

3.0 ALTERNATIVES CONSIDERED

3.1 Introduction

With the 19 subway line damaged and out of service south of Chambers Street as a result of the World Trade Center (WTC) attacks of September 11, 2001, MTA/NYCT began to study alternatives to restoring the service that went beyond simply rebuilding the damaged sections. The service shutdown, along with the planning effort already underway for the area, provided an opportunity to examine new ideas for transit access and improvements. With the uncertainty around redevelopment of the WTC site, MTA/NYCT underwent a planning process which included three broad categories of alternatives. These included: 1) repairing the damaged 19 tunnel, with limited improvements at the existing South Ferry Station; 2) repairing the damaged tunnel, with a new terminal at South Ferry; and 3) relocating the 19 alignment to West Street, with a new terminal at South Ferry. The preliminary screening process eliminated several alternatives due to site constraints and construction complexity. The alternatives that remained for consideration are described in this chapter.

As part of the project planning process, alternative courses of action are considered to compare their characteristics, benefits, and relative environmental impacts. As identified in Chapter 1, the purpose of the Proposed Action is to replace the existing South Ferry Subway Station with a new terminal facility, to address functional and operational problems with the station, to better integrate the station with other transportation facilities in the vicinity, to improve reliability, provide safer and simpler access, and achieve ADA compliance, all while minimizing impacts to resources. Several alternatives were considered by MTA/NYCT for the South Ferry Terminal Project, including the No Build Alternative. Each was evaluated based on its ability to meet the project goal and objectives as defined in Chapter 1, and support the recovery and revitalization of Lower Manhattan.

3.2 Alternatives Analysis

Seven build alternatives have been considered for the South Ferry Terminal Project. The alternatives were evaluated based on their technical complexity, potential for impacts to Battery Park and other local area resources, and ability to meet the project's goal and objectives. These alternatives, described in the following sections, are listed below:

- Platform Extension Alternative
- Three-Track Terminal in Battery Park
- Terminal Inside Existing 19 Loop
- Water Street Terminal
- South Street Terminal
- Whitehall Street Terminal
- Two-Track Terminal in Peter Minuit Plaza (Proposed Action)

3.2.1 Description of the Build Alternatives Considered

3.2.1.1 Platform Extension Alternative

This alternative consists of moving the entire station northward to a tunnel section with less curvature, and extending the platform by approximately 260 linear feet. These improvements could eliminate the use of the platform extenders and allow an entire 10-car train to berth at the station, while maintaining proximity to the Whitehall Ferry Terminal. Figure 8 provides a schematic drawing of the platform extension alternative.

The construction of the additional 260 linear feet of platform at the north end of the station would be relatively straightforward as there are no major underground interferences in this area. However, sliding the entire station off of the existing loop is not feasible without relocating an existing track crossover. The crossover connects the East (4 5) and West (1 9) side subway lines and is critical to transit operation for handling subway service disruptions. The crossover also provides necessary flexibility for system operations to accommodate system maintenance. Therefore, eliminating this crossover is not considered a feasible option. Relocating the crossover from its existing position would be technically complicated because the tunnel structure just north of the crossover diverges into two separate tunnels, each with varying elevations. The only approach to resolving this issue would be to construct a new tunnel section north of the crossover and regrade the existing track profiles level.

3.2.1.2 Three-Track Terminal in Battery Park

To achieve the benefits that a new terminal should provide, two alternatives were evaluated for constructing a new South Ferry Terminal while maintaining proximity to the Whitehall Ferry Terminal. One of these alternatives is a new three-track terminal within and underneath the southeast corner of Battery Park.

A three-track terminal design was considered for a location west of the South Ferry Station within the southeastern limits of Battery Park. Figure 9 provides a schematic drawing of this design. While this design addresses the operational and functional deficiencies of the existing terminal, such a station would be located further from the Whitehall Ferry Terminal than the existing station (approximately 460 feet from the Whitehall Terminal), and would require a significant amount of space to construct because of the required track interlocking. The potential construction area would be bound by the 1 9 loop tracks to the east, the Brooklyn Battery Tunnel to the west, and the Brooklyn Battery Underpass to the south.

3.2.1.3 Terminal Inside Existing 1 9 Loop

This alternative, a new terminal situated inside the existing 1 9 loop, was also developed to achieve the benefits that a new terminal could provide, while maintaining proximity to the Whitehall Ferry Terminal.

This alternative would involve construction of a new two-track terminal below the existing South Ferry Station, between the eastern and western loop tracks. Figure 10 provides a schematic drawing of this alternative. This alternative achieves the objective of maintaining proximity to the Whitehall Ferry Terminal, but its construction would be very complex. Multiple structures including the Battery Park Underpass, Whitehall Ferry Terminal, South Ferry Station, and the existing South Ferry loop tracks would require underpinning to permit the construction of this terminal alternative and related approach tracks.

3.2.1.4 Water Street Terminal

To reduce potential construction and operational impacts to Battery Park, three alternative locations for a terminal outside the park were considered: Water Street, South Street, and Whitehall Street. The Water Street Terminal alternative would provide a two-track single island platform terminal along Water Street in the vicinity of Broad Street. The inbound/southbound trains would follow the existing ① ⑨ loop alignment through the existing South Ferry Station, and outbound/northbound trains would connect to the existing loop tracks on the north side of the station. Figure 11 provides a schematic diagram of this alternative. Fitting a terminal in this location is problematic because of Water Street's curved alignment and the location of other subway facilities along the alignment. Since subway construction generally must follow the alignment of the street above to avoid impacting the basements of adjacent properties, the terminal would need to be built along the same curved alignment of Water Street.

3.2.1.5 South Street Terminal

This alternative also reduces potential construction and operational impacts to Battery Park. The South Street Terminal alternative would provide a two-track single island platform terminal along South Street between Whitehall and Broad Streets. New approach tracks and tunnels would be required underneath the eastern edge of Battery Park. Figure 12 provides a schematic diagram of this alternative. Similar to the Water Street terminal issues, constructing a terminal in this location would be problematic.

3.2.1.6 Whitehall Street Terminal

This alternative would provide a three-track, two-island platform along Whitehall Street between State Street and Beaver Street. New approach tunnels would be required in the eastern edge of Battery Park and Peter Minuit Plaza. Figure 13 provides a schematic diagram of this alternative. Similar to the Water and South Street terminal issues, constructing a terminal in this location would be problematic.

3.2.1.7 Two-Track Terminal in Peter Minuit Plaza (Proposed Action)

This alternative, which is the Proposed Action evaluated in this EA, would be located under Peter Minuit Plaza and adjacent to State Street, and would be a two-track, single island platform terminal. New approach tunnels would be required underneath the eastern edge of Battery Park, and one ingress/egress point would be required within the

sidewalk between the eastern edge of the park and State Street. Figure 5 in Chapter 1 provides a schematic diagram of this alternative. This terminal configuration would be located outside Battery Park and would maintain proximity to the Whitehall Ferry Terminal and other transportation modes.

3.2.2 Selection of the Preferred Build Alternative

The alternatives discussed above were developed through a series of conceptual studies and consultations that MTA/NYCT conducted with engineering consultants, horticulturalists, tunneling experts, and stakeholders. The alternatives were then evaluated for their ability to meet the project goal and objectives; this evaluation is summarized in Table 3-1 at the end of this chapter. Based on this evaluation, the following conclusions have been drawn regarding the alternatives.

3.2.2.1 Platform Extension Alternative

This alternative does not offer terminal operations; therefore recovery time, overall reliability, and operational flexibility would continue to be limited (e.g. an out of service train could not be taken out immediately with only one track). This alternative would also require substantial construction in the southeastern and eastern portions of Battery Park, with additional permanent easements required within the park for station entrances/exits. Therefore, this alternative does not meet the project goal and objectives.

3.2.2.2 Three-Track Terminal in Battery Park

As with the Platform Extension Alternative, this alternative would require significant construction in the southeastern and eastern portions of Battery Park. Additional permanent easements in Battery Park would also be required to provide ADA-accessibility. In addition, the terminal would be located further from the Whitehall Ferry Terminal than the existing South Ferry Station. Therefore, this alternative does not meet the project goal and objectives.

3.2.2.3 Terminal Inside Existing 19 Loop

This alternative would require extensive underpinning of several structures in the project area. The terminal would likely need to penetrate the Lower Manhattan bulkhead, thus requiring an Army Corps of Engineers permit to allow for construction in a navigable waterway. Therefore, this alternative, although meeting many objectives of the project, would be difficult to design and construct.

3.2.2.4 Water Street Terminal

With this alternative, it would not be possible to meet ADA platform design requirements for maximum curvature since the terminal would need to be built along the same curved alignment of Water Street. The design would also conflict with the **N R** line's Whitehall Street Station mezzanine and the **J M Z** line tunnels underneath Broad Street. In addition, the terminal would be located further from the Whitehall Ferry Terminal than

the existing South Ferry Station. Therefore, this alternative does not meet the project goal and objectives.

3.2.2.5 South Street Terminal

This alternative would require the terminal to be constructed 110 feet below ground to avoid conflicts with the Battery Park Underpass. This depth causes vertical constraints in the terminal design, and also requires property acquisition because of the location of the Underpass. In addition, there is insufficient street level circulation capacity in this vicinity; there would be a single sidewalk approach with the nearest street entrance approximately 285 feet away from the Whitehall Ferry Terminal. Therefore, this alternative does not meet the project goal and objectives.

3.2.2.6 Whitehall Street Terminal

Under this alternative, the terminal would need to be built above the existing **N R** Whitehall Street station with approach tunnels diving under the **4 5** Joralemon tunnel and the existing **1 9** tunnel. Also to move southbound **1 9** trains into the terminal or northbound train out of the terminal, the train would follow a small radius curve limiting train speed. This alignment is not possible due to the interferences caused by existing infrastructure. Even if built, the closest entrance would be 600 feet from the Whitehall Ferry Terminal building, a greater distance than the existing South Ferry Station. Therefore, this alternative does not meet the project goal and objectives.

3.2.2.7 Two-Track Terminal in Peter Minuit Plaza (Proposed Action)

The new two-track terminal alternative was selected as the Proposed Action because it has the features necessary to address the functional and operational deficiencies of the existing station, and fulfills the purpose and need of the project.

As shown in Table 3-1, each of the first six alternatives described failed to either resolve the functional and operational deficiencies of the existing station, did not facilitate intermodal connectivity, or they all proved to be technically complex and difficult to build. The Proposed Action, although also technically complex due to the underpinning required as the new approach tunnel crosses under the existing **1 9** loop and the Joralemon tunnel, would bring the new subway terminal closer to the Whitehall Ferry Terminal than the other alternatives (except for the Inside Existing Loop alternative, which would require complex construction methods). The Proposed Action represents a compromise of the standards for modern subway terminals, in that it would have only two tracks rather than three or four; however, a two-track terminal will achieve most of the requirements for a terminal and is a substantial improvement over the existing one-track station.

In addition, the Proposed Action is the only prudent and feasible alternative that minimizes impacts to Battery Park, which is one of the goals of the project. Although the Proposed Action would have temporary construction impacts to the park, a high degree of planning has been utilized to minimize those impacts. A three-track terminal is only

feasible if constructed within Battery Park; this is unacceptable to MTA/NYCT due to the prolonged disruption to the park that would occur during construction.

The Proposed Action was therefore selected because it has the features necessary to address the functional and operational deficiencies of the existing station, and to fulfill the purpose and need of the project. Following is a summary of the reasons for selection of the Proposed Action:

- It provides convenient access to the Whitehall Ferry Terminal.
- It provides for a two-track terminal with single-island platform and retains the existing loop track that can be used for train lay-up purposes. This design enhances overall system reliability on the **1** **9** subway lines.
- It provides a direct connection to the **N** **R** line's Whitehall Street Station and enhances the function of Peter Minuit Plaza as an intermodal transfer site.
- Temporary construction impacts to Battery Park would be limited to the eastern portion of the park.
- It provides three entry/exit points to alleviate existing pedestrian constrictions, complies with ADA and National Fire Protection Association (NFPA) 130 (which provides standards for fire protection requirements for underground, surface, and elevated fixed guideway transit systems), and serves multiple destinations in the Lower Manhattan area.

3.3 Definition of the Alternatives

In accordance with NEPA guidance for the preparation of EAs, the alternatives evaluated in this EA consist of the No Build Alternative and the Proposed Action, each of which is briefly described below.

3.3.1 No Build Alternative

Under the No Build Alternative, the existing South Ferry Station would be expected to continue to function in its current capacity, with no changes to the current station complex and track configuration (see detailed description of existing station conditions in Section 1.4 of Chapter 1). The existing tight curvature loop track would remain and there would be no improvements to the entry/exit features of the station.

3.3.1 Proposed Action

As described in detail in Section 1.5 of Chapter 1, the Proposed Action consists of replacing the existing South Ferry Station with a new and improved terminal that would eliminate the physical and operational deficiencies of the existing station. The new terminal and associated improvements would be located under Peter Minuit Plaza, and new approach tracks would be located under the eastern edge of Battery Park. A new bellmouth and fan plant would be located underneath Battery Place at the intersection of Greenwich Street and State Street, respectively.

**Table 3-1
Alternatives Summary Comparison**

Alternative	EA Section	Will the alternative improve reliability and operational flexibility?	Will the alternative provide safer/simpler access?	Will the alternative facilitate intermodal connectivity, especially with Whitehall Ferry Terminal?	Will the alternative achieve ADA?	Will the alternative minimize temporary and permanent impacts?
No Build	3.3.1	No. Current deficiencies will continue and worsen with continued growth.	No. Would worsen with continued growth.	No. Pedestrian surges into station would worsen with continued growth.	No.	Somewhat. There would be ongoing operations/ maintenance work as station deteriorates (e.g. gap fillers, wheel grinding).
Platform Extension	3.2.1.1	No. Eliminates problems associated with curve, but no improvement in station operations or recovery time.	Yes. Eliminates gap fillers, multiple entrances.	Yes. Maintains proximity to Whitehall Ferry Terminal.	No.	No. Major impacts and permanent easements to Battery Park.
Three-Track Terminal in Battery Park	3.2.1.2	Yes. Eliminates operational and functional deficiencies.	Yes. Multiple entrances.	No. Located further from Whitehall Ferry Terminal than existing station; 460 feet away.	Yes.	No. Major impacts and easements to Battery Park.
Terminal Inside Existing 19 Loop	3.2.1.3	Yes. Eliminates operational and functional deficiencies.	Yes. Multiple entrances.	Yes. Close proximity to Whitehall Ferry Terminal.	Yes.	No. Difficult construction; penetrates bulkhead; permanent easement in Battery Park.
Water Street Terminal	3.2.1.4	Somewhat. Eliminates curve at station; however train must negotiate curve in approach.	Yes. Multiple entrances.	No. Far from Whitehall Ferry Terminal; 835 feet away.	No.	No. Station conflicts with N R and J M Z infrastructure.
South Street Terminal	3.2.1.5	Somewhat. Eliminates curve at station; however train must negotiate curve in approach.	Somewhat. Insufficient street level circulation capacity; single pedestrian sidewalk approach.	Somewhat. Located further from Whitehall Ferry Terminal than existing station; 285 feet away.	Yes.	No. Terminal is very deep (110'). Temporary easements to Battery Park.
Whitehall Street Terminal	3.2.1.6	Yes. Eliminates curve at station; however train must negotiate curve in approach.	Yes. Multiple entrances.	No. Located further from Whitehall Ferry Terminal than existing station; 600 feet away.	Yes.	No. Station approach tunnels conflict with 45 and 19 tunnels.
Two-Track Terminal in Peter Minuit Plaza. (Proposed Action)	3.2.1.7	Yes. Eliminates operational and functional deficiencies.	Yes. Multiple entrances.	Yes. Close proximity to Whitehall Ferry Terminal.	Yes.	Somewhat. Terminal can be built with temporary impacts to Battery Park. Approach tunnels need to dive under 45 and 19 infrastructure.