

CHAPTER 1: PURPOSE AND NEED

1.1. INTRODUCTION

In 1994 MTA New York City Transit (MTA NYCT) completed a comprehensive ventilation study that evaluated every subway tunnel section in New York City to determine the magnitude of requirements to comply with the National Fire Protection Association (NFPA) 130 Standard¹ for emergency ventilation. A hazard assessment was also conducted to prioritize the locations that should be addressed first, considering engineering, construction, and economic factors. This priority index ranked each MTA NYCT subway tunnel section in order of priority from 1—as most critical for safety—to 252—least critical, and, since then, there has been an ongoing program of rehabilitating, expanding, and constructing new fan (or ventilation) plants throughout the system. As examples, an emergency ventilation plant is currently being constructed on the 6th Avenue Subway Line on Sixth Avenue at 30th Street and another has recently been completed at Sixth Avenue and 13th Street. These emergency ventilation plant projects have priority indexes of 3 for the 30th Street plant, and 4 and 7 for the 13th Street plant, depending on what track they are designed to protect. The tunnel section being addressed herein has a priority index of 10. MTA NYCT also recognizes that there is a potential to optimize the functionality of the ventilation plant (as described above) by engineering it so that it could *also* serve some or all of the emergency ventilation needs of the 7th Avenue Subway Line tunnel segment (priority ranking 179) between the Christopher Street and 14th Street Stations; that potential is also considered herein.

1.2. IDENTIFICATION OF THE PROPOSED ACTION

The Proposed Action will enable the construction of a new emergency ventilation plant to service the 8th Avenue Subway Line tunnel segment (see Figure 1-1) approximately mid-distance between the West 4th Street and 14th Street Stations, which will provide improved life safety facilities. The proposed ventilation plant will contain multiple fans having a total nominal capacity of approximately 500,000 CFM in order to achieve the necessary velocity in the tunnel to control the movement of smoke and provide tenable evacuation routes in the tunnel segment. Because the 7th Avenue Subway Line tunnel crosses above the 8th Avenue Subway Line at Greenwich Avenue and Seventh Avenue South, the potential exists that the new ventilation plant could also be designed so as to service both subway tunnel segments and, thus, minimize overall cost, time, and cumulative environmental effects/impacts of MTA NYCT's ongoing program to improve emergency ventilation and life safety conditions.

Construction of the emergency ventilation plant is expected to begin in 2010, and, depending on the alternative selected, will be operational by 2013 (Alternative P1) or 2014 (Alternative SB1 or SB5). The schedule is also affected by, for example: property acquisition; DOT traffic stipulations; construction sequencing and techniques required; potential cumulative effects from/to other major vicinity project(s); and, environmental mitigation requirements established for the project by MTA NYCT. These and other considerations are presented throughout this DEIS.

1.3. PROBLEM IDENTIFICATION

The original New York City subway system, which was built at the turn of the 20th century, had no emergency ventilation plants—all were added later. The original system relied on the trains' piston action, as well as fresh air from the open gratings (natural ventilation), to ventilate the tunnels. However, the need to further ventilate tunnels was an early concern for MTA NYCT. Though fan equipment was

¹ NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems.

not installed at the outset, fan chambers were excavated and constructed with the intent of equipping them at a later date, if required. In fact, there are still empty fan chambers (having no mechanical equipment) within the system. Because the existing empty fan chambers are quite small (less than 15 percent of the required dimensional capacity), there is insufficient room to house the necessary state-of-the-art fans, silencers, and auxiliary equipment in the existing chambers.

1.3.1. SYSTEM DEFICIENCIES

In the 1910s and early 1920s, fans were added to the lower Lexington Avenue Subway Line, and subsequent subway lines (including the IND) were constructed with fan plants (or chambers), though not all of them were equipped with mechanical equipment. To reiterate, this is the case in the subject 8th Avenue Subway tunnel segment that exists between the West 4th Street and 14th Street Stations, serving the **A**, **C**, and **E** trains (on Tracks A1, A2, A3, and A4). An unequipped fan chamber exists midway between the stations, located near the intersection of Greenwich Avenue and Seventh Avenue (built in 1926). A similar situation exists on the 7th Avenue Subway Line between the Christopher Street and 14th Street stations; existing small, unequipped facilities are located approximately near Perry Street. These chambers do not have the space needed to house the fans, auxiliary equipment, and facilities required to ventilate the subway tunnels to meet current NFPA requirements.

1.3.2. NATIONAL ASSOCIATION FIRE PROTECTION COMPLIANCE

The NFPA Standard 130 – Standard for Fixed Guideway Transit and Passenger Rail Systems – specifies fire protection and life safety requirements for underground, surface, and elevated fixed guideway transit systems including trainways, vehicles, transit stations, and vehicle areas. Requirements are also provided for passenger rail. NFPA pertains to stations accommodating only passengers and employees of the fixed guideway transit systems and incidental occupancies in the stations.

1.4. PROJECT PURPOSE AND NEED

The purpose of the Proposed Action is principally to provide necessary mechanical emergency ventilation to a tunnel segment of the New York City subway system between the West 4th Street and 14th Street Stations on the 8th Avenue Subway Line, which currently has no such protection, to improve life safety. Collaterally, because of the proximity of the 7th Avenue Subway Line to the 8th Avenue Subway Line tunnel segment in this area of West Greenwich Village, all reasonable attempts will *also* be made to provide emergency ventilation to the 7th Avenue Subway Line between the Christopher Street and 14th Street Stations at the same time. In this way, one ventilation plant can be used for “double duty” while minimizing the cost, time, and cumulative effects/impacts such as neighborhood disruption, of constructing more than one emergency ventilation plant over different time periods.

1.5. PROJECT GOALS

The goal of the Proposed Action is to provide the necessary emergency ventilation for the 8th Avenue Subway Line tunnel segment between West 4th Street and 14th Street on the 8th Avenue Subway Line and, to the extent feasible, the 7th Avenue Subway Line tunnel segment between Christopher Street and 14th Street, to assure the necessary improvements to life safety conditions in the subject tunnel segments of the New York City subway system, while minimizing potential engineering, economic, and environmental effects and impacts.

FIGURE 1-1: 8TH AVENUE SUBWAY TUNNEL SECTION AND PROJECT STUDY AREA

