

## **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.<sup>1</sup>

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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<sup>1</sup> 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**).

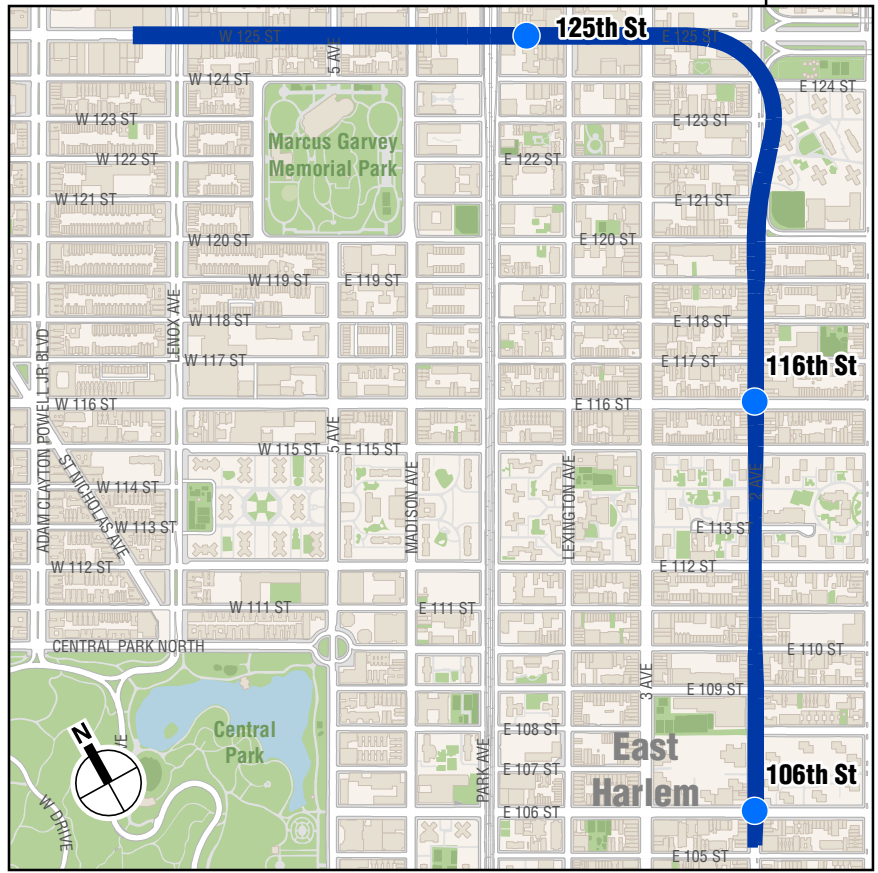
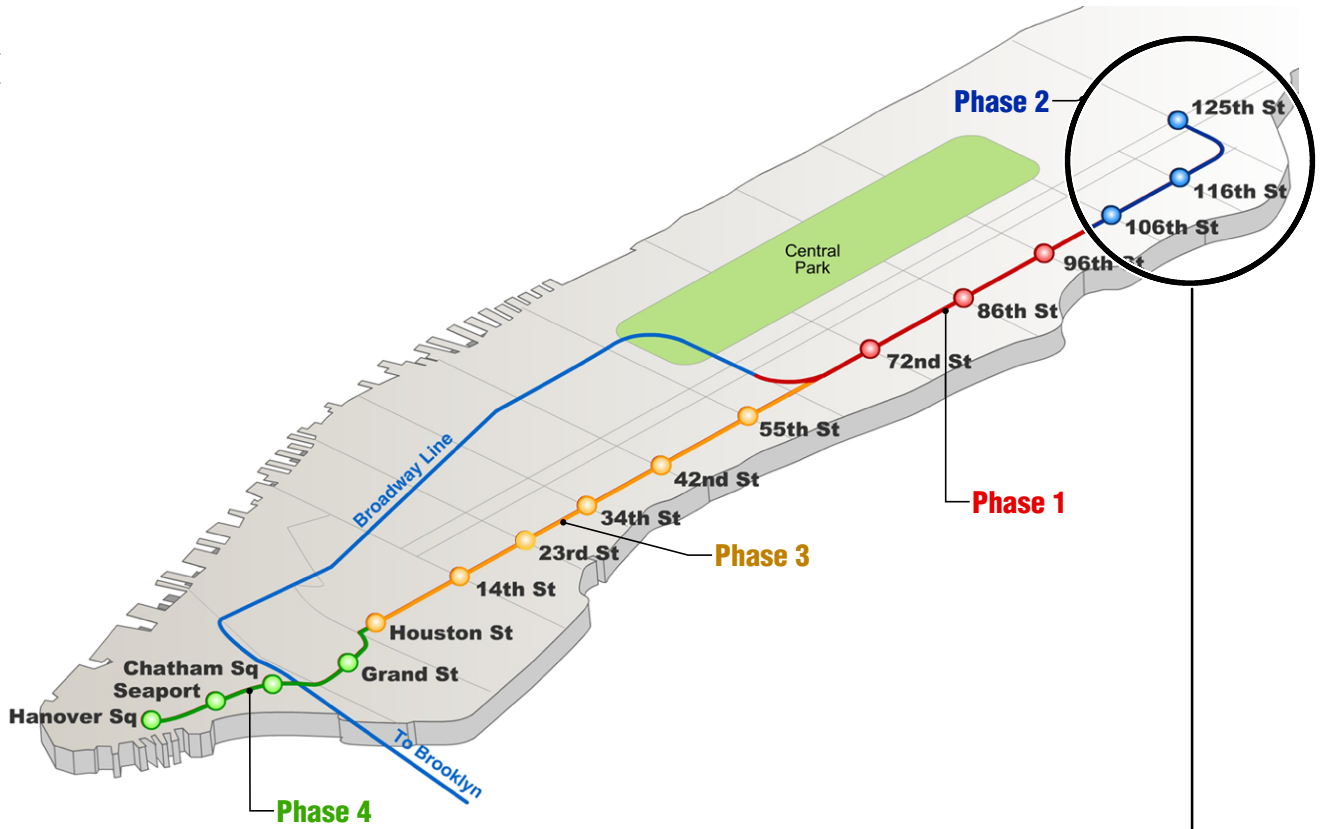
### 1.2.1 PROJECT PURPOSE AND NEED

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, overtaking, 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.

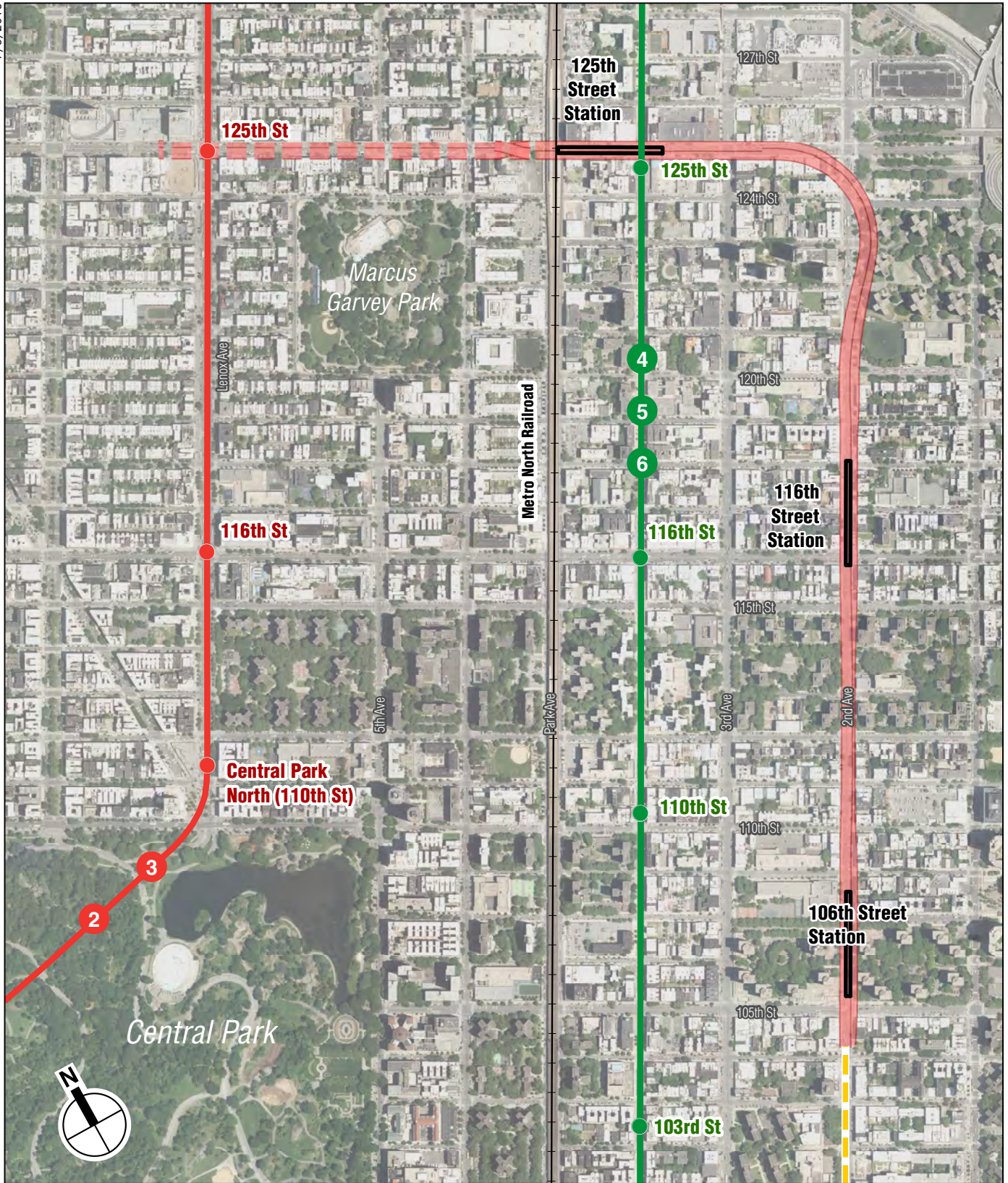
### 1.2.2 PROJECT GOALS AND OBJECTIVES

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



Proposed Alignment - Phase 2      Proposed Stations - Phase 2





- Proposed SAS Phase 2 Alignment
- Proposed SAS Phase 2 Tail Tracks
- Proposed Station
- SAS Phase 1 Limits
- Existing Stations
- Existing Subway Lines
- Existing Subway Lines
- Existing Subway Lines



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<sup>2</sup> 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<sup>3</sup> 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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<sup>2</sup> Once the full-length subway is complete.

<sup>3</sup> 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

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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. \*