CHAPTER 18: SAFETY AND SECURITY

18.1 INTRODUCTION

18.1.1 CONTEXT AND KEY ISSUES

This chapter identifies safety and security considerations related to the design, construction and operation of the Fulton Street Transit Center (FSTC) and includes discussion of the safety procedures to be implemented during the project’s construction, as well as those that would be in place once the facility is in operation. The project would feature advanced safety and security systems and procedures to protect passengers, workers, tenants, and the local community.

The events of September 11 resulted in a number of changes to safety and security considerations in Lower Manhattan. The increased need for greater public safety and security, both locally and regionally, also demonstrated opportunities for potential safety and security improvements to existing transit facilities, including the Existing Complex (see Chapter 1: Purpose and Need, for definition). These improvements included opportunities to improve compliance with the Americans with Disabilities Act (ADA); the Existing Complex is not fully ADA compliant with respect to access to and from the street, and between platforms.

The construction and operation of the FSTC would be implemented in compliance with relevant Federal, State and City codes, policies and guidelines, including those of Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) intended to protect safety and security for construction workers, patrons and the general public. Key elements in these codes and policies are guidelines on safety in the event of a fire or other threat, security from crime, and safe construction practices. These codes, policies and guidelines have not been altered due to the events of September 11. Because of this, analysis in this section compares the proposed construction and operation of the FSTC with their attendant impacts on safety against the current conditions of the area.

18.1.2 CONCLUSIONS

Under the No Action Alternative, the Existing Complex would be maintained and operated in its current state. Minor maintenance and rehabilitation activities could occur, including typical station and transit infrastructure maintenance and repair. Although NYCT would continue its usual programs and procedures to assure passenger and facility safety and security throughout the transit system, the Existing Complex would continue to suffer from the safety and security concerns associated with crowded peak-hour operating conditions. Operational inefficiencies created by poor Level of Service (LOS) associated with current system deficiencies would continue. In the event of a safety or security incident, the No Action Alternative would not allow NYCT to take advantages of improved safety and security conditions that could be created with the Build Alternatives.

Under the Build Alternatives, the construction of the FSTC would be implemented in compliance with relevant Federal, State and City codes, policies and guidelines, including those of NYCT, intended to protect safety and security for construction workers, patrons and the general public. Construction contracts will incorporate requirements for developing and implementing a contract-specific Health and Safety Program (HASP) to protect construction workers and the public. NYCT would monitor to ensure compliance with each HASP. FSTC design would be based on applicable prescriptive codes as well as performance-based fire protection design approaches considering potential hazard scenarios. The design will also be based on results of a Smoke Purge Study and a Threat and Risk Assessment study, which would be completed as part of continuing Preliminary Engineering. As a result of these measures, the proposed FSTC under both Alternative 9 and Alternative 10 - the Preferred Alternative, is not expected to result in adverse impacts to safety and security during the construction phase.
Operation of the FSTC would improve public safety and security by the implementation of enhanced safety and security practices. As a result of both function and design, the FSTC would promote improved safety and security. A number of features would be included in the design to enhance and maximize safe use of the FSTC. The FSTC would be designed to place adequate space in and around corridors, public waiting and information areas, and around any areas of retail. The use of natural light, and reduced distances between nodes and destinations, would improve visibility, user orientation and pedestrian flow, and increase overall security, and a visible police presence would be maintained to improve law enforcement and enhance public safety. Security measures would be included in the design and operation features consistent with the current security methods and practical procedures being employed and implemented by NYCT.

The table below summarizes the potential impacts associated with each Alternative.

Table 18-1
Summary of Comparison of Alternatives: Safety

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<tbody>
<tr>
<td>No Action</td>
<td>Existing conditions maintained.</td>
<td>N/A</td>
<td>Safety and security not improved.</td>
<td>Same as 2008</td>
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<tr>
<td>Alternative 9</td>
<td>Worker safety protected through contract Health and Safety Plans.</td>
<td>Implementation of Health and Safety Plan for each construction contract.</td>
<td>Transit patron safety maintained/ improved through design to prescriptive codes and scenario-based evaluations of fire and incidents. Security improved through design of defensible space, improved sightlines and lighting.</td>
<td>Same as 2008</td>
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<tr>
<td>Alternative 10 - the Preferred Alternative</td>
<td>Worker safety protected through contract Health and Safety Plans.</td>
<td>Implementation of Health and Safety Plan for each construction contract.</td>
<td>Transit patron safety maintained/ improved through design to prescriptive codes and scenario-based evaluations of fire and incidents. Security improved through design of defensible space, improved sightlines and lighting.</td>
<td>Same as 2008</td>
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18.2 CONSTRUCTION SAFETY AND SECURITY

The Federal Transit Administration (FTA) and NYCT have extensive experience in overseeing and managing safety and security in complex construction projects; NYCT has particularly extensive experience in safely operating the City’s subway system. As part of the construction plan for the FSTC, NYCT would develop a detailed overall HASP to be implemented throughout all aspects of the project’s construction. The HASP, actually a compendium of several HASP plans specific to particular areas of construction and activities, would require that each contractor develop a plan governing their work for NYCT review and approval prior to implementation and commencement of any construction activity. HASP plans would require compliance with all applicable laws and regulations and would be coordinated in their development and implementation with appropriate City and State agencies via the Technical Advisory Committee (TAC) (see below) and other existing NYCT inter-agency coordination mechanisms, such as regular meetings with the New York City Department of Transportation (NYCDOT).
The HASP plans would identify all preventive and emergency response procedures to be implemented in managing and controlling hazards and safety issues. The HASP plans would also describe methods to protect construction workers, the public and the environment, thereby ensuring overall safety in each task. Specific measures would typically address equipment, materials, controls, crew size, and job responsibilities, and ensure that operating procedures and maintenance practices are addressed, employed, and audited for safety. Preventive measures would include inspections, self-assessments, and testing to identify problem areas. For oversight, NYCT would implement an audit program to ensure that all contractors are in conformance with their individual HASP plan, as well as the project-wide HASP.

Appropriate security measures would be implemented during construction to address site needs prior to the completion and implementation of operational security structures and systems.

As a result of the above, the FSTC is not expected to result in adverse impacts to safety and security during the construction phase. Coordination with the New York Police Department (NYPD) and the Fire Department of New York (FDNY) has been implemented via a TAC, a technical working group comprising Federal, State and City agencies which have been actively involved in the environmental review process. Within the TAC, opportunity has been provided for both NYPD and FDNY to receive information on the proposed construction and operation of the FSTC, and provide comment on safety and security concerns. Coordination with NYPD, FDNY and other relevant agencies would continue throughout the design and engineering of the FSTC.

Management of the structural integrity of the historic Corbin Building as related to safety and security requirements would be a component of construction safety (see Chapter 11: Cultural Resources). The building’s stability and structural integrity would be evaluated and construction methods would be implemented to maintain that integrity.

**18.3 OPERATIONAL SAFETY AND SECURITY**

Upon completion, the FSTC would be fully compliant with NYCT’s System Safety Program Plan which addresses operational safety issues relating to train and station safety (including corridors, mezzanines, surface accessways, concourses, etc.). NYCT routinely trains its staff and contractors on aspects of the plan that are pertinent to individual staff duties, such as track safety, emergency communications, fire exit procedures and security.

As with other NYCT projects, the FSTC design would reflect safety and security considerations as paramount issues. Operational safety measures would include specific security, control and communication systems directed toward maintaining a safe environment during everyday and emergency situations. Visual surveillance, lighting, signage, emergency communications and public and emergency access are examples of measures that would be carefully considered in the final design. In conjunction with the facility’s physical design, NYCT would coordinate with appropriate public safety agencies such as NYPD and FDNY to develop detailed safety and security plans for all areas of the proposed facility. Representatives of both the NYPD and FDNY have been actively involved in TAC meetings conducted during the EIS process.

As a result of the above, the FSTC is not expected to result in adverse impacts to safety and security during the operational period. As a beneficial public transit project during operation, the FSTC would offer greatly increased opportunity for improved safety and security in comparison to the No Action Alternative. The proposed improvements to wayfinding, visibility, signage and LOS would all contribute to increased passenger safety and security, and would allow for greater safety and security during any emergency situation. NYPD, via the TAC, has expressed support for the FSTC as a project that would improve both safety and security conditions in the Existing Complex.
18.4 EMERGENCY SAFETY AND SECURITY

Construction of the proposed FSTC would meet or exceed safety requirements dictated by the Building Code of New York State (BCNYS), the Building Code of the City of New York (BCCNY) and other applicable codes. An integrated fire alarm and Public Address (PA) system, designed to achieve recommended intelligibility levels of the National Fire Alarm Code (National Fire Protection Association (NFPA) 72), would alert occupants and passengers in the event of an emergency. Emergency power would be provided for all fire and life safety systems. The height of the proposed FSTC Entry Facility would necessitate the adherence to Section 403 of the BCNYS, which specifies requirements in high-rise facilities for emergency voice communication, emergency power, a fire command center and automatic fire detection and sprinkler protection. The exits would be designed with attention to the number of exits, accessibility for persons with disabilities, exit separation and exit width to support safe egress in emergency conditions. Dead-end corridors and common paths of travel would be limited by BCNYS requirements.

Normal and reserve power would be provided by separate electrical services, in addition to an emergency diesel generator to serve emergency life safety loads. The systems to be powered during failure of normal electric systems include exit lighting, communication and PA system, fire pump, smoke control fan and emergency operation of at least one (1) elevator per bank. An automatic transfer switch would be in place between the normal and reserve electrical services.

Depending on the Build Alternative, the FSTC design would ensure that the Corbin Building would continue to be compliant with relevant fire safety codes. Under Alternative 9, appropriate fire egress would be provided through the utilization, and where appropriate, upgrading of the existing fire escapes currently located on the north face of the Corbin Building. This would be implemented by the provision of an enclosed stair tower to grade, or by continuing existing fire escapes down to grade level, with both options leading to a fire rated exit discharge path leading to Broadway. This would not affect the interior of the Corbin Building, and would not trigger any requirement for alterations to the existing interior fire safety system of the building. Specific details of the fire safety egress appropriate for Alternative 9 would be provided during Final Design.

Under the Preferred Alternative, the Corbin Building would be integrated into the Entry Facility and would be designed to be fully compliant with relevant fire safety codes.

18.4.1 BUILDING/FIRE CODE AND SYSTEM REQUIREMENTS

The FSTC would be considered an assembly or public assembly occupancy as defined by BCNYS and BCCNY, respectively. The code anticipates large volumes of people using assembly occupancies and as such requires specific features to be utilized to protect the occupants. A fire strategy would be developed for the FSTC through a combination of prescriptive requirements and performance-based engineering. Specific standards and codes would be observed such as maximum distance traveled for egress and maximum compartment size for containment of fires. Sprinklers, standpipes and extinguishers would be available in accordance with code requirements. The stations would primarily adhere to the NFPA 130 as their primary document for code requirements. NFPA 130 specifies fire protection and life safety requirements for underground, surface and elevated fixed guideway transit systems including trainways, vehicles, transit stations and vehicle areas. Active smoke control would be in place to create an atmosphere which would enhance egress and emergency response operations, including underground portions of the FSTC building. Smokeproof enclosures are dictated for stairways serving areas 75 feet above grade or higher. In addition, detailed analyses of integrated systems would be used to identify and examine special considerations in the development of a successful fire and life safety strategy.

A performance-based fire protection design approach is outlined in the Society of Fire Protection Engineers (SFPE) Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings. This approach involves the identification of fire safety goals and the utilization of fire scenarios to assess alternatives and safety objectives. Analysis and assessment is completed in this
approach by using appropriate engineering tools, methodologies and performance criteria to achieve a quantitative assessment of safety alternatives with comparative achievement of safety goals and objectives. The systems and issues that are typically placed under scrutiny through performance-based engineering include: fire ignition and growth; detection; alarm; egress; fire-fighting facilities; smoke management and compartmentalization; structural fire resistance and suppression. The combination of prescriptive codes and regulations with performance-based engineering and design creates an integrated approach for the project. Overall safety targets would be prescribed by the general codes, and evaluation or improvement upon these performance targets would be sought through further applied research and system models.

18.4.2 SPECIAL STUDIES

Special studies have been initiated to develop a detailed evaluation of measures involved in the promotion of safety during operation and use of the FSTC. These special studies, undertaken to assist NYCT in the evaluation of building codes and life and fire safety measures that could potentially be employed in the FSTC, would be provided for review and comment to appropriate city agencies such as the New York City Department of Buildings (NYCDOB), NYPD and FDNY. Findings of these studies, together with the input of safety and security agency experts, would be used to refine the design of the FSTC to further improve operational safety and security, both during standard use and within any emergency situations.

Code & Standard Report

An assessment of the BCNYS and NFPA 130 has been initiated by NYCT to compare the applicability and requirements of both codes. The results of a comparative matrix will be presented in a Code and Standard Study Report, including an evaluation of fire and life safety requirements of each code and the relevance of those requirements to the FSTC. The applicability of NFPA 130 to the entire facility would be evaluated along with defined proposed requirements for station upgrades and new buildings. Fire safety issues will also be addressed through adherence to specific codes and system requirements prescribed for fire safety. The following codes have been identified as relevant to the proposed action:

- **NFPA 130 – Standard for Fixed Guideways**
  This standard provides guidance for the fire protection of passenger rail, underground, surface and elevated fixed guideway transit stations, trainways and vehicles.

- **Building Code of New York State (BCNYS)**
  The BCNYS is the code that dictates principal requirements applied to non-station areas.

- **Building Code of the City of New York (BCCNY)**
  Although not mandatory, NYCT has a memorandum of understanding with NYCDOB to attempt adherence to this set of requirements.

- **SFPE Engineering Guide to Performance Based Fire Protection Analysis and Design of Buildings**
  This guide outlines a process for the design and assessment of building fire safety using a combination of both prescriptive and performance based code systems.

- **NYCT Design Guidelines**
  These Guidelines address fire and safety in new and existing stations and are used in the development of fire and life safety strategies.

**Smoke Purge Study**

A Smoke Purge System Study is under development by NYCT to assess applicable code requirements and potential smoke management concepts. This study will evaluate and discuss the merits of each concept, including a discussion of advantages and disadvantages. The results of the Smoke Purge System
Study will recommend smoke management methods for each area of the FSTC. Applicable codes will be observed as well as the objectives outlined by NYCT. These objectives include protection of passengers and occupants evacuating from the public areas of the FSTC. The Entry Facility would also be designed with the capability of isolation from the interconnecting stations in the event of fire. Possible methods of fire isolation to be evaluated include smoke barriers, air curtains and physical compartmentalization. The study will also address the integration of a smoke purge system with the normal heating, ventilation and air conditioning (HVAC) system in accordance with the NYCT Design Guideline 302 – Critical Fan Plant Facilities Design Guideline. Both passenger and work trains would be considered in the design.

**Threat and Risk Assessment Study**

A Threat and Risk Assessment Study would be completed by NYCT to determine the appropriate design guidelines and criteria to afford protection of the FSTC under threats. The threats to be addressed include, but are not limited to, explosions, arson, and biological, chemical or radiological attacks. A special item would consider the interfaces with neighboring projects, reflecting the common approach adopted by NYCT and the PANYNJ for federally-funded Lower Manhattan projects. Additionally, the seismic, wind load and life and fire safety effects of the FSTC on adjacent buildings and vice versa will be assessed and managed. The design of emergency egress routes would incorporate computational simulations of pedestrian flow. These calculations would draw upon occupant loads from ridership data.

While these special studies are underway, preliminary safety strategies are being developed based on preliminary assumptions of applicable codes. Future work has been identified for development of the fire and life safety strategy through the examination of safety goals and objectives, development of design basis fires, and design of egress or evacuation, emergency response, compartmentalization, smoke management and critical structural elements. Additional information regarding the emergency, fire, and life safety strategies and design will be developed as engineering progresses.

**18.5 SPECIFIC REQUIREMENTS OF ALTERNATIVES**

The FSTC would result in a modern, state-of-the-art transportation facility whose design would reflect safety and security considerations as paramount issues and would meet or exceed safety requirements dictated by the BCNYS, BCCNY and other applicable codes. The individual FSTC Build Alternatives would warrant specific further attention, in addition to the safety matters addressed above, based on their particular features.

**18.5.1 NO ACTION ALTERNATIVE**

If the No Action Alternative were selected, the Existing Complex would remain and the FSTC would not be constructed or operated. Although NYCT would continue its usual programs and procedures to assure passenger and facility safety and security throughout the transit system, the Existing Complex would continue to suffer from the safety and security concerns associated with crowded peak-hour operating conditions. Operational inefficiencies created by poor LOS associated with current system deficiencies would continue. The lack of adequate space for passenger flows, exacerbated by conflicting passenger movements at crowded platforms, stairs and fare controls would continue to contribute to operational conditions that detract from improved safety and security. This would prevent NYCT from fully addressing current system inadequacies with respect to wayfinding, system connectivity, and efficiency and ease of passenger movements. In the event of a safety or security incident, the No Action Alternative would not allow NYCT to take advantages of improved safety and security conditions that could be created within the Build Alternatives.

**18.5.2 ALTERNATIVE 9**

In this alternative, particular attention would be given to identification of the engineering features that must be addressed in the FSTC design and construction so as not to compromise the security and safety of the Corbin Building, as well as the FSTC, in relation to adjacent and nearby structures. Specific
investigations would be undertaken with respect to the windows, fire escapes and other fire and life safety aspects on the northern face of the Corbin Building, as described in Section 18.4.

With respect to ventilation, there would be no substantial difference between this alternative and the Preferred Alternative described below.

18.5.3 ALTERATIVE 10 - THE PREFERRED ALTERNATIVE

Because this alternative fully engages the street, lower levels and potentially upper levels of the Corbin Building into the Entry Facility, special attention would be given to integrate:

- Seismic and wind load conditions;
- Fire safety; and,
- Security.

With respect to ventilation, appropriate facilities would be located throughout the FSTC complex. The main ventilation equipment would be located on the roof of the Entry Facility and would be appropriately enclosed for aesthetic and security purposes.