrances could be located where higher ridership demand was expected; proximity to bus transfers; maximizing geographic distribution of station entrances along the alignment; and minimizing environmental impacts related to the station entrances and ancillary facilities.

Chapter 8 of the 2004 FEIS, "Displacement and Relocation," presented a preliminary list of the specific properties identified for station entrances and ancillary facilities and noted that "These locations are not final; it is possible that some will shift during continuing engineering from their currently proposed locations to other similar locations in the same vicinity, and/or that additional, similar properties could be required." The 2004 FEIS also stated that "Affected property owners will be notified during final design after plans have been confirmed" (FEIS page 8-8).

The 2004 FEIS identified 12 full property acquisitions and 4 partial property acquisitions associated with the proposed 106th Street, 116th Street, and 125th Street Stations for new entrances, ancillary facilities, and emergency exits. Using standard factors of employees per square foot for each type of business and residential occupancy rates from the 2000 Census, the 2004 FEIS estimated that these acquisitions would result in displacement of approximately 14,000 square feet of commercial space with about 42 employees, and displacement of 12 residential units with about 36 residents, as shown in **Table 6-1**. As discussed above in Section 6.2.1, the 2004 FEIS also identified acquisition of two sites at the 125th Street curve to be used for construction staging. While the acquisitions were to be temporary, one building containing auto-related facilities and second-floor residences was anticipated to be demolished, and would thereby have displaced two businesses with an estimated 21 employees and eight residences with an estimated 21 residents. In addition, the 2004 FEIS stated that new subway stations elements created by cut-and-cover construction could require permanent use of the area beneath the sidewalk, potentially curtailing use of that area by existing buildings for vault space or cellar doors.

Chapter 8 of the 2004 FEIS also described the process MTA used to identify the preliminary locations for station entrances and ancillary facilities for the 2004 FEIS Design (see FEIS page 8-8). As discussed there and summarized in Chapter 2 of this Supplemental EA, "Description of Phase 2 Modified Design," sites for station entrances and ancillary facilities were selected to limit the need for displacement of residents or businesses where possible, by choosing potential

easements in existing or planned buildings, vacant lots and buildings, plazas and arcades, and open areas before occupied buildings. Priority was given to acquisition of vacant or underutilized sites and structures, to the extent practicable. The 2004 FEIS stated that property acquisitions and displacements would be conducted in accordance with the EDPL and the Uniform Act of 1970.

The 2004 FEIS identified permanent subsurface easements beneath 11 private properties at the 125th Street curve where the tunnel would be located below private properties, which would not result in any permanent displacements (see discussion in Section 6.2.1 for potential temporary displacements during construction). In addition, the 2004 FEIS identified a ventilation/emergency egress structure for the potential 129th Street storage tracks to be constructed in an easement near Second Avenue and 127th Street.

The 2004 FEIS noted that specific locations of acquisitions could change because the design of the station areas was not yet finalized at that time and new development was expected to occur. The 2004 FEIS noted that if the proposed locations of any of the permanent subway facilities (i.e., entrances and ancillary facilities) were to shift, the nature and extent of impacts would be similar.

The 2004 FEIS identified the potential temporary but long-term displacements at the 125th Street curve, the acquisition for the construction staging sites at the curve, and the permanent acquisitions along the full alignment as significant adverse impacts, but stated that businesses and property owners would be compensated according to the EDPL and Uniform Act.

Table 6-1

Preliminary List of Private Properties to be Acquired for Phase 2 Permanent Project Elements for the 2004 FEIS Design

Block	Lot	Address	Approximate Location	Current Use	Estimated Commercial Displacement (Square Feet)	Commercial Displacement (Full-Time Equivalent Employees)[1]	Estimated Residential Displacement (Units)[2]	Estimated Residential Displacement (Residents)[2]	Proposed Use	Acquisition Type[3]
106th Street Station										
1681	50	2132 Second Ave	SW corner 110th Street	1-story beer [4] distributor	3,600	9	0	0	Ancillary facility	Full acquisition
1678	1	2080 Second Ave	SE corner 108th St	Unused building at Ben Franklin Houses	0	0	0	0	Station entrance	Partial acquisition
1678	1	2078 Second Ave	NE corner 106th St	Portion of plaza at residential building	0	0	0	0	Station entrance	Partial acquisition
1677	1	2042 Second Ave	E side Second Ave, 105th-106th Sts	Vacant lot	0	0	0	0	Ancillary facility and emergency egress	Full acquisition
1677	2	2042 Second Ave	E side Second Ave, 105th-106th Sts	Vacant lot	0	0	0	0	Ancillary facility and emergency egress	Full acquisition
1677	3	2042 Second Ave	E side Second Ave, 105th-106th Sts	Vacant lot	0	0	0	0	Ancillary facility and emergency egress	Full acquisition
			Subtotal		3,600	9	0	0		
116th Street Station										
1795	2	2304 Second Ave	E side Second Ave near 118th St	Vacant land	0	0	0	0	Ancillary facility	Full acquisition
1795	3	2306 Second Ave	E side Second Ave near 118th St	Vacant land	0	0	0	0	Ancillary facility	Full acquisition
1688	1	2262 Second Ave	NE corner 116th St	Vacant 5-story residential with ground-floor retail	1,196	3	6	18	Station entrance, ancillary facility and emergency egress	Full acquisition
1688	1	301 E. 116th St	N side 116th St, Second-First Aves	1-story retail	1,196	3	0	0	Station entrance and ancillary facility	Full acquisition
1688	2	307 E. 116th St	N side 116th St, Second-First Aves	Vacant land	0	0	0	0	Station entrance and ancillary facility	Full acquisition
1687	51	2254 Second Ave	SE corner 116th St	4-story residential with ground-floor barber shop	1,020	3	3	9	Ancillary facility	Full acquisition
1687	151	2252 Second Ave	SE corner 116th St	4-story residential with ground-floor discount store	1,020	3	3	9	Ancillary facility	Full acquisition
			Subtotal		4,432	12	12	36		

Table 6-1 (Cont'd)
Preliminary List of Private Properties to be Acquired for Phase 2 Permanent Project Elements for the 2004 FEIS Design

Block	Lot	Address	Approximate Location	Current Use	Estimated Commercial Displacement (Square Feet)	Commercial Displacement (Full-Time Equivalent Employees)[1]	Estimated Residential Displacement (Units)[2]	Estimated Residential Displacement (Residents)[2]	Proposed Use	Acquisition Type[3]
125th Street Station										
1773	57	132 E. 125th St	SW corner Lexington Ave at 125th St	2-story commercial w ground-floor pawn shop, grocery, and restaurant	6,594	21	0	0	Station entrance and ancillary facility	Full acquisition
1773	67	110 E. 125th St	S side 125th St, Park-Lexington Aves	Portion of parking lot	0	0	0	0	Ancillary facility	Partial acquisition
1789	46	2293 Third Ave	SE corner Third Ave at 125th St	Portion of vacant parcel	0	0	0	0	Ancillary facility	Partial acquisition
				Subtotal	6,594	21	0	0		

Notes:

1. Commercial displacement was estimated using the following rates:
   Retail: 1 full-time equivalent (FTE) employee per 400 square feet (sf),
   Office: 1 FTE employee per 250 sf,
   Restaurant: 1 FTE employee per 200 sf,
   Manufacturing: 1 FTE employee per 500 sf,
   Parking: 1 FTE employee per 1,500 sf.
   Vacant space was assumed to be occupied.
2. Residential units represent all units in the building (including vacant units), based on New York City Department of Finance Real Property Assessment Data.
   Number of residents is based on the average household size for the census tract in which the station is located.
   When a station area falls in two census tracts, the larger of the two average household sizes was used.
3. Acquisitions are considered partial when only a portion of a property must be acquired and the remaining portion would remain usable.
4. This property is not available for use by the Second Avenue Subway Project, as a residential building is planned for the site. An alternate site may be more appropriate, subject to further engineering.

Source: 2004 FEIS, Table 8-1.

6.3 UPDATE OF BACKGROUND CONDITIONS

As discussed in Chapter 4, "Social and Economic Conditions," substantial new development has occurred in East Harlem since the 2004 FEIS and more development is planned. As a result, some sites identified in the 2004 FEIS for ancillary facilities and entrances have since been developed, or are currently planned to be developed, with private development and are no longer suitable for use by the Second Avenue Subway Project, because of the size of the new or proposed private development or other features. In addition, some of the properties above the 125th Street curve have been redeveloped with new, larger buildings. Site-specific changes are described in the following sections.

6.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

6.4.1 CONSTRUCTION IMPACTS

As with the 2004 FEIS Design, during construction of the Modified Design, construction of the Second Avenue Subway would require some short-term access limitations during construction. Access would be maintained to most residential and commercial buildings and retail businesses near the construction zone at all times, but in limited areas, there could be temporary disruption to access to protect public safety or where access to building entrances may be blocked during construction. As stated in the 2004 FEIS, this would generally occur for only a few hours at a time, but in a few instances, disruptions could extend for up to 6 months.

In addition, similar to the 2004 FEIS Design, as part of the construction of the Phase 2 alignment along 125th Street, some temporary, subgrade easements would be required for installation of rockbolts to support the tunnel wall. Once construction is complete, the easements would lapse. No temporary or permanent displacement or relocation would be required as a result of these easements.

Like the 2004 FEIS Design, the Modified Design would have a curved tunnel alignment from Second Avenue to 125th Street. This 125th Street curve would pass beneath the same properties identified in Section 6.2.1, as well as a small portion of an additional parcel (see **Figure 6-1**). The potential staging area site identified in the 2004 FEIS occupied with auto-related services and residences remains a viable potential staging area, but as shown on **Figure 6-1**, this site would now also be constructed with an ancillary facility and require a permanent acquisition (see Section 6.4.2 below). The vacant lot on Second Avenue that was also identified as a potential staging area in the 2004 FEIS has been merged with adjacent lots and developed as an 11-story mixed residential and commercial building and is no longer under consideration for use during construction.

The changes to the tunnel depth (i.e., vertical alignment) proposed in the Modified Design may reduce, or possibly avoid, the need for temporary displacements on the properties above the curve. With the Modified Design, the tunnel alignment would be about 20 feet deeper at the 125th Street curve than in the 2004 FEIS Design, which would provide greater separation from building foundations. The Modified Design, like the 2004 FEIS Design, would include ground stabilization measures (e.g., grouting) to harden the soil in preparation for tunneling. However, with the Modified Design, this may be conducted primarily from the staging area rather than from within the buildings above the curve, which would reduce disruptions to residents of those buildings.

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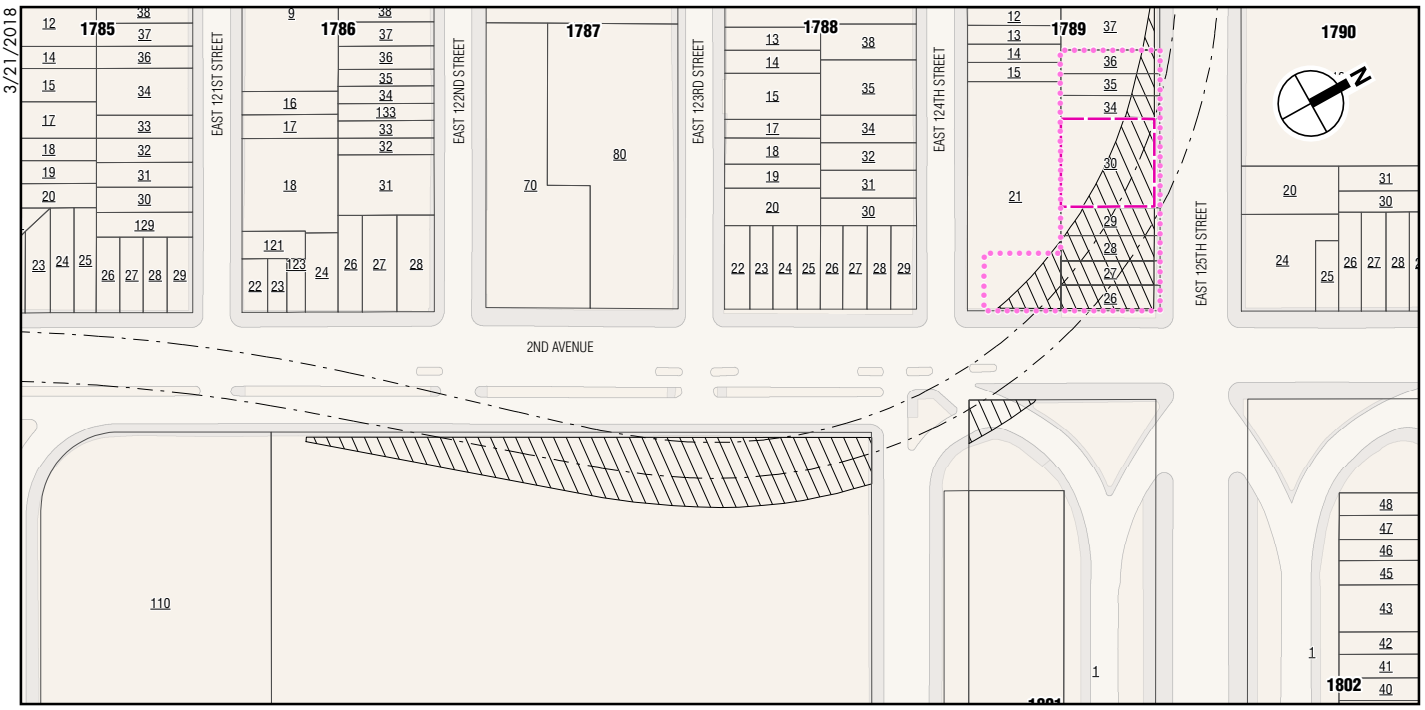
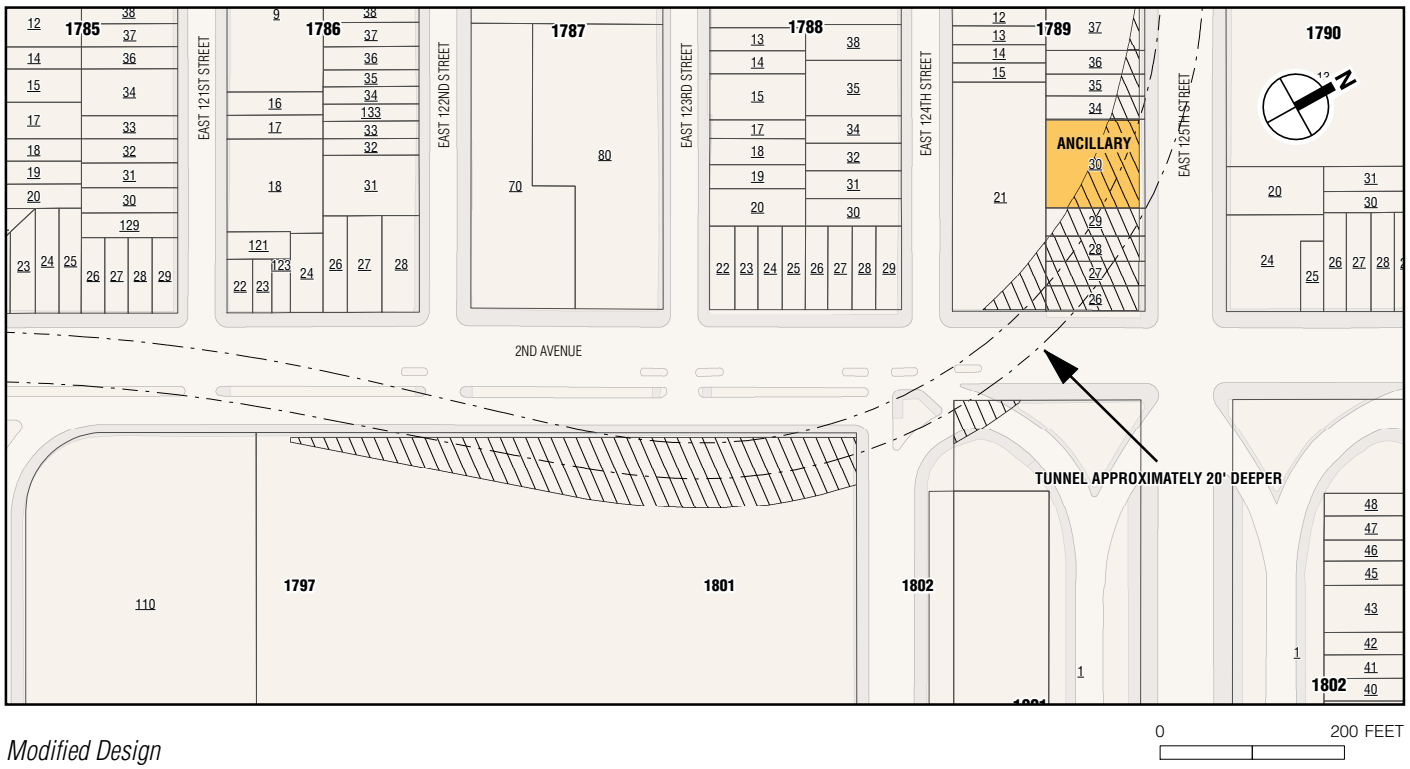


2004 FEIS Design

Potential Temporary Displacements - 2004 FEIS Design

Proposed Construction Staging Site with Building Demolition - 2004 FEIS Design

Permanent Subsurface Easement



Modified Design

Ancillary

Permanent Subsurface Easement

Land Acquisition - Comparison of 2004 FEIS Design and Modified Design 125th Street Curve

SECOND AVENUE SUBWAY PHASE 2

Figure 6-1

Overall, no new temporary property acquisitions or displacements would occur for the Modified Design as compared to the 2004 FEIS Design. Measures are being implemented in the Modified Design to avoid, or reduce, the potential 12-month temporary displacements along the 125th Street tunnel curve identified in the 2004 FEIS, to be determined as design advances. Displacement of the estimated 21 employees and 21 residents at the site of the proposed staging area and new ancillary facility remains consistent with the 2004 FEIS Design.

6.4.2 PERMANENT IMPACTS

As described in Chapter 2, "Description of Phase 2 Modified Design," the Phase 2 alignment is largely the same as presented in the 2004 FEIS; however, some entrance and ancillary facilities have been relocated due to shifts in platform alignments, constructability considerations, or changes in background conditions that have made sites identified for entrances or ancillary facilities in the 2004 FEIS no longer suitable for that use today. Some entrances and ancillary facilities are also larger than described in the 2004 FEIS due to site-specific conditions, changes in background conditions and engineering standards, and advanced preliminary design (see discussion in Section 2.3.3 of Chapter 2). Additionally, the Modified Design includes a new ancillary facility for the tail tracks and an ancillary facility at the 125th Street tunnel curve. However, as the potential 129th Street storage tracks identified in the 2004 FEIS have been eliminated, an associated ancillary facility identified near 127th Street has also been eliminated. The 2004 FEIS did not identify any potential displacement associated with that ancillary facility. Potential displacement of vault spaces or cellar doors on or beneath the sidewalk near cut-and-cover construction activities would remain the same with the Modified Design.

The 2004 FEIS included a general sizing of ancillary facilities, as design for each Project phase was not yet advanced and site-specific requirements were not yet known. However, based on more advanced design for Phase 2, more space would be required for the ancillary facilities. As described in Chapter 2, Section 2.3.3, the reasons for the increase in size include:

- Construction of Phase 1 of the Second Avenue Subway provided valuable experience for construction of this large and complex capital project. For example, during design of Phase 1, some ancillary facilities needed to be relocated or enlarged from the 2004 FEIS Design to accommodate features such as additional maintenance spaces and meet specific NYCT design requirements As preliminary engineering has advanced, measures based on this experience have been incorporated into the Modified Design.
- The Modified Design would include a different cooling system for the stations than was envisioned for the 2004 FEIS Design or was constructed in Phase 1, to reduce the operations and maintenance demands of the system, as well as the noise attenuation requirements for the cooling towers. The new cooling system requires more space within the ancillary facility.
- To meet the Project objectives of maintaining neighborhood character and creating transit facilities that are aesthetically pleasing and compatible with neighborhood character, the proposed ancillary facilities in the Modified Design would accommodate ground floor-retail spaces that require additional space not originally contemplated.
- The 106th and 116th Street Station shells would have a relatively shallow alignment in order to align with existing tunnel segments that were constructed in the 1970s for the future subway; therefore, they would have limited space to accommodate operations and maintenance spaces, requiring these spaces to be located in the ancillary facilities.

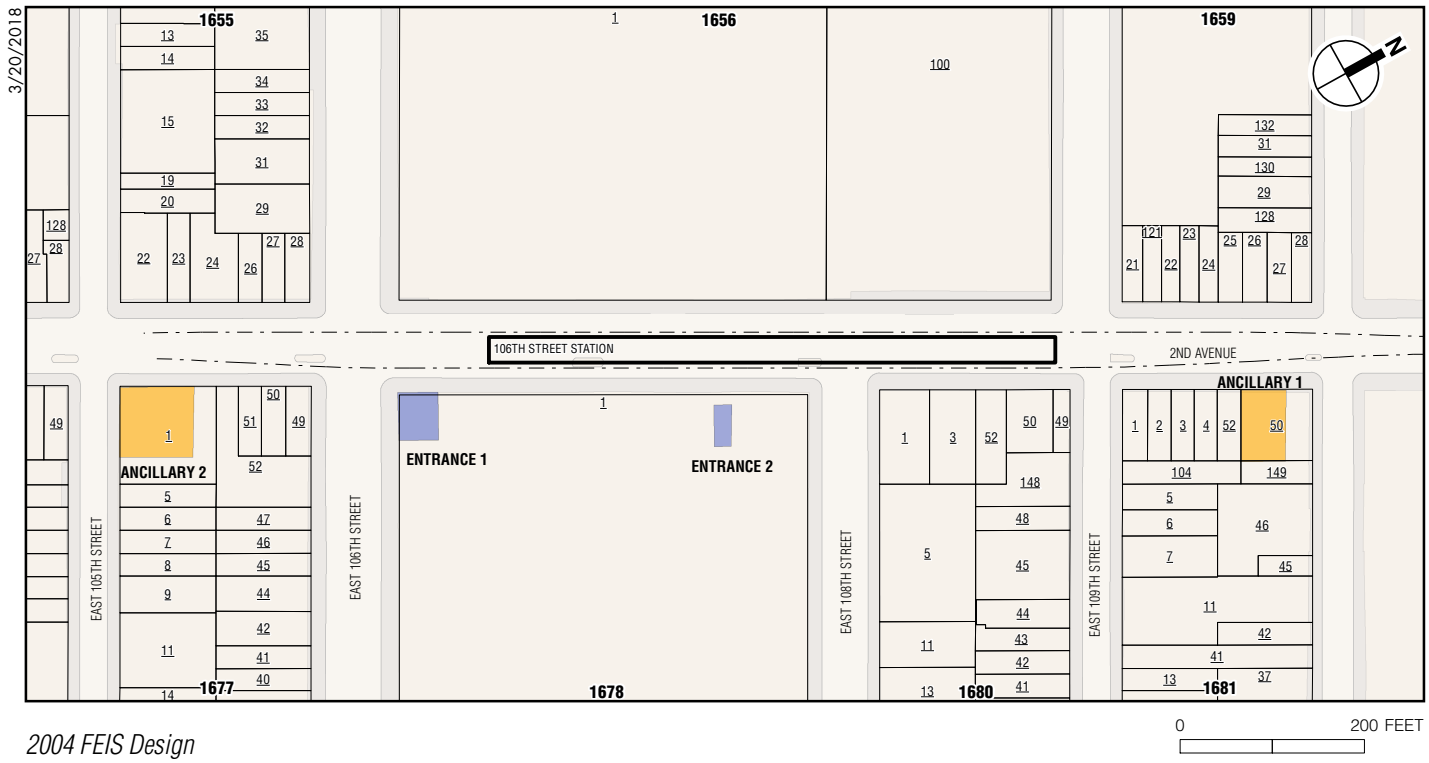
- Subsequent to the 2004 FEIS, Hurricane Sandy caused widespread flooding and damage in New York City, and modified flood protection design standards have been implemented for NYCT projects throughout the city. With these new design standards, the Modified Design must have more critical elements located above ground at higher design elevations, which requires larger above-ground structures for the ancillary facilities.
- The 125th Street Station would require additional ancillary space to support the functions of a terminal station.
- During construction of Phase 1, MTA experienced substantial constructability risks and challenges related to underpinning, stabilizing, and strengthening adjacent buildings from working within smaller staging site footprints. As a result, larger work sites have been identified in the Modified Design to avoid these risks and associated costs.

As also discussed in Section 2.3.3 of Chapter 2, the Modified Design would also require more area for station entrances, to allow for more full-service entrances (with escalators and elevators to meet the requirements of the Americans with Disabilities Act) as passenger loading demand has been refined, and to minimize constructability impacts to adjacent buildings.

MTA is using the site selection criteria outlined in the 2004 FEIS for identifying new sites, when ancillary facilities and station entrances must be relocated. Those criteria are described in Section 2.2.2 of Chapter 2, 'Description of Phase 2 Modified Design." As noted there, sites for station entrances and ancillary facilities are selected to limit the need for displacement of residents or businesses where possible, by choosing potential easements in existing or planned buildings, vacant lots and buildings, plazas and arcades, and open areas before occupied buildings. The entrance and ancillary facility locations must provide functionality to the subway system, but sites have been selected with the intention of avoiding occupied residences, historic sites, active commercial uses, and parks and recreational spaces, where possible. Priority is given to acquisition of vacant or underutilized sites and structures, to the extent practicable. **Table 6-2** provides an overview of each potential property acquisition. Modifications to planned property acquisitions specific to each section of the Phase 2 alignment are summarized below:

- **106th Street Station:** As shown in **Figure 6-2**, Entrance 1 and Entrance 2 would remain in the same general location as provided in the 2004 FEIS, but would be expanded for the reasons discussed above. Entrances 1 and 2 would continue to require partial acquisitions on Block 1678, Lot 1, part of the New York City Housing Authority's (NYCHA) Franklin Plaza Apartments. Entrance 2 would be shifted to the corner and would require displacement of approximately 14 spaces in a Franklin Plaza Apartments parking lot. Ancillary 1 and Ancillary 2 would both be shifted within the same original blocks to avoid newly constructed mid-rise buildings on the previous locations—thereby reducing displacements and costlier demolition—and to better align with the shifted station shell. The ancillary facilities would also be larger, as discussed above.

  Overall, the Modified Design for the 106th Street Station would require the same two partial acquisitions (though slightly larger) as identified in the 2004 FEIS and requires 11 full property acquisitions as compared to 4 in the 2004 FEIS.
- **116th Street Station:** As shown in **Figure 6-3**, Entrance 1 would remain in a similar location as in the 2004 FEIS Design, but would be larger for the reasons discussed above. This expansion incorporates a portion of a community center, the Corsi Senior Center operated by Union Settlement (Block 1688, part of Lot 45) at the NYCHA Corsi Houses. MTA will coordinate with NYCHA and the Union Settlement to address this displacement and

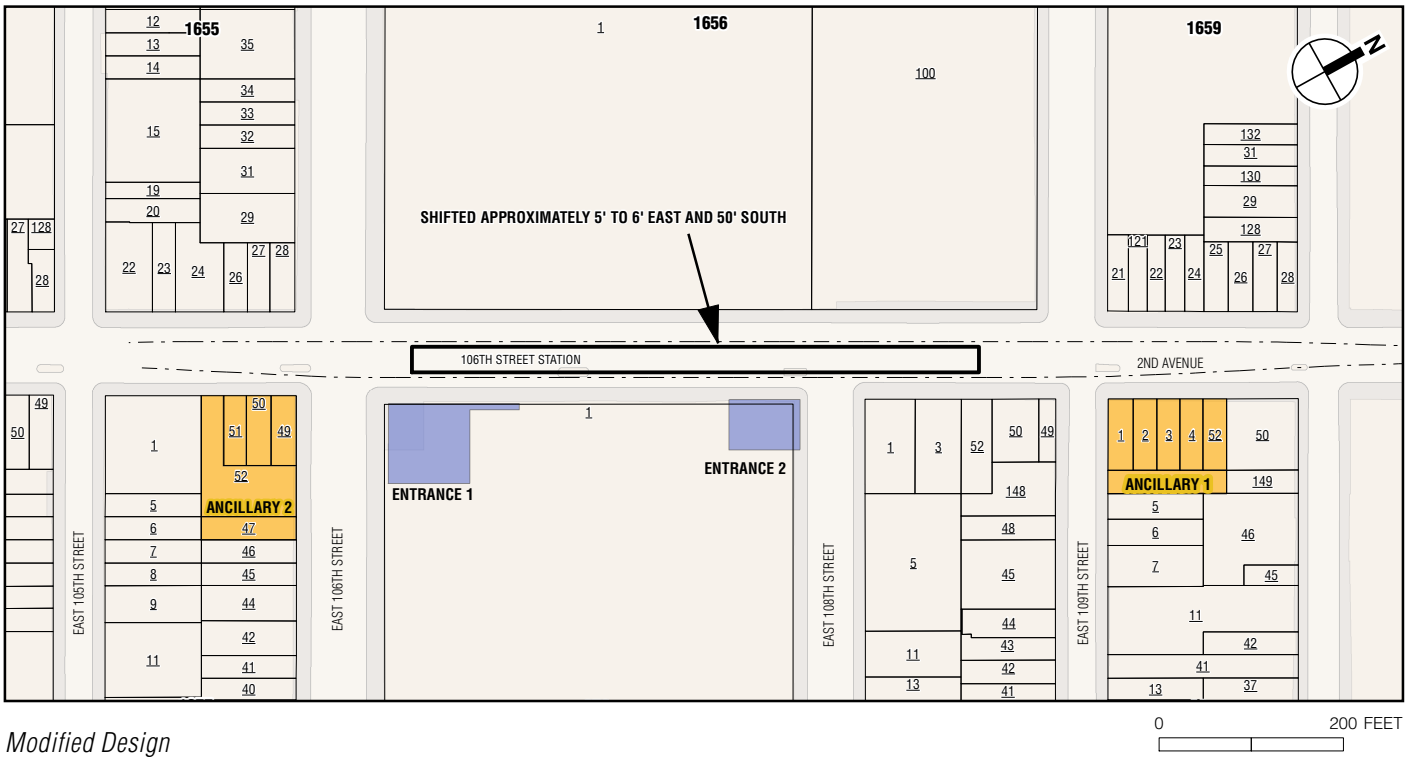


2004 FEIS Design

Entrance

Ancillary

Station Platform



Modified Design

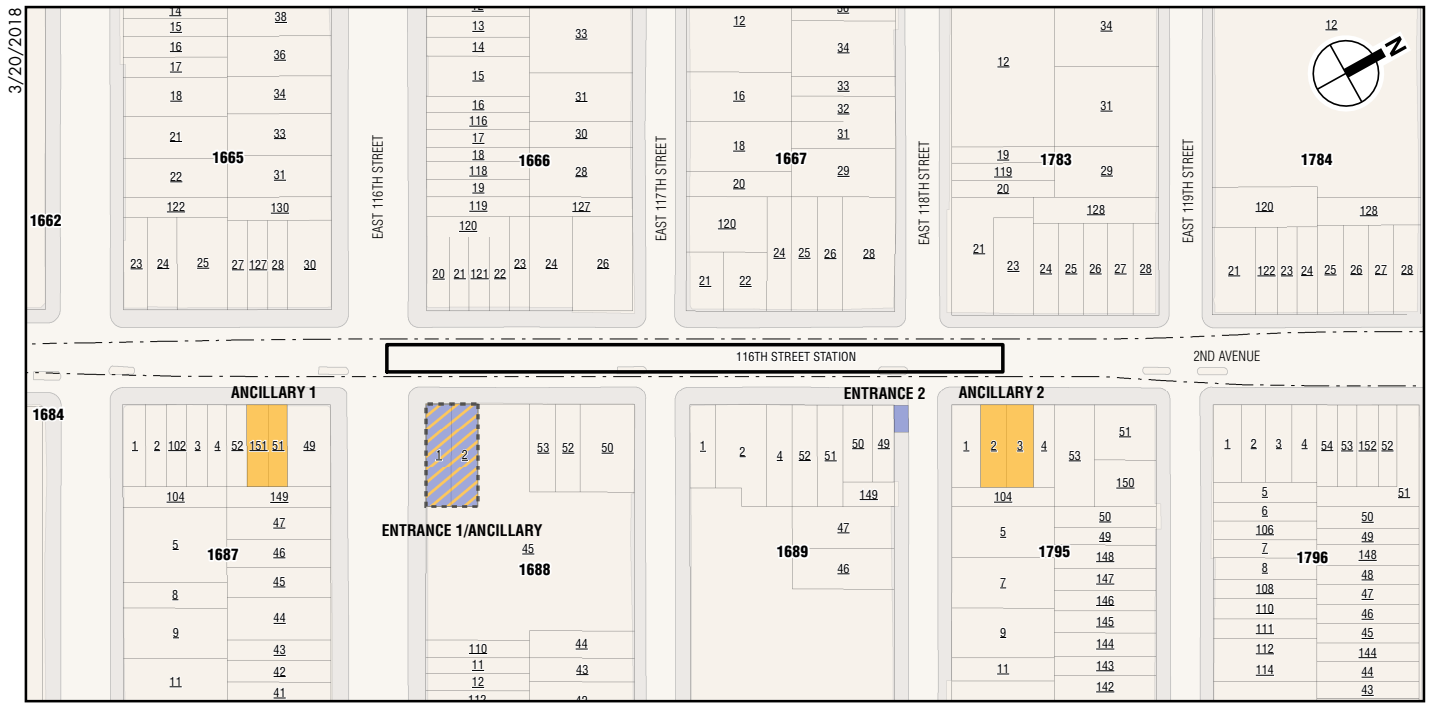
Entrance

Ancillary

Station Platform

Land Acquisition - Comparison of 2004 FEIS Design and Modified Design
106th Street Station
Figure 6-2

SECOND AVENUE SUBWAY PHASE 2



2004 FEIS Design

Ancillary

Entrance/Ancillary

Station Platform

Modified Design

Entrance

Ancillary

Station Platform

Land Acquisitions - Comparison of 2004 FEIS Design and Modified Design 116th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure 6-3

appropriately restore uses of the facility. Entrance 2 would be in a new location across 118th Street from its location in the 2004 FEIS Design and would be a full-service (with escalators and an elevator) entrance to accommodate the anticipated passenger load, rather than a small sidewalk stairway entrance as it was in the 2004 FEIS Design.

Ancillary 1 would be in a location farther south on the same block to avoid impacts to the Banca Commerciale Italiana building, a newly designated historic structure (see Chapter 8, "Historic and Archaeological Resources"), and to provide a better ventilation connection to the subway structure. Ancillary 2 would be relocated about one block farther north, which would provide a better ventilation connection to the station box and tunnel section, and would provide a staging area for the TBM launch operations.

The area shown on **Figure 6-3** for Ancillary 2 would not only accommodate the new ancillary facility, but would provide a staging area for construction of the station and TBM operations for the tunnel curve and along 125th Street. Not all properties identified for Ancillary 2 may be needed and as design advances, opportunities will be investigated to reduce property acquisitions, if practicable. However, a number of the structures on the site are vacant; they have been included to allow design flexibility and to avoid constructability issues associated with reinforcing these structures during construction.

In summary, the Modified Design for the 116th Street Station would require 19 full property acquisitions and one partial property acquisition, as compared to seven full acquisitions and no partial acquisitions in the 2004 FEIS.

- **125th Street Curve:** As shown in **Figure 6-1**, the Modified Design would include an ancillary facility on 125th Street near Third Avenue to provide intermediate tunnel ventilation and emergency egress between stations. This site (Block 1789, Lot 30) was previously identified as a temporary acquisition for a construction staging site in the 2004 FEIS Design and required demolition of the existing building, but no permanent acquisition or ancillary facility was proposed here. While the ancillary facility now requires a permanent acquisition, it does not alter displacements that were previously identified for this site.

  Lot 25 (now merged with Lot 21) on this block was previously identified as a temporary acquisition for construction staging, but has been developed with a large residential development and is no longer under consideration. Permanent subsurface easements where the tunnel travels below private property would remain largely consistent with the 2004 FEIS.

- **125th Street Station**: As shown in **Figure 6-4**, Entrance 1 and an option for Entrance 2 (Option 2) would remain in similar locations with the Modified Design as presented in the 2004 FEIS Design, but would be larger for the reasons discussed above. In the 2004 FEIS Design, Entrance 1 was envisioned as a small sidewalk entrance in the public right-of-way, but the expanded footprint with the Modified Design now requires partial acquisition of an adjacent lot (Block 1773, Lot 20).

  With the Modified Design, an additional (preferred) option for Entrance 2 (Option 1) is being investigated at the northwest corner of 125th Street and Lexington Avenue that could enhance transfers between the Second Avenue Subway and the existing Lexington Avenue (4/5/6) subway line. To accommodate anticipated passenger demand, MTA anticipates a need for at least three escalators at Entrance 2; two for the peak direction and one for the opposing direction. The property at the southwest corner (Option 2) is not large enough to accommodate the escalator core for three escalators for this deep station, and expanding into the adjacent property to the west could result in impacts to a historic bank on that site that is listed on the

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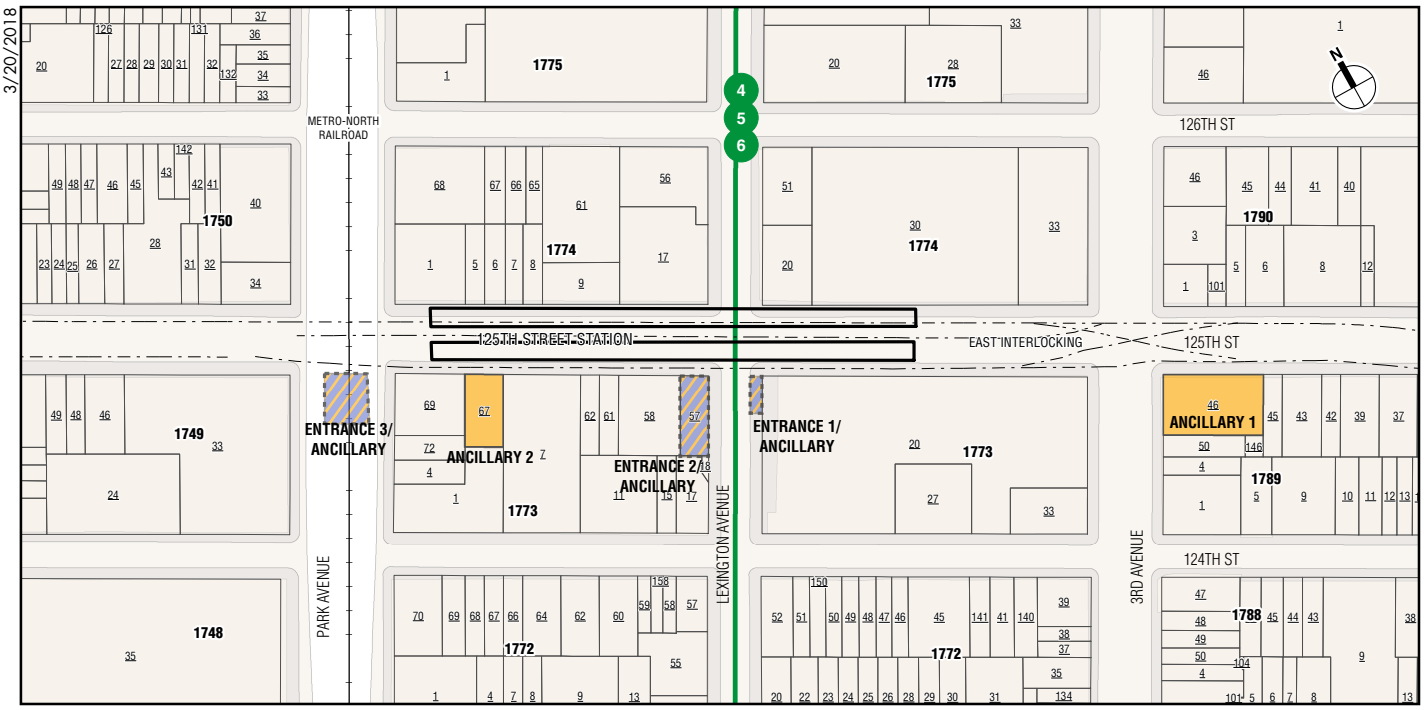


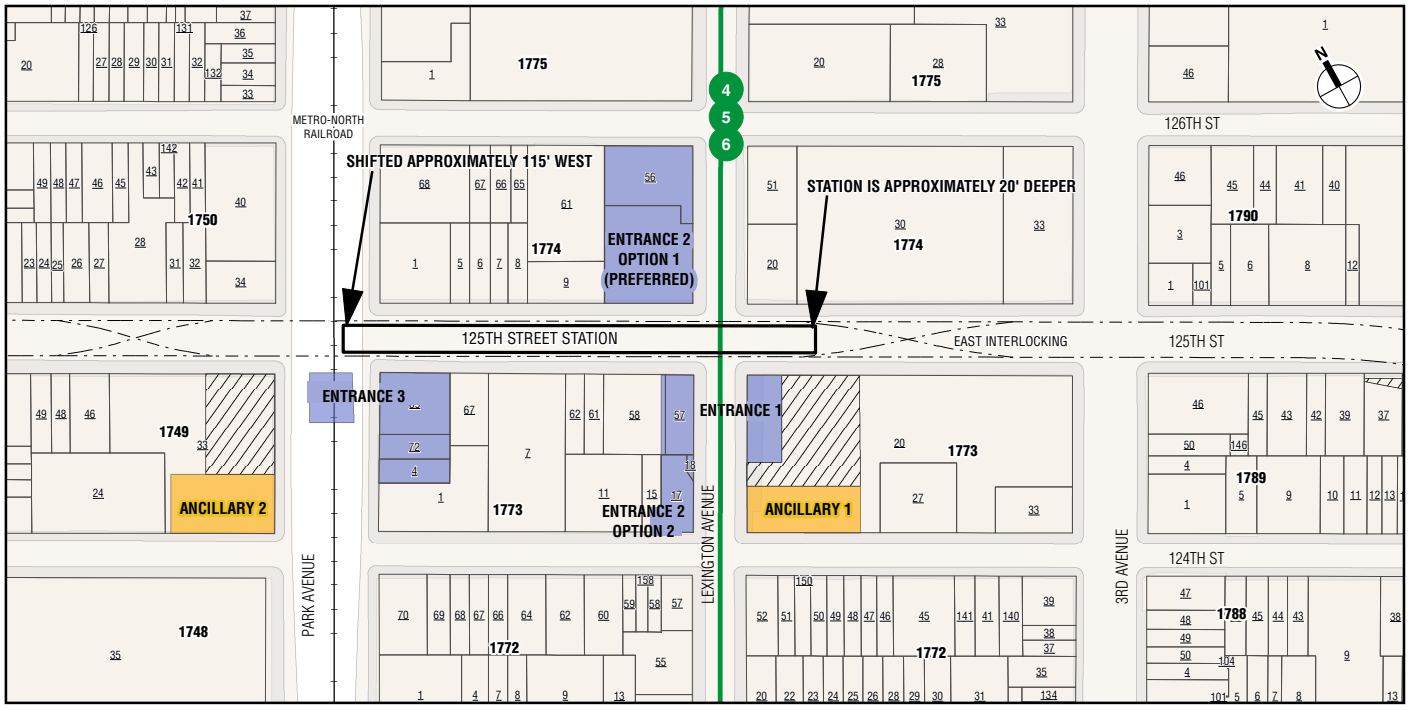
2004 FEIS Design

0 200 FEET

Ancillary

Entrance/Ancillary

Station Platform



Modified Design

0 200 FEET

Entrance

Permanent Subsurface Easement

Ancillary

Station Platform

Land Acquisition - Comparison of 2004 FEIS Design and Modified Design 125th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure 6-4

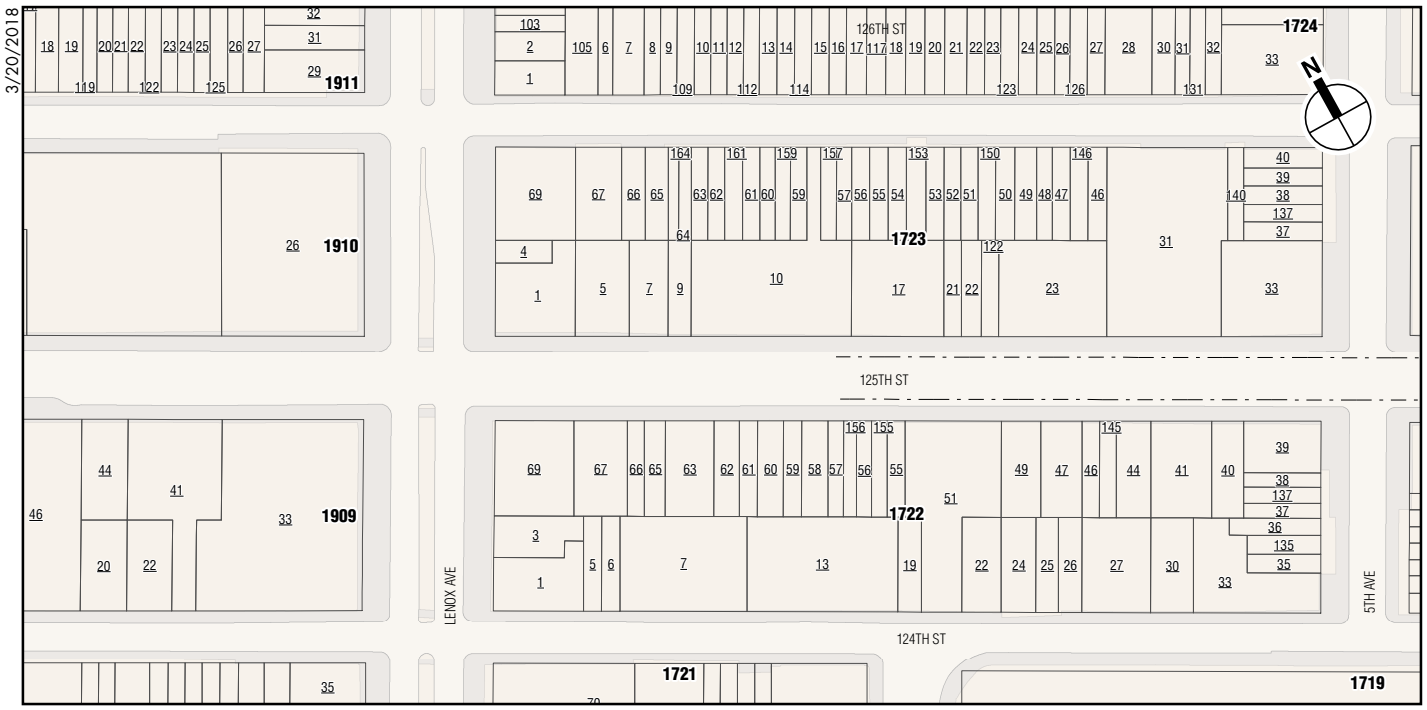
State and National Register of Historic Places. Therefore, an entrance at the southwest corner (Option 2) could accommodate only two escalators. The property at the northwest corner (Entrance 2, Option 1) would adequately accommodate three escalators. In addition, the location of Entrance 2 with Option 1 could potentially provide a higher capacity transfer connection between the Second Avenue Subway and Lexington Avenue (4/5/6) subway line by providing a transfer point at the northern end of the Lexington Avenue (4/5/6) subway platform in addition to the transfer point at the southern end of the platform provided by Entrance 1. This would allow a greater distribution of passengers for the expected heavy use of this station. Conversely, Entrance 2 with Option 2 would remain at the southern end of the platform, thereby concentrating passenger movements in a smaller area. These two options are being evaluated to determine optimal connectivity and distribution of transfer passengers, and the final option will be selected as design advances.

Entrance 3 would continue to be a shallow entrance within the Park Avenue median under the Metro-North Railroad viaduct, but with the Modified Design this entrance would be larger than in the 2004 FEIS Design and would incorporate property at the southeast corner of 125th Street and Park Avenue. This additional site is needed to provide more space to accommodate passenger demand and vertical circulation elements. It is also needed to address constructability constraints associated with working near the foundations and superstructure of the railroad viaduct and Entrance 3's proximity to a historic Comfort Station building. Depending on the results of ongoing investigations related to the viaduct, this entrance may shift entirely to the corner property.

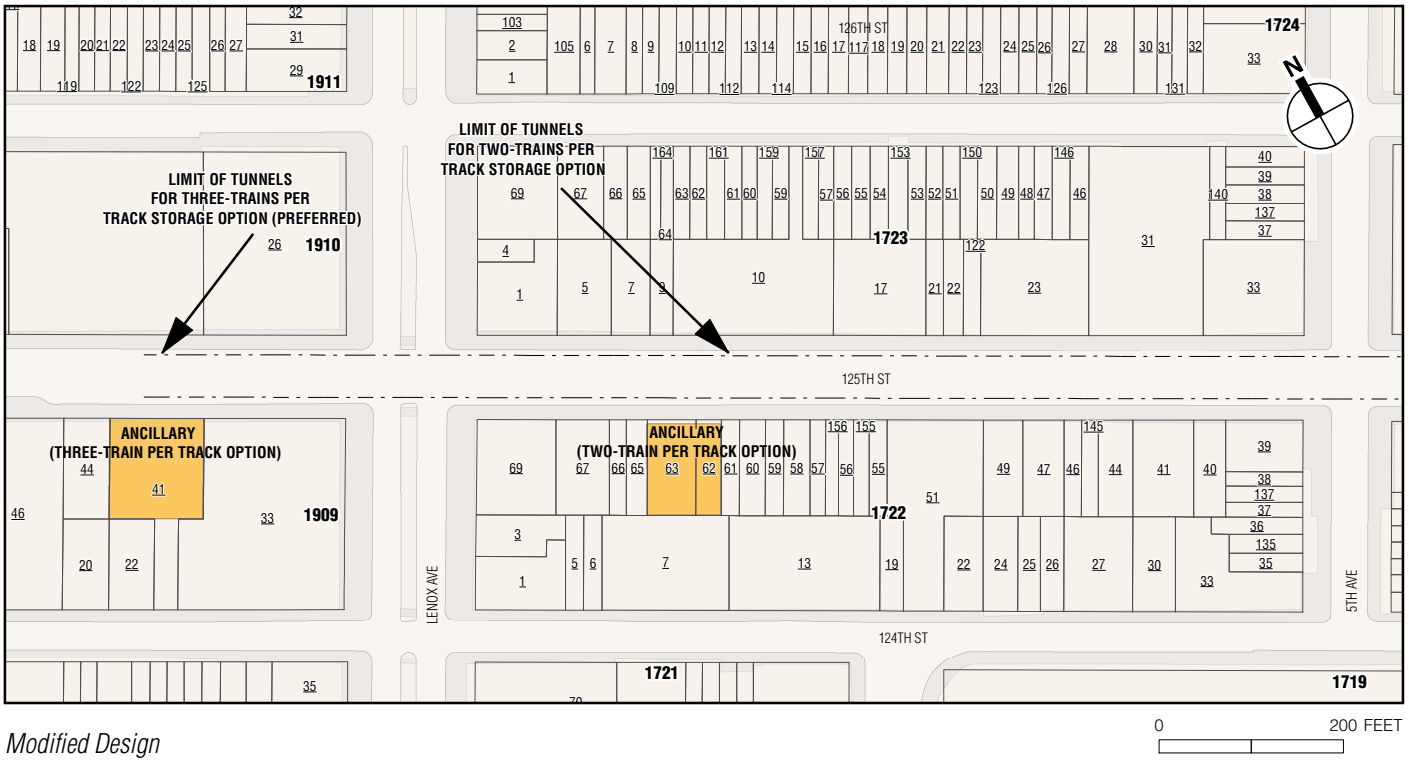
With the Modified Design, Ancillary 1 and Ancillary 2 would be relocated to better align with the 125th Street Station, which would be shifted westward to allow a revised construction technique. In addition, these ancillary facilities would be sited on 124th Street rather than 125th Street, to reduce construction impacts along the heavily traveled 125th Street. As discussed in Chapter 2, the sites of Entrance 1/Ancillary 1 and Ancillary 2 are the subject of private development interests, and MTA will coordinate with the developers, as needed.

In summary, the Modified Design for the 125th Street Station would require six full property acquisitions with the preferred Option 1 for Entrance 2 and five full property acquisitions with Option 2 of Entrance 2, as compared to one full acquisition in the 2004 FEIS Design. Two partial property acquisitions would be required, which is consistent with the 2004 FEIS Design. Two permanent subsurface easements would be required to connect Ancillary 1 and Ancillary 2 to the subway station structure (see **Figure 6-4**).

- **125th Street Tail Tracks**: The Modified Design would include an ancillary facility for the 125th Street tail tracks, which was not included in the 2004 FEIS Design, since the storage tracks were shorter in length and essentially part of the 125th Street Station. As shown in **Figure 6-5**, two options for the tail tracks are now being considered, which would locate an ancillary facility either just east or just west of Lenox Avenue. The two-train per storage track option would require two full property acquisitions, and the three-train per storage track would require one partial property acquisition. At this time, the three-train per track storage option is preferred, as it provides greater capacity to support future phases (i.e., Phases 3 and 4) of the Second Avenue Subway Project, but the final selection will be determined as financial considerations and further operations planning is conducted. The temporary acquisition of Block 1789, Lot 30 identified in the 2004 FEIS Design would be a permanent acquisition with the Modified Design, for a new ancillary facility that was not included in the 2004 FEIS Design, but the number of estimated displacements remains the same.



2004 FEIS Design



Modified Design

Entrance

Ancillary

Land Acquisition - Comparison of 2004 FEIS Design and Modified Design
125th Street Tail Tracks

SECOND AVENUE SUBWAY PHASE 2

Figure 6-5

Table 6-2 provides a summary of potential property acquisitions for the Modified Design. It identifies full and partial acquisitions, as well as permanent subsurface easements where subway facilities would be located beneath private property but would not affect the use of that property. Potential residential and commercial (employee) displacements are also provided in **Table 6-2**. It is assumed that displacements would only result from full acquisitions, but partial acquisitions and permanent subsurface easements would not affect property use or result in displacements. Potential residential displacements are calculated based on average household size in the area as reported by the 2011-2015 American Community Survey (ACS) and employee displacements are based on rates established for each type of business sector (e.g., retail, industrial, etc.). These rates are provided in footnotes at the end of the table.

In total, with the Modified Design an estimated 36 (for the preferred design option) to 39 potential full property acquisitions would be required and 4 to 5 (for the preferred design option) potential partial property acquisitions would be required. As shown in **Table 6-2**, the potential property acquisitions would range from an estimated displacement of 76,171 to 180,981 square feet (for the preferred design option) of commercial space and 157 to 505 employees (for the preferred design option). The number of residential displacements would be the same under either design option, at an estimated 65 occupied residential units and 170 residents.

As design proceeds from preliminary engineering to final design, opportunities to reduce property acquisitions will be identified, if practicable. In the event that property required for construction staging is no longer needed for permanent project operation, excess property would be used or disposed of in accordance with MTA real estate procedures and will adhere to all pertinent federal regulations. Property that is sold would be subject to underlying zoning regulations. In addition, the Modified Design incorporates retail spaces within the ancillary facilities and entrances, which would allow for reinstating some of the displaced commercial uses.

In addition, there may be an opportunity to include other development in combination with some ancillaries and/or entrances, within the building envelope permitted by the zoning recently enacted through the East Harlem Rezoning adopted by New York City. No such overbuild or other development projects are being proposed at this time. At the 125th Street Station, entrances and ancillaries planned for sites that are currently vacant and the subject of private development interests will be coordinated with the developers for those sites as design advances. If MTA pursues an opportunity for joint development in accordance with FTA joint development guidelines, such proposal(s) would be subject to additional NEPA re-evaluation(s).

The Modified Design, like the 2004 FEIS Design, would require permanent subsurface easements at the 125th Street curve under the 11 properties identified in the 2004 FEIS Design (although three of the original lots have now been merged with Lot 21) and includes one additional permanent subsurface easement beneath a small section of Block 1789, Lot 37. Consistent with the 2004 FEIS, no permanent displacements would result from these easements.

Table 6-2
Potential Property Acquisitions Required for the Modified Design

Proposed Use	Block	Lot	Land Use	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Employees)	Occupied Residential Displacement (Units)	Residential Displacement (Residents)	Acquisition Type		
								Full	Partial	Perm't Ease-ment
106th Street Station *(see Figure 6-2)*										
Ancillary 1	1677	47	1-story commercial	2,500 (retail)	6	0	0	✓		
	1677	49	2-story mixed residential (vacant) and commercial	1,725 (retail)	4	0	0	✓		
	1677	50	4-story mixed residential and commercial	1,362 (retail)	3	6	14	✓		
	1677	51	4-story mixed residential and place of worship	1,458 (institutional)	1	5	12	✓		
	1677	52	4-story mixed residential (vacant), commercial, and lumber yard	1,725 (retail) 5,669 (industrial)	15	0	0	✓		
Entrance 1 and Entrance 2	1678	01	Portion of plaza and parking lot at residential building	0	0	0	0		✓	
Ancillary 2	1681	01	4-story mixed residential and commercial	1,296 (retail)	3	2	6	✓		
	1681	02	4 story mixed residential and commercial	1,250 (retail)	3	6	17	✓		
	1681	03	4 story mixed residential and commercial	1,250 (retail)	3	6	17	✓		
	1681	04	4-story mixed residential and commercial	1,263 (retail)	3	6	17	✓		
	1681	52	4-story mixed residential and commercial	1,250 (retail)	3	6	17	✓		
	1681	104	3-story residential	0	0	4	11	✓		
			Subtotal	*20,748*	*44*	*41*	*111*	*Full: 11* *Partial: 1* *Perm't Easements: 0*		
116th Street Station *(see Figure 6-3)*										
Ancillary 1	1687	01	4-story mixed residential and commercial	1,673 (retail)	4	6	14	✓		
	1687	02	4-story mixed residential and commercial	2,100 (retail)	5	1	2	✓		
	1687	03	4-story mixed residential (vacant) and commercial	1,020 (retail)	3	0	0	✓		
	1687	102	Industrial	1,600 (industrial)	3	0	0	✓		

Table 6-2 (Cont'd)
Potential Property Acquisitions Required for the Modified Design

Proposed Use	Block	Lot	Land Use	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Employees)	Occupied Residential Displacement (Units)	Residential Displacement (Residents)	Acquisition Type		
								Full	Partial	Perm't Ease-ment
116th Street Station (Cont'd)										
Entrance 1	1688	01	1-story commercial	2,300 (retail)	6	0	0	✓		
	1688	02	2-story commercial	2,500 (retail)	6	0	0	✓		
	1688	45	1-story community center at residential building	5,000 (institutional)	5	0	0		✓	
Entrance 2	1795	01	2-story place of worship	4,023 (institutional)	8	3	7	✓		
	1795	02	Parking Lot	0	0	0	0	✓		
	1795	03	Parking Lot	0	0	0	0	✓		
	1795	04	3-story mixed residential and commercial	982 (retail)	2	2	5	✓		
Ancillary 2	1784	23	3-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1784	24	3-story mixed residential and place of worship	900 (institutional)	1	2	5	✓		
	1784	25	4-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1784	26	4-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1784	27	4-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1784	28	4-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1784	120	Parking Lot	0	0	0	0	✓		
	1784	122	3-story mixed residential and commercial	1,952 (retail)	5	2	5	✓		
	1784	128	5-story residential (vacant)	0	0	0	0	✓		
			Subtotal	*24,050*	*48*	*16*	*38*	*Full: 19* *Partial: 1* *Perm't Easements: 0*		

Table 6-2 (Cont'd)
Potential Property Acquisitions Required for the Modified Design

Proposed Use	Block	Lot	Land Use	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Employees)	Occupied Residential Displacement (Units)	Residential Displacement (Residents)	Acquisition Type		
								Full	Partial	Perm't Ease-ment
125th Street Curve *(see Figure 6-1)*										
Tunnel below private property	1797	01	Greenspace areas at residential complex	0	0	0	0			✓
	1081	01	RFK Bridge ramps and roadway median	0	0	0	0			✓
	1789	21	12-story mixed residential and commercial	0	0	0	0			✓
	1789	26	5-story mixed residential and commercial	0	0	0	0			✓
	1789	27	5-story mixed residential and commercial	0	0	0	0			✓
	1789	28	5-story mixed residential and commercial	0	0	0	0			✓
	1789	29	5-story mixed residential and commercial	0	0	0	0			✓
	1789	30	2-story mixed residential and commercial	8,550 (retail)	21	8	21		✓	
	1789	34	4-story religious institution	0	0	0	0			✓
	1789	35	4-story religious institution	0	0	0	0			✓
	1789	36	4-story religious institution	0	0	0	0			✓
	1789	37	3-story public library	0	0	0	0			✓
			Subtotal	*8,550*	*21*	*8*	*21*	*Full: 1* *Partial: 0* *Perm't Easements: 11*		
125th Street Station *(see Figure 6-4)*										
Entrance 1 and Ancillary 1	1773	20	1-story commercial (vacant)	0	0	0	0		✓	✓
Entrance 2 (Option 1) *[preferred]*	1774	17	3-story office and commercial	24,930 (retail) 12,465 (office)	112	0	0	✓		
	1774	56	6-story office and commercial	47,458 (office) 11,490 (retail)	219	0	0	✓		
Entrance 2 (Option 2)	1773	17	1-story commercial	4,037 (retail)	10	0	0	✓		
	1773	18	2-story commercial (vacant)	0	0	0	0	✓		
	1773	57	2-story commercial (partially vacant)	3,297 (office) 2,100 (retail)	18	0	0	✓		

Table 6-2 (Cont'd)
Potential Property Acquisitions Required for the Modified Design

Proposed Use	Block	Lot	Land Use	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Employees)	Occupied Residential Displacement (Units)	Residential Displacement (Residents)	Acquisition Type		
								Full	Partial	Perm't Ease-ment
125th Street Station (Cont'd)										
Entrance 3	1773	4	Vacant land	0	0	0	0	✓		
	1773	69	4-story hotel and ground floor commercial (vacant)	8,512 (hotel)	3	0	0	✓		
	1773	72	Vacant lot	0	0	0	0	✓		
Ancillary 2	1749	33	Vacant	0	0	0	0		✓	✓
			Subtotal (with Entrance 2, Option 1) [preferred option]	*104,855*	*334*	*0*	*0*	*Full: 5 Partial: 2 Perm't Easements: 2*		
			Subtotal (with Entrance 2, Option 2)	*17,946*	*31*	*0*	*0*	*Full: 6 Partial: 2 Perm't Easements: 2*		
125th Street Tail Tracks *(see Figure 6-5)*										
Ancillary (Two-Train per Track Option)	1722	62	4-story mixed residential and commercial (vacant)	0	0	0	0	✓		
	1722	63	1-story commercial	5,147 (retail)	13	0	0	✓		
Ancillary (Three-Train per Track Option) *[preferred]*	1909	41	2-story commercial (under construction)	23,018 (retail)	58	0	0		✓	
			Subtotal (Two-Train Option)	*5,147*	*13*	*0*	*0*	*Full: 2 Partial: 0 Perm't Easements: 0*		
			Subtotal (Three-Train Option) [preferred]	*23,018*	*58*	*0*	*0*	*Full: 0 Partial: 1 Perm't Easements: 0*		

Table 6-2 (Cont'd)
Potential Property Acquisitions Required for the Modified Design

Proposed Use	Block	Lot	Land Use	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Employees)	Occupied Residential Displacement (Units)	Residential Displacement (Residents)	Acquisition Type		
								Full	Partial	Perm't Ease-ment
			Total (with preferred design options)*	***180,981***	***505***	***65***	***170***	***Full: 36 Partial: 5 Perm't Easements: 13***		
			Total (with alternate design options)*	***76,171***	***157***	***65***	***170***	***Full: 39 Partial: 4 Perm. Easements: 13***		

Notes:

1. Employee numbers are for full-time equivalent (FTE) employees. Commercial displacement was estimated using the following rates:
   Retail: 1 full-time equivalent (FTE) employee per 400 square feet (sf),
   Office: 1 FTE employee per 250 sf,
   Manufacturing/Industrial: 1 FTE employee per 500 sf,
   Institutional: 1 FTE per 1,000 sf,
   Hotel: 1 FTE per 3 hotel rooms,
   Vacant space was assumed to be unoccupied.
2. Residential units represent all occupied units in the building (not including vacant units), based on New York City Department of City Planning, Bytes of the Big Apple, MapPLUTO, 16v2 data. Number of residents is based on the average household size for the census tract.
3. Building occupancy was assessed during field visits conducted in October 2017. For buildings that appeared vacant, 0 displacements are assumed, which will be confirmed during final design.
4. For partial acquisitions and permanent easements, it is anticipated that there will not be any displacements from these properties.

* Depending on the design options that are advanced (e.g., Entrance 2, Option 1 or 2 at 125th Street and the two-train or three-train storage option), displacements would vary.

Sources: NYC Dept. of City Planning, Bytes of the Big Apple, MapPLUTO, 16v2; New York City Digital Tax Map, http://gis.nyc.gov/taxmap/map.htm, last accessed on October 24, 2017; LavaMap, https://lavamap.com/, last accessed on October 24, 2017; U.S. Census Bureau 2011-2015 American Community Survey 5-year estimates.

6.5 CONCLUSIONS

Like the 2004 FEIS Design, the Modified Design would require acquisition of residential and commercial buildings on sites proposed for new station entrances and ancillary facilities. The 2004 FEIS identified preliminary locations for property acquisitions based on conceptual design, but noted that the required properties may change as design advances but the types of acquisition and the nature and extent of impacts would be similar. With the Modified Design, more properties would be acquired and the amount of displacement would be greater than for the 2004 FEIS Design. **Table 6-3** provides a comparison of property acquisitions with the 2004 FEIS Design and the Modified Design. While the number of property acquisitions and displacements would be greater for the Modified Design than identified in the 2004 FEIS, the nature and extent of impacts would similar to those identified in the 2004 FEIS. Compensation and displacements would continue to be conducted in accordance with the EDPL and Uniform Act. Therefore, as a result of the Phase 2 Modified Design, there will not be any new or different significant adverse impacts related to acquisitions, displacements, and relocations not previously identified in the 2004 FEIS and ROD.

Table 6-3
Comparison of Property Acquisitions, FEIS Design versus Modified Design

Segment	2004 FEIS Design (2004) and Modified Design (2018)	Occupied Commercial Displacement (Square Feet)	Commercial Displacement (Estimated Employees)	Occupied Residential Displacement (Estimated Units)	Residential Displacement (Estimated Residents)	Full / Partial Acquisitions
106th Street Station	2004	3,600	9	0	0	4 full / 2 partial
	2018	20,748	44	41	111	11 full / 1 partial
116th Street Station	2004	4,432	12	12	36	7 full / 0 partial
	2018	24,050	48	16	38	19 full / 1 partial
125th Street Curve	2004	8,550 (retail)	21	8	21	0 full / 0 partial
	2018	8,550	21	8	21	1 full / 0 partial
125th Street Station	2004	6,594	21	0	0	1 full / 2 partial
	2018 (preferred)	104,855	334	0	0	5 full / 2 partial
	2018 (alternate)	17,946	31	0	0	6 full / 2 partial
125th Street Tail Tracks	2004	N/A	N/A	N/A	N/A	N/A
	2018 (pref.)	23,018	58	0	0	0 full / 1 partial
	2018 (alt.)	5,147	13	0	0	2 full / 0 partial
TOTAL	**2004**	**23,176**	**63**	**20**	**57**	**12 full / 4 partial**
	2018 (preferred)	**180,981**	**505**	**65**	**170**	**36 full / 5 partial**
	2018 (alternate)	**76,171**	**157**	**65**	**170**	**39 full / 4 partial**

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Chapter 7: Visual and Aesthetic Resources

7.1 INTRODUCTION

This chapter evaluates the effects of the Modified Design on visual and aesthetic resources, in comparison to the effects of 2004 FEIS Design. The 2004 FEIS concluded that construction of the Project would result in temporary significant adverse visual impacts related to visually intrusive construction activities. For the completed Project, the 2004 FEIS concluded that visible elements, including station entrances and above-ground ventilation and cooling structures, are all common features of Manhattan streetscapes and would not be incongruous to the visual environment. Moreover, the design of the station entrances was to be sensitive to the surrounding architectural context. The Modified Design of Phase 2 would not change the overall conclusions of the 2004 FEIS. The station entrances and above-ground ancillary buildings would be larger than those described in the 2004 FEIS, but still would be designed to be sensitive to the surrounding neighborhood and would not result in adverse visual effects.

7.2 FEIS FINDINGS

The 2004 FEIS evaluated the Project's effects on visual and aesthetic resources in Chapter 6, "Social and Economic Conditions," since visual resources and urban design are among the components that contribute to the social conditions and character of a neighborhood.

7.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS identified temporary impacts on visual and aesthetic resources during construction as a result of construction equipment and vehicles, barriers, and nighttime lighting that would adversely affect the visual environment of the surrounding area. It also noted that street trees would also need to be removed from affected sidewalks, resulting in visual changes to the streetscapes. As described in the 2004 FEIS, construction would introduce visually incongruous activities, which would be temporary but would become part of the streetscape for long periods of time. This would include construction equipment, including nighttime lighting. As a result, the visual character of the nearby areas would be diminished during construction, and the intensity of the impacts would be compounded by the length of construction.

The 2004 FEIS noted that the construction contractor will be required to comply with the noise mitigation requirements outlined in the 2004 FEIS (see FEIS Chapter 12). As stated in the 2004 FEIS, this may include enclosing areas where spoils from tunnel operations would be loaded into trucks, or at station locations where spoils removal would take place for long durations during the daytime or at night; placing some equipment or operations below grade in shielded locations. The FEIS concluded that where barriers would be used to limit views of construction sites and/or block noise from construction activities, these barriers would themselves be visually intrusive. When located near building facades and windows, barriers would block some light for those windows. Therefore, the 2004 FEIS concluded that the use of tall barriers or enclosures in close proximity to windows would result in a significant adverse visual impact. The decision as to whether such

walls should be used is to be made after considering the advantages and disadvantages of the various types of significant adverse impacts that would occur during construction with and without such barriers.

In addition, significant adverse impacts on visual conditions due to longer term construction activities were identified at Second Avenue north of 125th Street to the Harlem River and 125th Street between Park and Third Avenues.

To mitigate the Project's significant adverse impacts on visual conditions during construction, the 2004 FEIS identified the use of barriers around construction sites when the benefits of such barriers outweigh their negative effects; the use of screens to block nighttime lighting; and the potential use of high-quality design for sidewalk sheds, such as the addition of windows, and better lighting in the sidewalk sheds; and restoration of disturbed conditions upon completion of construction.

7.2.2 PERMANENT IMPACTS

When completed, the Second Avenue Subway would have above-ground features at each station, including new station entrances and ancillary facilities. Specific dimensions for ancillary facilities were not known at the time of the 2004 FEIS, but a general sense of scale and massing was provided. The 2004 FEIS described ancillary facilities as potentially being similar in size to a typical rowhouse, ranging from about 25 to 40 feet wide (depending on if the facility is combined with an entrance), 75 feet deep, and up to about 75 feet tall. It was noted that some facilities might need to be wider. In the 2004 FEIS Design, the ancillary facilities were to include fresh air intake louvers facing the rear yard of structures and exhaust gratings and louvers primarily on the roofs. The 2004 FEIS also indicated that some ancillary facilities would include a cooling tower on the roof, shielded by privacy screens.

The 2004 FEIS Design also did not include specific information on the appearance of the ancillary facilities and the 2004 FEIS stated that ancillary facilities would be designed to be consistent with the neighborhood character. For example, they could appear similar to a neighborhood row house in height, scale, materials, and colors, and in some locations the existing building façade may be preserved while the interior of the building is reconstructed to serve its intended use. The 2004 FEIS also stated that "the design of the station entrances and ancillary facilities would be sensitive to the surrounding architectural context; they would not disturb views in the study area, nor would they change the study area's urban design" (FEIS page S-47).

The 2004 FEIS stated that visible elements, including station entrances and above-ground ventilation and cooling structures, are all common features of Manhattan streetscapes and would not be incongruous to the visual environment. Moreover, the design of the station entrances was to be sensitive to the surrounding architectural context; not disturb views in the study area, nor change the study area's urban design. As such, the 2004 FEIS did not identify any adverse impacts related to visual resources or aesthetics. The 2004 FEIS stated that community input on the design of ventilation facilities would be solicited.

7.3 UPDATE OF BACKGROUND CONDITIONS

As described in Chapter 4, "Social and Economic Conditions," Section 4.3, East Harlem has seen extensive new development since completion of the 2004 FEIS. Much of the development predicted in the 2004 FEIS has occurred, and there have also been many completed or planned

developments that were not foreseen in the 2004 FEIS. The 125th Street corridor, in particular, has been and continues to be a focus of much of the new development and continues to strengthen its position as a retail and economic hub in Harlem. In addition, along Second Avenue, many of the sites that were vacant or occupied by low-rise or vacant buildings in 2004 have more recently been redeveloped with mid-rise (8- to 10-story) apartment buildings.

In addition, as also described in Chapter 4, an area-wide rezoning and related land use actions for East Harlem were approved in November 2017. As a result of this rezoning, additional redevelopment is likely to occur in the future.

7.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

7.4.1 CONSTRUCTION IMPACTS

With the Modified Design, no cut-and-cover construction would occur along Second Avenue north of 125th Street, and substantially less surface construction activity, including cut-and-cover construction, would occur on 125th Street. These changes would reduce the visual effects of construction activities for Phase 2 of the Project. Consistent with the 2004 FEIS Design, in areas where construction activities are occurring, they would disrupt the visual character of the area. This could include the use of tall barriers or enclosures at construction zones, which may be in close proximity to windows. As described in the 2004 FEIS, this would result in a significant adverse visual impact.

7.4.2 PERMANENT IMPACTS

As described in Chapter 2, "Description of Phase 2 Modified Design," with the Modified Design, some of the above-ground features of the subway (the station entrances and ancillary facilities) would be in different locations and would be larger than was anticipated in the 2004 FEIS. While these locations are different than shown in the 2004 FEIS Design, they would be in the same general locations and continue to be designed to blend in with the surrounding urban context of the neighborhood.

Subsequent to publication of the 2004 FEIS, design of proposed ancillary facilities was advanced for Phase 1 of the Second Avenue Subway and some of those design modifications would be carried forward into Phase 2. Design changes for the ancillary facilities constructed during Phase 1 were evaluated in several Technical Memoranda reviewed by FTA. Some design changes would carry forward into Phase 2, such as intake and exhaust louvers on street-facing facades rather than the rear façade and roofs. In addition, the Modified Design would use dry coolers rather than a chilled water cooling system, which would reduce ongoing maintenance requirements for the cooling system and eliminate the need for equipment on the roof, but would result in a taller building envelope.

As discussed above and detailed in Chapter 2, "Description of Phase 2 Modified Design," Section 2.3.2.6, updated design and flood protection standards require more electrical and mechanical equipment to be located above ground, therefore requiring larger above-ground ancillary facilities than was presented in the 2004 FEIS. In addition to the larger footprints, ancillary facilities would also be taller than anticipated in the 2004 FEIS Design and taller than those constructed for Phase 1. To make use of the existing tunnel segments that have already been constructed, Phase 2 would have a shallower alignment than the deep tunnel alignment in Phase 1; therefore, the Phase 2 ancillary facilities, while similar in overall height (from lowest level to the roof level), would have more of the ancillary space above grade. In addition, unlike Phase 1, portions of the Phase 2

alignment are within the floodplain, where important infrastructure must be located above the flood elevation (and therefore cannot be underground). Typical dimensions of the ancillary facilities for Phase 2 would range from about 90 to 100 feet wide, 80 to 110 feet deep, and would vary in height based on location. The ancillary facilities along 125th Street, where the tunnel would be deeper, would range from 45 to 75 feet high (equivalent to 5 to 8 stories). Along Second Avenue, they would be 90 to 140 feet tall (equivalent to 9 to 14 stories).

Specific façade treatments were not known at the time of the 2004 FEIS, but treatments were selected for Phase 1 ancillary facilities that intended to be compatible with the architectural and urban context of the surrounding neighborhood, including the use of granite at the building's base, brick-colored terra-cotta tiles for the façade above the base, translucent glass curtain-wall elements, and silver-colored metal slats to integrate and protect the areas of ventilation louvers that must be included on the façade. Specific façade treatments have not yet been determined for Phase 2, but would similarly be selected to be compatible with the surrounding neighborhood. The design specifications for the new facilities would require the use of massing design and façade materials that visually break up the facades of the ancillary facilities so that they are compatible with the characteristics of smaller buildings nearby, to avoid adverse effects on neighborhood visual character. Additionally, MTA is exploring options to incorporate ground-floor retail in ancillary facilities and entrances to maintain a continuous and active streetscape.

At the 106th Street, 116th Street, and 125th Street Stations, the ancillary facilities would be located at or near the intersections of these streets with Second Avenue. The presence of buildings of a larger footprint and/or height would be consistent with the urban design of much of the area around Second Avenue, where taller buildings are located along the avenue rather than on the narrower cross streets.

At the 106th Street Station, the planned ancillary facility on Second Avenue and East 109th Street would be located diagonally across Second Avenue from the Tito Puento Educational Complex, a building of a contemporary design that has a very large footprint and with brick and metal cladding, and with immediately surrounding buildings of seven and eight stories, including those with modern facades. The second ancillary facility at East 106th Street would be located in an urban context that includes the 20-story Franklin Plaza Apartments complex across East 106th Street and Second Avenue.

At the 116th Street Station, the ancillary facility at Second Avenue and 120th Street would be in proximity to the Wagner Houses north of 120th Street, with much taller towers on 122nd Street also located in the surrounding area. The second ancillary facility for the 116th Street Station, anticipated to be located at Second Avenue and 115th Street, would be located across the street from the multiple buildings of the 14-story NYCHA Thomas Jefferson Houses complex occupying several blocks on the south side of 115th Street between First and Third Avenues.

At the 125th Street Station, the ancillary facilities would be located on 124th Street west of Park Avenue and east of Lexington Avenue, in the vicinity of the New York College of Podiatric Medicine which has a very large footprint, the 12-story masonry building at 1825 Park Avenue, the nine-story Northern Manhattan Rehabilitation & Nursing Center which also has a large footprint and extends through the block to East 124th Street (at 116 East 125th Street), the recently completed 12-story apartment building at 69 East 125th Street, commercial and office buildings with contemporary façade treatments along Lexington Avenue and 125th Street, and with other much taller residential towers visible to the south and east.

For the tail tracks along 125th Street, an ancillary facility would be located on the south side of the street either east or west of Lenox Avenue. This ancillary facility would be smaller in size than the station ancillary facilities and would similarly be compatible with the urban design of 125th Street and the immediately surrounding area, which is developed with a mix of older and shorter masonry structures and larger and taller buildings of a contemporary design (including the 14-story office building at 55 West 125th Street) that vary in terms of massing, façade articulation including location, size, and type of fenestration, and façade materials including brick and glass and metal curtain walls. The ancillary facility to be located at the tunnel curve between Second Avenue and 125th Street would also be smaller than the station ancillary facilities and be within an urban context that includes the approach to the RFK Bridge and the 16-story NYCHA Wagner Houses complex south of East 124th Street.

Overall, the surrounding areas of the proposed ancillary facilities and entrances typically include dense development of mid- to high-rise structures. While the ancillary facilities and entrances would replace existing structures in most cases, they would not remove any visual resources and would not substantially alter views from the surrounding areas. As discussed in Chapter 8, "Historic and Archaeological Resources," the design specifications for the new facilities would require the use of massing design and façade materials that visually break up the facades of the ancillary facilities so that they are compatible with the historic and architectural characteristics of nearby architectural resources, so as to avoid or minimize significant contextual effects to nearby resources. As such, the conclusions of the 2004 FEIS remain valid and no new or different adverse impacts related to visual resources and aesthetics would result from the Modified Design.

7.5 CONCLUSIONS

The Phase 2 Modified Design would not change the conclusions of the 2004 FEIS with respect to visual and aesthetic resources. Consistent with the 2004 FEIS Design, construction activities for the new subway in East Harlem would be disruptive and result in temporary adverse impacts to visual character. These impacts would be reduced with the Modified Design because it would reduce the amount of cut-and-cover construction that would occur.

The completed project with the Modified Design would have similar effects on visual character. Like the 2004 FEIS Design, it would introduce new station entrances and ancillary facilities along the Project corridor. Some of these would be in different locations than were anticipated in the 2004 FEIS, but the general visual character of their setting would be similar. In addition, the ancillary facilities and entrances would have larger footprints and would be taller than shown in the 2004 FEIS. While specific designs have not yet been finalized for the ancillary facilities, they would include the use of materials and design elements that would make them compatible with the urban design of the surrounding areas, as was described in the 2004 FEIS. Ground-level retail space was not included in the 2004 FEIS for the ancillary facilities and entrances, but has been added as a consideration to the Modified Design, which would contribute to maintaining an active streetscape.

As a result of the Phase 2 Modified Design, there will not be any new or different significant adverse impacts on visual and aesthetic resources not previously identified in the 2004 FEIS and ROD. ✷

Chapter 8: Historic and Archaeological Resources

8.1 INTRODUCTION

This chapter assesses the potential effects to architectural (i.e., historic) and archaeological resources as a result of the construction and operation of the Modified Design, in comparison to the effects described in the 2004 FEIS. The 2004 FEIS prepared for the Second Avenue Subway analyzed the Project's effects on architectural and archaeological resources (also collectively referred to as cultural resources or historic properties) in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966. This law requires that federal agencies consider the effects of their actions on any properties listed on or determined eligible for listing on the National Register of Historic Places (NR). The NHPA also requires that federal agencies afford the federal Advisory Council on Historic Preservation the opportunity to comment on federal actions and that federal agencies undertake planning and actions to minimize harm to properties designated as National Historic Landmarks. NHPA also requires the opportunity for public comment on a project's effects on historic properties.

In addition, historic properties are also protected from adverse effects by Section 4(f) of the Department of Transportation Act of 1966, which prohibits actions by the Secretary of Transportation that require the "use" of a historic property that is listed in or eligible for inclusion in the NR, unless a determination is made that there is no feasible and prudent alternative to such use, and all possible planning has been undertaken to minimize harm to the 4(f) property. A Section 4(f) Evaluation for the Modified Design is included in Chapter 17 of this Supplemental EA.

A Programmatic Agreement (PA) for the Second Avenue Subway Project was prepared pursuant to Section 106 of the NHPA among the Federal Transit Administration (FTA), Metropolitan Transportation Authority (MTA) New York City Transit,[1] and the New York State Historic Preservation Officer (SHPO) and executed on April 8, 2004, to set forth the procedures that would be followed to document and protect historic properties that could be adversely affected by the construction of the subway. The New York City Landmarks Preservation Commission (LPC) is a consulting party for the PA (indicating that LPC participated in consultation related to the PA). The PA has been amended once, in 2012, with respect to vibration thresholds.

The PA sets forth the steps to be followed for any changes to the Project that would expand the Project's Area of Potential Effect (APE) for architectural resources, such as would occur for station entrances and ancillary facilities that were not included in the design as analyzed in the 2004 FEIS. As set forth in the PA and consistent with Section 106, as the Project design proceeds, if additional APEs are identified, surveys are to be conducted to identify any potential architectural

[1] New York City Transit (NYCT) was the official signatory of the Programmatic Agreement. The MTA Capital Construction Company (MTACC) is responsible for planning, design, and construction of the project and related public outreach, and New York City Transit (NYCT) will operate and maintain the service, but for purposes of this document, they are collectively referred to herein as MTA.

resources in those APEs, and the potential architectural resources will then be evaluated in consultation with the SHPO to determine whether they are eligible for the State and National Registers of Historic Places (S/NR). The PA also sets forth the steps to be followed for any changes to the Project that introduce new Project elements that would involve subsurface construction and for which the effects of such construction have not yet been analyzed. For these areas, archaeological investigation is to be conducted in consultation with the SHPO and LPC.

The Modified Design would change the APEs for architectural and archaeological resources from what was analyzed in the 2004 FEIS. The APE for potential storage tracks along Second Avenue north of 125th Street that were proposed for the 2004 FEIS design would be eliminated, and the Modified Design would have new APEs at new or expanded locations for station entrances and ancillary facilities. Therefore, consistent with the procedures set forth in the PA, the buildings located within the new APE for architectural resources were evaluated by professional architectural historians to determine whether they appear to meet the eligibility criteria for the S/NR. The new APE for archaeological resources was evaluated by professional archaeologists to determine its potential to contain archaeological resources (i.e., its "sensitivity" for archaeological resources).

The 2004 FEIS concluded that the new Second Avenue Subway's planned direct, subsurface connection to the historic Metro-North Harlem-125th Street Railroad Station would result in a potential adverse effect on that architectural resource. The Modified Design eliminates this connection and therefore avoids this adverse effect. The Modified Design would not result in adverse effects to any other architectural resources. The 2004 FEIS also identified archaeologically sensitive areas along the Phase 2 alignment, and concluded that if archaeological resources are found to be present and could be impacted during construction, then there is a potential for adverse effects to archaeological resources. This conclusion remains the same with the Modified Design.

8.2 FEIS FINDINGS

The 2004 FEIS evaluates the full Second Avenue Subway's possible effect on architectural resources in Chapter 9, "Historic Resources," and its possible effect on archaeological resources in Chapter 10, "Archaeological Resources." For both architectural and archaeological resources, the analysis identified resources located within the Project's APE and evaluated the Project's impacts on those resources. The following APEs were used for the evaluation:

- **Architectural resources:** The 2004 FEIS used an APE for architectural resources that was generally the area within 50 feet of the proposed new subway alignment starting from the building line on either side of the alignment. An APE of 50 feet was also used for potential shaft sites and staging areas (in East Harlem, these were along Second Avenue north of 125th Street). An APE of 50 feet was also used around potential station entrances and ancillary buildings.
- **Archaeological resources:** The 2004 FEIS used an APE for archaeological resources that was the full alignment for the new tunnel. No APEs were defined for any of the station entrances, vents, or other ancillary facilities for the 2004 FEIS because the locations of these facilities had not been confirmed. Instead, the PA specified that additional research will be conducted for all such areas prior to any construction.

For all Project APEs, the 2004 FEIS evaluated the Project's potential effects on "known" historic properties—i.e., properties that are National Historic Landmarks (NHLs), properties listed on or determined eligible for listing on the S/NR, properties located within historic districts that are either listed on or determined eligible for listing on the S/NR, properties designated as New York City Landmarks (NYCLs), and properties located within New York City Landmark Historic Districts.

In addition to known historic properties, the 2004 FEIS also identified and considered the "potential" historic resources that could be affected by Project elements, including station entrances and ancillary facilities, that were developed during the more refined engineering conducted for the 2004 FEIS. Potential resources are properties that were identified by a professional architectural historian as having the potential to meet the eligibility criteria for S/NR and/or designation as NYCLs. The PA stipulated that the potential historic resources should be evaluated in consultation with the SHPO to determine whether they are eligible for the S/NR.

For archaeological resources, the 2004 FEIS included an evaluation of the potential archaeological resources that could be affected by the Second Avenue Subway, based on an evaluation of the past history of the area and an assessment of the likelihood for buried resources that may be important to remain in place.

8.2.1 CONSTRUCTION IMPACTS

8.2.1.1 ARCHITECTURAL RESOURCES

Table 8-1 lists the known and potential architectural resources identified within the APE in East Harlem in the 2004 FEIS.

The 2004 FEIS identified the potential for the Project to result in an adverse effect on the S/NR-eligible MTA Metro-North Harlem-125th Street Station, located at 125th Street and Park Avenue, as a result of a direct connection planned to be constructed between the Second Avenue Subway and the existing station. The 2004 FEIS described that the historic property includes a subterranean level that incorporates the station platforms and other elements of the former 1873-74 Harlem Station of the New York Central and Hudson River Railroad. This former station was built within a cut on Park Avenue, with the present MTA Metro-North Harlem-125th Street Station built above it and incorporating the former station structure in its foundations and basements. The 2004 FEIS design could have required alterations to the basement level of the existing station, which could result in the removal or alteration of features of an earlier 125th Street Station and buried retaining walls of the earlier 1874 railroad cut in Park Avenue.

The 2004 PA required that MTA, along with FTA, consult with the SHPO regarding any proposed alterations to the Metro-North Harlem-125th Street Station to preserve and avoid, to the extent practicable, adverse effects to the significant historic station features. In addition, the PA stipulated that design specifications would be developed to ensure that above-ground visible Project elements around the Metro-North Harlem-125th Street Station, as well as an associated Comfort Station located on the south side of 125th Street and constructed in conjunction with the station, would be compatible with the station's historic and architectural qualities. Although vacant and in disrepair, the Comfort Station is a contributing component of the Harlem-125th Street Station and is therefore also eligible for listing on the S/NR.

Table 8-1
Architectural Resources in the East Harlem APE
Identified in the 2004 FEIS

Block/ Lot	Address	Name	Historic Status					
			S/NR Listed	S/NR Eligible	NYCL	Pending NYCL/ NYCL-Eligible	Potential Resource	Potential Effect (See Notes)
1722/38	2014 Fifth Ave	Mount Morris Park Historic District	✓					A
1749/66	4-12 East 125th St	Residential building		✓				A
1749/56	28-30 East 125th St/ 1944 Madison Ave	Residential building		✓				A
1750/34	81-85 East 125th St	Mount Morris Bank Building	✓		✓			A, C
N/A	Park Avenue at 125th St	Park Avenue Viaduct		✓				A, C
N/A	Park Avenue at 125th St	MTA Metro-North Harlem-125th St Station and Comfort Station		✓				A, C
1773/62	120 East 125th St	Engine Co. 36 firehouse		✓	✓			A, C
1773/58	124 East 125th St	Apple Bank for Savings	✓			✓		A, C
1774/20	145-147 East 125th St	Twelfth Ward Savings Bank		✓				A, C
1789/37	224 East 125th St	NY Public Library, 125th St Branch		✓		✓		A
N/A	125th St at Second Ave	Triborough Bridge (now the Robert F. Kennedy Bridge)		✓				A
1789/10	207 East 124th St	Tenement		✓				A, B
1667/24	2291 Second Ave	Fischer & Co. Building				✓		A, C
1646/19, 20	231, 233 East 96th St	Two tenements		✓		✓		C
1687/47	306 East 116th St	4-story brownstone					✓	C
1795/50	306 East 119th St	5-story tenement					✓	C

Notes:

SR: New York State Register of Historic Places.
NR: National Register of Historic Places.
S/NR Eligible: Site has been found eligible for listing on the New York State and National Registers of Historic Places.
NYCL: New York City Landmark.
Pending NYCL: Site has been calendared for a public hearing or heard for designation by the New York City Landmarks Preservation Commission
NYCL Eligible: LPC has determined that the site appears eligible for NYCL designation.
Potential Resource: Identified for FEIS but not confirmed with the SHPO.

Potential Effects:

A: Potential effect during construction because of location near possible cut-and-cover activities.
B: Potential effect during construction because of potential for building underpinning, other protective measures, or ground improvement.
C: Potential contextual effect because of location near potential station entrances and ancillary facilities.

Source: 2004 FEIS.

In addition, the 2004 FEIS disclosed that construction of the Second Avenue Subway would have the potential to result in accidental damage to architectural resources along the full Project alignment where architectural resources located in proximity to proposed construction activities. In East Harlem, such effects were identified for a number of resources along the alignment, indicated in **Table 8-1**. The 2004 FEIS and PA stipulated that detailed Construction Protection Plans (CPPs) will be developed in consultation with the SHPO for each major Project construction segment once engineering advanced further and would contain protection measures for architectural resources, as appropriate, as outlined in Exhibit E of the PA. Each CPP will specify the construction protection

measures to be implemented for each affected resource and will be implemented prior to any Project excavation or construction activities. Construction activities identified as having the potential to affect architectural resources typically include cut-and-cover construction, underpinning or other methods of providing structural support for historic buildings, construction of station entrances and ancillary facilities, ground improvement techniques, and possible vibration effects such as from drilling or controlled blasting. The PA also stipulated that MTA consult with LPC for any locally designated properties that may be directly affected by Project construction.

8.2.1.2 ARCHAEOLOGICAL RESOURCES

The 2004 FEIS identified areas where archaeological resources may exist within the project's APE in East Harlem (i.e., areas of archaeological sensitivity). These included potential resources associated with the precontact (Native American) resources as well as buried resources associated with historic period occupation. These areas of precontact and historic period archaeological sensitivity were identified in the 2003 Phase 1A Archaeological Documentary Study and supplemental documentary and soil borings analyses that were completed as part of the 2004 FEIS pursuant to Section 106 of the National Historic Preservation Act. No archaeological resources are present in bedrock, since there is no soil there in which subsurface remains can be buried, so bedrock areas were not identified as archaeologically sensitive. The areas of archaeological sensitivity that were identified in the 2004 FEIS are summarized in **Table 8-2** of this chapter of this Supplemental EA.

The 2004 FEIS concluded that the Second Avenue Subway has the potential to adversely affect archaeological resources associated with both the precontact and historic period occupation of the project site, if the resources are actually present in the locations affected by the Project and if they are significant resources with high research value. In other words, adverse impacts would occur to archaeological resources under the following conditions: (1) if archaeological resources are actually present in the locations and at the depths described in **Table 8-2**; (2) if those resources are eligible for listing on the S/NR; and (3) if the construction of the Second Avenue Subway would disturb those S/NR-eligible archaeological resources.

The Second Avenue Subway PA executed in 2004 stipulates that as design for the Project advances, boring logs prepared following completion of the 2004 FEIS will be reviewed by a professional archaeologist to refine the depths and locations of archaeological sensitivity. It also requires completion of supplemental documentary research for the locations of any newly added Project elements; the completion of subsurface archaeological testing in any affected areas of archaeological sensitivity; and continued consultation with the SHPO and all Section 106 consulting parties.

As described in the 2004 FEIS and summarized in the PA, if archaeological analysis completed subsequent to the 2004 FEIS confirms that an adverse effect would occur, measures would be developed to mitigate impacts on archaeological resources pursuant to Section 106. The 2004 FEIS stated that mitigation measures will be designed to address the specific resources that would be adversely affected by the Project and could include archaeological testing or monitoring.

As set forth in the PA, if the Project impacts human remains associated with either the precontact or historic period occupation of the area, mitigation measures would involve either avoidance or disinterment in consultation with the SHPO and the descendant community (or communities) as appropriate. In the event that human remains are encountered that are identified as Native American, consultation with Native American Tribal Nations will be completed as required by

city, state, and federal laws (e.g., the Native American Graves Protection and Repatriation Act [NAGPRA]). Mitigation measures for effects to human remains are to include (but are not limited to) the identification of and consultation with an appropriate descendant community or communities prior to the archaeological investigation of areas sensitive for human remains. Mitigation measures also include the retention of a qualified physical anthropologist or forensic archaeologist to be on call or on site in areas where human remains could be encountered.

Table 8-2
Areas of Archaeological Sensitivity Identified in the 2004 FEIS

Location of Potential Resource	Type of Potential Resource	Depth of Potential Resource	Potential for Effects from Construction Disturbance?		
			No	Yes	Why*
Second Ave, 99th-105th St	Precontact	0-22 feet	✓		EST
Second Ave, 105th-106th St	Precontact	0-22 feet		✓	C&C
Second Ave, 109th-110th St	Precontact	18-23 feet	✓		EST
Second Ave, 111th-112th St (east side)	Early 19th century residential features	0-12 or 0-30 feet	✓		EST
Second Ave, 111th-116th St (outside existing subway tunnel)	Precontact	13-23 feet	✓		EST
Second Ave, 116th-118th St (outside existing subway tunnel), excluding 118th St	Precontact	13-18 feet		✓	C&C
Second Ave, 118th-120th St (outside existing subway tunnel)	Precontact	13-18 feet	✓		EST
Second Ave, 121st-124th St	Precontact	12-17 feet		✓	C&C
	Early to mid-19th century residential features (only from 122nd to 124th)	0-18 feet		✓	C&C
Southwest corner of Second Ave and 124th St (Block 1788, Lot 28)	Precontact	5-15 feet		✓	BU
	Late 17th century/early 19th century residential features	0-15 feet		✓	BU
124th St west of Second Ave	Precontact	5-15 feet	✓		TB
	Late 17th century/early 19th century residential features	0-15 feet	✓		TB
Block west of Second Ave between 124th and 125th St (Block 1789)	Precontact	5-15 feet		✓	BU
	Late 17th century/early 19th century residential features (specific lots only)	0-15 feet		✓	BU
125th St, Second to Fifth Ave, south side	Precontact	14-23 feet		✓	C&C
125th St, Second to Fifth Ave, north side	Precontact	3-15 feet		✓	C&C
Second Ave, 126th-127th St	Mid-19th century farm-related features and outbuildings	0-15 feet		✓	C&C
Train storage area on Second Ave, 125th St to Harlem River	Precontact	12-25 feet		✓	C&C

Notes: * C&C = Cut and Cover; BU = Building or other structural Underpinning; TB = Tunnel Below Depth of Potential Resource; EST = Use or Construct Within an Existing Subway Tunnel.
Source: 2004 FEIS.

As part of the mitigation strategy, the 2004 FEIS and PA stated that MTA would appoint a professional archaeologist who meets the standards of the New York Archaeological Council (NYAC) and the Secretary of the Interior's standards for cultural resources professionals (36 CFR 61) as the Cultural Resource Manager for the project. The Cultural Resource Manager must reside

in the New York metropolitan area and will be responsible for assessing the nature of unanticipated archaeological discoveries made during construction (and stopping construction for a certain period of time in order to do so) in order to determine the discoveries' horizontal and vertical extents and its potential significance. The Cultural Resource Manager will also be responsible for retaining the services of a physical anthropologist or forensic archaeologist if human remains are unexpectedly encountered during construction. Additional mitigation strategies outlined in the 2004 FEIS and PA involved additional levels of archaeological analysis, the curation of artifacts, and public outreach and education.

Finally, the 2004 FEIS also concluded that some areas of archaeological sensitivity that would be impacted by the project may be inaccessible, rendering it impossible to complete an archaeological investigation of those areas. Disturbance to archaeologically sensitive areas for which it would be physically impossible to complete an archaeological investigation is defined as an unmitigated adverse impact.

8.2.2 PERMANENT IMPACTS

8.2.2.1 ARCHITECTURAL RESOURCES

The 2004 FEIS determined that, given the densely developed and highly urbanized context of the historic resources and history of the use of Second Avenue for transportation, it is highly unlikely that any significant contextual effects would occur to architectural resources as a result of the construction of visible subway elements. However, the 2004 FEIS stated that permanent effects could occur if above-ground elements such as signs, stairways, vents, ventilating structures, and other ancillary facilities for the new subway were to change the setting or context of nearby architectural resources, or if any of these elements were constructed within existing historic structures (see **Table 8-1** for historic sites where the 2004 FEIS Design could potentially cause contextual effects). Therefore, in cases where entrances were to be located within or adjacent to historic structures, or where ventilation structures and other ancillary facilities were planned to be contiguous to or in close proximity to historic structures, the 2004 FEIS and PA stated that consultation would be undertaken with the SHPO. This was to include the development of design specifications to ensure that any permanent and visible Project elements that may be built within or near an architectural resource be compatible with the historic and architectural characteristics of the affected resources(s). The 2004 FEIS identified that above-grade entrance structures could affect the context of the Metro-North Harlem-125th Street Station, although the design of these entrances had not yet been completed and the effects of the construction could not at that point be determined.

Guidelines for the preparation of design specifications were included in the Project's PA. As the local historic preservation agency, LPC is a consulting party to the PA. As specified in the PA, the design specifications will be prepared in consultation with the SHPO and LPC.

8.2.2.2 ARCHAEOLOGICAL RESOURCES

The 2004 FEIS determined that potential adverse effects on archaeological resources could occur within the project corridor during the construction phase of the proposed project. Since all potential effects would be encountered by construction activities, the 2004 FEIS determined that no further effects to archaeological resources would occur because of the project's operation and that no mitigation measures would be required.

8.3 UPDATE OF BACKGROUND CONDITIONS

8.3.1 ARCHITECTURAL RESOURCES

Subsequent to the 2004 FEIS, some architectural resources near the proposed Phase 2 alignment have been determined eligible for listing on the S/NR. The SHPO recently identified a new S/NR-eligible East Harlem Historic District that extends along both sides of East 116th Street from the East River to Park Avenue and north and south along First Avenue between East 111th to East 120th Street (see **Figure 8-1**). Along Second Avenue, this new historic district includes the blocks from East 115th Street to East 117th Street on both sides of the avenue. Within the large area encompassed by the district, specific properties have been identified as contributing resources to the district, whereas other properties are not contributing.

The new historic district is centered on East 116th Street as the area's commercial spine, and includes buildings developed primarily from the 1870s to the 1920s. Contributing buildings include residential buildings (rowhouses, apartment flats, and tenements), churches and schools, and banks and commercial buildings. The district is important because of its extensive history as an enclave of working-class ethnic communities and also because of its architecture.

In addition, an extensive inventory of potential architectural resources was developed for the East Harlem Rezoning completed by the City Planning Commission on September 19, 2017.[2] For that study, architectural resources that appeared to meet one or more of the criteria for listing on the NR were identified based on field surveys and by using historical sources. Potential architectural resources identified were reviewed by LPC and in a letter dated March 29, 2017, LPC confirmed the sites that appeared to meet eligibility requirements.

The Modified Design results in some changes to the APE for Phase 2 of the Project. Some additional architectural resources that were not in the APE evaluated in the 2004 FEIS are located in those new areas. Those additional historic resources are discussed below in Section 8.4.1.1.

8.3.2 ARCHAEOLOGICAL RESOURCES

Since the completion of the 2004 FEIS, new archaeological data was collected from sites in northeastern Manhattan as part of unrelated projects that have resulted in changes to the archaeological sensitivity of the general area surrounding the proposed alignment. This includes a general archaeological sensitivity zone in the area bounded by East 124th Street, Second Avenue, East 127th Street, and a point east of First Avenue associated with two now-redeveloped cemeteries—the Reformed Dutch Church of Harlem Cemetery and the Harlem African Burial Ground (HABG). Recent excavations completed in association with project sponsored by the New York City Economic Development Corporation (NYCEDC) at the former NYCT bus depot on East 126th Street confirmed the presence of human remains on the site and also confirmed that the graves formerly within the HABG were disturbed and redistributed outside the mapped boundaries of the historic cemetery. The zone of sensitivity has been established to include areas where human remains may have been redistributed.

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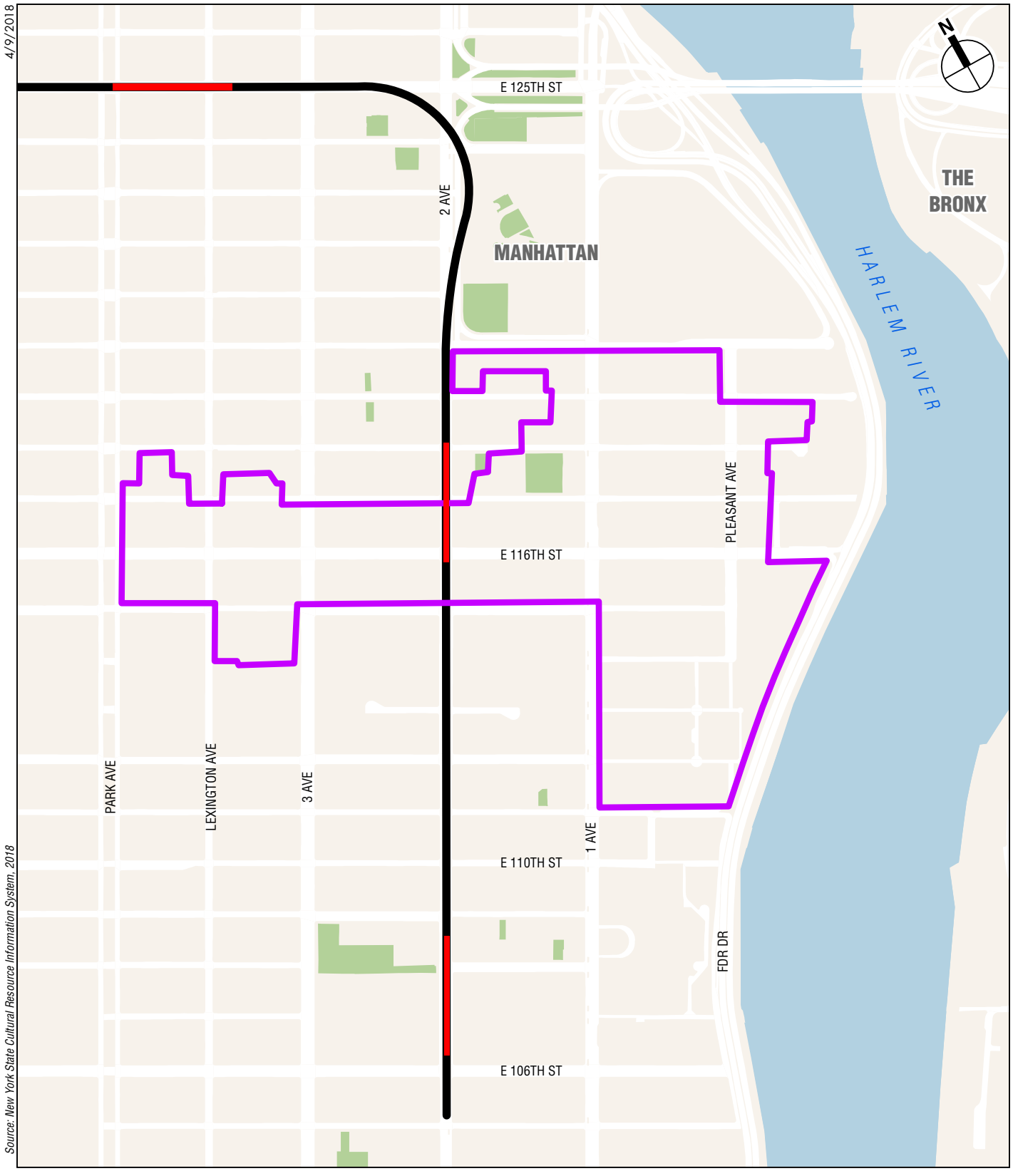
[2] New York City Planning Commission, East Harlem Rezoning Final Environmental Impact Statement, CEQR No. 17 DCP048M, September 19, 2017. Available at: www1.nyc.gov/site/planning/applicants/env-review/east-harlem.page.



East Harlem Historic District

SECOND AVENUE SUBWAY PHASE 2

Figure 8-1

8.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

8.4.1 CONSTRUCTION IMPACTS

8.4.1.1 ARCHITECTURAL RESOURCES

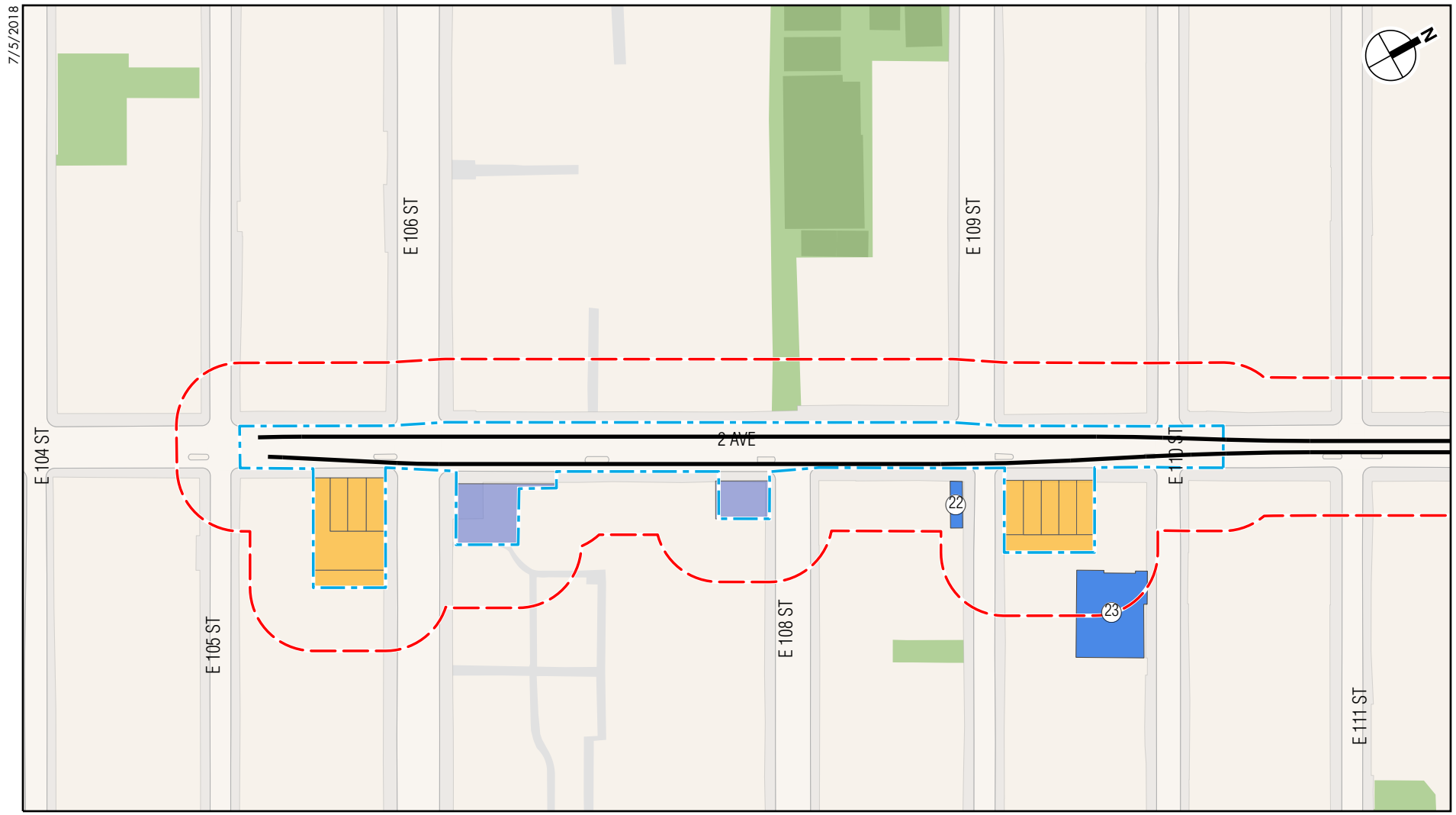
Changes associated with the Modified Design require modifications to the APE for architectural resources analyzed in the 2004 FEIS. Consistent with guidance contained in the New York City Department of Building's (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88*, an APE of 90 feet around the alignment of the Modified Design was used.[3] For areas where blasting may occur, an APE of 200 feet was used, consistent with methodology employed during Phase 1 of the Second Avenue Subway. Based on geological conditions and anticipated construction methodologies, the potential for blasting to occur was assumed at the proposed locations for the 116th Street Station (including tunnel box, entrances, and ancillary facilities), the ancillary facilities for the 125th Street Station, and the ancillary facilities for both 125th Street tail track options. If additional areas of blasting are deemed necessary during construction, the APEs will be expanded in these areas, as needed, and evaluated in accordance with the PA. The modified APE is illustrated on **Figures 8-2 through 8-6**.

Since the completion of the 2004 FEIS, additional architectural resources have been identified in the modified APE. This includes properties that have been identified by the SHPO or LPC since 2004 as known historic properties (properties listed on or eligible for listing on the S/NR and designated and potential NYCLs). It also includes properties that fall within the modified APE that were not in the 2004 FEIS APE. **Table 8-3** lists all known architectural resources located in the modified APE, including those properties identified in the 2004 FEIS and those identified subsequently. Four known resources identified in the 2004 FEIS are no longer in the modified APE and therefore are not listed in the table: the Triborough Bridge (which is not within the APE for the Modified Design), 207 East 124th Street, and the two resources on East 96th Street (which were in the APE for the 96th Street Station, which is now completed). In addition, the 2004 FEIS also identified two potential architectural resources in the East Harlem APE, one on East 116th Street and another on East 119th Street. The architectural resource on East 116th Street is now a contributing resource to the East Harlem Historic District. Based on a review by the SHPO conducted during preparation of this Supplemental EA, the property on East 119th Street is not an architectural resource.

The southern end of the proposed 116th Street Station, the proposed ancillary facility (Ancillary 1) at the northeast corner of East 115th Street and Second Avenue, and the proposed entrance (Entrance 1) at the northeast corner of East 116th Street and Second Avenue would be located within the boundaries of the new East Harlem Historic District. However, these properties are not proposed on lots that contain buildings that are contributing resources to the significance of the historic district. Contributing buildings are listed in **Table 8-4**.

In addition to the known historic properties already identified, the modified APE also includes properties that were identified as potential architectural resources based on field surveys and a

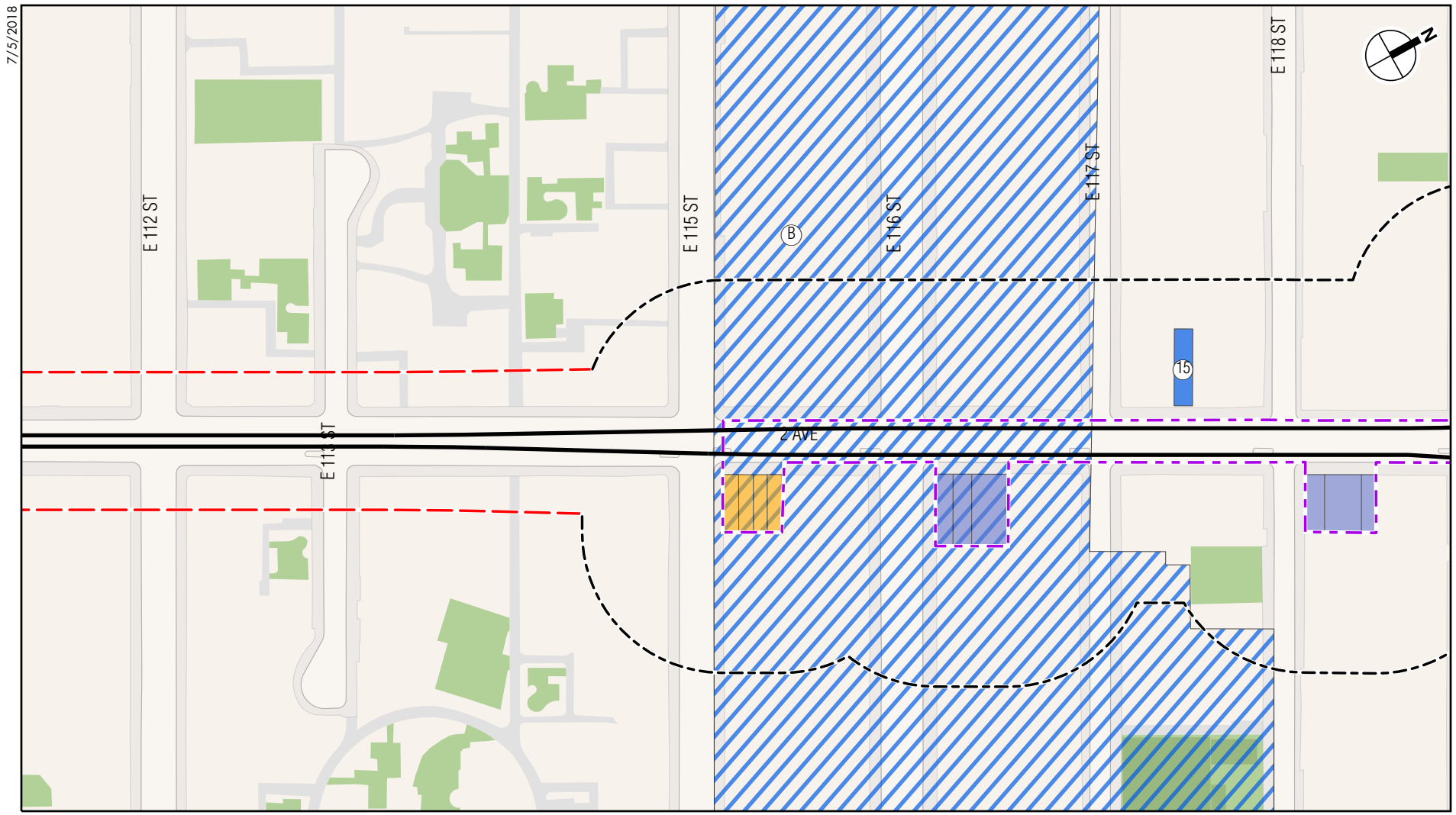
[3] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.



See Table 8-3 for information on resources

SECOND AVENUE SUBWAY PHASE 2

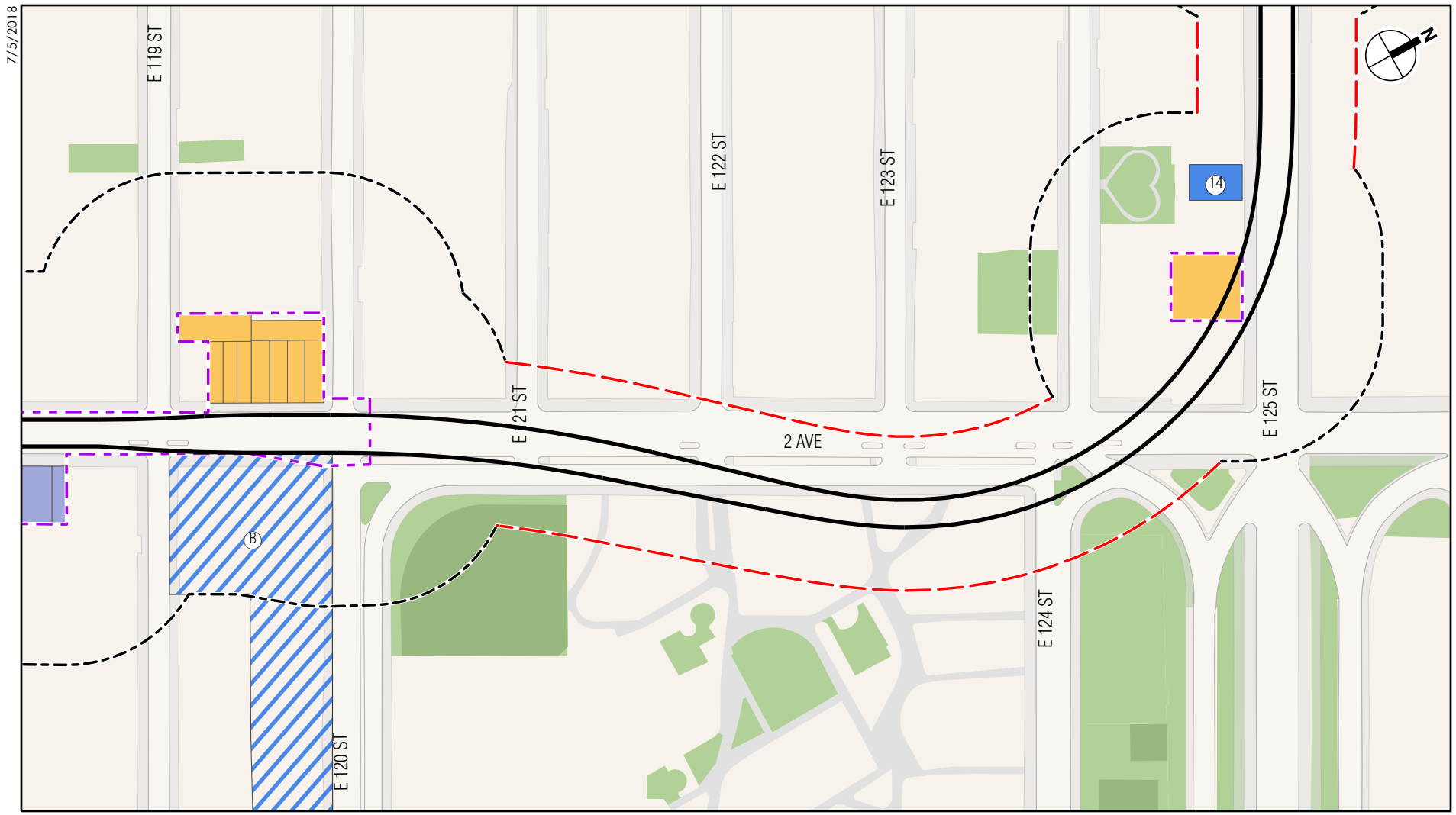
Architectural Resources
106th Street Station
Figure 8-2



See Table 8-3 for information on resources

SECOND AVENUE SUBWAY PHASE 2

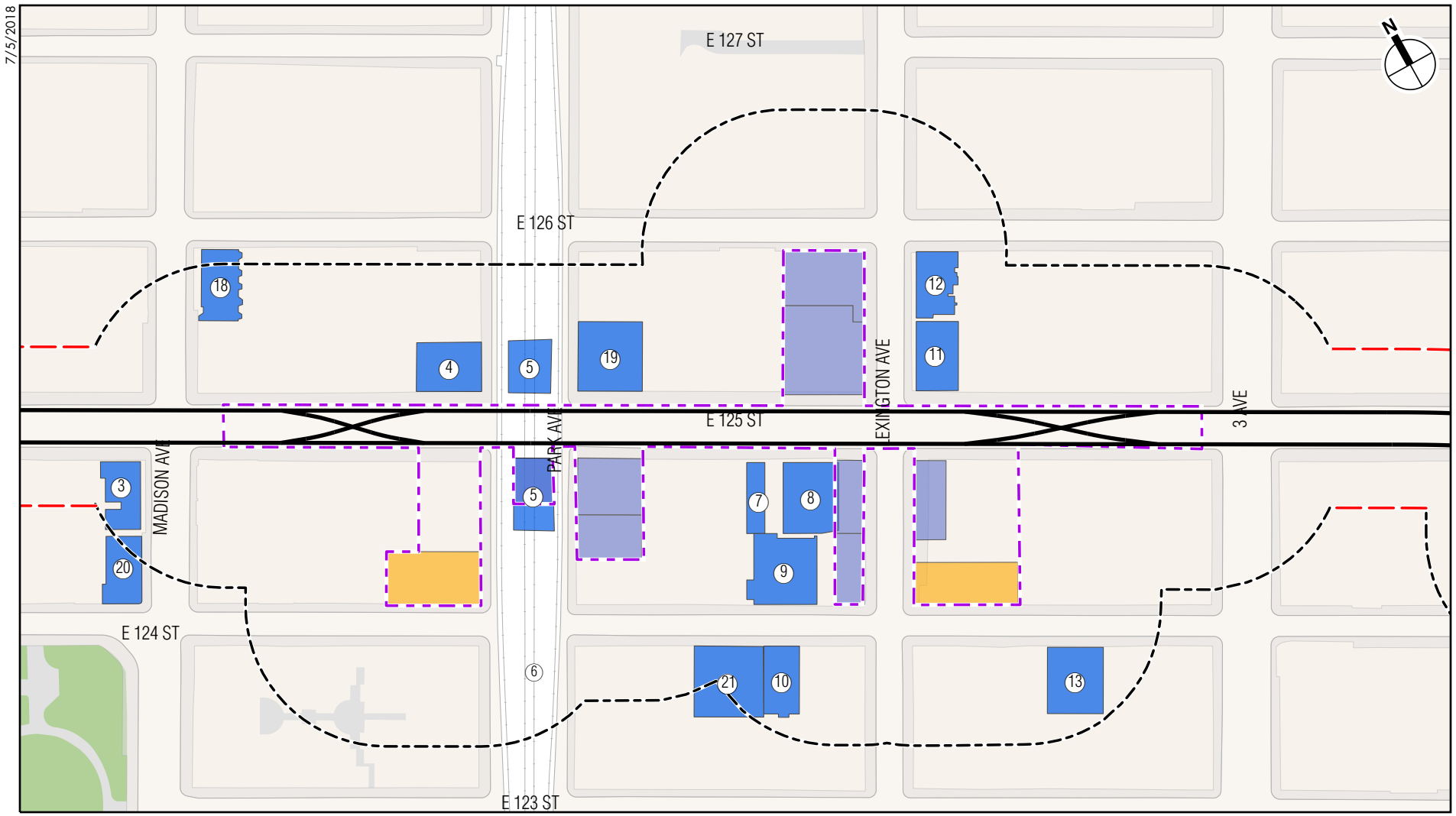
Architectural Resources
116th Street Station
Figure 8-3



See Table 8-3 for information on resources

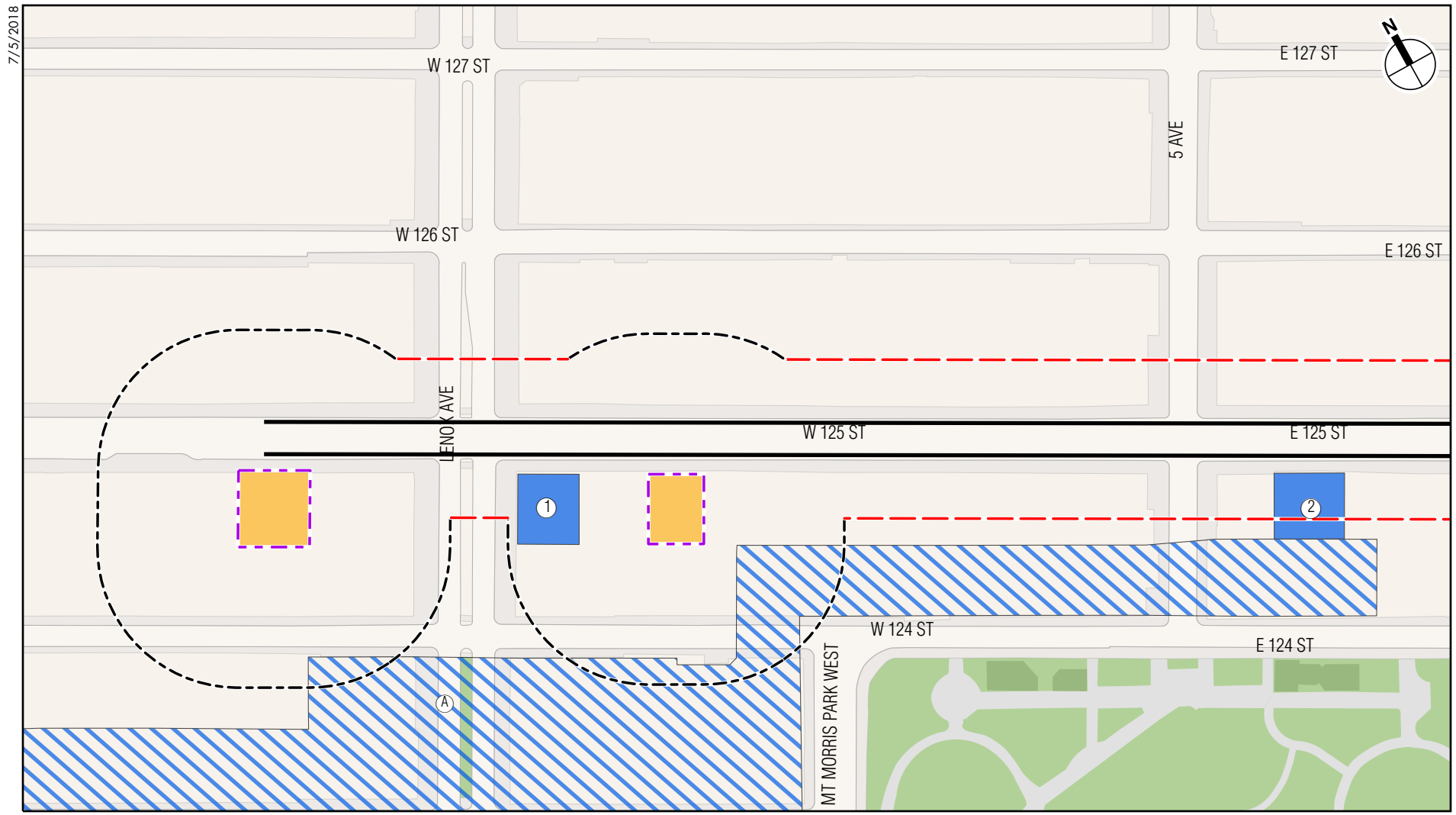
SECOND AVENUE SUBWAY PHASE 2

Architectural Resources
125th Street Curve
Figure 8-4



See Table 8-3 for information on resources

Architectural Resources
125th Street Station
Figure 8-5



See Table 8-3 for information on resources

Architectural Resources
125th Street Tail Tracks
Figure 8-6

review of historical sources conducted by an architectural historian in 2017. For all identified potential historic resources, information was provided to the SHPO and LPC, and these agencies provided determinations of S/NR and NYCL eligibility. Those properties identified as meeting S/NR and/or NYCL eligibility criteria are included in **Table 8-3**. **Figures 8-2 through 8-6** depict the location of all architectural resources in the modified APE.

Table 8-3
Architectural Resources in Modified APE

Fig. Ref. No.[1]	Block / Lot	Address	Name	Historic Status			
				S/NR Listed	S/NR Eligible	NYCL	NYCL Eligible
1	1722 / 69	100-110 West 125th St	Marion Building		✓		
A	Multiple	Multiple	Mount Morris Historic District		✓		
2	1749 / 6	4-12 East 125th St	Flats and stores		✓		
3	1749 / 56	1944 Madison Ave	Flats and stores		✓		
4	1750 / 34	81 East 125th St	Mount Morris Bank	✓		✓	
5	N/A	1818 Park Ave	Metro-North Harlem-125th Street Station (including Comfort Station)		✓		
6	N/A	Park Ave from East 97th to East 132nd St	Park Avenue viaduct		✓		
7	1773 / 62	120 East 125th St	Fire Hook and Ladder No. 14	✓		✓	
8	1773 / 58	124 East 125th St	Former Harlem Savings Bank (Apple Bank)	✓			
9	1773 / 11	123 East 124th St	Former New York City Telephone Company		✓[2]		
10	1772 / 60	124 East 124th St	Former stable		✓[2]		
11	1774 / 20	141-147 East 125th St	Former Twelfth Ward Bank		✓		
12	1774 / 51	2075-2087 Lexington Ave	Apartment building		✓		
13	1772 / 45	166 East 124th St	Former stable		✓[2]		
14	1789 / 37	224 East 125th St	New York Public Library 125th Street Branch		✓	✓	
15	1667 / 24	2291 Second Ave	Fisher & Co. Building				✓
16	1666 / 19	247 East 116th St	Fiorello LaGuardia Political Association		✓[2]		
17	1687 / 49	2256 Second Ave	Banca Commerciale Italiana		✓[2]		
B	Multiple	Multiple (see below)	East Harlem Historic District		✓		
18	1750 / 50, 52, 53	1969-1961 Madison Avenue	Rowhouses		✓[3]		
19	1774 / 1	1825 Park Avenue	Former Hamilton Storage and Warehouse Co.		✓[3]		
20	1749 / 14, 16	23-25 East 124th Street	Cambridge and Oxford Flats		✓[3]		
21	1772 / 62, 64	116-120 East 124th Street	Loft building		✓[3, 4]		
22	1680 / 49	2118 Second Avenue	Former Bank		✓[3]		
23	1681 / 45, 46, 11	312 East 110th St	St. Ann's Roman Catholic Church Complex		✓[3, 4]		

Notes:
[1] See **Figures 8-2 through 8-6** for locations of resources.
[2] LPC determined S/NR eligibility of these resources in comments dated March 29, 2017 in connection with the East Harlem Rezoning FEIS.
[3] The SHPO determined S/NR eligibility of these resources in letters dated April 11, 2018 and June 14, 2018.
[4] LPC determined S/NR eligibility of these resources in comments dated May 3, 2018.

Table 8-4
East Harlem Historic District Properties
Within Modified APE

Block / Lot	Address	Contributing Resource	Non-Contributing Resource
East 115th Street to East 116th Street			
East of Second Avenue			
1687 / 104	305 East 115th St	X	
1687 / 5	307-311 East 115th St	X	
1687 / 8	313 East 115th St	X	
1687 / 9	315 East 115th St	X	
1687 / 11	319 East 115th St	X	
1687 / 1*	**2240 Second Ave**		**X**
1687 / 2*	**2242 Second Ave**		**X**
1687 / 102*	**2244 Second Ave**		**X**
1687 / 3*	**2246 Second Ave**		**X**
1687 / 4	2248 Second Ave	X	
1687 / 52	2250 Second Ave	X	
1687 / 151	2252 Second Ave	X	
1687 / 51	2254 Second Ave	X	
1687 / 49	2256 Second Ave	X	
1687 / 149	304 East 116th St	X	
1687 / 47	306 East 116th St	X	
1687 / 46	308 East 116th St	X	
1687 / 45	310 East 116th St	X	
1687 / 44	312 East 116th St	X	
1687 / 43	316 East 116th St	X	
1687 / 42	318 East 116th St	X	
West of Second Avenue			
1665 / 18	237 East 115th St	X	
1665 / 21	239 East 115th St	X	
1665 / 22	241 East 115th St	X	
1665 / 122	245 East 115th St		X
1665 / 23	2243 Second Ave	X	
1665 / 24	2245 Second Ave		X
1665 / 25	2249 Second Ave		X
1665 / 27	2251 Second Ave	X	
1665 / 127	2253 Second Ave	X	
1665 / 28	2255 Second Ave	X	
1665 / 30	2259 Second Ave	X	
1665 / 130	246 East 116th St	X	
1665 / 31	242 East 116th St	X	
1665 / 33	238 East 116th St	X	

Table 8-4 (Cont'd)
East Harlem Historic District Properties
Within Modified APE

Block / Lot	Address	Contributing Resource	Non-Contributing Resource
East 116th Street to East 117th Street			
East of Second Avenue			
1688 / 112	325 East 116th St	X	
1688 / 12	323 East 116th St	X	
1688 / 11	321 East 116th St	X	
1688 / 110	319 East 116th St	X	
1688 / 1*	**2262 Second Ave**		**X**
1688 / 2*	**2264 Second Ave**		**X**
1688 / 53	2270 Second Ave	X	
1688 / 52	2272 Second Ave	X	
1688 / 50	2274 Second Ave	X	
1688 / 43	318 East 117th St		X
1688 / 44	316 East 117th St	X	
1688 / 45*	**306 East 117th St**		**X**
West of Second Avenue			
1666 / 17	239 East 116th St	X	
1666 / 18	241 East 116th St	X	
1666 / 118	243 East 116th St	X	
1666 / 19	245 East 116th St	X	
1666 / 119	247 East 116th St	X	
1666 / 120	249 East 116th St	X	
1666 / 20	2261 Second Ave	X	
1666 / 21	2263 Second Ave		X
1666 / 121	2265 Second Ave		X
1666 / 22	2267 Second Ave		X
1666 / 23	2269 Second Ave		X
1666 / 24	2271 Second Ave	X	
1666 / 26	250 East 117th St	X	
1666 / 127	248 East 117th St		X
1666 / 28	244 East 117th St	X	
1666 / 30	242 East 117th St	X	
1666 / 31	236 East 117th St		X
East 117th Street, East of Second Avenue			
1689 / 5	305 East 117th St	X	
East 119th Street to East 120th Street, East of Second Avenue			
1796 / 8	313 East 119th St		X
1796 / 7	311 East 119th St		X
1796 / 106	309 East 119th St		X
1796 / 6	307 East 119th St	X	
1796 / 5	305 East 119th St	X	
1796 / 1	2322 Second Ave	X	
1796 / 2	2324 Second Ave		X
1796 / 3	2326 Second Ave	X	
1796 / 4	2328 Second Ave	X	
1796 / 54	2330 Second Ave	X	

Table 8-4 (Cont'd)
East Harlem Historic District Properties
Within Modified APE

Block / Lot	Address	Contributing Resource	Non-Contributing Resource
1796 / 53	2332 Second Ave	X	
1796 / 152	2334 Second Ave	X	
1796 / 52	2336 Second Ave	X	
1796 / 51	2338 Second Ave		X
1796 / 50	304 East 120th St	X	
1796 / 49	306 East 120th St	X	
1796 / 148	308 East 120th St	X	
1796 / 48	310 East 120th St	X	

Note:
* Properties indicated with bold text and an asterisk are properties proposed for use as an ancillary facility or station entrance with the Modified Design.

The Modified Design also includes modifications that result in changes to conclusions about adverse effects to architectural resources as identified in the 2004 FEIS. With the Modified Design, cut-and-cover construction would no longer occur in many of the locations where it would occur for the 2004 FEIS Design, including along 125th Street. Therefore, potential impacts related to proximity to cut-and-cover construction identified in the 2004 FEIS would no longer occur. In addition, the Modified Design no longer includes a direct connection to the subterranean portion of the Metro-North Harlem-125th Street Station, thereby avoiding direct effects to the existing S/NR-eligible station.

Consistent with the 2004 FEIS, an entrance (Entrance 3) is planned under the S/NR-eligible Park Avenue viaduct, but this entrance would be expanded in the Modified Design to include the property at the southeast corner of 125th Street and Park Avenue (as detailed in Chapter 2, "Description of Phase 2 Modified Design"). As design advances, additional evaluation of the viaduct structure may result in the need to place the entrance entirely on the southeast corner of 125th Street and Park Avenue. The Modified Design would not directly affect the Park Avenue viaduct; the Metro-North Harlem-125th Street Station; or the Comfort Station, a contributing component of the S/NR-eligible Metro-North Harlem-125th Street Station, although the entrance would be constructed in proximity to S/NR-eligible Comfort Station. MTA, along with FTA, will consult with the SHPO as set forth in the PA to ensure that the 125th Street Station elements that would occur in proximity to the Metro-North Harlem-125th Street Station, associated Comfort Station, and Park Avenue viaduct are compatible with the historic and architectural qualities of these historic structures and to avoid or minimize adverse effects to architectural resources. Consultation will include the preparation of design specifications, as specified in the 2004 FEIS and PA.

As stated in the 2004 FEIS and the PA, architectural resources that could be affected by construction activities will be included in a CPP prepared prior to construction, demolition, or excavation work. The CPP will set forth the specific measures to be used, and specifications that will be applied, to protect each of the architectural resources that could be affected during the construction period. Typical protective measures that will be included in a CPP are presented in Exhibit E of the Programmatic Agreement. Each of the architectural resources listed in **Table 8-3**

will be included in the CPP. The SHPO reviewed the conclusions that are presented in this chapter and concurred with the conclusions; copies of correspondence from the SHPO are provided in **Appendix B**.

8.4.1.2 ARCHAEOLOGICAL RESOURCES

The Modified Design includes areas of potential disturbance outside the Archaeological APE analyzed in the 2004 FEIS. Therefore, in accordance with the PA, a Supplemental Phase 1A Archaeological Documentary Study ("Supplemental Phase 1A Study") was prepared in November 2017 to evaluate the potential for effects on archaeological resources within the Supplemental Archaeological APE that were not assessed in the 2003 Phase 1A study or the 2004 FEIS. These newly added areas within the Supplemental Archaeological APE are summarized in **Table 8-5**.

8.4.1.2.1 Review of Borings

A geotechnical and environmental borings program was developed to support the Modified Design. In accordance with the PA, a qualified archaeologist has reviewed these plans to determine whether any borings would be located in areas of sensitivity for human remains. Monitoring was recommended for any borings located within the zone of sensitivity associated with the HABG. For those locations where monitoring is recommended, an archaeological monitoring plan was developed and submitted to the SHPO and LPC for review. LPC and the SHPO concurred with the monitoring plan in letters dated August 8, 2017 and August 18, 2017, respectively (see **Appendix B**). Archaeological monitoring of these borings was completed and upon the completion of the boring program, a final report will be submitted to LPC and the SHPO for review.

8.4.1.2.2 Supplemental Phase 1A Archaeological Documentary Study

The November 2017 Supplemental Phase 1A was prepared in accordance with the *Standards for Cultural Resources Investigations and Curation of Archaeological Collections in New York State* of NYAC, issued in 1994 and adopted by the SHPO in 1995, and the *Guidelines for Archaeological Work in New York City* issued by LPC in 2002. The study documents the development history of the proposed project corridor and its potential to yield archaeological resources, including both precontact and historic cultural resources. The Modified Design would involve tunneling at greater depths than was presented in the 2004 FEIS along the 125th Street tunnel curve and along 125th Street. The depth of these project elements is sufficient that it would not impact soils associated with past human occupation of the Supplemental Archaeological APE and the archaeological sensitivity of those project elements was therefore not assessed. The archaeological sensitivity and additional recommendations for areas within the Supplemental Archaeological APE where project-related effects would occur at depths associated with precontact or historic period occupation are described below and depicted in **Figures 8-7 through 8-9**. LPC and the SHPO reviewed the Supplemental Phase 1A Study and concurred with the findings and recommendations of the report; copies of correspondence from LPC and the SHPO are provided in **Appendix B**.

Table 8-5
Archaeological APE for the Supplemental Phase 1A Study

Project Component	Location	Block	Lot	Potential for Effects from Construction Disturbance?			Recommendations for Additional Analysis
				No	Yes	Why[1]	
106th Street Station							
Ancillary 1	Southeast corner of Second Ave and 106th St	1677	47, 49, 50, 51, 52		✓	C&C	None
Ancillary 2	Northeast corner of Second Ave and 109th St	1681	1, 2, 3, 4, 52, and 104		✓	C&C	None
Entrance 1, Option 1	Northeast corner of Second Ave and 106th St	1678	1 (part)		✓	C&C	Soil borings review
Entrance 2, Option 1	Southeast corner of Second Ave and 108th St	1678	1 (part)		✓	C&C	Soil borings review
East 106th St Improvements	Streetbed 200 ft west and 200 ft east of Second Ave	n/a	n/a		✓	C&C	None
East 108th St improvements	Streetbed 210 ft west and 85 ft east of Second Ave	1656	1 and 100		✓	C&C	Soil borings review
East 109th St improvements	Streetbed 40 ft west and 105 ft east of Second Ave	n/a	n/a		✓	C&C	None
East 110th St improvements	Streetbed 200 ft west and 205 ft east of Second Ave	n/a	n/a		✓	C&C	None
116th Street Station							
Ancillary 1	Northeast corner of Second Ave and 115th St	1687	1,2, 3, and 102		✓	C&C	None
Ancillary 2	Southwest corner of Second Ave and 120th St	1784	12 (part), 23 to 28 and 128		✓	C&C	None
Entrance 1	Northeast corner of Second Ave and 116th St	1688	1, 2, and 45 (part)		✓	C&C	None
Entrance 2	Northeast corner of Second Ave and 118th St	1795	1 to 4		✓	C&C	None
East 115th St Improvements	Streetbed 90 ft west and 50 ft east of Second Ave	n/a	n/a		✓	C&C	None
East 116th St improvements	Streetbed 200 ft west and 200 ft east of Second Ave	n/a	n/a		✓	C&C	Final project plans review
East 117th St improvements	Streetbed 200 ft west and 200 ft east of Second Ave	n/a	n/a		✓	C&C	Final project plans review
East 118th St improvements	Streetbed 200 ft west and 200 ft east of Second Ave	n/a	n/a		✓	C&C	None
East 119th St Improvements	Streetbed 50 ft west and 50 ft east of Second Ave	n/a	n/a		✓	C&C	Final project plans review
East 120th St improvements	Streetbed 200 ft west and 200 ft east of Second Ave	n/a	n/a		✓	C&C	None
125th Street Station							
Ancillary 1 and Entrance 1	Southeast corner of 125th St and Lexington Ave	1773	20 (part)		✓	C&C	Phase 1B testing
Ancillary 2	Southwest corner of Park Ave and 125th St	1749	33 (part)		✓	C&C	None
Entrance 2, Option 1	Northwest corner of Lexington Ave and 125th St	1774	17 and 56		✓	C&C	Topic intensive study
Entrance 2, Option 2	Southwest corner of Lexington Ave and 125th St	1773	17, 18, and 57		✓	C&C	Phase 1B testing

Table 8-5 (Cont'd)
Archaeological APE for the Supplemental Phase 1A Study

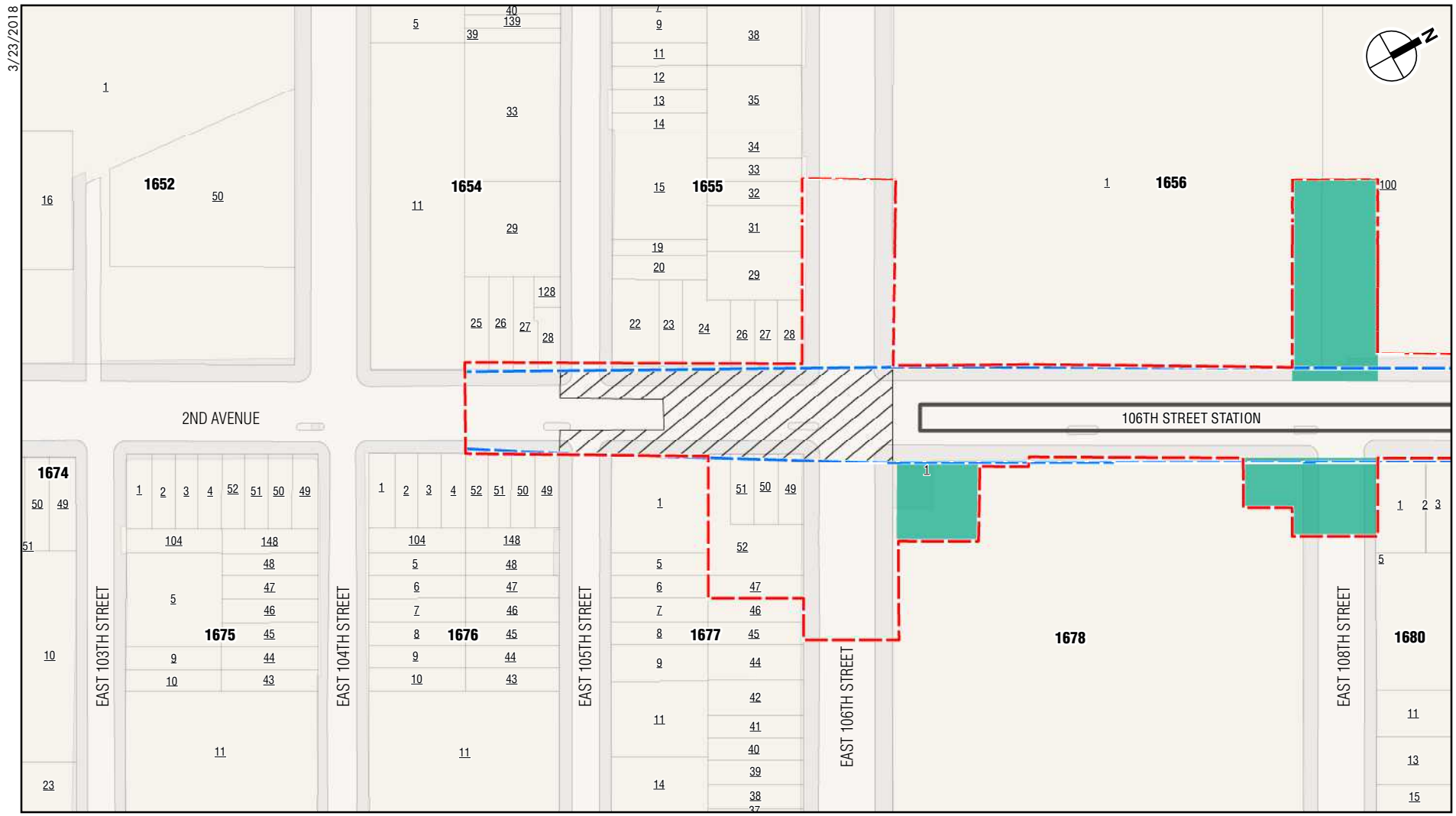
Project Component	Location	Block	Lot	Potential for Effects from Construction Disturbance?			Recommendations for Additional Analysis
				No	Yes	Why[1]	
125th Street Station (Cont'd)							
Entrance 3 (eastern portion)	Southeast corner of Park Ave and 125th St	1773	4, 69, 72		✓	C&C	None
Entrance 3 (western portion)	Within Park Ave streetbed	n/a	n/a		✓	C&C	None
Park Ave Improvements	Streetbed 200 ft south of 125th St	n/a	n/a		✓	C&C	None
Rockbolting (60- 110 ft below ground)	South side of 125th St, Third-Lexington Ave	1773	20 (part)	✓		TB	None
Rockbolting (60- 110 ft below ground)	North side of 125th St west of Third Ave	1774	Parts of 20, 30, and 33	✓		TB	None
Rockbolting (60- 110 ft below ground)	South side of 125th St, Lexington-Park Ave	1773	Parts of 7, 58, 61, 62, and 67	✓		TB	None
Rockbolting (60- 110 ft below ground)	North side of 125th St, Lexington-Park Ave	1774	Parts of 1, 5, 6, 7, 8, 9, and 17	✓		TB	None
Rockbolting (60- 110 ft below ground)	South side of 125th St, Park-Madison Ave	1749	Parts of 33, 46, 48, 49, and 50	✓		TB	None
Rockbolting (60- 110 ft below ground)	North side of 125th St, Madison-Park Ave	1750	Parts of 21, 23-28, 31, 32, and 34	✓		TB	None
125th Street Curve							
Tunnel (50-75 ft below ground surface)	East of Second Ave, 121st-124th St	1797	1 (part)	✓		TB	None
	East of Second Ave, 121st-124th St	1801	1 (part)	✓		TB	None
125th Street							
Tunnel (10-120 ft below ground surface)	Streetbed between Fifth Ave and Adam Clayton Powell, Jr. Blvd	n/a	n/a	✓		TB	None
125th Street Tail Tracks: Two-Train Tail Track Option							
Ancillary	South side of 125th St, Fifth-Lenox Aves	1722	62 and 63		✓	C&C	None
Temporary subsurface easement	North side of 125th St, Fifth-Lenox Aves	1723	10 (part)	✓		TB	None
125th Street Tail Tracks: Three-Train Tail Track Option							
Ancillary	South side of 125th St west of Lenox Ave	1909	41 (part)		✓	C&C	None
Temporary subsurface easement	North side of 125th St west of Lenox Ave	1910	1 (part) and 1272 (part)	✓		TB	None

Notes:

[1] C&C = Cut and Cover; TB = Tunnel Below Depth of Potential Resource.

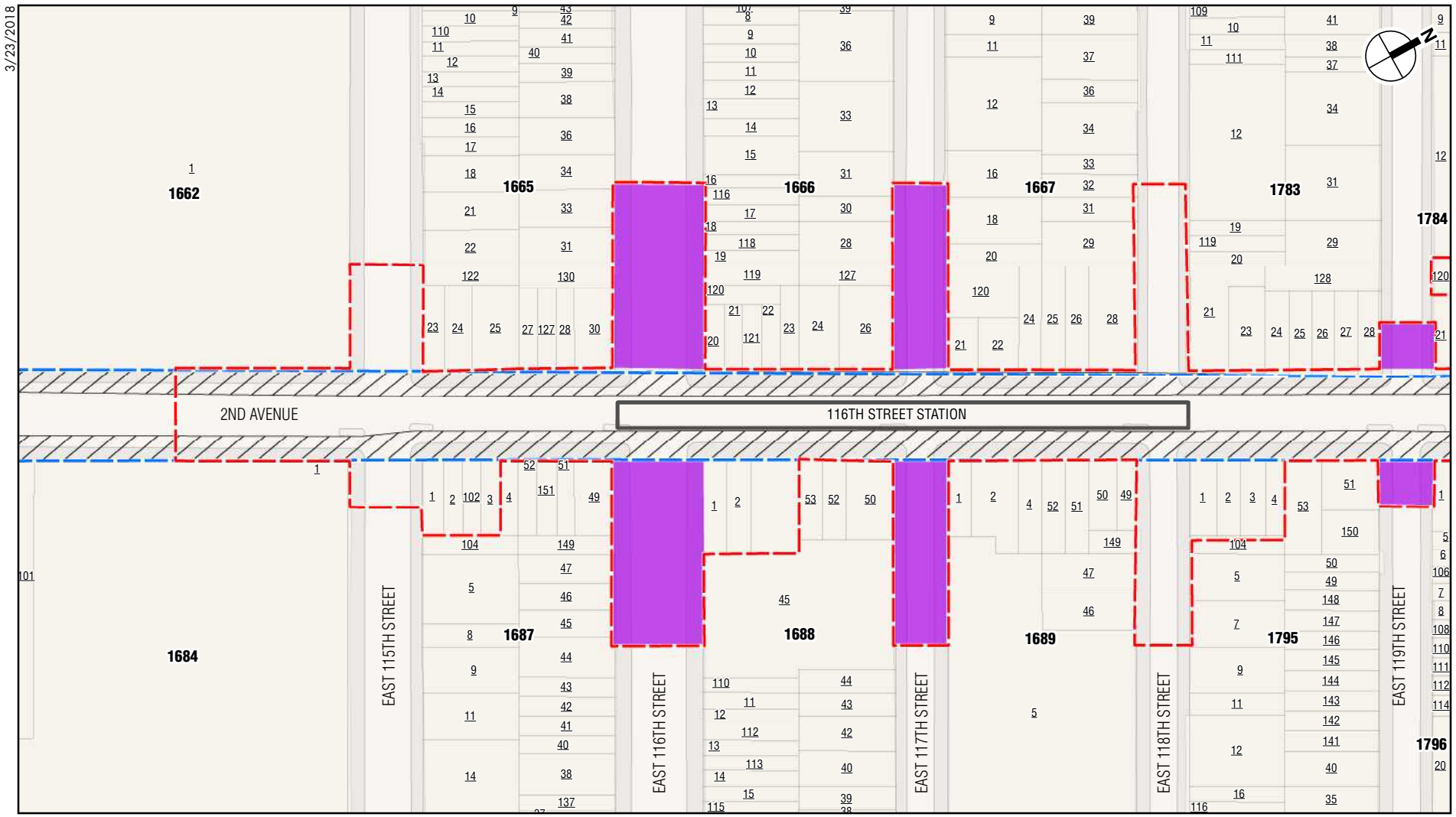
[2] All areas at depths likely to contain cultural resources and that would be affected by project construction were analyzed in the Supplemental Phase 1A Study. Based on that analysis, it was determined whether further action is recommended. Any areas where construction-related effects would be at depths far greater than those likely to contain cultural resources were not assessed in the Supplemental Phase 1A study and no further archaeological investigation is warranted.

Source: 2017 Supplemental Phase 1A Study.



SECOND AVENUE SUBWAY PHASE 2

Areas of Archaeological Sensitivity
106th Street Station
Figure 8-7



SECOND AVENUE SUBWAY PHASE 2

Areas of Archaeological Sensitivity
116th Street Station
Figure 8-8

Areas of Archaeological Sensitivity
125th Street Station

SECOND AVENUE SUBWAY PHASE 2

Figure 8-9

8.4.1.2.2.1 Precontact Archaeological Sensitivity Assessment

As described in the 2004 FEIS and in the Supplemental Phase 1A Study, extensive Native American activity has been documented near the Second Avenue Subway Phase 2 alignment since the 19th century. Native American archaeological sites are typically found at shallow depths, within the top 5 feet of the original ground surface, but given the extent of development and landscape modification during the 19th and 20th centuries, much of the pre-development ground surface was likely destroyed as a result of this development. Where the original ground surface may be present and undisturbed, those surfaces would be considered to be sensitive for precontact archaeological resources.

Each of the Supplemental Archaeological APE locations was determined to have been likely to have been the site of some form of Native American activity (e.g., habitation, camping, or resource acquisition/processing) during the precontact period. The Supplemental Phase 1A Study also determined that deeply buried resources associated with the occupation of Manhattan prior to the rise of sea levels and the formation of marshes circa 3,000 years ago may be present in formerly inundated areas that have since been filled. However, the actual sensitivity of these locations depends on the extent to which these areas were disturbed as a result of subsequent development. Many hills and elevated areas were cut down during the construction of the city's street grid and streetbed areas were then further disturbed by the installation of utilities and streetcar lines, in addition to the construction and maintenance of roads. As described in the Supplemental Phase 1A Study, areas that have been disturbed as a result of the grading of streets/installation of utilities or as a result of the construction of buildings were determined to have no precontact archaeological sensitivity. However, locations where historic marsh and river deposits were filled in advance of the construction of the modern landscape of East Harlem were identified as potentially containing deeply buried archaeological resources beneath the depths of the marsh. Additional information will be collected through the completion of a soil boring program that will provide greater information on the potential depth of such resources.

As described above, in the event that human remains are encountered that are identified as Native American, consultation with Native American Tribal Nations will be completed as required by city, state, and federal laws (e.g., NAGPRA).

8.4.1.2.2.2 Historic-Period Archaeological Sensitivity Assessment

As described in the Supplemental Phase 1A Study, the historic village of Harlem remained a relatively rural area through the mid-19th century. Several of the Supplemental Archaeological APE sites were developed with or were near houses or other buildings (e.g., historic mills) that were constructed in the late 18th or early 19th century. Most of the residential development of the neighborhood occurred beginning in the 1860s and 1870s, when water and sewer infrastructure became available in the neighborhood and train and streetcar lines increased the area's accessibility, making it an attractive residential area for commuters. All of the Supplemental Archaeological APE locations were developed with structures at some point during the 19th and 20th centuries and therefore all have experienced disturbance to some degree. However, not all structures were constructed with basements and therefore may not have been disturbed to great depths. Any site that was developed with a map-documented structure and was not subsequently impacted by basement disturbance was determined to have historic period sensitivity.

Given the extent to which project sites within the Supplemental Archaeological APE were developed, the Supplemental Phase 1A Study determined that it is possible that domestic shaft features (e.g., privies, cisterns, and wells) could still be present in certain locations. Such features

were typically filled with household refuse after they were no longer needed for their original purpose, and therefore, are of high archaeological research value. Shaft features were typically constructed of brick or stone and often extended to great depths of 10 to 15 feet below the ground surface or more. As such, these types of features frequently survive disturbance episodes, even if the upper portions are truncated during development. Shaft features could be present in portions of the site that were not fully excavated as part of 19th and 20th century development. Therefore, any sites within the Supplemental Archaeological APE that contained or were immediately adjacent to map-documented structures pre-dating the 1850s or 1860s were determined to be potentially sensitive for archaeological resources associated with the historic period occupation of the area. The Supplemental Phase 1A Study made recommendations for future work to be conducted for these areas, consistent with the provisions of the PA, which are discussed below.

8.4.1.2.2.3 Recommendations for Additional Archaeological Analysis

As summarized in **Table 8-5**, the Supplemental Phase 1A Study recommended four types of additional archaeological analysis (i.e., Soils Boring Review, Phase 1B Testing, Final Project Plans Review, or Topic Intensive Study) for specific project elements. These recommendations will be implemented as design advances, as discussed below:

- For the 106th Street Station, the proposed locations of Entrance 1, Entrance 2, and streetbed improvements along East 108th Street are in locations where deeply buried precontact archaeological resources could be present beneath locations of filled marsh. A Geotechnical Investigation Program of the Phase 2 project corridor will be completed by MTA by the end of 2018 during development of the design. The boring logs from that investigation will be reviewed to determine the potential depth of buried ground surfaces that predate the formation of the marshes circa 3,000 years ago. If project elements would result in disturbance to those buried soil levels, then additional archaeological analysis will be conducted pursuant to the terms of the 2004 PA. As dictated by the PA, all boring logs (including those monitored by an archaeologist) will be reviewed by an archaeologist and a memorandum summarizing that review will be submitted to LPC and the SHPO. This review may result in revisions to the depths of archaeological sensitivity as determined in the 2003 Phase 1A and subsequent soil boring analysis, which relied on soil boring information that is now more than 14 years old. Any changes to the depths of potential sensitivity within the 2003 APE will be determined in consultation with LPC and the SHPO pursuant to the terms of the 2004 PA.
- For the 116th Street Station, the proposed streetbed improvements within East 116th Street, East 117th Street, and East 119th Street could impact undisturbed precontact ground surfaces that may have survived disturbance associated with the construction of streets and the installation of utilities. As design advances, a qualified archaeologist will review the final project plans to determine if the proposed improvements would impact potentially undisturbed areas.
- For the 125th Street Station, a Topic Intensive Documentary Study will be prepared for the location of Entrance 2 (Option 1) to clarify the historic boundaries of the 125th Street Methodist Church and to determine the likelihood that the burial vaults associated with the church could be located within the site. This will provide information that will ensure that human remains are not impacted during construction. If the Topic Intensive Documentary Study concludes that human remains are potentially present in this location, further archaeological analysis will proceed in consultation with LPC, the SHPO, and the descendant community pursuant to the stipulations of the PA before this site is used for construction.

- Additionally, for the 125th Street Station, Phase 1B archaeological testing will be conducted after the demolition of existing buildings in two locations. The sites of Ancillary 1, Entrance 1, and Entrance 2 (Option 2) were developed before the installation of water and sewer lines in the neighborhood and were not fully developed with buildings with basements during the 19th and 20th centuries. Buried domestic shaft features may be present on these properties. For these locations, a Phase 1B testing protocol will be prepared and submitted to the SHPO and LPC for review and concurrence pursuant to the terms of the 2004 PA and once the protocol has been developed, Phase 1B testing will be conducted.

8.4.2 PERMANENT IMPACTS

8.4.2.1 ARCHITECTURAL RESOURCES

Since the completion of the 2004 FEIS, the location and preliminary designs of Phase 2 project elements including ancillary facilities and entrances have been established. The Modified Design no longer includes a direct connection to the S/NR-eligible Metro-North Harlem-125th Street Station that was presented in the 2004 FEIS, which eliminates the direct effect to this architectural resource that was identified for the 2004 FEIS Design. The Modified Design maintains the entrance (Entrance 3) beneath the Park Avenue viaduct but it would not directly affect the Park Avenue viaduct; the Metro-North Harlem-125th Street Station; or the Comfort Station, a contributing component of the S/NR-eligible Metro-North Harlem-125th Street Station, although the entrance would be constructed in proximity to S/NR-eligible Comfort Station. If design plans change such that Entrance 3 would directly affect the Comfort Station, consultation would be undertaken with the SHPO as set forth in the PA.

The proposed ancillary facilities in the Modified Design would be approximately 80 to 100 feet wide, 80 to 110 feet deep, and would range in height depending on location. In and around 125th Street, the ancillary facilities would range in height from between 45 and 75 feet (equivalent to 5 to 8 stories). Along Second Avenue, they would range from 90 to 140 feet tall (equivalent to 9 to 14 stories). The design specifications for the new facilities would require the use of massing design and façade materials that visually break up the facades of the ancillary facilities so that they are compatible with the historic and architectural characteristics of nearby architectural resources, so as to avoid or minimize significant contextual effects to nearby resources.

No elements of the proposed 116th Street Station would affect buildings that contribute to the significance of the new East Harlem Historic District. The southern entrance (Entrance 1) and ancillary facility (Ancillary 1) would be located within the boundaries of the district. Continued consultation with the SHPO will be undertaken as the designs of the entrance and ancillary facility advance, as set forth in the PA.

The proposed ancillary facility (Ancillary 1) at the northeast corner of 115th Street and Second Avenue would introduce a taller building to the site with a larger footprint than the buildings it would replace. The ancillary facility would be approximately 120 to 140 tall (equivalent to 12 to 14 stories). The building would be similar in height to, or slightly taller than, the buildings of the New York City Housing Authority Thomas Jefferson Houses, directly across 115th Street from the new ancillary facility. Thomas Jefferson Houses occupies multiple blocks and has eight 14-story buildings along the south side of 115th Street between First and Third Avenues. As the ancillary facility would not result in the removal of any contributing buildings to the East Harlem Historic District, would be located at the corner with Second Avenue at the edge of the historic

district and across 115th Street from the tall NYCHA housing complex, and furthermore would be designed in consultation with the SHPO, the ancillary facility would not result in an adverse effect to the East Harlem Historic District. Similarly, the southern entrance (Entrance 1) to the 116th Street Station would not remove any contributing buildings to the historic district, would be designed in consultation with the SHPO, and also would not result in an adverse effect to the East Harlem Historic District.

Additionally, ancillary facilities and entrances would be located adjacent to or in close proximity to architectural resources as listed in **Tables 8-3** and **8-4** and shown on **Figures 8-2 through 8-6**. These locations include:

- The ancillary facility on the south side of West 125th Street between Lenox Avenue and Fifth Avenue, which is near the S/NR-eligible Marion Building at 100-110 West 125th Street and the S/NR-eligible Mount Morris Historic District;
- The ancillary facility at the northwest corner of East 124th Street and Park Avenue, which is near the S/NR-eligible Park Avenue viaduct and the S/NR-eligible Metro-North Harlem 125th Street Station and associated Comfort Station;
- The entrance at the southeast corner of East 125th Street and Park Avenue, which is near the S/NR-eligible Metro-North Harlem-125th Street Station and associated Comfort Station, and the S/NR-eligible Park Avenue viaduct, which carries the Metro-North Railroad. This entrance is also located across East 125th Street from the S/NR-eligible former Hamilton Storage and Warehouse Co. at 1825 Park Avenue;
- The entrance at the southwest corner of East 125th Street and Lexington Avenue, which is adjacent to the S/NR-listed Former Harlem Savings Bank (Apple Bank) at 124 East 125th Street, the S/NR-eligible Former New York City Telephone Co. at 123 East 124th Street, and across East 124th Street from the S/NR-eligible former stable at 124 East 124th Street;
- The entrance at the southeast corner of East 125th Street and Lexington Avenue, which is across East 125th Street from the S/NR-eligible Former Twelfth Ward Bank at 141-147 East 125th Street;
- The ancillary facility at the northeast corner of East 124th Street and Lexington Avenue, which is across East 124th Street from the S/NR-eligible former stable at 166 East 124th Street;
- The entrance on the west side of Lexington Avenue between East 125th Street and East 126th Street is across Lexington Avenue from the S/NR-eligible Former Twelfth Ward Bank at 141-147 East 125th Street and the S/NR-eligible apartment building at 2075-2087 Lexington Avenue;
- The ancillary facility on the south side of East 125th Street between Third and Second Avenues, which is in proximity to the S/NR-eligible and New York City Landmark (NYCL) New York Public Library-125th Street Branch at 224 East 125th Street;
- The ancillary facility on the west side of Second Avenue between East 120th and East 119th Streets is across Second Avenue from the East Harlem Historic District (S/NR-eligible);
- The ancillary facility at the northeast corner of East 115th Street and Second Avenue is located within the boundaries of the East Harlem Historic District (S/NR-eligible) and in close proximity to the S/NR-eligible Banca Commerciale Italiana at 2256 Second Avenue;

- The entrance location at the northeast corner of East 116th Street and Second Avenue is located within the boundaries of the East Harlem Historic District (S/NR-eligible) and is across the street from the S/NR-eligible Banca Commerciale Italiana at 2256 Second Avenue;
- The ancillary facility at the northeast corner of Second Avenue and East 109th Street, which is adjacent to the S/NR-eligible St. Ann's Roman Catholic Church Complex at 312 East 110th Street, and across East 109th Street from the S/NR-eligible bank building at 2118 Second Avenue.

Therefore, as specified in the 2004 FEIS and the PA, MTA will consult with the SHPO and LPC, including with respect to the proposed construction of the entrance and ancillary facilities located within the East Harlem Historic District, potential effects to the S/NR eligible Comfort Station associated with the Metro-North Harlem-125th Street Station, and in preparing design specifications to avoid adverse contextual effects to the nearby resources.

The SHPO reviewed the conclusions that are presented in this chapter and concurred with the conclusions; copies of correspondence from the SHPO are provided in **Appendix B**.

8.4.2.2 ARCHAEOLOGICAL RESOURCES

Any effects to areas of archaeological sensitivity would occur during the construction of the project (see discussion in Section 8.4.1.2 above). Therefore, operation of the Second Avenue Subway with the Modified Design would not result in new effects on archaeological resources and no mitigation measures would be required.

8.5 CONCLUSIONS

Consistent with the 2004 FEIS, the Modified Design would not require demolition of any known architectural resource or any resource that has been determined to contribute to a historic district. The ancillary facility (Ancillary 1) located at the northeast corner of 115th Street and Second Avenue and the entrance (Entrance 1) located at the northeast corner of 116th Street and Second Avenue would be located within the East Harlem Historic District, but they would not remove any portion of a contributing architectural resource within the district.

At the same time, a potential adverse effect to the Metro-North Harlem-125th Street Station identified in the 2004 FEIS has been eliminated with the Modified Design. Consistent with the 2004 FEIS Design, the Modified Design would result in the construction of above-ground elements in proximity to the S/NR-eligible Metro-North Harlem 125th Street Station, Park Avenue Viaduct, and associated Comfort Station, although a direct connection to the Metro-North station has been eliminated. Under the Modified Design, the entrance (Entrance 3) beneath the Park Avenue Viaduct would not directly affect the S/NR eligible Comfort Station associated with the Metro-North Harlem-125th Street Station, but would be in proximity to this historic structure.

Consistent with the 2004 FEIS, for all historic properties that could be adversely affected by construction activities for Phase 2 of the subway, MTA will prepare a CPP that includes these historic properties. The CPP would be developed prior to any excavation or construction of the Project in consultation with the SHPO, in keeping with the 2004 FEIS and PA. In addition, MTA will consult with the SHPO with respect to the identification of architectural resources and the assessment of effects on any resources not previously evaluated in the 2004 FEIS. As also stated in the 2004 FEIS, MTA will develop design specifications in consultation with the SHPO and

LPC to avoid or minimize adverse effects to architectural resources adjacent to or in proximity to above-grade Project elements as has been described above.

A Supplemental Phase 1A Study was prepared to evaluate the potential archaeological sensitivity of areas that would be affected by the Modified Design that were not evaluated in the 2004 FEIS. The Supplemental Phase 1A Study identified areas of archaeological sensitivity that could potentially result in effects on archaeological resources within some of the newly added portions of the APE and identified mitigation measures to address potential impacts of the Modified Design that are consistent with the measures developed for the 2004 FEIS and set forth in the PA.

As a result of the Phase 2 Modified Design, there will not be any new or different significant adverse impacts on architectural and archaeological resources not previously identified in the 2004 FEIS and ROD that would require an amendment to the PA, and MTA will continue to follow the procedures set forth for the Project in the PA to avoid, minimize, and mitigate potential adverse effects to historic and archaeological resources. ✷

Chapter 9: Air Quality

9.1 INTRODUCTION

This chapter of the Supplemental EA considers the potential for construction or operation of the Modified Design to result in impacts related to air quality. The 2004 FEIS concluded that construction activities for the new subway would result in increased dust and pollutant emissions from construction equipment and increased traffic congestion near the construction zones. The Project's Construction Environmental Protection Plan (CEPP) requires an aggressive dust control program to minimize dust and use of diesel emission controls to reduce pollutant emissions. The 2004 FEIS found that once the Project is complete and operational, the new subway would result in local and regional improvements in air quality by reducing the use of motor vehicles. The Modified Design would not change the conclusions of the 2004 FEIS.

9.2 FEIS FINDINGS

9.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS included an analysis of the Second Avenue Subway project's effects on air quality in Chapter 11, "Air Quality." As discussed in the 2004 FEIS (see FEIS page 11-9), during construction of the subway, heavy trucking activity as well as substantial diversions of and increased congestion for existing traffic can be expected when cut-and-cover excavation takes place at station locations. In addition, air quality in close proximity to construction sites would also be affected by fugitive dust, diesel emissions, and other particulate matter created at active construction sites.

The 2004 FEIS included an analysis of the localized (microscale) effects of construction activities on carbon monoxide (CO) for five representative locations along the 8.5-mile alignment of the Second Avenue Subway. The modeling effort accounted for increased congestion, lower running speeds, and increased idle emissions. The five locations were selected to represent reasonable worst-case conditions based on the results of the traffic analysis presented in the 2004 FEIS. Although a detailed analysis was only conducted for the five intersections (124th Street and Park Avenue, 96th Street and Lexington Avenue, 96th Street and Second Avenue, 34th Street and Lexington Avenue, and 34th Street and Second Avenue), these receptor sites represented the reasonable worst-case conditions that would be likely to occur throughout the entire alignment area during any construction phase.

Two construction zones were selected for construction activity modeling of particulate matter (PM), including PM of 10 micrometers or less in diameter (PM_{10}) and fine particulate matter 2.5 micrometers or less ($PM_{2.5}$): the area between 97th and 92nd Streets to be constructed in Phase 1, and a corresponding area near 36th Street to be constructed in Phase 3. These sites were selected because they could experience the most intense and longest duration construction activities along the alignment, because both locations have heavy existing traffic volumes as well as sensitive receptors nearby, and because both areas can represent activities that would occur in other places

along the alignment. At both locations, two construction activities were modeled separately: the open-cut station excavation process and the spoils removal process for the Tunnel Boring Machine (TBM). These activities were chosen for modeling because they would each require a large number of construction vehicles and machinery over a multi-year period and because they would also occur at all locations where stations would be constructed. Further, although a variety of construction techniques could be used to build a particular project element, these two construction activities (open cut station excavation and TBM spoils removal) would result in the greatest potential effect to air quality. Consequently, the activities analyzed represent the worst-case conditions at those construction sites, and the results of the analysis for these activities can be used to make conclusions about other portions of the subway alignment where less construction activity would take place.

The 2004 FEIS's air quality analysis concluded that the Project's construction activities, including construction activities at the construction sites and truck trips, congestion, and diversions of existing traffic on the roadways, would not result in adverse impacts on carbon monoxide (CO) levels that would exceed standards or benchmarks. In addition, particulate matter of 10 micrometers or less in diameter (PM_{10}) concentrations were not predicted to exceed standards or benchmarks.

In the areas immediately adjacent to major construction sites, the Project's construction activities were projected to result in maximum local annual increases in concentrations of finer particulate matter, $PM_{2.5}$, concentrations that would exceed the interim annual threshold value of 0.3 $\mu g/m^3$ that was used at that time by the New York State Department of Environmental Conservation (NYSDEC) in review of projects requiring New York State air quality permits. At that time, some of the background particulate matter of 2.5 micrometers or less in diameter ($PM_{2.5}$) levels exceeded the annual National Ambient Air Quality Standards (NAAQS) at monitoring stations within the study area. While maximum 24-hour average increases in $PM_{2.5}$ concentrations from diesel exhaust only (i.e., not including fugitive dust) was not predicted to exceed the interim guidance threshold value of 5 $\mu g/m^3$, the maximum projected 24-hour increase in $PM_{2.5}$ concentrations including fugitive dust were predicted to exceed those values. However, total daily $PM_{2.5}$ concentrations, including background levels during construction, were predicted to be below the NAAQS.

While the Project was not required to meet the NYSDEC and New York City Department of Environmental Protection (NYCDEP) thresholds, the criteria were applied to assess the magnitude of the Project's effects and to identify mitigation measures to minimize the generation of $PM_{2.5}$ to the maximum extent practicable. As a result, construction for the Project was required to follow measures to reduce air pollutant emissions. These measures were set forth in the Project's CEPP and included an aggressive dust control program, including dust covers for trucks, (water) spray misting exposed areas, and using safe chemical dust suppressants to treat and control spoils at construction areas. In addition, a fence of an appropriate height was required to surround the construction sites to reduce wind-borne dust. To reduce emissions from construction equipment, the CEPP required diesel emission controls for non-road equipment. These controls required that all heavy equipment use ultra-low sulfur diesel (ULSD) fuel and diesel particle filters (DPF) or other retrofit technology, in accordance with MTA policies. In addition, idling time for all diesel equipment was limited to three consecutive minutes, except in certain limited circumstances.

9.2.2 PERMANENT IMPACTS

As described in the 2004 FEIS, the completion of the Second Avenue Subway will result in overall benefits to local and regional air quality by reducing vehicle trips and vehicle miles of travel. The 2004 FEIS outlined the improvements in regional air quality that would result once the Second Avenue Subway was operational. The 2004 FEIS stated that the Project would contribute to the ongoing improvement in New York City's air quality by decreasing traffic and related congestion. The Project was not projected to increase vehicular traffic at intersections within the study area, and therefore was not projected to result in localized increases in air pollutants.

9.3 UPDATE OF BACKGROUND CONDITIONS

Subsequent to the 2004 FEIS, certain air quality standards, regulations, and criteria have been revised, which affects how air quality analyses for proposed projects are conducted. These include the following:

- Changes in the NAAQS;
- Changes in NAAQS attainment status and relevant State Implementation Plans (SIP) in the New York City area;
- Changes in other criteria applied for determining the significance of potential impacts; and
- Changes in engine emissions standards.

Non-road engine emissions are regulated through manufacturing requirements known as tiers. The highest (cleanest) tier, Tier 4, was finalized in 2004 after the 2004 FEIS was published, and imposes stricter PM and nitrogen oxides (NO_x) emission requirements that were phased in (depending on engine type and size) from 2008-2014, with some exceptions. Cleaner on-road diesel engines were phased in earlier, starting with model year 2007.

The U.S. Environmental Protection Agency (USEPA) established a new 1-hour average NO_2 standard of 100 parts per billion (ppb), effective April 12, 2010, in addition to the annual standard. However, at this time, EPA has not issued new regulations and guidance that would outline methods and criteria for evaluating 1-hour NO_2 impacts from project-level emissions. Therefore, although EPA has promulgated the 1-hour standard, it has yet to be fully implemented.

In addition, since the 2004 FEIS, background air pollutant concentrations have changed. Moreover, the models and methodologies used to perform air quality analyses have evolved.

Also since the 2004 FEIS, during construction of Phase 1, blasting activities resulted in odors and emissions that raised community concerns. To address these concerns, MTA undertook several studies in 2012 to assess the adequacy of the contractor's ongoing Community Air Monitoring Plan and to make recommendations for improving its efficacy as a warning system to take corrective action when problems occur. Additional measures were implemented to address these emissions.

9.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

9.4.1 CONSTRUCTION IMPACTS

Some of the proposed changes in construction means and methods for the Modified Design would reduce the intensity of construction and the ensuing air pollutant emissions. Specifically, the

reduction of cut-and-cover construction along 125th Street would reduce the associated surface disruptions and dust emissions. It would also reduce truck traffic needed to remove spoils, as the amount of excavation would be substantially reduced. In addition, on Second Avenue, the amount of cut-and-cover construction at the north end of the 116th Street Station would be substantially reduced because of the Modified Design's smaller bellmouth and shift in the terminus of the curved tunnel southward from about 122nd Street to about 120th Street. While this change would require some additional demolition of the existing 1970s tunnel between 118th and 120th Streets, the originally proposed bellmouth location north of 120th Street would have required more substantial cut-and-cover construction than is now proposed.

As described above, reasonable projections of construction-related 1-hour average NO_2 concentrations are not possible based on existing methods and data. However, given the magnitude of the NO_x emissions associated with the Project's construction, exceedances of the 1-hour NO_2 standard resulting from construction activities could occur. To mitigate potential construction related NO_2 impacts to the extent practicable, land-based non-road diesel-powered vehicles and construction equipment rated Tier 3 or higher would be used where conforming equipment is available, and the use of such equipment is practicable.

Mitigation will be implemented consistent with what was described in the 2004 FEIS. As described in Section 9.2.1, the 2004 FEIS required an aggressive dust control program, including dust covers for trucks, (water) spray misting exposed areas, and using safe chemical dust suppressants, and the use of the maximum practicable emission reduction technologies for off-road and non-road engines to the maximum extent practicable.

The mitigation program for Phase 2 will be enhanced to meet current standards for best practices aimed at achieving maximum practicable dust and $PM_{2.5}$ emissions reductions, and adding NO_x emissions reductions by requiring cleaner engine selection, thus meeting the mitigation requirement. The Phase 2 mitigation program will include the following measures:

1. The dust mitigation plan will be aimed at reducing dust emissions to the extent practicable, using measures for all activities that may result in dust emissions. The plan will be specific to construction sites and jobs and will include a no-visible-dust policy.
2. The contractor will be required to establish a program for controlling emissions from blasting, where blasting is used, including measures to monitor the efficacy of the controls and address issues as they arise.
3. All diesel engines with a power rating of 50 horsepower (hp) or greater will be required to meet at least the Tier 3 EPA emissions rating (other than engines where there is no Tier 3) and to be retrofit with a diesel particle filter (DPF) (other than engines already equipped with DPF).[1] Minor exceptions would be considered on a case-by-case basis if tier or retrofit requirements are not practicable, with next-best mitigation options considered instead, including but not limited to, flow-through wire mesh filters and diesel oxidation catalysts.

[1] The first federal regulations for new non-road diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces emissions standards for all equipment 50 hp and greater, referred to as Tier 1, and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. In 2004, the EPA introduced Tier 4 emissions standards with a phased-in period of 2008 to 2015. The Tier 1 through 4 standards regulate the EPA criteria pollutants, including PM, hydrocarbons (HC), NOx and CO.

4. Truck fleets working on site and substantial heavy-duty fleets serving the sites such as dump trucks and concrete mixing trucks and pumps will be required to be model year 2007 or newer (the newer trucks are equipped with emissions controls) or retrofit with DPFs.
5. Vehicles making deliveries to and removing materials from the construction zone will not be permitted to idle for more than three minutes, consistent with New York City law. In addition, engines for equipment on the construction sites will not be permitted to idle for more than three minutes unless it is necessary for the construction work.
6. Temporary power will be obtained at construction sites, where practicable, and power will be distributed throughout the site as necessary and used in lieu of generators to the extent practicable. Where electric grid power is available, electric engines will be used in lieu of diesel or gasoline engines where practicable. Solar powered equipment such as variable message signs will also be used wherever practicable.
7. Verifiable enforcement and record-keeping will ensure compliance with the above requirements.

9.4.2 PERMANENT IMPACTS

Consistent with the design presented in the 2004 FEIS, the Modified Design includes a new subway service along Second Avenue with stations and related elements (entrances and ancillary facilities) in the same general locations as previously contemplated. With the Modified Design, the Project would continue to increase transit options and enhance accessibility to transit services, thereby decreasing reliance on automobiles and affording benefits to air quality. Some advancement in vehicle engine emissions regulations and technology may reduce the air quality benefits of the Project relative to those presented in the 2004 FEIS (avoided emissions from on-road vehicles would be lower). Nonetheless, the Project would still result in air quality improvements within the local urban setting and emissions reductions within the non-attainment and maintenance areas.

9.5 CONCLUSIONS

The Modified Design includes revised construction means and methods aimed at reducing surface level impacts, such as conducting mining operations instead of cut-and-cover construction along 125th Street. While new air quality standards have been implemented for 1-hour NO_2 impacts since the 2004 FEIS, methodology for evaluating has not yet been implemented. Nevertheless, the robust air quality mitigation program established in the 2004 FEIS to reduce dust and emissions would continue to be implemented, and updated technologies (such as Tier 3-rated equipment) would be incorporated to the extent practicable. Once Phase 2 is operational, the new subway with either the 2004 FEIS Design or the Modified Design would provide similar air quality benefits by expanding accessibility to transit and reducing reliance on automobiles. The Phase 2 Modified Design would not result in any new or different significant adverse impacts related to air quality not previously identified in the 2004 FEIS and ROD. ✷

Chapter 10: Greenhouse Gas Emissions

10.1 INTRODUCTION

This chapter addresses the Modified Design's potential effects related to greenhouse gas (GHG) emissions. GHGs trap heat in the atmosphere and include gases such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. GHGs can result from construction activities, as well as from exhaust from vehicles (including trains). However, trains are typically a more efficient form of transportation than private automobiles (i.e., they are able to move larger numbers of passengers with less overall fuel consumption) and usually provide a benefit with respect to GHG emissions. The 2004 FEIS did not include an analysis of GHG, since such an analysis was not typically included in NEPA documentation at that time.

10.2 FEIS FINDINGS

The 2004 FEIS did not address GHG because a GHG analysis was not required or typically performed at that time. The 2004 FEIS did note (in FEIS Chapter 2, page 2-6) that the Second Avenue Subway will comply with the Environmental Management System (EMS) established by NYCT, which establishes protocols to achieve energy efficiency, enhanced indoor environmental quality, conservation of materials and resources, and water conservation and site management. The EMS conforms with the ISO 14001 Standard, an internationally recognized system that provides a disciplined framework under which NYCT can demonstrate control over key issues related to raw materials consumption, energy usage, emissions, wastes, products, transport, distribution, and services. The EMS requires not only a continuing compliance with relevant legislation but also that NYCT remain committed to achieving improvements in these key issues. A key aspect of this system involves the adoption of Design for the Environment Guidelines for use during the Project's design phase.

10.3 UPDATE OF BACKGROUND CONDITIONS

Since the publication of the 2004 FEIS, environmental documents now typically include an assessment of a project's GHG emissions. The analysis also evaluates opportunities for projects or actions to reduce energy consumption and GHG emissions.

10.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

10.4.1 CONSTRUCTION IMPACTS

As with any construction project, for the construction of Phase 2, there would be GHG emissions associated with the extraction, production, and transport of materials used for construction such as cement and steel, as well as emissions from fuels consumed for transport of materials and personnel to and from the sites, and energy use on-site (electricity and fuel) for non-road engines.

Similar to the 2004 FEIS Design, the Modified Design would comply with sustainability guidelines established by MTA and NYCT, in order to achieve energy efficiency, enhanced indoor

environmental quality, conservation of materials and resources, and water conservation and site management. Opportunities to reduce construction emissions are associated with the use of lower-carbon and renewable alternatives to the materials used, shorter distances for the disposal and/or reuse of excavated materials, and the use of biodiesel or renewable energy for construction. The use of biodiesel blends (B20) will be recommended for future Project contractors. Materials with recycled content, such as slag and flyash used in cement mixes, may be used during construction.

10.4.2 PERMANENT IMPACTS

Since the Project is a transit project, the change in GHG emissions associated with Phase 2's operations would largely be a net benefit. There would be some emissions associated with power supply for vehicle operations, and increases in energy use would occur for system lighting, ventilation, cooling, and other equipment. However, the 2004 FEIS air quality analysis demonstrated a regional reduction in criteria pollutant emissions based on a shift of on-road trips to transit; a similar benefit would be achieved for GHG emissions. Furthermore, MTA has studied the net effect of the New York City transit system,[1] and found that in addition to the direct GHG emissions reduction, the transit system results in reduced congestion and benefits that have developed over the years in the efficiency of New York City's land use patterns as a result of the transit system—people living nearer to their destinations and more efficient homes and buildings. The study demonstrates that the New York City transit system has more than an eight-fold net benefit, meaning that the system reduces more than eight times the emissions it creates. The subway system is by far the most efficient of the MTA transit modes. Therefore, the net change associated with Phase 2 operations would be a net reduction in energy use and GHG emissions.

In terms of the inclusion of further energy saving opportunities in the design, MTA does incorporate enhanced energy efficiency in its building and systems design, as well as vehicle operations such as regenerative braking (braking produces electric power rather than being dissipated as heat and mechanical wear).

10.5 CONCLUSIONS

Like any construction project, construction of Phase 2 of the Second Avenue Subway would involve some GHG emissions associated with the extraction, production, and transport of materials used for construction. Given the high projected usage of the system and the potential energy and GHG benefits of shifting trips to efficient transit, and the extended benefit that the transit system effects on the efficiency of New York City land use in general, the operational benefits of the Second Avenue Subway likely far exceed the construction-related GHG emissions. The findings in this chapter are consistent with FTA's Programmatic Assessment of GHG emissions from transit projects (FTA report #0097), which was published on January 18, 2017. Heavy rail projects result in a net decrease in GHG, and FTA and MTA NYCT hereby incorporate the Programmatic Assessment by reference into this Supplemental EA. ✷

[1] MTA. *Impact of Public Transportation on GHG in the MTA Area*. 2009; MTA. *An Average MTA Trip Saves Over 10 Pounds of Greenhouse Gas Emissions*. 2012.

Chapter 11: Noise and Vibration

11.1 INTRODUCTION

This chapter considers the potential for construction or operation of the Modified Design to result in impacts related to airborne noise, ground-borne noise, and vibration. *Airborne noise* is noise that travels through the air—such as the sound of traffic on a nearby roadway, or children playing in a playground. *Ground-borne noise* is the rumbling sound caused by *vibration* (or oscillatory motion). With ground-borne noise, buildings and other structures act like speakers for low-amplitude noise. As an example, ground-borne noise is the low rumbling sound that occurs within a building as a subway passes beneath.

The 2004 FEIS concluded that airborne noise, ground-borne noise, and vibration associated with construction activities for the new subway would result in significant adverse impacts in nearby areas. An extensive construction noise mitigation plan is included as part of the Project's Construction Environmental Protection Plan to reduce and alleviate impacts to the extent practicable. The 2004 FEIS found that once the Project is complete and operational, the new subway would not result in significant adverse impacts related to airborne noise or ground-borne vibration. Significant adverse impacts related to ground-borne noise were identified in the 2004 FEIS if no mitigation were employed due to a new a subway being introduced in areas where no subway currently exists. MTA committed to addressing potential issues by including design features that reduce noise and vibration as part of the Project. These include designing all above-ground mechanical equipment with noise attenuation and using resilient track fasteners or track support structures or other similar measures at locations with the potential for ground-borne noise or vibration impacts. With these measures, ground-borne noise levels were to be reduced below the Federal Transit Administration's (FTA's) impact thresholds. The Modified Design would not change the conclusions of the 2004 FEIS.

11.2 FEIS FINDINGS

11.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS evaluated the noise and vibration impacts of construction of the new subway following the procedures in FTA's guidance manual, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995. The analysis identified the potential for construction of the Second Avenue Subway to result in significant adverse impacts from airborne and ground-borne noise and vibration. These impacts would occur in the vicinity where construction work is occurring.

Significant adverse airborne noise impacts were predicted to occur at all stations and at all shaft sites/spoils removal locations during certain construction periods because of the proximity of construction to sensitive uses. The types and extent of the impacts were found to be comparable in all construction phases. Some activities creating such impacts would not have occurred during late night and early morning hours (e.g., 10 PM to 7 AM). Noise levels from construction of the

project up to 101 dBA were predicted during daytime hours and levels up to 92 dBA were predicted during nighttime hours.[1] These airborne noise impacts were identified for locations up to approximately 750 feet from where construction operations would be taking place. Airborne noise travels both vertically and horizontally; whenever a line-of-sight is available between the noise source and a receptor location within approximately 750 feet, the impacts could occur.

The values described above did not include noise from pile-driving operations, because these operations would have typically taken place only for a relatively short time period (about three months) at any location. Noise produced by pile driving varies depending on the soil conditions and the specific construction equipment and techniques utilized. For example, typical noise levels for an impact pile driver are 109 dBA at 20 feet and 101 dBA at 50 feet. Vibratory or sonic pile drivers are about 5 dBA quieter. To mitigate noise impacts, MTA committed to avoiding use of impact pile driving methods where possible, using bored or augured piles instead. In all cases, however, pile-driving operations would have produced intrusive and annoying noise levels that would exceed the FTA's construction impact criteria. Pile-driving operations typically do not occur at night, although it is possible that certain activities needed to support pile-driving (such as drilling) could have occurred during nighttime hours under certain circumstances.

The 2004 FEIS stated that MTA was committed to implementing an extensive mitigation program to reduce and alleviate construction noise impacts. This program was therefore included in the Project's CEPP.

Table 12-9 in the 2004 FEIS provided a list of proposed mitigation measures on a site-by-site basis. Contractors will be required to implement measures to achieve the levels specified in the performance standards identified in Table 12-6 of the 2004 FEIS. This information is presented below in **Table 11-1**.

Mitigation measures for the construction airborne noise identified in the 2004 FEIS included: enclosing areas where spoils from tunnel operations would be loaded into trucks, or at station locations where spoils removal would take place for long durations during the daytime or at night; placing some equipment or operations below grade in shielded locations; changing construction sequencing to reduce noise impacts by combining noisy operations to occur in the same time period or by spreading them out; avoiding nighttime activities; prohibiting blasting after 8 PM or on holidays; and using alternative construction methods, such as avoiding impact pile installation in sensitive areas, using special low noise emission level equipment, and selecting and specifying quieter demolition methods. Despite these measures, it was disclosed in the 2004 FEIS that it would not be possible to fully mitigate all airborne noise impacts because of the proximity of residences and other sensitive uses to construction.

According to the 2004 FEIS, construction would result in varying degrees of ground vibration, depending on the stage of construction, equipment and construction methods employed, and distance from the construction to buildings and vibration-sensitive structures. Due to the proximity of sensitive receptors, vibration levels during a large portion of the period of the construction were predicted to be perceptible. Airblast from blasting was also predicted to be perceptible.

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[1] Sound pressure levels are measured in units called "decibels" (dB). This measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or dBA.

Table 11-1
Cumulative Construction Noise Lot-Line Limits at 50 Feet
Based on 2004 FEIS[1]

Noise Monitoring Location Land Use	Average Noise Not to Exceed (L_{eq}) [2]	Maximum Noise Level Criteria (L_{max}) [3]
DAYTIME (7 AM TO 6 PM)		
Noise Sensitive Locations	75 or Background + 5 [4]	85 [4] (or 90 for impact equipment)
Commercial Areas	80 or Background + 5 [4]	None [5]
Industrial Areas	85 or Background + 5 [4]	None [5]
EVENING (6 PM TO 10 PM)		
Noise-Sensitive Locations	Background + 5	85
Commercial Areas	Background + 5 [4]	None [5]
Industrial Areas	None [5]	None [5]
NIGHT-TIME (10 PM TO 7 AM)		
Noise-Sensitive Locations	Background + 5	80
Commercial Areas	None [5]	None [5]
Industrial Areas	None [5]	None [5]

Notes:
[1] All measurements will be taken at the affected lot line. In situations where the work site is within 50 feet of a lot-line, the measurement will be taken at the lot line, and projected to a distance of 50 feet.
[2] L_{eq} noise readings are averaged over 20-minute intervals and compared against the higher of the two criteria. L_{eq} Level (dB(A), slow) re 2x10-5 Pa
[3] L_{max} noise readings occur instantaneously. L_{max} Level (dB(A), slow) re 2x10-5 Pa
[4] Noise from impact equipment is exempt from the L_{eq} requirement, but is subject to a lot-line Lmax limit of 95 dBA.
[5] In no case will the public be exposed to construction noise levels exceeding 90 dB(A) on "slow" response or to impulsive noise levels exceeding 125 dB(A) maximum transient level fast response as measured on a general purpose sound level meter.

Source: 2004 FEIS Table 12-9.

The construction vibration analysis included in the 2004 FEIS determined that with the exception of pile installation machines and clam shovel drops (needed for the slurry walls), at distances greater than 20 feet, all of the vibration values for the types of equipment likely to be used during subway construction would be below the New York City Department of Buildings (NYCDOB) vibration damage threshold criterion for fragile buildings and the FTA vibration damage threshold for extremely fragile historic buildings. Similarly, at distances greater than 20 feet, vibration levels for the Tunnel Boring Machine (TBM) would be below both thresholds. Ground-borne noise from the TBM would be perceptible, but would only occur for a limited time at any particular location, since the equipment is continuously moving. Sensitive buildings, including all historic structures, typically receive careful consideration to determine appropriate vibration thresholds. In addition, special measures are typically taken at all phases of construction to avoid damaging fragile and extremely fragile (including historic) structures.

At the time of the 2004 FEIS, MTA had committed to mitigation measures for construction ground-borne noise and vibration including development of a Project-wide vibration monitoring program to minimize vibration levels and respond to community complaints and concerns as they arise. Multi-delay blasting techniques, careful installation of tracks for spoils removal trains, and other site-specific vibration control measures were to be employed as necessary.

11.2.2 PERMANENT IMPACTS

The noise analysis included in the 2004 FEIS found no potential for operation of the Second Avenue Subway to result in significant adverse airborne noise impacts at any nearby receptors along the alignment or at potential storage yards. Once operational, the Second Avenue Subway's trains themselves do not have the potential to create airborne noise impacts outside of the tunnel and stations because they are generally below ground and do not have an unobstructed pathway for airborne sound to travel to receptors. The various ancillary facilities such as fans, cooling towers, chillers, and pumps required to operate the Second Avenue Subway Project are located at every station and in certain other areas along the entire alignment, but these facilities include in-duct splitter attenuators (which can achieve between 20 to 30 dBA reductions in noise), sound absorptive plenums (large rooms enclosed by acoustic materials which can achieve between 10 and 15 dBA reductions), and/or acoustic louvers for fans. The 2004 FEIS indicated that noise from the ancillary facilities' cooling towers located on buildings' roofs would be controlled by building noise barriers around one or both sides of the towers. MTA committed to designing all above-ground mechanical equipment (as well as any below-ground equipment requiring above-ground vents or similar structures) so that the noise level produced when the equipment is in use would not exceed 60 dBA as measured from the façade of the nearest residential property.

The vibration and ground-borne noise analysis included in the 2004 FEIS found no potential for operation of the Second Avenue Subway to result in significant adverse vibration impacts at any nearby receptors along the alignment or at potential storage yards, but concluded that operation of the Second Avenue Subway would have the potential to result in significant adverse ground-borne impacts in the absence of mitigation measures. MTA committed to mitigating ground-borne noise impacts from train operations using resilient track fasteners or track support structures or other similar measures at all locations where operational ground-borne noise impacts were predicted. With these measures, ground-borne noise levels were predicted to be reduced at all locations to below FTA's impact thresholds.

11.3 UPDATE OF BACKGROUND CONDITIONS

Subsequent to the 2004 FEIS, new development has occurred in East Harlem, but the overall urban character and traffic patterns of the area have not changed ambient noise levels drastically. In May 2006, the Federal Transit Administration (FTA) issued updated noise and vibration guidance, *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06).

11.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

11.4.1 CONSTRUCTION IMPACTS

As part of the Modified Design, there have been changes to the configuration of the stations and ancillary facilities for Phase 2. None of these configuration changes would substantially alter the location of the construction work or material staging areas compared to the 2004 FEIS. Consequently, these changes would not result in any change to the area of predicted adverse noise or vibration impacts identified in the 2004 FEIS.

As described in Chapter 2, "Description of Phase 2 Modified Design," Section 2.3.4, the Modified Design includes changes to construction means and methods. The Modified Design would substantially reduce the amount of surface activity along and near 125th Street, where tunnel and

station excavation would occur below ground rather than using cut-and-cover techniques. The refinement in construction means and methods along 125th Street for the Modified Design would reduce the intensity and duration of noise from construction, because it would reduce cut-and-cover work in proximity to receptors. The Modified Design would also redirect some construction traffic along 124th Street rather than 125th Street, to limit disruption on this heavily traveled and commercial corridor. The land uses along 124th Street between Park Avenue and Second Avenue include several Category 2 noise-sensitive uses according to FTA noise impact criteria (i.e., residential, nursing home), as well as industrial, commercial, and playground uses that would not be considered noise-sensitive. The impacts identified in the 2004 FEIS for receptors along construction truck routes would occur along the newly determined construction truck routes with the same intensity and duration as identified in the 2004 FEIS. However, the same mitigation measures identified in the 2004 FEIS would also apply to the areas along any newly determined construction truck routes, and the expected noise and/or vibration impacts would be the same as those identified in the 2004 FEIS.

On Second Avenue, construction techniques would be similar to those described in the 2004 FEIS for the 2004 FEIS Design. The 2004 FEIS Design anticipated removal of TBMs used to excavate the curved tunnel between Second Avenue and 125th Street at a shaft excavated in Second Avenue near 122nd Street. With the Modified Design, this excavation would be farther south, near 120th Street, which would reduce the excavated area on Second Avenue. The 120th Street shaft would be used to launch the TBM headed northward and also for staging associated with tunneling and construction of the 116th Street Station. Similar to the 2004 FEIS Design, intensive construction activities would occur in this area of Second Avenue.

For the Modified Design, as for the 2004 FEIS Design and for Phase 1, the construction contract will be required to comply with the noise mitigation requirements outlined in the 2004 FEIS and Record of Decision. As stated in the 2004 FEIS, this may include enclosing areas where spoils from tunnel operations would be loaded into trucks, or at station locations where spoils removal would take place for long durations during the daytime or at night; placing some equipment or operations below grade in shielded locations; changing construction sequencing to reduce noise impacts by combining noisy operations to occur in the same time period or by spreading them out; avoiding nighttime activities; prohibiting blasting after 8 PM or on holidays; and using alternative construction methods, such as avoiding impact pile installation in sensitive areas, using special low noise emission level equipment, and selecting and specifying quieter demolition methods.

11.4.2 PERMANENT IMPACTS

The changes in location of ancillary facilities may potentially result in noise at different receptors than those identified under the design analyzed in the 2004 FEIS; however, since the noise levels would be less than 60 dBA at all receptors, which is generally less than the existing condition noise levels at all receptors in the Project study area, these changes would be imperceptible to barely perceptible and would not constitute adverse impacts. Moreover, the Modified Design includes use of a dry cooler system, which would eliminate the need for rooftop cooling towers and therefore remove a source of noise. The other changes in the Modified Design would not affect any of the conclusions of the noise, vibration, or ground-borne noise analyses included in the 2004 FEIS.

11.5 CONCLUSIONS

The Modified Design would reduce the amount of cut-and-cover construction at some locations, which would reduce the amount of construction noise and vibration adjacent to these locations, and the 2004 FEIS conclusions regarding construction noise and vibration remain unchanged at other locations. Once construction is complete, the changes to the locations of ancillary facilities would not have the potential to result in adverse noise impacts because of MTA's commitment to design the facilities such that they do not produce noise more than 60 dBA at the nearest residential property, regardless of the location of the facility. Therefore, the Phase 2 Modified Design would not result in any new or different significant adverse impacts related to noise and vibration not previously identified in the 2004 FEIS and ROD. ✷

Chapter 12: Infrastructure and Energy

12.1 INTRODUCTION

This chapter describes the potential adverse impacts to utilities and other subsurface infrastructure, as well as energy requirements for the Project, and describes changes to those impacts with the Modified Design as compared to the 2004 FEIS Design.

The 2004 FEIS concluded that construction activities for the new subway would require relocation of many buried utilities within or near the Project alignment, and that this relocation would be conducted in coordination with the utility companies responsible for that infrastructure. The 2004 FEIS also described that the new subway would draw power from New York City's power grid through new substations, and this would not adversely affect the local or regional power supply. The Modified Design would not change the conclusions of the 2004 FEIS.

12.2 FEIS FINDINGS

12.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS stated that construction activities could affect utilities buried beneath streets affected by the Second Avenue Subway. Utilities include water mains, sewers, gas pipes, and electrical conduits, including the Empire City Subway (ECS) ductbank, which runs along the west side of Second Avenue. Some of these utilities were anticipated to be above tunneling activities and could remain in place during construction, with protection measures established, whereas others may need to be relocated. Efforts to avoid relocation of utilities and maintain continuous service to customers were to be employed to the extent practicable. While the 2004 FEIS disclosed that short-term outages typical of other construction projects in New York City could occur, measures were to be taken to ensure that no significant adverse impacts would result. Close coordination with utility suppliers, as well as the New York City Department of Environmental Protection (NYCDEP), was to be conducted throughout the planning and construction process.

The 2004 FEIS did not identify any adverse impacts with respect to energy demand during construction. The 2004 FEIS noted that energy resources would be required to power construction equipment, including a Tunnel Boring Machine (TBM), but this would be negligible compared to City's peak load demand. The 2004 FEIS indicated that temporary substations would be created to power the TBM, in coordination with Con Edison.

12.2.2 PERMANENT IMPACTS

The 2004 FEIS noted that any utilities requiring replacement or relocation during construction would be in place once the subway is operational. The subway itself would have minimal impact on the area's infrastructure. Connections to water and sewer services would be required for the new stations, but sufficient supply would be available.

The 2004 FEIS stated that power would be obtained from the existing Con Edison electrical grid, distributed through substations within the below-ground station boxes. It was estimated that about 94.6 megawatts (MW) of power would be required annually for the Second Avenue Subway, which would be a very small fraction of the total energy consumed in New York City (about 0.7 percent of the projected 2020 load of 13,400 MW within the city). It was also stated that although substations produce electromagnetic fields (EMFs), there was general consensus at the time among the medical and scientific community that there was insufficient evidence to prove that EMFs cause adverse health effects. A 2002 study by Enertech Consultants, which took measurements near Consolidated Edison substations in Manhattan, also found that EMF levels are indistinguishable from background within a very short distance from the substations.

12.3 UPDATE OF BACKGROUND CONDITIONS

No substantial changes in utility infrastructure or energy supply has occurred along the Phase 2 alignment since the 2004 FEIS. As the Phase 2 preliminary engineering design has advanced, construction work zones along side streets adjacent to Second Avenue and 125th Street have been refined and include areas not previously included. A full utility survey will be conducted for Phase 2 to identify specific utility infrastructure that may be affected by the Project.

12.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

12.4.1 CONSTRUCTION IMPACTS

No major changes to utility services have occurred along the Phase 2 alignment. As the preliminary engineering for Phase 2 has advanced, the construction work zone has extended along adjacent areas of some cross streets off Second Avenue near the proposed subway stations and may require protection or relocation of additional utilities, similar to those within Second Avenue.

The Modified Design includes some modifications that would help reduce impacts to utility services. For instance, the 106th Street Station platform has been shifted about five to six feet east to reduce impacts to the ECS ductbank; the tunnel at the 125th Street curve and the 125th Street station would be about 20 feet deeper than originally designed, providing greater separation from utilities; and the deeper 125th Street station would substantially reduce cut-and-cover construction along 125th Street, thereby reducing potential utility conflicts in this area.

To expedite construction, based on experience gained during construction of Phase 1 and other major transit projects, MTA intends to implement an early utility relocation program to address a portion of the utility relocation work needed to prepare for the upcoming heavy construction. By performing some major utility relocations along Second Avenue in advance of the underground station shells and tunnel construction, unanticipated complications can be resolved in advance, thereby reducing the risk of construction delays in the follow-on contracts.

12.4.2 PERMANENT IMPACTS

As with the 2004 FEIS Design, any utilities affected by the Modified Design would be relocated or replaced once Phase 2 is operational. Some of these utilities may benefit from replacement with new and updated materials. Entrances and ancillary facilities would continue to require water and sewer connections in coordination with NYCDEP, and energy supply would continue to be coordinated with Con Edison. Due to new flood protection standards, substations would be

required to be above ground and located in ancillary facility structures. However, this would not affect their function or result in any new adverse impacts.

12.5 CONCLUSIONS

The Phase 2 Modified Design would not result in any new or different significant adverse impacts related to utility services or energy supply not previously identified in the 2004 FEIS and ROD. The Modified Design includes elements to reduce potential impacts on utilities, and early utility relocations would be implemented to reduce utility impacts during construction. A utility survey will be conducted prior to construction and any impacts to utility services would be coordinated closely with service providers and regulating agencies, such as NYCDEP. ✷

Chapter 13: Contaminated Materials

13.1 INTRODUCTION

This chapter addresses the potential for soil and groundwater contamination to exist along the Phase 2 alignment and describes changes in impacts with respect to contaminated materials under the Modified Design as compared to the 2004 FEIS Design.

The 2004 FEIS concluded that the potential for adverse impacts related to contaminated materials could occur during construction along the Phase 2 alignment, where contaminated soil and groundwater may be present as a result of past activities along the alignment. The 2004 FEIS identified measures to be implemented during construction to address this risk, including the use of Health and Safety Plans. The 2004 FEIS concluded that once construction is complete, the new subway would not result in significant adverse impacts related to contaminated materials. The Modified Design would not change the conclusions of the 2004 FEIS.

13.2 FEIS FINDINGS

13.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS included a preliminary Environmental Site Assessment (ESA) for the full 8.5-mile length of the proposed Second Avenue Subway. In total, 724 sites were identified for potential contamination, with 143 considered candidates for further analysis, including 21 sites along the Phase 2 alignment. Soil and groundwater sampling was conducted for 11 locations along the project alignment, two of which were in the Phase 2 corridor. No contaminants with elevated levels were detected at these locations, but petroleum odors were observed at one of these locations and the 2004 FEIS concluded that further sampling would be needed.

The 2004 FEIS stated that ground areas that would be disturbed as part of the subway's construction would be evaluated and tested for contaminated materials, as appropriate, and that contaminated soils would be disposed of in accordance with all applicable local, state, and federal regulations. The 2004 FEIS indicated that once construction activities were complete, any remaining non-volatile subsurface contaminated materials would be "capped" by paved areas and potential pathways of exposure would be eliminated. Water and vapor barriers would be installed, as needed and feasible, to prevent or minimize seepage of water and vapors into the tunnel, which could include concrete tunnel liners with voids between the liner and the rock/soil sealed by injecting cement grout under pressure.

Levels of soil or groundwater contamination in areas to be disturbed by Phase 2 construction were not specifically identified in the 2004 FEIS, as this would be determined later at a time closer to initiation of construction of this phase. However, the 2004 FEIS identified potential contaminants that could be encountered and the process for addressing these contaminants. For instance, site-specific Health and Safety Plans (HASP) were to be developed for each construction phase to detail the health and safety guidelines, procedures, and work practices that must be adhered to; all workers were required to follow all applicable local, state, and U.S. Occupational Health and

Safety Administration (OSHA) construction codes and regulations; and a hazardous materials management plan would be developed for testing, handling, transporting, and disposing of contaminated materials encountered during the proposed excavations, consistent with applicable regulations, which would be included in the project's CEPP. Contaminants encountered were to be disposed of and handled in accordance with applicable laws and regulations.

A testing protocol for water in the sumps was to be developed and approved by the New York City Department of Environmental Protection (NYCDEP) as part of the permit/approval and CEPP process for the construction of the Project. If any groundwater exceeded NYCDEP's sewer use limitations, it was to be treated by readily available technologies and retested before being disposed of to the sewer systems.

13.2.2 PERMANENT IMPACTS

The 2004 FEIS disclosed that operation of the subway would include the use of a variety of chemicals, including fuels, lubricants, and other oils, which would be handled and stored according to all applicable city, state, and federal regulations. With these protocols in place, no adverse impacts related to contaminated materials were identified in the 2004 FEIS.

13.3 UPDATE OF BACKGROUND CONDITIONS

A Contaminated Materials Screening Assessment was prepared in November 2017 for the Phase 2 alignment to update information in this corridor and account for changes in conditions since the 2004 FEIS. The screening assessment involved a database search, review of historic Sanborn maps, and visual site reconnaissance from publicly accessible areas. Conditions along the entire Phase 2 alignment were evaluated, with a focus on the proposed property acquisition sites and the areas of probable subsurface excavation. The screening assessment identified 29 sites that warrant further investigation, as compared to 21 sites identified in the 2004 FEIS along the Phase 2 alignment.

13.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

13.4.1 CONSTRUCTION IMPACTS

The updated Contaminated Materials Screening Assessment prepared in November 2017 for the Phase 2 alignment recommended that full Phase I ESAs be conducted on all proposed property acquisition sites. The Phase I ESAs would determine whether Phase II Investigations are warranted. Phase II Investigations are also recommended for the new station areas where excavation would occur adjacent or within sites identified for further investigation in order to establish appropriate handling protocols, as necessary.

Consistent with the 2004 FEIS, site-specific evaluations will be conducted for sites to be disturbed by construction activities for the Modified Design, and any contaminants encountered would be handled appropriately, and measures would be in place to protect worker and public safety. Therefore, no new or different adverse impacts related to contaminated materials during construction have been identified.

13.4.2 PERMANENT IMPACTS

The Modified Design includes some changes to specific locations for ancillary facilities and entrances from those contemplated in the 2004 FEIS, and some modifications to the Phase 2 alignment. New sites have been evaluated, and some of them have the potential to be contaminated. The measures to mitigate these contaminated sites would be as described in the 2004 FEIS.

Consistent with the 2004 FEIS, with the Modified Design, the Project would establish appropriate protocols for storing and handling contaminated materials used in association with the new subway, as well as protocols for addressing migration of contaminated groundwater or vapors into the tunnels. As such, no new or different adverse impacts related to contaminated materials have been identified.

13.5 CONCLUSIONS

Consistent with the approach outlined in the 2004 FEIS, further investigation of contaminated materials along the Phase 2 alignment has been conducted as the preliminary engineering design has advanced. Site-specific reconnaissance will be conducted for potential acquisition sites as the design is refined. Handling and management of contaminated materials would continue to be conducted in accordance with all applicable laws and regulations. Therefore, the Phase 2 Modified Design would not result in any new or different significant adverse impacts related to contaminated materials from those identified in the 2004 FEIS. ✷

Chapter 14: Natural Resources

14.1 INTRODUCTION

This chapter summarizes the natural resources impacts previously identified in the 2004 FEIS and then evaluates any changes in those impacts with the Modified Design. In the 2004 FEIS, natural resources included geological and terrestrial conditions, floodplains, wetlands, groundwater, surface water, and aquatic biota. Since the Phase 2 alignment would not require any in-water work and does not include any wetlands, direct effects to surface water resources (other than as related to stormwater management), wetlands, and aquatic biota are not discussed in this chapter of the Supplemental EA.

The 2004 FEIS concluded that construction of the new subway would not result in any significant adverse impacts on natural resources. Street trees removed for the construction would be replaced in coordination with the New York City Department of Parks and Recreation (NYC Parks) and best management practices would be used to control runoff and stormwater from construction sites. The 2004 FEIS also concluded that the completed subway would not result in significant adverse impacts on natural resources. The Modified Design would not change the conclusions of the 2004 FEIS. The Modified Design now reflects updated floodproofing requirements for critical infrastructure that were implemented by New York City Transit (NYCT) following Hurricane Sandy in 2012.

14.2 FEIS FINDINGS

14.2.1 CONSTRUCTION IMPACTS

While the 2004 FEIS noted that the Project would require a substantial amount of excavation of soil and bedrock, no adverse impacts to geological or soils conditions were identified. In addition, no adverse impacts to vegetation and wildlife during construction were identified. The 2004 FEIS noted that street trees may need to be removed along the Project alignment, and would be replanted in coordination with NYC Parks.

The 2004 FEIS Design's alignment was within the 100-year and 500-year floodplains in East Harlem. The 2004 FEIS did not identify specific construction-related effects due to the potential for flooding. For more information, see Section 14.2.2 below. No adverse impacts to groundwater or surface water resources during construction of Phase 2 were identified in the 2004 FEIS. The 2004 FEIS stated that best management practices would be used to control runoff and stormwater where required to protect water quality. The 2004 FEIS also stated that a Stormwater Pollutant Discharge Elimination System (SPDES) permit for construction activity from the New York State Department of Environmental Conservation (NYSDEC) would be secured, as necessary, and stormwater management plans implemented during construction to minimize the potential for on-site erosion, sedimentation, and stormwater pollution.

The stormwater management program as described in the 2004 FEIS contained appropriate requirements for erosion and sedimentation controls to be used during construction. These and

other construction-period requirements were to be incorporated into a Construction Environmental Protection Plan (CEPP) for the Project, which was to be incorporated into all construction contracts, obligating contractors to follow these provisions. These measures were designed to minimize erosion and stormwater pollution and avoid adverse impacts to water bodies near the construction sites. The 2004 FEIS stated that approval from the New York City Department of Environmental Protection (NYCDEP) would also be secured in order to discharge water from the required dewatering activities into the sewer system. With use of proper pre-treatment measures, impacts to the East River would be avoided.

14.2.2 PERMANENT IMPACTS

The 2004 FEIS stated that the operation of the Second Avenue Subway would have no significant impacts on geology, groundwater, floodplains, water quality, or aquatic and terrestrial vegetation and wildlife. No endangered, threatened, or special concern species would be adversely affected.

The 2004 FEIS noted that the vast majority of the area that could be directly or indirectly affected by the Second Avenue Subway consists of paved property where natural resources would not be affected. Consequently, the text concentrated on sites where impacts to natural resources could potentially occur—chiefly, unpaved areas (parklands) and the Pier 6 site along the water's edge at the East River (the latter of which is not associated with the Phase 2 alignment).

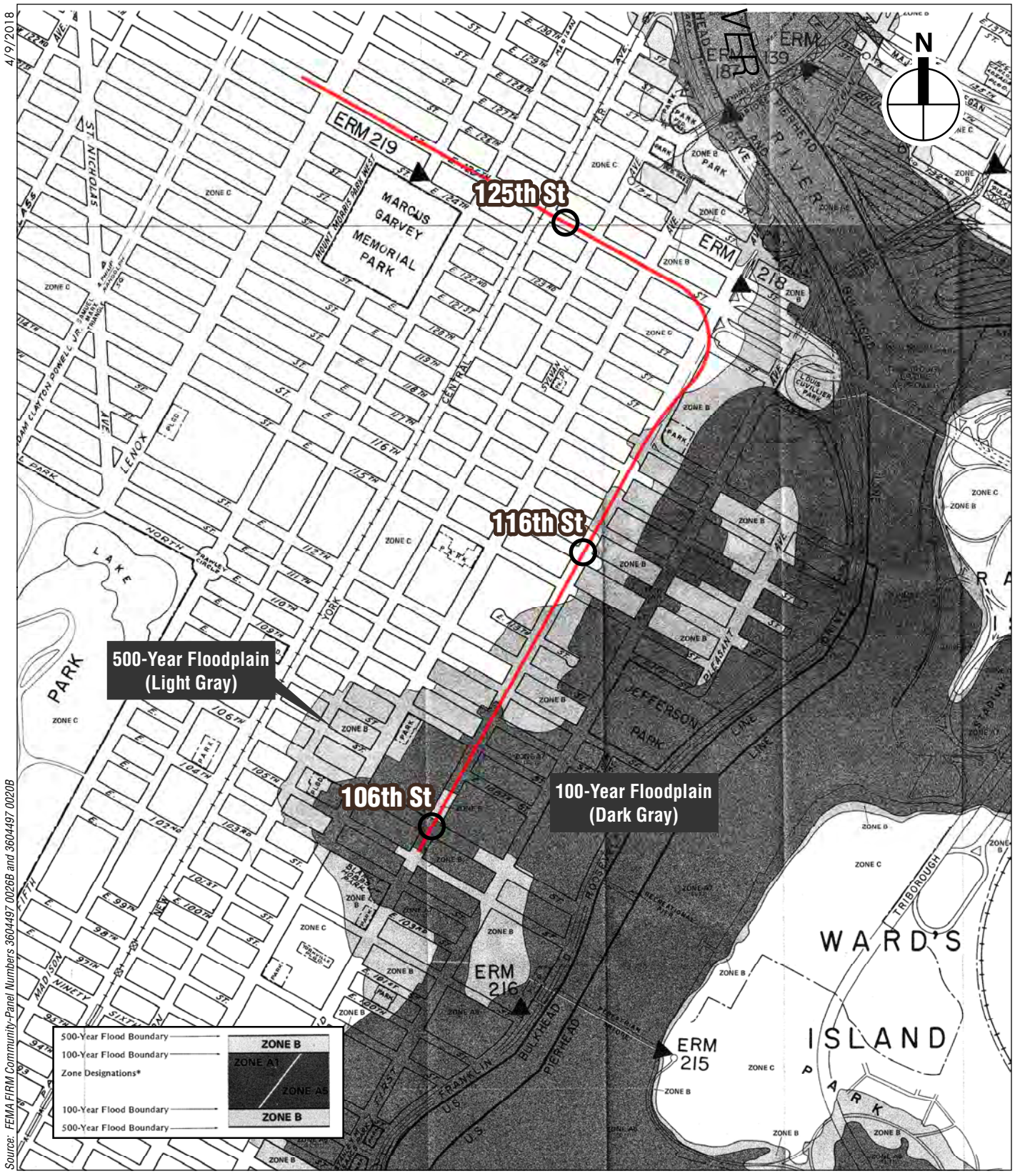
The 2004 FEIS Design's alignment was within the 100-year and 500-year floodplains in East Harlem (see **Figure 14-1**). A floodplain is any land area susceptible to being inundated by riverine or coastal flood waters. The 100-year floodplain is the area of that has a 1 percent chance of flooding in any given year. That area is mapped by the Federal Emergency Management Agency (FEMA) on its Flood Insurance Rate Maps (FIRMs). As shown in **Figure 14-1**, in 2004 the alignment fell within the 100-year floodplain from 103rd Street to 110th Street, except for small areas near East 106th Street that were in the 500-year floodplain. In addition, the alignment from 102nd to 103rd Street and some of the alignment between 110th and 120th Street also fell within the 500-year floodplain.

As described in the 2004 FEIS, the Second Avenue Subway could not be constructed outside the 100-year floodplain in East Harlem and still meet the Project's goals of providing service along the Second Avenue corridor and relieving congestion on the existing Lexington Avenue (4/5/6) subway line. The 2004 FEIS noted that no habitable structures would be located within the floodplain, and the Project would not result in any increase in flooding in those areas.

As described in the 2004 FEIS, the new subway tunnels and stations would be constructed to be resistant to water infiltration. However, some groundwater would nevertheless enter the tunnels, and would be drained to sumps (low points) used to collect water and then pump it to the sewer system. The Project would not add significant amounts of groundwater to the city's sewer system, and would not increase the flows from the city's combined sewer outfalls to nearby water bodies substantially.

14.3 UPDATE OF BACKGROUND CONDITIONS

Subsequent to the 2004 FEIS, peregrine falcon (*Falco peregrinus*), a state-listed endangered species, was documented within ½-mile from the Second Avenue Subway Phase 2 corridor. Based on correspondence from the New York Natural Heritage Program (NYNHP), dated



FEMA Effective (2004)
Flood Hazard Areas

Figure 14-1

August 17, 2017, breeding peregrine falcons are known to occur less than one mile away from the project area (see correspondence in **Appendix C**).

Since 2004, the floodplain maps for New York City, including for East Harlem, have been updated and there are now two sets of FEMA FIRMs for New York City. FEMA's Effective FIRMs, prepared in 2007, apply for flood insurance purposes, and FEMA's more current 2015 Preliminary FIRMs are in effect for Building Code, zoning, and planning purposes in accordance with Local Law 96, in effect January 6, 2014. The 2007 Effective FIRMs and the 2015 Preliminary FIRMs for East Harlem show similar floodplain boundaries to those from 2004 (see **Figures 14-2 and 14-3**).

FEMA's maps indicate the Base Flood Elevation (BFE), which is the height of flooding that can be expected in the 100-year flood within the floodplain. The BFE is measured not from ground or sea level, but from a fixed tidal benchmark established by NOAA called the North American Vertical Datum of 1988 (NAVD88). In addition, in the future, sea level-rise would result in higher elevations of any severe storm flooding, including hurricanes and other severe events. New York State has adopted sea level-rise projections for use in infrastructure planning and permitting (6 NYCRR Part 490). These projections include estimates of potential sea level rise in the near term (by the 2020s) and the long term (by 2100) and a range of potential outcomes. Using the most severe projections, the "High" scenario, sea levels would increase by up to 10 inches by the 2020s, 30 inches by the 2050s, 58 inches by 2080, and up to 75 inches by the end of the century. These sea level rise changes would increase the 100-year base flood elevation in the project area from 12.00 feet at present to 12.8 feet by 2020, 14.5 feet by 2050, 16.8 feet by 2080, and 18.3 feet by 2100. In addition to increasing flood depths, these projected increases in flood elevations would expand the land area within the future 100-year floodplain north up to 125th Street and west to Lexington Avenue.

In 2012, Hurricane Sandy caused extreme flooding and damage throughout New York City, including in East Harlem. As a result, NYCT has updated its flood protection design standards.[1] The design standards set the specific flood elevation that must be used for design purposes for all transit infrastructure located in a flood zone and identify standards and guidelines for critical infrastructure to protect it from flooding.

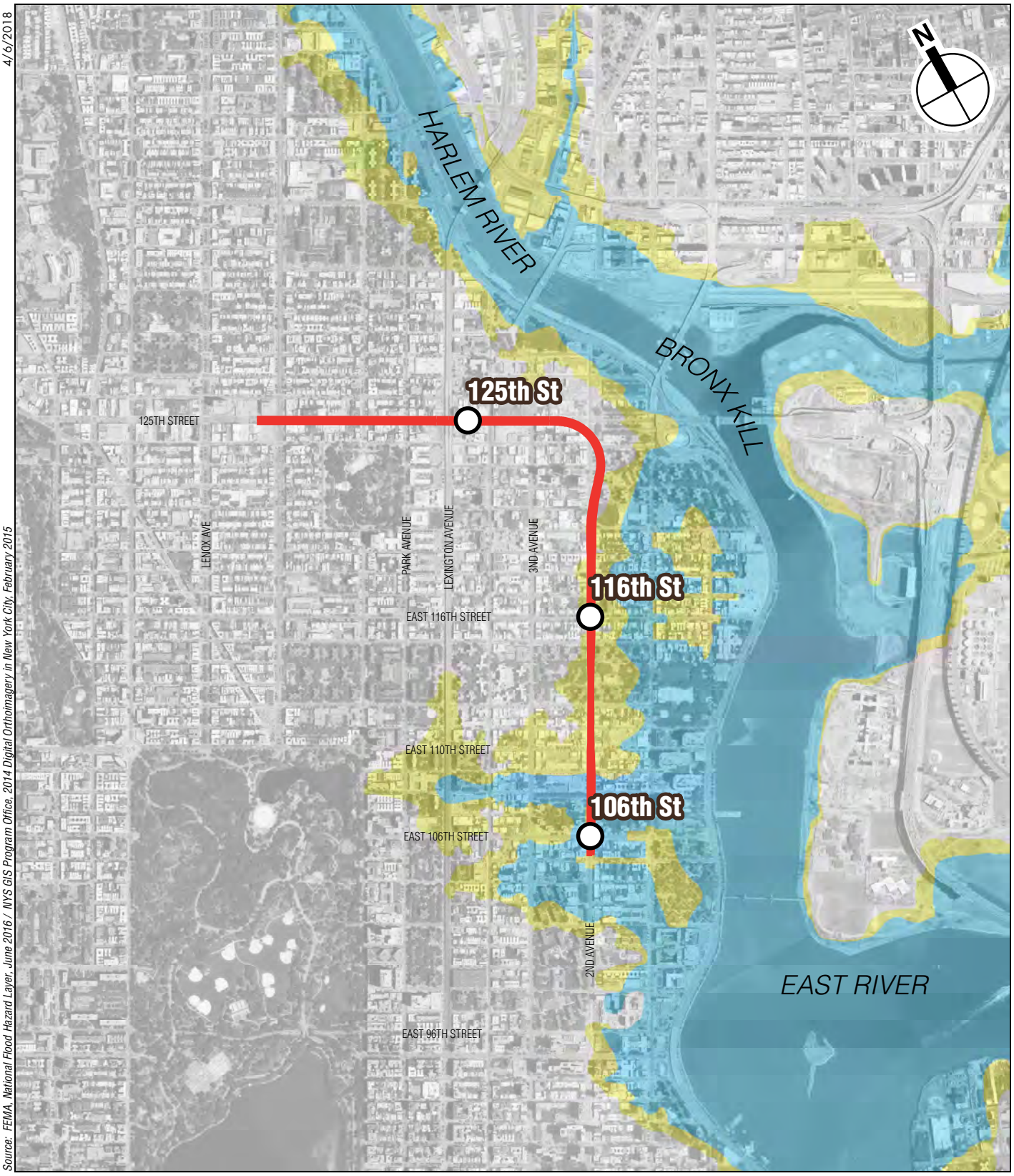
14.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

14.4.1 CONSTRUCTION IMPACTS

Construction of the Modified Design would occur in the same general area identified in the 2004 FEIS. No new undeveloped areas (e.g., parklands or other vegetated areas) or water resources would be affected by the Modified Design. Consistent with the 2004 FEIS Design, street trees would need to be removed along the Project alignment, and would be replanted in coordination with NYC Parks.

Peregrine falcons, a species listed by New York State as endangered, have been sighted within ½ mile from the Phase 2 alignment since the 2004 FEIS. This species is accustomed to the intensely developed habitats of New York City, and peregrine falcons frequent construction projects

[1] NYCT Flood Resiliency Design Guidelines (DG312), Issue 7, was most recently updated in July 2017.



4/6/2018

Source: FEMA, National Flood Hazard Layer, June 2016 / NYS GIS Program Office, 2014 Digital Orthoimagery in New York City, February 2015

Proposed Station

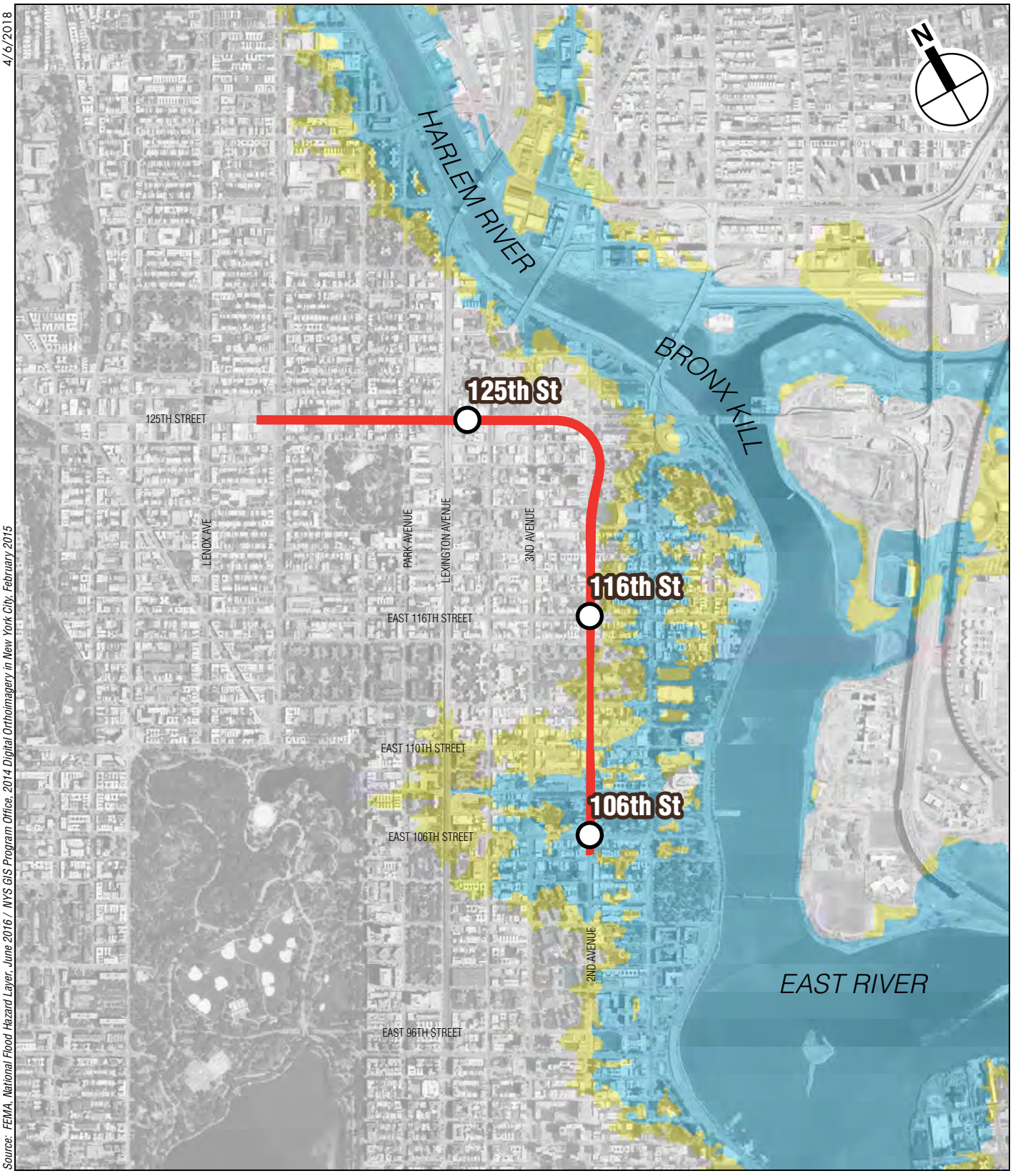
Proposed SAS Phase 2 Alignment

100-Year Floodplain

500-Year Floodplain

SECOND AVENUE SUBWAY PHASE 2

FEMA Effective (2007)
Flood Hazard Areas
Figure 14-2



4/6/2018

Source: FEMA, National Flood Hazard Layer, June 2016 / NYS GIS Program Office, 2014 Digital Orthoimagery in New York City, February 2015

Proposed SAS Phase 2 Alignment

Proposed Station

100-Year Floodplain

500-Year Floodplain

SECOND AVENUE SUBWAY PHASE 2

FEMA Preliminary (2015)
Flood Hazard Areas

Figure 14-3

throughout the city. For this reason, peregrine falcons would not be adversely affected by construction activities for Phase 2.

Construction of the Modified Design would occur within the 100- and 500-year floodplain. To prepare for potential storms and related flooding at the construction sites, MTA will require the construction contractor to prepare a storm risk management plan prior to construction. The plan will identify the potential risks during each construction period and location. The plan will list the means that will be in place at the various sites and during all construction phases to prepare for severe storms and potential flooding so as to reduce the risk of damage to the facilities. The plan will also identify the procedures for determining when storm preparations should begin and the entities responsible for implementing storm preparations in advance of a potential severe storm. At a minimum, the plan will prepare for potential storms that would include hurricane force winds and flooding up to 14.5 feet NAVD88 north of 120th Street and 15.5 feet NAVD88 south of 120th Street. These requirements will be included in the contract documents, and the contractors will be responsible for implementing the storm risk management plan. To protect the Phase 1 infrastructure and train service from the potential for surface flooding during construction of Phase 2, the existing bulkhead (wall) in the tunnel at 105th Street will be maintained in place during construction until other flood measures for Phase 2 are in place.

As with the 2004 FEIS Design, the Modified Design would be required to secure a SPDES permit from NYSDEC for construction activity and adhere to all necessary stormwater management protocols. The stormwater management program would contain appropriate requirements for erosion and sedimentation controls to be used during construction to minimize adverse impacts to water bodies. Approval from NYCDEP would also be secured in order to discharge water from the required dewatering activities into the sewer system.

14.4.2 PERMANENT IMPACTS

As with the 2004 FEIS Design, the Modified Design would have no significant adverse impacts on natural resources. The new subway and associated facilities would not create new impervious surfaces within this already developed area.

The Modified Design would be constructed within the 100- and 500-year floodplains, similar to the 2004 FEIS Design. The Modified Design would be consistent with current MTA flood protection and resiliency design standards, including a design flood elevation for Modified Design that would accommodate flooding up to an elevation of 17.9 feet (NAVD88).

With respect to geology and soils, the revised construction means and methods of the Modified Design (i.e., mining in place of cut-and-cover construction, particularly along 125th Street), would to reduce the amount of excavated materials substantially, with a reduction at 125th Street Station along from about 465,000 cubic yards in the 2004 FEIS Design to about 150,000 cubic yards in the Modified Design.

14.5 CONCLUSIONS

Consistent with the 2004 FEIS, the Modified Design would not result in any adverse impacts with respect to natural resources. Revised floodplain boundaries and flood protection standards have informed the Modified Design, but the construction and operation of Phase 2 would not affect these floodplains. The Phase 2 Modified Design would not result in any new or different significant adverse impacts to natural resources not previously identified in the 2004 FEIS. ✷

Chapter 15: Safety and Security

15.1 INTRODUCTION

This chapter identifies safety considerations related to the design, construction, and operation of Phase 2. The Phase 2 Modified Design would feature current safety and security systems and procedures to protect passengers and workers as well as the community. The chapter addresses safety procedures to be implemented during construction as well as those that would be in place once the new subway is in operation.

The 2004 FEIS described the safety and security components of the full-length Second Avenue Subway and did not identify any significant adverse impacts related to safety or security. The Modified Design would incorporate the latest safety and security measures into the Phase 2 project and would not change the conclusions of the 2004 FEIS with respect to safety and security.

15.2 FEIS FINDINGS

15.2.1 CONSTRUCTION SAFETY

The 2004 FEIS noted that MTA and NYCT have extensive experience managing safety and security in complex construction projects, as well as operating the subway system. A detailed overall Health and Safety Program (HASP) was to be developed, consisting of several HASP plans to be implemented throughout all aspects of the Project's construction.

As described in the 2004 FEIS, the HASP plans developed and implemented by each contractor would have required that detailed work scopes be reviewed and approved by MTA and NYCT to ensure safety in each task, and that equipment, materials, controls, crew size, job responsibilities, operating procedures, and maintenance practices be addressed, implemented, and audited for safety. The HASP plans were to identify potential safety concerns and describe methods to protect construction workers. In addition, the HASP plans were to include and acknowledge compliance with specialized training requirements for track safety as set forth by NYCT. The HASP plans were to also set forth the emergency response procedures to be followed. MTA and NYCT, through its contractors, were to use preventive as well as responsive measures in managing and controlling hazards. These were to include inspections, self-assessments, and testing to identify problem areas. Immediate actions to remediate problem areas were to be required. MTA and NYCT were to implement an audit program to ensure all contractors are in conformance with their individual HASP plans and the project-wide HASP. In addition, each contractor was also to perform its work in accordance with NYCT System Safety requirements for any construction along or adjacent to active NYCT property. Contractors were to also comply with safety aspects as they pertain to U.S. Occupational Safety and Health (OSHA) or MTA regulations.

15.2.2 OPERATIONAL SAFETY

The 2004 FEIS stated that operational safety protocols adhering to the latest guidance and procedures were to be implemented once construction is completed. Plans for all aspects of train

safety, station safety, and safety in other facilities (including emergency communications systems and fire exit procedures, for example) were described as a key component of the design being developed for the Second Avenue Subway. Once completed, the new subway, including its trains, tunnels, and stations, was to be fully compliant with NYCT's overall System Safety Program Plan. As part of that plan, the 2004 FEIS noted that NYCT trains its staff and contractors in appropriate track safety procedures.

New stations were to be designed to support the provision of effective security. Visual surveillance, lighting, emergency communications and egress were to be carefully considered in the design. NYCT, in coordination with city, state, and federal law enforcement agencies, was to develop detailed security plans for the new subway.

An important operational safety aspect of the new Second Avenue Subway, as described in the 2004 FEIS, was the additional flexibility it would provide for passengers traveling along the eastern side of Manhattan, where subway service for much of the area is currently limited to one line—the severely overcrowded Lexington Avenue (4/5/6) subway line. This would also provide a needed alternative to the Lexington Avenue line in the event of shutdowns to that service due to emergencies or breakdowns.

15.3 UPDATE OF BACKGROUND CONDITIONS

No notable changes have occurred with respect to safety procedures and protocols since the 2004 FEIS. However, MTA and NYCT continue to adapt to the latest standards and technologies with respect to maintaining safe construction zones and operations.

15.4 MODIFIED DESIGN

15.4.1 CONSTRUCTION SAFETY

Consistent with the 2004 FEIS, all current applicable safety standards would be implemented during construction of the Modified Design to protect worker safety and public safety. HASPs would continue to be required by contractors, subject to approval by MTA and NYCT.

15.4.2 OPERATIONAL SAFETY

Consistent with the 2004 FEIS, operation of Phase 2 with the Modified Design would be conducted in accordance with all applicable NYCT operations safety procedures. Stations and ancillary facilities would be designed to accommodate NYCT emergency egress requirements and clear signage would be incorporated to indicate emergency exits. Proper lighting and emergency communication features will continue to be considered as part of the design of Project elements.

15.5 CONCLUSIONS

The Phase 2 Modified Design would not result in any new or different significant adverse impacts related to construction or operations safety not previously identified in the 2004 FEIS. The Modified Design would incorporate all applicable current safety standards to ensure safety during construction and during operation of Phase 2. ✷

Chapter 16: Environmental Justice

16.1 INTRODUCTION

This chapter of the Supplemental Environmental Assessment (Supplemental EA) considers whether the Modified Design would result in new or different disproportionate adverse impacts on environmental justice communities not previously identified in the 2004 FEIS. The 2004 FEIS concluded that construction activities for the new Second Avenue Subway would result in significant adverse impacts along the entire alignment, including in low-income and minority (i.e., environmental justice) communities. East Harlem, where Phase 2 of the new subway will be constructed, was identified as an environmental justice community. Overall, the 2004 FEIS found that the adverse effects and benefits along the full 8.5-mile-long new subway line associated with construction and then operation of the Project would affect a wide variety of people, with no disproportionate adverse effect to low-income or minority populations. The Modified Design for Phase 2 would not change the conclusions of the 2004 FEIS.

16.2 REGULATORY CONTEXT AND METHODOLOGY

According to the U.S. Environmental Protection Agency (USEPA), "Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was issued in 1994 to direct federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The executive order also stipulates that federal agencies make concerted efforts to engage environmental justice communities and provide opportunities for their participation in the environmental review process.

The Federal Transit Administration (FTA) must comply with Executive Order 12898 and uses the following guidance documents for addressing environmental justice, some of which were issued after the 2004 FEIS:

- USDOT's Environmental Justice Order 5610.2(a) "Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," 2012;
- FTA Circular C4073.1 "Environmental Justice Policy Guidance for Federal Transit Administration Recipients," 2012;
- Council on Environmental Quality's (CEQ) "Environmental Justice Guidance Under the National Environmental Policy Act," December 1997; and
- "Promising Practices for EJ Methodologies in NEPA Reviews," report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee, March 2016.

FTA's Environmental Justice Circular 4703.1 issued in 2012 defines minorities to include American Indians or Alaskan Natives, Asian, African Americans or Black persons, Hispanic or Latino persons, and Native Hawaiians or other Pacific Islanders. In addition, minority populations may include persons who identified themselves as being either "some other race" or "two or more races" in response to the Census questionnaire. CEQ guidance defines minorities the same way as FTA, and indicates that minority populations should be identified where either: (1) the minority population of the affected area exceeds 50 percent; or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. For this preliminary assessment, block groups with minority populations of more than 50 percent are considered minority communities.

Low-income is defined by FTA to be people whose median household income is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines. FTA also encourages the use of local poverty thresholds or a percentage of median income for the area, provided that the threshold is at least as inclusive as the HHS poverty guidelines. Because HHS data is not available below the state level, this analysis uses instead the information on individuals in households below the poverty level as defined by the U.S. Census Bureau. The percent of individuals living below the poverty level in each block group, as estimated in the American Community Survey 2015 5-Year Estimates, was used. Block groups with a percentage of individuals living below the poverty level of greater than 17.9 percent, which is the percent of the population in Manhattan identified as below poverty level, are considered low-income communities.

16.3 FEIS FINDINGS

Chapter 18 of the 2004 FEIS identified the East Harlem study area as an environmental justice community, with an overall population that was 92 percent minority, notably higher than the proportion of minority population for Manhattan as a whole (54.2 percent) and New York City overall (65 percent). It also reported that approximately 35.6 percent of the households of the East Harlem study area were living below the federal poverty threshold, compared to 16.6 percent for Manhattan and 19.7 percent for New York City as a whole.

The 2004 FEIS described that the Second Avenue Subway Project would bring benefits to low-income and minority communities, including East Harlem, but its construction would result in significant adverse impacts. The 2004 FEIS also noted that these same benefits and impacts would accrue to the entire population living near the full-length Second Avenue Subway, which included environmental justice communities as well as non-environmental justice communities. Overall, the 2004 FEIS concluded that the adverse effects and benefits along the new subway line associated with construction and then operation of the Project would affect a wide variety of people, with no disproportionate adverse effect to low-income or minority populations.

Mitigation measures to limit adverse effects throughout the corridor included measures to limit disturbance during construction using barriers, dust suppression, traffic management plans, and community outreach programs. Businesses and residents who would need to be displaced for the project would be compensated as required by state and federal law. Plans would be developed for identifying suitable replacement facilities for park facilities that would need to be closed during construction, and all park spaces would be fully restored and trees replanted once the project is complete.

16.4 UPDATE OF BACKGROUND CONDITIONS

As described in Chapter 4, "Social and Economic Conditions," the population of East Harlem based on the 2011-2015 American Community Survey (ACS) 5-Year Estimates has increased since the 2004 FEIS. While the proportion of low-income and minority residents has decreased slightly, the East Harlem area remains an environmental justice community. **Table 16-1** below provides a comparison of demographic data for East Harlem between the 2000 Census and the 2011-2015 ACS.

Table 16-1
Comparison of Population and Income Characteristics in the Study Area, 2004 FEIS vs. Current Conditions

	Population							Income Profile		
		Race and Ethnicity (Percent)								
Study Area	Total	Non-Hispanic and Hispanic White[1]	Non-Hispanic and Hispanic Black[1]	Non-Hispanic and Hispanic Asian[1]	Non-Hispanic and Hispanic Other[1,2]	Hispanic[3]	Total Minority[4]	Number of House-holds	Median Household Income ($2017)	House-holds Below Poverty (Percent)[5]
East Harlem (2011-2015)	121,669	27.8	34.4	7.5	31.3	46.5	86.1	46,870	$31,837	31.4
East Harlem (2000)	*116,357*	*25.3*	*40.9*	*2.8*	*31.0*	*52.4*	*92.8*	*43,525*	*$33,881*	*35.5*
Manhattan (2011-2015)	1,629,507	56.4	15.0	11.7	16.9	25.8	52.9	750,419	$74,904	15.6
Manhattan (2000)	*1,537,195*	*54.4*	*17.4*	*9.4*	*18.9*	*27.2*	*54.2*	*739,167*	*$71,163*	*16.6*
New York City (2011-2015)	8,426,743	43.3	24.5	13.5	18.7	28.9	67.5	3,113,535	$54,862	19.4
New York City (2000)	*8,008,278*	*44.7*	*26.6*	*9.8*	*18.9*	*27.0*	*65.0*	*3,022,477*	*$57,943*	*19.7*

Notes:

1 White, Black, Asian, and Other population may also be Hispanic (see note 3).

2 "Other" includes residents of American Indian, Alaska Native, Native Hawaiian and Other Pacific Islander descent, as well as those respondents who did not identify with any listed racial groups (white, black, Asian), or who indicated that they are of more than one race than the census defines.

3 The Hispanic category consists of those respondents who classified themselves in one of the several Hispanic Origin categories in the American Community Survey. People of this ethnic group may be any race.

4 The total minority population includes all those who are not non-Hispanic White.

5 Percent of households with incomes below established poverty level. The U.S. Census Bureau using its established income thresholds for poverty levels defines poverty levels.

Sources: U.S. Department of Commerce, Bureau of Census, *American Community Survey 2011-2015 5-Year Estimates; Second Avenue Subway FEIS.*

Figure 16-1 identifies environmental justice populations in proximity to (i.e., within ¼ mile) the Phase 2 alignment. Census block groups with greater than 50 percent minority populations and greater than 17.9 percent poverty rates are shown. As shown in the figure, all block groups within this corridor are environmental justice communities, with nearly all of them having both minority and low-income populations.

As described in Section 16.2 above, several new guidance documents have been issued since 2004 with respect to environmental justice. The USDOT's Environmental Justice Order 5610.2(a) "Actions to Address Environmental Justice in Minority Populations and Low-Income

SECOND AVENUE SUBWAY PHASE 2

Environmental Justice Communities

Figure 16-1

Populations," was issued in 2012; FTA Circular C4073.1, "Environmental Justice Policy Guidance for Federal Transit Administration Recipients," was also issued in 2012; "Promising Practices for EJ Methodologies in NEPA Reviews," report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee, was issued in March 2016. The updated assessment of environmental justice communities considers these new guidance documents, as well as any still applicable previous documents.

16.5 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

The Modified Design includes changes in construction means and methods, largely intended to reduce construction impacts, particularly at the 125th Street curve and along 125th Street. For example, the launch site for the Tunnel Boring Machine (TBM) would be at about 120th Street, a block south of the TBM retrieval site identified in the 2004 FEIS. The new bellmouth structure would be constructed from about 118th Street to 120th Street using cut-and-cover methods, which requires additional demolition of an existing tunnel segment constructed in the 1970s, a change from the 2004 FEIS. However, the originally proposed bellmouth location north of 120th Street would have required more substantial cut-and-cover construction to allow for a future extension to the Bronx.

Surface impacts during construction would also be reduced along 125th Street due to the deeper tunnel and station allowing for mining construction and avoiding much of the cut-and-cover construction originally anticipated. The lower profile would also provide more rock cover between the new station and the existing Lexington Avenue Station, thereby reducing the risk of impacts on the existing station and potential service disruptions on the existing Lexington Avenue (4/5/6) subway line.

The 2004 FEIS concluded that all neighborhoods along the full Second Avenue Subway alignment would experience cut-and-cover construction activities for new stations, with greater impact occurring in areas where rock is too deep to allow mined stations. Although Phase 2 is located in a low-income and minority community, the impacts of the construction activities, including cut-and-cover activity, would not be considered disproportionate in the context of all the construction activities required for the full alignment, which include cut-and-cover and other construction activities in a variety of different neighborhoods. The Modified Design would maintain cut-and-cover construction for the 106th and 116th Street Stations, but proposed construction activities along 125th Street would be modified to use mining techniques, substantially reducing cut-and-cover construction and surface impacts in this area.

The mitigation measures that were proposed in the 2004 FEIS would be implemented to limit disturbance during construction using barriers, dust suppression, traffic management plans, and community outreach programs. As with construction of Phase 1, MTA will set forth a robust community outreach plan during construction of Phase 2 to keep the community informed and to ascertain concerns of the community (see Chapter 20, "Public Outreach"). Businesses and residents who must be displaced for the project would be compensated as required by state and federal law. Compensation for property would be based on fair market value and, in the case of partial takings, diminution (if any) to the value of the remaining property in accordance with the New York State's Eminent Domain Procedure Law. Provision of relocation services, moving payments, replacement housing payments, and other allowable payments related to commercial and residential moving costs and displacement would be in accordance with the federal Uniform Act. Plans will be developed for identifying suitable replacement facilities for park facilities that

must be closed during construction, if applicable, and all park spaces would be fully restored and trees replanted once the project is complete. Therefore, as with the Project that was analyzed in the 2004 FEIS, the 2017 Modified Design would not be expected to result in any disproportionate adverse impacts on minority or low-income populations. Additionally, overall, the new subway would have a positive effect on the communities where it operates, including those with low-income and minority populations, by providing enhanced access to transit services.

16.6 CONCLUSIONS

Consistent with the 2004 FEIS, the full-length Project including the Modified Design would not result in disproportionately high and adverse effects on environmental justice communities. Measures have been taken to reduce surface construction by impacts by reducing cut-and-cover construction, particularly along 125th Street. Mitigation measures as described in the 2004 FEIS would continue to be implemented to minimize adverse impacts to the community during construction. The Project would ultimately provide a benefit to the community through enhanced accessibility to transit services. Therefore, the Phase 2 Modified Design would not result in any new or different disproportionate adverse impacts on environmental justice communities not previously identified in the 2004 FEIS and ROD. ✷

Chapter 17: Section 4(f) Evaluation

17.1 INTRODUCTION

This chapter addresses the requirements of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (49 USC § 303; 23 CFR § 774). This Section 4(f) Evaluation is being circulated along with the project's Supplemental Environmental Assessment (EA) prepared in accordance with the National Environmental Policy Act (NEPA).

The 2004 FEIS included a Section 4(f) Evaluation, which identified a use of one Section 4(f) resource along the Phase 2 alignment—the Metro-North Harlem-125th Street Station and Comfort Station. This use would no longer occur with the Phase 2 Modified Design. In addition, the Phase 2 Modified Design would not result in any other uses of Section 4(f) resources.

17.2 REGULATORY CONTEXT

Section 4(f) prohibits the Secretary of Transportation from approving any program or project that requires the "use" of 1) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or 2) any land from a historic site of national, state, or local significance (collectively "Section 4(f) resources"), unless (a) the agency determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures), will have a *de minimis* impact; or (b) there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to the resource. The requirements of Section 4(f) apply to the operating administrations of USDOT, including the Federal Transit Administration (FTA).

As set forth in the Section 4(f) regulations, archaeological resources are protected under Section 4(f) only when their importance is derived from their preservation in place.

The Section 4(f) regulations define three types of "use" of Section 4(f) property (23 CFR Part 774.17):

1) When land is permanently incorporated into a transportation facility;

2) When there is a temporary occupancy of land that is adverse to the preservation purpose of Section 4(f) as determined by the criteria in 23 CFR 774.13(d); and

3) When there is a constructive use of a Section 4(f) property, which occurs "when the transportation project does not incorporate land from a Section 4(f) resource, but the proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired" (23 CFR Part 774.15(a)). Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished.

Parks and recreational spaces are also protected by additional legislation. In addition to Section 4(f), the Land & Water Conservation Fund Act (LWCFA), 16 U.S.C. §§ 460l-4 to 460l-11 (commonly referred to as Section 6(f), as the provision was originally contained in Section 6(f)(3)

of the LWCFA, Public Law 88-578 of 1962, before codification); and the Urban Park and Recreation Recovery Act (UPARRA), 16 U.S.C. §§ 2501 to 2514 restrict the future use of parklands or open spaces that have been improved with funds received through the LWCFA and UPARRA.

The 2004 FEIS included a Section 4(f) Evaluation for the potential use of the following Section 4(f) resources located along the 8.5-mile alignment of the Second Avenue Subway:

Parks and Recreational Facilities

- Coenties Slip (Lower Manhattan);
- Vietnam Veterans Plaza (Lower Manhattan);
- Fulton Street Plaza (Lower Manhattan);
- Pearl Street Playground (Lower Manhattan);
- St. James Square (Lower Manhattan);
- Kimlau Square (Lower Manhattan);
- Sara D. Roosevelt Park (Lower East Side/Chinatown/East Village);
- St. Vartan Park (at 35th Street); and
- Playground 96 (at 96th Street).

Historic Sites

- Possible burials associated with a former portion of Shearith Israel Cemetery (Lower Manhattan);
- Possible burials associated with former St. Stephen's Episcopal Church Cemetery (Lower East Side);
- Possible burials associated with former Methodist Episcopal Church Cemetery (Lower East Side/Chinatown/East Village);
- Possible burials associated with former First Baptist Church site (Lower East Side/Chinatown/East Village); and
- Metro-North Harlem-125th Street Station and Comfort Station (East Harlem)

St. Vartan Park was also identified in the 2004 FEIS as having received Section 6(f) funding. No parks along the alignment were identified as having received UPARRA funding.

17.3 APPLICABILITY OF SECTION 4(f) TO PHASE 2 MODIFIED DESIGN

Neither the 2004 FEIS Design nor the Modified Design would require the use of any parks or recreational facilities for construction activities or permanent features of Phase 2 of the subway. The Modified Design would result in adverse impacts associated with construction noise during construction to fewer parks near the alignment than would have occurred with the 2004 FEIS Design (see Chapter 5, "Public Open Spaces," for more information).

For historic sites, the 2004 FEIS Design required the use of one Section 4(f) resource, the Metro-North Harlem-125th Street Station and Comfort Station, which is a historic property that has been identified as eligible for the State and National Registers of Historic Places (S/NR). The Modified Design's revised construction means and methods have removed much of the cut-and-cover construction along 125th Street and have eliminated the originally proposed direct connection to the subterranean portion of the Metro-North Harlem-125th Street Station, thereby avoiding direct effects to this historic property. Consistent with the 2004 FEIS, an entrance (Entrance 3) is planned

under the Park Avenue viaduct, which is also a historic property that is eligible for the S/NR, but this entrance would be expanded in the Modified Design to include the southeast corner of 125th Street and Park Avenue (as detailed in Chapter 2, "Description of Phase 2 Modified Design"). The Modified Design would not directly affect the Metro-North Harlem-125th Street Station; the Comfort Station, a contributing component of the S/NR-eligible Metro-North Harlem-125th Street Station; or the Park Avenue viaduct, and therefore no use of this Section 4(f) resources is required with the Modified Design.

A Programmatic Agreement (PA) for the Second Avenue Subway Project was prepared pursuant to Section 106 of the NHPA among the FTA, Metropolitan Transportation Authority (MTA) New York City Transit,[1] and the New York State Historic Preservation Officer (SHPO) and executed on April 8, 2004, to set forth the procedures that would be followed to document and protect cultural resources that could be adversely affected by the construction of the subway. Consistent with the PA and with the conclusions of the 2004 FEIS, MTA, along with FTA, will consult with the SHPO to ensure that the 125th Street Station elements that would occur in proximity to the Metro-North Harlem-125th Street Station, associated Comfort Station, and Park Avenue viaduct are compatible with the historic and architectural qualities of these historic structures so as to avoid or minimize adverse contextual effects to architectural resources. In addition, as stated in the 2004 FEIS and the PA, architectural resources that could be affected by construction activities will be included in a Construction Protection Plan (CPP) prepared prior to construction, demolition, or excavation work. The CPP will set forth the specific measures to be used, and specifications that will be applied, to protect each of the historic resources that could be affected during the construction period.

None of the other station entrances or ancillary facilities with the Modified Design would be located on historic properties. The southern entrance (Entrance 1) and ancillary facility (Ancillary 1) of the 116th Street Station would be located within the boundaries of the S/NR-eligible East Harlem Historic District, but would not affect any properties that have been identified as contributing resources to the district. Continued consultation with SHPO will be undertaken as the designs of the entrance and ancillary facility advance, as set forth in the PA, to avoid or minimize any contextual effects to the historic district as a result of the new station buildings. In addition, as stated in the 2004 FEIS and the PA, architectural resources that could be affected by construction activities will be included in a CPP prepared prior to construction, demolition, or excavation work to avoid accidental damage to the historic properties during construction.

17.4 CONCLUSIONS

With the Modified Design, no use of any Section 4(f) resources would occur for the Second Avenue Subway Phase 2. The 2004 FEIS Design required the use of a Section 4(f) resource along the Phase 2 alignment, the Metro-North Harlem-125th Street Station. This use is no longer required for the Phase 2 Modified Design. ✷

[1] New York City Transit (NYCT) was the official signatory of the Programmatic Agreement. The MTA Capital Construction Company (MTACC) is responsible for planning, design, and construction of the Project and related public outreach, and New York City Transit (NYCT) will operate and maintain the service, but for purposes of this document, they are collectively referred to herein as MTA.

Chapter 18: Coastal Zone Consistency

18.1 INTRODUCTION

Portions of the Phase 2 alignment would be located in New York City's designated Coastal Zone and so the Project is subject to the New York City Waterfront Revitalization Program (WRP). The WRP is the City's primary coastal zone management tool and was developed in accordance with the Federal Coastal Zone Management Act of 1972 and New York State Executive Law Article 42, Waterfront Revitalization of Coastal Areas and Inland Waterway Act. The WRP is made up of 10 major policies focusing on the goals of improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats like wetlands and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses. This chapter assesses consistency of the Phase 2 Modified Design with these coastal zone policies.

The 2004 FEIS identified that portions of the Phase 2 alignment would fall within the designated Coastal Zone and that therefore the Project is subject to the WRP, and included an assessment of consistency with coastal zone policies. This analysis updates that assessment using the current coastal zone policies. Overall, the Modified Design would not change the conclusion of the 2004 FEIS that the Project is consistent with the New York City and New York State coastal zone policies.

18.2 FEIS FINDINGS

The 2004 FEIS analyzed the Second Avenue Subway Project's consistency with the policies of the New York City WRP and New York State coastal zone management program in effect at that time, and concluded that once operational, the Second Avenue Subway Project would be consistent with all applicable state and local coastal zone policies. During construction, the 2004 FEIS contained the following measures to avoid and minimize impacts to the Coastal Zone:

- To employ mitigation measures so that subway construction activities have no significant adverse impact on wetlands or natural features that protect against flooding and erosion. Any impacts on primary producers, benthic organisms or water quality would be temporary.
- To employ best management practices and stormwater and erosion control measures to prevent pollution and contaminated materials from entering the waterways. These and other construction-period requirements were to be incorporated into a Construction Environmental Protection Plan (CEPP)—a document that assembles all project commitments and conditions. MTA/NYCT would incorporate the relevant portions of the CEPP into all construction contracts and contractors would be obligated to follow these provisions.
- To incorporate a construction protection plan to protect historic resources into the CEPP, so as to protect such resources from accidental damage during construction. Mitigation measures were expected to also be developed for adverse impacts to archaeological resources, however some adverse impacts to archaeological resources could potentially have occurred, owing to issues of safety, access, and research redundancy at some sites.

- Although portions of the alignments and construction areas were located in the 100- and 500-year floodplain mapped by the Federal Emergency Management Agency (FEMA), the 2004 FEIS concluded that the Second Avenue Subway construction would not adversely affect the floodplain's ability to store flood waters, nor would it lead to additional or increased flooding.

18.3 UPDATE OF BACKGROUND CONDITIONS

In 2011, revisions to the City's WRP were made to reflect policy elements included in the New York City Department of City Planning's (NYCDCP) 2011 "Vision 2020 New York City Comprehensive Waterfront Plan," including incorporation of climate change and sea level rise considerations to increase the resiliency of the waterfront area, promotion of waterfront industrial development and both commercial and recreational water-borne activities, increased restoration of ecologically significant areas, and design of best practices for waterfront open spaces. In addition, updates to the WRP include adding consideration of climate change and sea level rise as a sub-policy to each of the 10 policies outlined in the WRP. The WRP was approved by the New York State Secretary of State for inclusion in the State's Coastal Management Program on February 3, 2016.

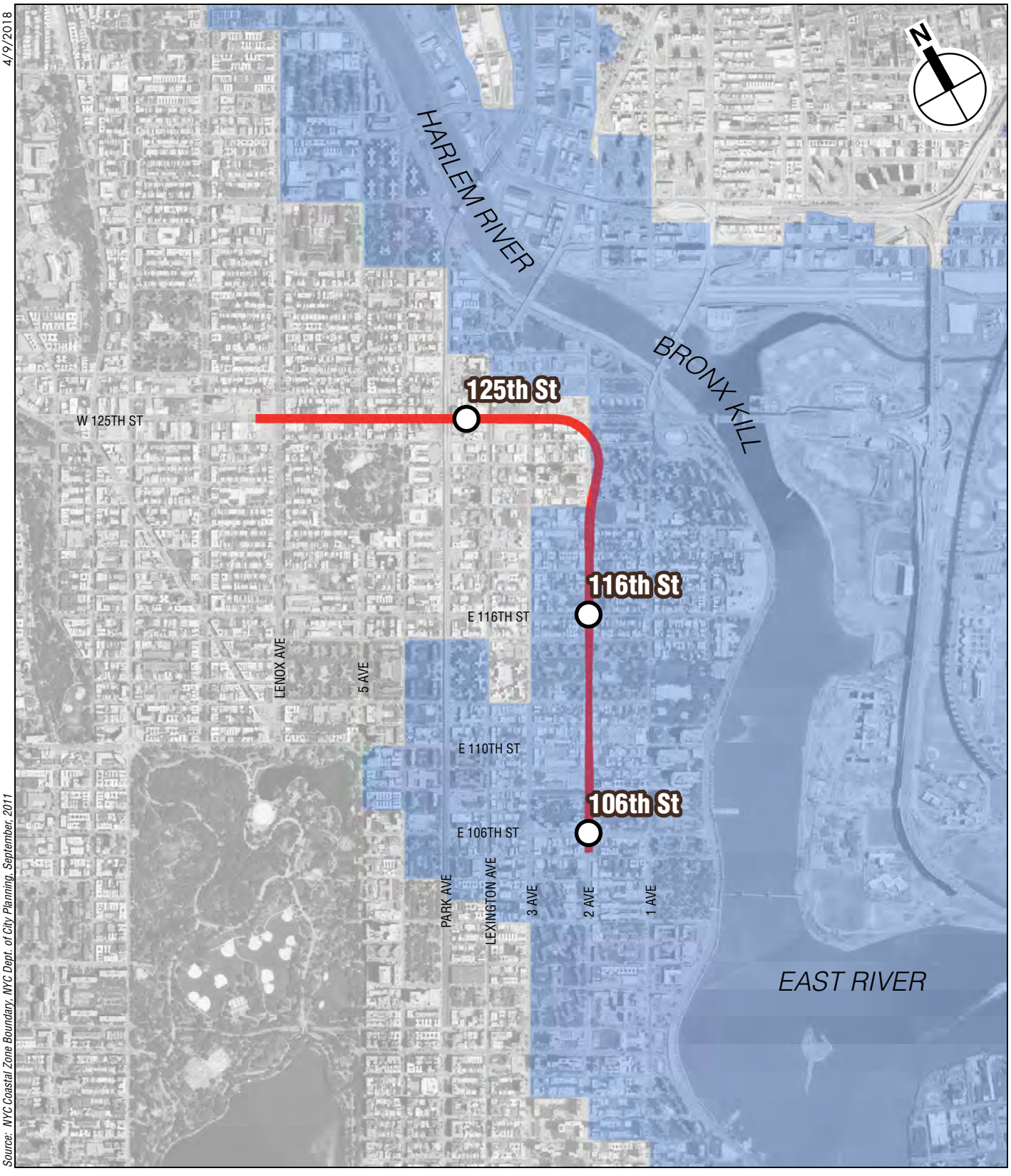
Since the 2004 FEIS, NYCDCP also issued new Coastal Zone Boundary Maps based on updated information on flooding, partly due to Hurricane Sandy. As shown in **Figure 18-1**, the Phase 2 alignment along Second Avenue is either within or adjacent to the New York City Coastal Zone, whereas the coastal zone boundary at the time of the 2004 FEIS generally did not extend west of First Avenue from the East River or south of 128th Street from the Harlem River in this area.

18.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS

A Coastal Assessment Form (CAF) has been completed for the Modified Design to assess its consistency with the revised WRP (see **Appendix D**). As required by the form, for any items marked as "promote" or "hinder" (the latter of which does not apply here), an expanded discussion of consistency with specific policies is provided. Consistency with state and federal coastal zone policies is also demonstrated in the state and federal CAFs provided in **Appendix D**.

With the Modified Design, the Phase 2 alignment is largely the same as presented in the 2004 FEIS; however, modifications to some planned entrance and ancillary facility locations have occurred because of current design standards, availability of previously identified sites, and constructability considerations (see further discussion in Chapter 2, "Description of Phase 2 Modified Design"). Additionally, tail tracks are proposed to extend farther west to the vicinity of Lenox Avenue to allow for greater train storage capacity. These changes have introduced no new coastal zone consistency impacts. Further, as described in Chapter 2, the Modified Design incorporates a new design flood elevation reflecting updated flood information and coastal zone mapping. Therefore, the Modified Design would be consistent with the new sub-policies as outlined in the WRP. Once operational, the Modified Design would be consistent with all applicable state and local coastal zone policies and would not alter conclusions of the 2004 FEIS.

The city, state, and federal CAFs were submitted to the New York State Department of State (NYSDOS), which administers the New York State Coastal Management Program. In a letter dated June 20, 2018 (see **Appendix D**), NYSDOS stated that "According to the information and plan drawings submitted, the proposed activity does not appear to require a federal permit, license, or other form of federal authorization. Therefore, further review of this project by the Department of State, and concurrence with your consistency certification, are not necessary. Additionally,



SECOND AVENUE SUBWAY PHASE 2

Coastal Zone Boundary
Figure 18-1

based on our review of the materials submitted, the Department of State has no objection to federal financial assistance in support of the proposed activities."

18.5 CONCLUSIONS

While new WRP policies have been adopted, namely with respect to sea level rise and climate change, the Modified Design remains consistent with New York City and New York State coastal zone policies, as was the case with the 2004 FEIS Design. ✷

Chapter 19: Indirect and Cumulative Effects

19.1 INTRODUCTION

This chapter discusses potential indirect and cumulative effects of the Modified Design, in comparison to the 2004 FEIS Design.

The White House Council on Environmental Quality's (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA), set forth at 40 CFR Part 1500-1508, require federal agencies to consider the environmental consequences of their actions, including not only direct effects, but also indirect and cumulative effects. Indirect impacts are those that are "caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8). Cumulative impacts result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 CFR 1508.7).

The 2004 FEIS identified the potential for adverse indirect and cumulative effects from the disruption that would occur during construction of the Second Avenue Subway, including in East Harlem. The 2004 FEIS concluded that once the new subway is complete and in operation, it would have positive indirect effects on surrounding neighborhoods and positive cumulative effects in combination with other proposed initiatives. The Modified Design would not change the conclusions of the 2004 FEIS.

19.2 FEIS FINDINGS

19.2.1 INDIRECT EFFECTS

19.2.1.1 CONSTRUCTION IMPACTS

The 2004 FEIS noted that indirect effects could occur during construction of the Project related to development trends—for example, if developers of new buildings delayed their development proposals to avoid conflicts with construction of the new subway. The 2004 FEIS noted that this could temporarily delay or even alter land use trends, particularly in East Harlem and the East Village/Lower East Side/Chinatown, where substantial development potential remained. The 2004 FEIS also noted that construction activities would temporarily reduce the desirability of some locations nearby, potentially resulting in a market decrease in rents for some properties. However, upon completion of the subway, these properties would benefit most from its construction, which would alleviate any long-term hardships to building owners.

Beneficial economic indirect effects during construction were identified in the 2004 FEIS. Construction workers and their families would shop and eat at local establishments, supporting these businesses. Construction would also require materials produced outside the metropolitan area, supporting jobs and manufacturers of these materials.

19.2.1.2 PERMANENT IMPACTS

The 2004 FEIS noted that indirect effects of the new subway once it is operational would be beneficial. The New York metropolitan area, and New York City itself, relies heavily on its transit system for commuter and pleasure travel. The new subway would expand the New York City transit network and expand travel options for residents, commuters, and visitors. This would support local and regional economic growth and productivity.

The 2004 FEIS noted that travel patterns would change within Manhattan's East Side due to the new subway. Travelers previously using the Lexington Avenue (4/5/6) subway line or local bus routes would now use the Second Avenue Subway. This may result in decreased patronage of businesses near the Lexington Avenue subway stations and local bus stops, but it would also increase patronage near and en route to the new Second Avenue Subway stations. However, the Lexington Avenue line and bus services would continue to be well-used and businesses in these area would not likely be affected greatly.

The 2004 FEIS stated that expanded transit services from the Second Avenue Subway would result in indirect effects on land use patterns and developments, particularly in East Harlem and the East Village/Lower East Side/Chinatown, where improved access would make development of vacant or underutilized lots in the area more likely by attracting new investment to the area. The 2004 FEIS also noted that market rents may increase near the new subway, due to its greater desirability.

19.2.2 CUMULATIVE IMPACTS

19.2.2.1 CONSTRUCTION IMPACTS

The 2004 FEIS acknowledged that a number of new transportation, infrastructure, and development projects were planned near the Second Avenue Subway corridor that could be under construction at the same time as the new subway. If these projects were to occur at the same time and in the same proximity as Second Avenue Subway construction activities, significant adverse cumulative impacts would occur.

Planned transportation projects within East Harlem identified in the 2004 FEIS included rehabilitation of the Third Avenue and Willis Avenue Bridges, rehabilitation and reconfiguration of certain aspects of the Triborough Bridge (now RFK Bridge), reconstruction of the 127th Street viaduct on the Harlem River Drive, and reconstruction work on the FDR Drive between 116th and 125th Streets. These projects would not have been located in the same areas as the Second Avenue Subway, but they could have created cumulative traffic impacts if constructed at the same time. In addition, ongoing commercial and residential development in the neighborhood was identified, as well as two large retail projects, which were expected to be completed before construction of Phase 2 of the Second Avenue Subway began.

As stated in the 2004 FEIS, to the greatest degree possible, MTA and NYCT were to coordinate with public and private contractors to reduce the cumulative impacts of simultaneous construction; however, in some cases it may have been impossible to avoid these impacts as developers and agencies strive to complete their projects in a timely and cost-effective manner. In those cases, the 2004 FEIS stated that significant adverse impacts from cumulative impacts could result.

19.2.2.2 PERMANENT IMPACTS

Once operational, the 2004 FEIS stated that the Second Avenue Subway would result in few, if any, adverse cumulative impacts. Beneficial cumulative impacts were anticipated with other large scale transportation projects planned at the time of the 2004 FEIS, including the Long Island Rail Road (LIRR) East Side Access Project to bring LIRR services to Grand Central Terminal in Manhattan, and the proposed No. 7 Flushing Line Extension from its terminus at 42nd Street-Times Square to the far West Side of Manhattan. Cumulatively, these transportation projects were to provide an overall benefit to the regional transportation system.

19.3 PHASE 2 MODIFIED DESIGN—CHANGE IN IMPACTS

19.3.1 INDIRECT EFFECTS

19.3.1.1 CONSTRUCTION IMPACTS

No changes to indirect effects during construction would result from the Modified Design. Construction of Phase 2 of the Second Avenue Subway would be result in temporary construction impacts in East Harlem, as anticipated in the 2004 FEIS. However, as with the 2004 FEIS Design, beneficial indirect economic effects would result from patronage by construction workers at local businesses and from production of materials in areas outside the metropolitan area.

19.3.1.2 PERMANENT IMPACTS

No changes to permanent indirect effects would result from the Modified Design. Long-term indirect effects from the new subway would continue to be beneficial with the enhancement of transit services in New York City. The expanded transit options in East Harlem would also support continued economic growth and productivity of the area.

19.3.2 CUMULATIVE IMPACTS

19.3.2.1 CONSTRUCTION IMPACTS

Consistent with the 2004 FEIS Design, if other large transportation, infrastructure, or development projects occur in East Harlem simultaneously with construction of the Modified Design, adverse cumulative impacts may result from the combined construction activities. The projects identified in the 2004 FEIS have largely been completed, but new projects are currently planned or under way (as shown in **Figure 4-1** in Chapter 4, "Social and Economic Conditions").

The 125th Street corridor continues to be a focus of commercial and residential development, partially due to a 2008 rezoning of the area. Several large developments are planned or are currently in construction. Because this corridor has become an increasingly important economic center for Harlem, and because the previously planned cut-and-cover construction along this corridor would have been very disruptive, the Modified Design has been revised to reduce surface disruption. Tunnel boring and mining methods would be used where cut-and-cover was previously planned, resulting in a substantial reduction in surface construction activities and reducing potential cumulative impacts with other development projects. Nevertheless, construction vehicles and traffic diversions associated with the Modified Design and other development projects could continue to result in cumulative traffic impacts, consistent with the 2004 FEIS Design.

As described in the 2004 FEIS, MTA would work with public and private contractors to coordinate and minimize cumulative impacts to the extent practicable.

19.3.2.2 PERMANENT IMPACTS

Consistent with the 2004 FEIS Design, the Modified Design would provide beneficial cumulative impacts with other transportation projects to enhance the overall transit network of the New York metropolitan area. The No. 7 line extension has been completed and the LIRR East Side Access project is under construction and scheduled for completion prior to Phase 2 of the Second Avenue Subway.

In November 2017, an area-wide rezoning of East Harlem and related land use actions were approved by City of New York. These actions aim to encourage and support growth in areas of East Harlem with ample transit accessibility, including the planned Second Avenue Subway.

The area that was rezoned extends along Second, Third, Lexington, and Park Avenues between 104th and 128th Streets, on 125th Street near Park Avenue, along 116th and 124th Streets between Second and Park Avenues, and in an area near Madison Avenue between 126th and 132nd Streets. The Final Environmental Impact Statement (FEIS) published for the East Harlem Rezoning in September 2017 reported that by 2027, existing background growth, planned projects, and new development spurred by the rezoning will result in an additional 6,600 apartments and 16,000 new residents in East Harlem, an increase of 12 percent. This area will also see an additional 523,000 square feet of new retail space and 245,000 square feet of commercial office space, bringing 3,800 new employees to East Harlem (an increase of 9 percent). While the rezoning does not specifically incorporate development proposals, it aims to focus greater development densities in transit-rich corridors within East Harlem, and supports the future Phase 2 of the Second Avenue Subway.

As part of the East Harlem Rezoning, the New York City Department of City Planning coordinated with MTA to revise the Special Transit Land Use Districts (STLUDs) mapped along Second Avenue to align with current plans for the Second Avenue Subway. By encouraging transit entrances off of the sidewalk, these special zoning districts are intended to ease pedestrian flows, provide light and air to underground transit facilities, encourage development that promotes needed pedestrian amenities, coordinate present and future relationship of land uses within the district, and conserve the value of land and buildings. At locations in the mapped special district, developers of new buildings are required to coordinate with the New York City Department of City Planning and MTA to determine whether MTA wishes to obtain a transit easement, and if so, the developer must provide that easement. STLUD overlays are now mapped in the locations of the 106th Street, 116th Street, and 125th Street Stations. In addition, the text of the New York City Zoning Resolution was revised as relates to the STLUD so that (1) floor area provided for any subway transit-related uses such as subway entrances and ancillary facilities is not considered to be zoning floor area, and therefore is not counted against the total amount of development allowed on a site; and (2) greater flexibility is available in transit easement volumes to accommodate entrances and/or ancillary facilities that meet ADA requirements, ventilation and access requirements. The STLUD text also allows MTA to obtain transit easements on vacant lots that are needed for development of the subway. This coordination between the City of New York and MTA will allow future development anticipated in East Harlem to be built in a manner that is supportive of the Second Avenue Subway, and will allow the Second Avenue Subway to best support that new development. As such, the Modified Design would work in tandem with the East

Harlem rezoning to support economic growth in this area, providing cumulatively beneficial effects.

19.3.3 CONCLUSIONS

The Modified Design would not result in any new or different adverse impacts related to indirect and cumulative effects in comparison to the 2004 FEIS Design. Consistent with the 2004 FEIS, adverse indirect and cumulative effects may result during construction of Phase 2 as a result of temporary delays in area development (indirect effects) and temporary overlap of traffic, noise, and community character impacts from simultaneous construction activities (cumulative impacts). While the specific projects identified in the 2004 FEIS may be different today, the indirect and cumulative effects would be similar.

As with the 2004 FEIS Design, the Modified Design would result in long-term beneficial indirect and cumulative effects to the local and regional economy through enhanced transit accessibility. Phase 2 of the Second Avenue Subway would contribute to the enhancement of the overall transit network, thereby supporting the continued economic viability of the region. ✷

Chapter 20: Public Outreach

20.1 INTRODUCTION

Projects seeking federal funding or approval are subject to federal project development procedures and public review requirements. The National Environmental Policy Act (NEPA) requires public review of Environmental Impact Statements (EISs) and Environmental Assessments (EAs). Federal projects are also subject to public involvement and review requirements of Section 106 of the National Historic Preservation Act with respect to historic resources, Section 4(f) of the U.S. Department of Transportation Act with respect to parklands and historic resources, and Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Since no "use" of any Section 4(f) resources have been identified with the Modified Design, no Section 4(f) evaluation is warranted, as discussed in Chapter 17, "Section 4(f) Evaluation."

The public outreach conducted over the history of the Second Avenue Subway Project, as well as public outreach related to this Supplemental EA, are summarized in the following sections of this chapter.

20.2 PUBLIC OUTREACH FOR THE EIS AND PHASE 1

The Second Avenue Subway Project has been the subject of extensive public outreach since its initiation in the 1990s. Environmental review began in 1995, when the Federal Transit Administration (FTA) issued a Notice of Intent to prepare an EIS and MTA and FTA conducted a scoping process. A combined Major Investment Study (a type of study that is now referred to as an alternatives analysis) and Draft Environmental Impact Statement (DEIS) was issued in August 1999 for a new subway, which initially was proposed to extend from 63rd Street to 125th Street, with a connection to the existing system at 63rd Street and Lexington Avenue. Based on input from the public, the Project was extended to Lower Manhattan and a Supplemental DEIS was prepared and published in April 2003 for public review. Public comments were addressed in the FEIS that was issued in May 2004. MTA has maintained a Project website where Project information and documents can be found (http://web.mta.info/capital/phase2_docs.html).

During construction of Phase 1 of the Second Avenue Subway, public coordination and outreach continued with a Community Information Center (CIC) located at 1628 Second Avenue, between East 84th and 85th Streets, and through ongoing communications, including public workshops, ask-the-expert sessions, exhibits, talks and virtual tours. A "Good Neighbor" initiative and regular Construction Advisory Committee meetings gave community stakeholders in-person access to project staff to obtain information and address any issues related to the Project. Modifications to construction means and methods were implemented in some cases based on community concerns, such as implementing temporary enclosures ("muck houses") at station openings to reduce noise, dust, and emissions related to excavation of the tunnel for neighboring buildings.

20.3 PUBLIC OUTREACH FOR PHASE 2

Following the recent opening of Phase 1 of the Second Avenue Subway, the preliminary engineering for Phase 2 has advanced, as detailed in Chapter 2, "Description of Phase 2 Modified Design." In conjunction with the advancement of design, MTA has developed a public outreach plan that was initiated in 2017, that will continue during the planning and NEPA phase of the Project, and that will continue throughout construction of Phase 2, similar to Phase 1. Public outreach initiatives for Phase 2 are outlined in the following sections.

20.3.1 GENERAL OUTREACH PLAN

As engineering, design, environmental review, property acquisition, utility relocation, and construction activities in the area that will be served by Phase 2 of the Second Avenue Subway begin, representatives of the Second Avenue Subway Project will proactively coordinate with the community. Through a robust community relations program, MTA will provide the public with Project status, alerts and information, and solicit and incorporate feedback when possible to minimize impacts to the affected neighborhoods.

Even though major construction is months away, MTA has already started its community outreach program for Phase 2. Presentations were given to Manhattan Community Boards 10 and 11 in June 2017 and April 2018; mailings have been distributed to provide contact information for reaching the community outreach team; numerous meetings have been held with community and business groups and elected officials (see **Appendix E**); and a Community Information Center (CIC) for Phase 2, which opened in September of 2017, at 69 East 125th Street, has welcomed over 4,000 visitors as of publication of this Supplemental EA.

The Community Board presentation in June 2017 provided a brief overview of Phase 2 at the early initiation stage of design, and included information on field activities that were planned in advance of Phase 2 construction, including geotechnical and environmental investigations. Businesses and residences near the locations of planned field investigations were also informed of the upcoming activities. The presentations in April 2018 provided a more detailed description of design elements and design modifications. The April 2018 meetings were held on April 18 at the Henry J. Carter Home & Hospital at 1752 Park Avenue (at 122nd Street) (Community Board 11) and on April 30 at Touro College at 231 West 124th Street (Community Board 10). Members of the community were given an opportunity to provide comments on the presentation. Comments at these meetings included concerns related to noise, air quality, and transportation impacts during construction; impacts to business visibility and access during construction; appearance of entrances and ancillary facilities and their affect on the continuity of businesses along the street; employment opportunities for local residents during construction; vermin during construction; property acquisition and displacement of residents; flood protection measures; level of public outreach during the planning and construction of Phase 2; and Project funding. Issues relating to potential social, economic, and environmental impacts are discussed in the technical chapters of this Supplemental EA and the public outreach program is discussed in this chapter. With respect to funding for Phase 2, the MTA continues to develop potential Project costs for Phase 2 and is seeking to use a combination of MTA capital funds and federal funds.

As Phase 2 moves forward and information from the preliminary engineering and design review process is synthesized, representatives of the Project team will:

- Prepare presentations on the findings to solicit public input on any identified design changes, and the potential community impacts.
- Initiate the formation of "Community Advisory Committees" and a "Retail Advisory Committee", which will consist of members who represent a larger audience of people, and who can help bring information about the project to their constituents.
- Continue to meet with and update established groups, elected officials, and nearby neighbors with an interest in the Project.

Specific components of the outreach plan are discussed below.

20.3.1.1 COMMUNITY INFORMATION CENTER (CIC)

The CIC was opened in September 2017 at 69 East 125th Street in Manhattan with visuals and interactive materials to provide information on Phase 2. The CIC will remain open until completion of Phase 2 as a community resource, to keep the public informed about Phase 2 and to provide a place for the community to communicate comments or concerns. The center has welcomed over 4,000 visitors since it opened for operation. In addition, outreach efforts have established connections to area schools with hundreds of schoolchildren having participated in presentations at the CIC. The CIC is staffed with people who can answer questions and provide information about the Project. Staff at the CIC speak both Spanish and English, so that they can communicate with community members who prefer to speak Spanish. The CIC will also be used to host workshops and other public events to engage the community.

At this time, the CIC is anticipated to have the following functions throughout the planning and construction periods of Phase 2:

- Develop and manage production of content/programming: displays, exhibits, interactive exhibits, etc. The first exhibit, *Second Avenue Subway: East Harlem*, launched with the facility's opening. Community outreach staff has begun developing concepts for future exhibits with one planned at this time approximately every six to nine months.
- Hold educational events for school and other youth groups.
- Host community meetings.
- Stage future tours of the project underground at the appropriate time.
- Conduct "TransitTalk" evening events about the Project.

20.3.1.2 STATION-AREA LIAISONS

A community outreach director and a community liaison have been assigned full-time on the Phase 2 corridor (in the CIC initially) to document community concerns and follow-up with MTA or other agencies as directed by MTA to resolve community concerns and communicate resolutions back to appropriate community members. As work begins in the corridor (beginning with utility relocation), up to two additional liaisons will be added as needed, one for each station area. The current staff of a community outreach director, outreach liaison, two part-time staffers, and CIC manager are all fluent in Spanish, to allow clear communication with community members who prefer to speak Spanish.

Through email, flyers, and newsletters, MTA will keep the station-area community apprised of the Phase 2 construction schedule, as well as foreseeable associated disruptions, such as street closings, water utility disruptions, bus stop relocations, etc. As heavy construction gets under way,

the frequency of newsletters will be increased to monthly and the number of email notifications will increase as well.

Also, with the start of heavy construction, the frequency of public meetings will increase to quarterly or more, if necessary. Meetings with local community leaders and targeted groups, such as buildings affected by specific/localized construction activities, will be held on an as-needed basis. Meetings may include the following:

- Community Advisory Committee meetings for each station area.
- Meetings with specific groups such as condo/co-op boards, business groups, etc.

20.3.1.3 QUARTERLY PUBLIC WORKSHOPS AND ASK THE EXPERTS SESSIONS

Biannual public workshops will be held as community outreach events. These events will pair members of the public with Project representatives to identify issues and problems and brainstorm potential solutions. These sessions will begin with a Project update, followed by small group discussions broken out by station area.

Alternating with the public workshops will be biannual *Ask the Experts* sessions, which will bring together, in a casual setting, members of the community with a number of Project and New York City agency personnel. *Ask the Experts* gives the public direct access to the specific agency that can address their Second Avenue Subway-specific issues. For example, if trash pickup has been problematic, a representative from the Department of Sanitation can field the inquiry and take appropriate action.

20.3.1.4 GOOD NEIGHBOR INITIATIVE

As part of a "Good Neighbor Initiative," MTA will conduct inspections of work sites and surrounding areas and work with construction managers and contractors to address deficiencies. Items to inspect include general cleanliness of worksites, fences and fence wrap condition, sidewalk and street conditions, presence of graffiti, wayfinding signage up-to-date, garbage alcoves maintenance, lighting, crosswalk striping and lines of sight, walk/don't walk and traffic light placement, building/store access, rodent activity, vehicles parked in work zones, and barricades, among others.

On a quarterly basis, Project representatives will review the occupancy of stores in the construction corridor, including on First, Second, and Third Avenues and East 125th Street along the length of the construction corridor and adjacent side streets. MTA will use this information to identify any unusual increase in vacancy rates vs. parallel streets, which could indicate an issue that needs to be addressed. MTA will share a report on the occupancy status with the East Harlem and Manhattan Chambers of Commerce.

MTA will create and update signage, construction maps, or other print materials as needed, including notifications of bus stop relocations, no parking zones, etc.

20.3.1.5 GOVERNMENT RELATIONS

Upon commencement of heavy construction, MTA will work with the City of New York to re-establish the Second Avenue Subway Interagency Taskforce. During construction of Phase 1, the taskforce met quarterly to review upcoming work and take the appropriate actions in their jurisdiction. For instance, when work zones were being established, the New York City

Department of Transportation (NYCDOT) provided permits and helped to ensure the area was safe for vehicle and pedestrian traffic.

MTA executives and public affairs staff will make periodic visits to elected officials representing the Phase 2 corridor and update them on the Project's progress so they can help keep their constituents informed.

20.3.2 OUTREACH FOR THIS ENVIRONMENTAL ASSESSMENT

In accordance with NEPA, this Supplemental EA was made available for at least 30 days for public review from July 12, 2018 to August 13, 2018. The Supplemental EA is available for review on the MTA's Project website (http://web.mta.info/capital/phase2_docs.html) as well as the following viewing locations:

Second Avenue Subway Community Information Center
69 East 125th Street
New York, NY 10035

Federal Transit Administration, Region II
One Bowling Green, Room 429
New York, NY 10004

Manhattan Community Board 10 Office
215 West 125th Street, 4th Floor
New York, NY 10027

Manhattan Community Board 11 Office
1664 Park Avenue, Ground Floor
New York, NY 10035

A public meeting has been scheduled to provide an opportunity for the community to learn more about Phase 2 of the Second Avenue Subway and to provide verbal comments on the Supplemental EA. The public meeting is scheduled as follows:

July 31, 2018
6:00–9:00 PM
Henry J. Carter Home & Hospital–Auditorium
1752 Park Avenue (at 122nd Street)
New York, NY 10035

Written comments on the Supplemental EA may also be submitted electronically or by mail during the public review period through August 13, 2018 to one of the following addresses:

outreach@mtacc.info

Hector Santana
Second Avenue Subway Community Information Center
69 East 125th Street
New York, NY 10035

Donald Burns
Federal Transit Administration, Region II
One Bowling Green, Room 429
New York, NY 10004

After considering public comments, FTA's findings under NEPA will be issued and made available to the public. Based on the analyses presented in the Supplemental EA and after considering public comments, FTA will determine whether design modifications to Phase 2 of the Second Avenue Subway would result in any significant adverse environmental impacts not already identified in the 2004 FEIS or ROD or require changes to mitigation measures. FTA will issue a Finding of No Significant Adverse Impact (FONSI) if there are no significant environmental impacts not already identified in the 2004 FEIS or ROD or changes in mitigation measures. If

there are any new significant adverse impacts or any significant changes to mitigation measures as a result of the proposed modifications, FTA and MTA will prepare a Supplemental EIS to evaluate those impacts.

20.3.3 SECTION 106 COORDINATION

Section 106 of the National Historic Preservation Act (NHPA; 36 CFR § 800) requires federal agencies to take into account the effects of their undertakings on historic properties that are listed in or meet the eligibility criteria for listing in the National Register of Historic Places. The NHPA also requires that federal agencies afford the federal Advisory Council on Historic Preservation the opportunity to comment on federal actions and that federal agencies undertake planning and actions to minimize harm to properties designated as National Historic Landmarks. NHPA also requires the opportunity for public comment on a project's effects on historic resources.

For the Second Avenue Subway, the Section 106 process was conducted in conjunction with the Project's review in accordance with NEPA. As part of that process, a Programmatic Agreement (PA) was executed among FTA, MTA, and SHPO on April 8, 2004 to describe the procedures that would be followed to document and protect historic resources that could be adversely affected by the construction of the subway. The New York City Landmarks Preservation Commission (LPC) is a consulting party to the PA (indicating that LPC participated in consultation related to the PA). The PA has been amended once, in 2012, with respect to vibration thresholds.

In accordance with the PA, FTA and MTA continued to coordinate with SHPO as design and construction of Phase 1 advanced, as needed, and is continuing to coordinate with SHPO as design of Phase 2 advances. Please see Chapter 8, "Historic and Archaeological Resources," for additional information on Section 106 coordination related to Phase 2.

20.3.4 ENVIRONMENTAL JUSTICE OUTREACH

The environmental justice process requires federal agencies to evaluate and avoid, minimize, and mitigate disproportionately high and adverse human health and environmental impacts to communities with substantial minority or low-income populations (i.e., environmental justice communities) resulting from federal actions. It also requires federal agencies to make concerted efforts to engage environmental justice communities and provide opportunities for their participation in the environmental review process.

The East Harlem area where Phase 2 will be located is an environmental justice community. In most cases, areas are identified as both minority and low-income populations. As described above in Section 20.3.1 of this chapter, MTA has conducted a number of community meetings in this area with local residents and community leaders to engage the community and has established an ongoing outreach plan to be conducted throughout development and implementation of Phase 2. Community meetings will continue throughout construction of Phase 2, and as noted above, a CIC has been established at 69 East 125th Street in Harlem for ongoing communication with the community.

For a full discussion of environmental justice considerations for Phase 2, see Chapter 16, "Environmental Justice" of this Supplemental EA.

20.4 CONTACT INFORMATION

For additional information regarding this document, please contact:

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Federal Transit Administration, Region II
One Bowling Green, Room 429
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(212) 668-2170

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Chapter 21: List of Preparers

21.1 INTRODUCTION

This document was prepared by Metropolitan Transportation Authority (MTA) in coordination with the Federal Transit Administration (FTA). Key individuals and firms involved in the preparation of this Supplemental Environmental Assessment are listed below.

21.2 FEDERAL TRANSIT ADMINISTRATION

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21.3 METROPOLITAN TRANSPORTATION AUTHORITY

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21.3.2 LEGAL COUNSEL

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21.3.3 NEW YORK CITY TRANSIT (NYCT)

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Joseph Ehrlich, Manager, Transit Demand Analysis
Jay Krantz, Director, Rail Network Planning
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Helene Cinque, Associate Director, Real Estate
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Munsun Park, Senior Real Estate Manager
Laura Wiles, Manager, Office of Strategic Initiatives

21.4 ENVIRONMENTAL CONSULTANT

21.4.1 AKRF, INC.—PRIME CONSULTANT

Christopher Calvert, AICP, Project Director
Claudia Cooney, Cultural Resources
Julie Cowing, AICP, Project Director
Steven Gates, AICP, Project Manager
Elizabeth Meade, RPA, Archaeological Resources

21.4.2 FITZGERALD & HALLIDAY, INC.—PUBLIC OUTREACH

Kristen Ahlfeld, PP, AICP, NEPA Public Outreach Task Leader

21.4.3 SIMCO—TRAFFIC AND TRANSPORTATION

Philip Betheil, Transportation Planner
Michael Monteleone, AICP, PP, Traffic and Transportation Studies Project Manager

21.4.4 ENVIRONMENTAL PLANNING & MANAGEMENT, INC. (EPM)—CONTAMINATED MATERIALS

Richard Hart, Hazardous Waste and Contaminated Materials Evaluations

21.4.5 RSG, INC.—RIDERSHIP

William Woodford, Travel Demand Forecast Task Leader

21.5 DESIGN CONSULTANT

21.5.1 PHASE 2 PARTNERSHIP (P2P)

Charles Hymes, Jr., P.E., Project Manager
Frank Pepe, P.E., Deputy Project Manager
Kieran Spillane, P.E., Design Manager ✴