

18.1 INTRODUCTION

This chapter of the Environmental Impact Statement (EIS) describes the approach for safety and security measures that the Federal Railroad Administration (FRA) and the New Jersey Transit Corporation (NJ TRANSIT) considered as part of the design for the Preferred Alternative, based on the preliminary design for the Preferred Alternative. The Port Authority of New York and New Jersey (PANYNJ), in its role as Project Sponsor, has accepted and relied on the evaluations and conclusions of this chapter.

The analysis in this chapter identifies existing system safety- and security-related requirements, policies, procedures, protocols, and infrastructure and identifies new elements that will be incorporated into the Preferred Alternative.

This chapter reflects the following changes made since the Draft EIS (DEIS) for the Hudson Tunnel Project:

- The chapter incorporates design modifications related to the permanent features of the Project (e.g., modifications to surface tracks and tunnel alignment) and changes to construction methods and staging.
- Information on regulatory context is updated.
- The description of the affected environment is updated.
- A description of the role of train horns for trains approaching the North River Tunnel is included, in response to comments received during the public comment period for the DEIS.

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18.2 ANALYSIS METHODOLOGY

During development of this EIS, FRA and NJ TRANSIT developed methodologies for evaluating the potential effects of the Hudson Tunnel Project in coordination with the Project's Cooperating and Participating Agencies (i.e., agencies with a permitting or review role for the Project). The methodologies used for analysis of safety and security are summarized in this chapter.

18.1.1 REGULATORY CONTEXT

Following completion of the Draft Environmental Impact Statement (DEIS), the PANYNJ became the Project Sponsor for the Hudson Tunnel Project (see Chapter 1, “Purpose and Need,” Section 1.1.2, for more information). Consistent with the roles and responsibilities defined in Section 1.1.1 of that chapter, as the current Project Sponsor, the PANYNJ will comply with mitigation measures and commitments identified in the Record of Decision (ROD).

Rail operations on the Northeast Corridor (NEC) in the Project area are regulated and/or monitored by Federal, state, and local agencies, including the FRA, New Jersey Department of Transportation (NJDOT), New York State Department of Transportation (NYSDOT), and Federal, state, and local law enforcement. Amtrak is responsible for assessing and implementing safety and security measures for the NEC and its trains in the study area. NJ TRANSIT, in collaboration with Amtrak, is responsible for assessing and implementing safety and security measures for its trains in the study area.

FRA has established regulations related to passenger train emergency preparedness,¹ which have all been directly considered in the design development of the Preferred Alternative.

In addition, other governmental agencies and industry organizations provide safety and security related regulations, criteria and guidance for infrastructure design and operations. While not exhaustive, the following is a list of relevant agencies and organizations:

- American National Standards Institute (ANSI);
- American Public Transportation Association (APTA);
- American Society of Civil Engineers (ASCE);
- U.S. Department of Homeland Security (DHS) including Transportation Security Administration (TSA), DHS Protective Security Coordination Division, DHS Office of Cyber and Infrastructure Analysis, DHS National Infrastructure Simulation and Analysis Center, and DHS Science and Technology;
- U.S. Department of Labor, Occupational Safety and Health Administration (OSHA);
- FRA (FRA guidance includes, but is not limited to *Emergency Preparedness Guidelines for Passenger Trains*, and standards for design, maintenance, inspection, and operations of railroads);
- FTA (FTA guidance includes, but is not limited to, the Transit Security Handbook, Public Transportation System Security and Emergency Preparedness Guide, Safety Certification Handbook; FTA’s Project Management Oversight Rule, and the requirement to develop a Project Management Plan with a safety and security section to govern the construction of the Project);
- Northeast Operating Rules Advisory Committee (NORAC), which has established a set of operating rules for railroads in the Northeast, including rules related to safety. The NORAC rulebook is used by full and associate member railroads, including Amtrak and NJ TRANSIT;
- Transportation Security Administration, which is responsible for transit security by statute and under a Memorandum of Understanding with FTA;
- National Fire Protection Association (NFPA); and
- U. S. Coast Guard (USCG).

¹ 49 CFR Part 239.

The USCG reserves a security zone in all waters within 25 yards of critical Project structures, such as ventilation facilities. However, none of the Preferred Alternative's critical structures, including the new ventilation facilities, would be within 25 yards of the water; therefore, this does not apply.

Among the NFPA standards that apply to the Preferred Alternative is the NFPA Standard for Fixed Guideway Transit and Passenger Rail Systems (NFPA 130). NFPA 130 specifies the latest fire protection and life safety requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems. NFPA 130 identifies numerous factors, including emergency ventilation, emergency exits, walkways to evacuate a train, access to the nearest position of safety, and fire standpipe systems.

18.1.2 ANALYSIS TECHNIQUES

This analysis identifies existing system safety- and security-related requirements, policies, procedures, protocols, and infrastructure and identifies elements that would be incorporated into the Preferred Alternative to address fire-life safety and security in compliance with all applicable Federal, state, and local regulations. The analysis also identifies potential impacts and benefits of the safety and security elements that would be components of the Preferred Alternative.

18.1.3 STUDY AREA

The study area for this analysis is the Project site itself, as defined in Chapter 4, "Analysis Framework."

18.3 AFFECTED ENVIRONMENT: EXISTING CONDITIONS

Amtrak maintains the NEC and the North River Tunnel in accordance with FRA regulations and requirements as well as other applicable Federal regulations. Among the FRA regulations are requirements for inspection of tracks, signals, bridges, and rail equipment. Amtrak's capital program includes required upgrades to operating systems, such as the provision of a Positive Train Control (PTC) signaling system in the study area as mandated by the Rail Safety Improvement Act of 2008; such a system is currently in place in the North River Tunnel. NJ TRANSIT adheres to the same requirements as Amtrak for its rail equipment that operates on the NEC to and from Penn Station New York (PSNY).

Train operators on the NEC are required to sound train horns on the approach to the North River Tunnel near Tonnelle Avenue in the Meadowlands, to protect the safety of workers who may be working in the vicinity and need to cross the tracks near the substation. A sign beside the tracks at this location requires train operators on New York-bound trains to sound horns, in conformance with the Northeast Operating Rules Advisory Committee (NORAC), which has established a set of operating rules for railroads in North America. The NORAC rulebook is used by full and associate member railroads, located mostly in the Northeast U.S., including Amtrak and NJ TRANSIT. Trains leaving the tunnel must sound horns inside the tunnel as they approach this crossing.

NJ TRANSIT and Amtrak provide operating crews with security awareness training related to security along the NEC right-of-way. Both organizations have policies and protocols in place to react to security threats and emergency situations, including alternative service plans for the NEC if trains are unable to operate through the North River Tunnel or into PSNY. NJ TRANSIT and Amtrak work together to coordinate their approach to security threats and emergencies.



Additionally, a consolidated PSNY Emergency Preparedness Task Force² assesses threats and vulnerabilities at PSNY, conducts drills regularly, and coordinates safety and security activities of the various railroads that use PSNY. The PSNY Emergency Preparedness Task Force also ensures appropriate coordination among emergency responders and agencies within PSNY.

18.4 AFFECTED ENVIRONMENT: FUTURE CONDITIONS

Under future conditions, existing safety and security measures and procedures would continue to be in place and continued maintenance would be conducted and repairs made in the North River Tunnel to assure continued safe operations.

As described in more detail in Chapter 14, Greenhouse Gas Emissions and Resilience,” Section 14.3.3.5, by the 2033 analysis year for this EIS, absent the Preferred Alternative, two transportation-related resilience projects will provide added resilience against future flooding for transportation infrastructure in and near the Project site. These include Amtrak’s floodproofing project at the existing North River Tunnel’s Weehawken ventilation shaft and the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR) flood protection project, the West Side Yard Perimeter Protection Project.

The PSNY Emergency Preparedness Task Force will continue to assess threats and vulnerabilities at PSNY, conduct drills, and coordinate safety and security activities of the various stakeholders operating within PSNY: the operating railroads (Amtrak, Long Island Rail Road [LIRR], NJ TRANSIT) and their police and security forces including MTA Police, NJ TRANSIT Police, the New York City Police Department (NYPD), tenants in PSNY, and Madison Square Garden. The Amtrak Emergency Management and Corporate Security (EMCS) Regional Emergency Manager assigned to PSNY and the New York tunnel system leads the PSNY Emergency Preparedness Task Force— activities, and coordinates meetings. The PSNY Emergency Preparedness Task Force will continue to provide coordination among emergency responders and agencies. In addition, as part of a separate DHS-funded project, Amtrak recently completed an inventory of the intrusion security systems in PSNY and the tunnels leading to PSNY, and is now planning to install additional security equipment at key existing North River Tunnel access points. This initiative, also funded by DHS, will be for the benefit of the passenger rail carriers operating in PSNY (i.e., Amtrak, NJ TRANSIT, and LIRR).

18.5 IMPACTS OF NO ACTION ALTERNATIVE

For purposes of analysis in this EIS, FRA and NJ TRANSIT have assumed that with the No Action Alternative, the existing North River Tunnel would remain in service and continue to operate in its current condition at least through the EIS analysis year of 2033, with continued maintenance as necessary to address ongoing deterioration (as detailed in Chapter 1, “Purpose and Need”). The flood protection projects discussed above in Section 18.4 will provide some protection to the North River Tunnel from flooding and inundation, addressing some of the risk of flooding from storms like Superstorm Sandy and the increasing risk of flooding during weaker and more frequent storms

² PSNY Emergency Preparedness Task Force meetings are chaired by the Amtrak Emergency Management and Corporate Security (EMCS) Regional Emergency Manager, and consists of the following members: Amtrak, NJ TRANSIT, the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR), Amtrak Police, MTA Police, NJ TRANSIT Police, New York City Police Department, New York City Fire Department (FDNY), North Hudson Regional Fire-Rescue Department, New York City Office of Emergency Management, FRA, New York State Police, National Guard, New York State Division of Homeland Security and Emergency Services, the New York State Public Transportation Safety Board, Madison Square Garden, One Penn Plaza, Two Penn Plaza, and the United States Postal Service.

(storms of higher probability). However, without a full rehabilitation of the North River Tunnel, the existing tunnel components would remain compromised by damage to the tunnel caused by Superstorm Sandy and would continue to degrade. This deterioration combined with the tunnel's age and intensity of use would likely lead to increasing instability of rail operations in the tunnel, and the need for increasingly frequent unplanned maintenance and repairs. In addition, the existing tunnel components would be at risk of further damage from salt water incursion into the ballast and electronics, cables, and other infrastructure in the bench wall and on the tunnel walls should seawater intrusion occur again. With only a single passenger rail crossing of the Hudson River for the NEC, the No Action Alternative also would not provide redundancy to allow for continued railroad operations if operations in the existing North River Tunnel are compromised or impaired for any reason, such as flooding.

While the existing North River Tunnel is operational, existing safety and security measures and procedures would continue to be followed under the No Action Alternative. If the North River Tunnel were closed for repairs, safety and security measures now in place to secure the tunnel, would continue during the repairs. Therefore, no impacts to safety and security would occur under the No Action Alternative.

18.6 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE

During final design, construction, Project commissioning, and startup, the Project Sponsor will continue to develop detailed safety and security analyses and measures beyond the conceptual measures discussed in this chapter.

Safety and security impacts that could occur during construction of the Preferred Alternative relate to the need to keep the construction sites, materials, and equipment secure, and construction workers safe from natural events (e.g., severe storms, flooding, earthquakes), or emergencies caused by human error, mechanical failure, or intentional human intervention. The Preferred Alternative will address and avoid these potential impacts, as described below.

During construction of the Preferred Alternative, including construction of the new tunnel and its approach tracks in New Jersey and rehabilitation of the existing North River Tunnel, all construction sites would be secured at a minimum through the use of fencing or other passive security measures (e.g., security lighting, concrete bollards). In addition, security personnel, active security measures (e.g., cameras, intrusion detection), and strict adherence to procedural security measures (e.g., entry protocols into construction sites, inspection of materials) would also be employed at the construction sites. The Project contractor would be required to meet all applicable safety and security requirements, including those specified by Amtrak, NJ TRANSIT, and state and Federal agencies, including the New Jersey Department of Environmental Protection (NJDEP), the New York State Department of Environmental Conservation (NYSDEC), the New York City Department of Environmental Protection (NYCDEP), the Transportation Security Administration (TSA), the Federal Aviation Administration (FAA), the USCG, U.S. Environmental Protection Agency (EPA), and OSHA.

Safety and security measures would be employed during construction to ensure the safety of workers, including watchmen as needed, and ensuring that the required railroad safety training has been completed by all workers that would be in the vicinity of the active NEC tracks during construction of the Preferred Alternative. Safety measures during construction would also include conformance with all applicable aspects of the NORAC rulebook, to ensure worker safety on and near the active railroad right-of-way. Safety and security measures would also be developed in consultation with the West 30th Street Heliport operator and the FAA to ensure that protocols and materials handling and storage procedures are in place at construction proximate to the Heliport



to ensure that no debris or construction equipment or materials (e.g., loose soil, gravel, tarps, etc.) can become airborne and interfere with the safe operation of helicopters at the adjacent facility. Before beginning work, the Project contractor will be required to develop for review and approval a Safety and Security Plan (SSP) that will cover the worksites, as well as other work in its contract, if any. The SSP will be required to meet all relevant Federal and Amtrak MW 1000³ requirements for safe construction of track and signal infrastructure.

Safety and security would be coordinated with various Federal and state law enforcement and safety agencies including but not limited to DHS, TSA, FAA, New Jersey and New York State Police, Amtrak Police, NJ TRANSIT Police, MTA Police and PANYNJ Police; and local municipal police and fire departments including but not limited to: NYPD (including Counterterrorism Unit and Emergency Medical Services Unit), North Bergen Police (New Jersey), FDNY, North Hudson Regional Fire and Rescue (New Jersey), and New York City Office of Emergency Management. Safety and security measures would be developed to address natural events (e.g., severe storms, flooding, earthquakes), or emergencies caused by human error, mechanical failure, or intentional human intervention.

During final design, worker and public safety and security requirements, procedures and protocols would be identified in greater detail and included in Project design performance specifications for each phase of construction.

With these measures in place, construction of the Preferred Alternative would not result in adverse impacts to safety and security.

18.7 PERMANENT IMPACTS OF THE PREFERRED ALTERNATIVE

During final design, construction, Project commissioning, and startup, the Project Sponsor will continue to develop detailed safety and security analyses and measures beyond the conceptual measures discussed in this chapter. The lead Federal agency will be responsible for ensuring that the Project Sponsor implements these measures, which will be identified in the ROD.

During operation of the Preferred Alternative, the potential safety- and security-related impacts that could occur relate to keeping rail passengers, railroad employees, and equipment safe and secure from natural events (e.g., severe storms, flooding, earthquakes), or emergencies caused by human error, mechanical failure, fire, or intentional or unintentional human intervention. The Preferred Alternative is being designed to incorporate measures to address and avoid, minimize, and mitigate these potential impacts.

When the Preferred Alternative is complete and operational, all applicable FRA regulations and guidance relative to the operation of railroad infrastructure, including tracks, train signals (including PTC), tunnels and bridges, would be followed. All applicable Amtrak and NJ TRANSIT guidelines and standards would be followed.

Trains approaching the new tunnel portal would not be required to sound their horns, as they do for the North River Tunnel, because there would not be a worker crossing over the tracks for the new alignment. Similarly, trains exiting the tunnel would also not be required to sound their horns.

The fuel tank at the West 30th Street Heliport may be relocated permanently, but if it is returned to its current location near the new tunnel alignment, the Project Sponsor will provide physical protection around the tank, and will coordinate with the heliport operator with respect to tank

³ *Limits and Specifications for the Safety, Maintenance and Construction of Track, MW1000*, National Passenger Railroad Corporation (Amtrak), Revision 4, March 2013.

security and compliance with regulatory standards. Design and operation of the Preferred Alternative, including the new Hudson River Tunnel and the rehabilitated North River Tunnel would take into account NFPA 130 requirements, where applicable and practicable, and regulations, criteria and guidance provided by ANSI, APTA, ASCE, DHS agencies (e.g., TSA, DHS Protective Security Coordination Division, DHS Office of Cyber and Infrastructure Analysis, DHS National Infrastructure Simulation and Analysis Center, and DHS Science and Technology), OSHA, FRA, FTA, and USCG.

The design of the Preferred Alternative would include several safety and security systems and measures, including the following:

- **Supervisory Control and Data Acquisition (SCADA) system:** With the Preferred Alternative, Amtrak's existing SCADA system for centralized control of the signaling and electric traction systems, and central supervisory control systems for communications systems, security systems, and railroad utilities would be modified to incorporate the new Hudson River Tunnel systems. The SCADA systems would provide supervisory control systems for train control, electric traction, communications, tunnel ventilation, pump and flood gate control, fire-life safety, access control, and security systems.
- **Emergency Backup Power:** Substations at each of the three fan plants for the new Hudson River Tunnel would provide power to the fan plants and other railroad systems, and each substation would also have emergency backup power supplies.

The existing North River Tunnel has a backup power supply that is used for lighting, pumps, fire alarms, security, and a small communications facility. The existing North River Tunnel fans also have redundant power generation and distribution, which may be upgraded during the rehabilitation, based on final design.

- **Ventilation:** In accordance with NFPA 130, the new Hudson River Tunnel would have a ventilation system designed to bring fresh air into the tunnel, during normal operations and congested (i.e., perturbed) conditions, when trains are stopped or moving slowly for extended periods. The ventilation system would also control and exhaust hot air, gases, and smoke during a fire in the tunnel and/or other emergency conditions. The fans would be used to move smoke so that smoke-free emergency routes are available for safe evacuation of passengers and fire-fighting operations. Smoke would be pulled away from the tunnel or train fire to allow passengers to exit to the nearest cross passage away from the fire. Ventilation would provide tenable air within the tunnels in the event of a fire by controlling the air flow within separate ventilation zones, which would be controlled by the SCADA system. The system would permit passengers to egress to the nearest cross passageway (away from the fire) by providing a smoke-free path while the smoke is removed. The ventilation zones would be large enough to accommodate the longest trains that would operate in the tunnel so that all trains can travel in separate zones and no zone would accommodate two trains at the same time. This would isolate smoke and hot gases within an area occupied by an incident train. Ventilation would be provided from the new tunnel's three fan plants, working together to move fresh air toward the incident train and smoke away from it.
- **Emergency walkways and egress and access:** Both the new Hudson River Tunnel and the rehabilitated North River Tunnel would have emergency egress and access walkways. Each tube of both tunnels would have an access walkway at the level of doors of the train as well as another, lower walkway for emergency responders. The higher walkway would have ladders at regular intervals to allow for access to and from the trackbed below. Access to trains by emergency responders would also be available from the low walkway. Access/egress from the low walkway to the high walkway would also be provided by stairs at the ventilation shafts. Deployable ship-stair type ladders would be provided along the high walkway for railroad personnel to gain access from track level.

The new Hudson River Tunnel would have cross passages approximately every 750 feet throughout the length of the tunnel. The egress walkway would permit passengers to exit a tube affected by a fire or smoke incident and enter the other tube. Fire-rated doors at the cross passages would separate the tubes. Emergency exits would be designed in accordance with NFPA 130 as well as NFPA 101, Life Safety Code. Emergency exits would also provide tunnel access for emergency responders. Egress and access points to the Hudson River Tunnel would be at the Hoboken and Twelfth Avenue fan plants and also at the Palisades portal. When the tunnel ventilation system is activated in a fire emergency, the proposed tunnel ventilation design would prevent infiltration of smoke and hot gasses into the emergency stairways in the vent shafts at the access and egress locations.

For the North River Tunnel, cross passages are located approximately every 100 feet between the two tubes of the North River Tunnel in the hard rock section of the tunnel beneath the Palisades and another cross passage is located at the Manhattan shoreline. Emergency egress and access is available at the North River Tunnel's portals and the Weehawken and Eleventh Avenue ventilation shafts.

In the new tunnel and rehabilitated tunnel, designated access locations would have fire alarm control panels and emergency communications systems. Exits to street level would consist of fire-resistant enclosed stairways and passageways. All emergency exits would be clearly marked and identified, with emergency lighting at the point of exit; additional signage at intervals within the tunnel identifying the distance to the next exit point in either direction.

- **Third rail power:** The new tunnel and rehabilitated tunnel would have an electrified third rail for rescue equipment. While generally not used to power trains (Amtrak and NJ TRANSIT trains use overhead catenary power), the third rail could be utilized in an emergency to rescue disabled trains.
- **Lighting:** The new and rehabilitated tunnels would have lighting that complies with the relevant requirements of the regulatory agencies, and satisfies operational and safety requirements of the agencies and operating railroads. This includes backup power supplies and uninterruptable power source (UPS) systems to assure continuous illumination in emergency situations.
- **Emergency communication/blue light stations:** Both the new and rehabilitated tunnels would have an emergency communication system with blue light stations at emergency exits and cross passageways that have an emergency phone for emergency personnel to communicate with Amtrak's Operations Control Center. Blue light stations also provide access to firefighting equipment including fire extinguishers and standpipe connections. Each blue light station would have a unique identification code to aid in response.
- **Fire suppression systems:** Both the new Hudson River Tunnel and the existing North River Tunnel would have new standpipe systems, including standpipes to provide water for firefighting and drains sized to accommodate firefighting activities. These systems would be designed in accordance with applicable fire codes and Amtrak requirements. In addition, both the new Hudson River Tunnel and the existing North River Tunnel would have new automated fire detection systems.
- **Positive Train Control (PTC) system:** Both the new Hudson River Tunnel and the rehabilitated North River Tunnel would have a PTC system, consistent with Amtrak and NJ TRANSIT existing railroad operations. The PTC is a transponder-based train control system that prevents train accidents by automatically controlling train speeds and movements should a train operator fail to take appropriate action for the conditions at hand. On the NEC, Amtrak uses a PTC system consisting of the Advanced Civil Speed Enforcement System (ACSES II), overlaid on Amtrak's Cab Signal/Automatic Train Control system. The system is in the North River Tunnel and will also be in the new Hudson River Tunnel.

- **Other electronics:** Both the new Hudson River Tunnel and the rehabilitated North River Tunnel would include closed-circuit television monitoring, and other safety and security systems. For the rehabilitated North River Tunnel, the existing in-tunnel monitoring and security systems will be replaced with modern technology.
- **Training and operational coordination:** Amtrak will coordinate with the FDNY and emergency responders in New Jersey (the North Hudson Regional Fire Rescue and Hoboken Fire Rescue) to develop a Response Plan in advance of tunnel construction and operation. Amtrak and NJ TRANSIT would continue to ensure the proper security awareness training of operating crews with security awareness information and training related to potential threats to safety and security along the NEC right-of-way. Both organizations would continue to have policies and protocols in place to react to security threats and emergency situations, including alternative service plans for the NEC if operations were disrupted. NJ TRANSIT and Amtrak would continue to work together to coordinate their approach to security threats and emergencies. The PSSTF would continue to assess threats and vulnerabilities at PSNY, conduct drills, and coordinate safety and security activities of the various stakeholders. The PSNY Fire Life Safety Committee would continue to provide appropriate coordination among emergency responders and agencies.

With these measures in place, the Preferred Alternative would result in permanent improved safety and security for Amtrak and NJ TRANSIT passengers, employees, equipment, and infrastructure between Secaucus Junction Station and PSNY.

18.8 MEASURES TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

The Preferred Alternative will be designed to meet Federal, state, and local standards related to fire-life safety. With those features, no adverse impacts related to safety would result and no additional mitigation is required. *