



FINAL ENVIRONMENTAL IMPACT STATEMENT AND FINAL SECTION 4(f) EVALUATION

## APPENDIX 21

# Coastal Zone Consistency

### **21-1: Coastal Zone Consistency: Agency Correspondence**

### **21-2: Coastal Assessment Forms Submitted for Concurrence in 2017**



FINAL ENVIRONMENTAL IMPACT STATEMENT AND FINAL SECTION 4(f) EVALUATION

APPENDIX 21-1

# **Coastal Zone Consistency: Agency Correspondence**



U.S. Department  
of Transportation

**Federal Railroad  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

May 12, 2017

Virginia Kop'kash  
Assistant Commissioner  
New Jersey Department of Environmental Protection  
Division of Land Use Management  
401 East State Street, 7th Floor  
Mail Code 401-07B  
Trenton, NJ 08625-0420

Re: Request for concurrence with CZMA Consistency Review for the Hudson Tunnel Project, Secaucus, New Jersey, to Manhattan, New York

Dear Ms. Kop'kash:

The Federal Railroad Administration (FRA) and New Jersey Transit Corporation (NJ TRANSIT) are acting as joint lead agencies for the preparation of a Draft Environmental Impact Statement (EIS), in compliance with the National Environmental Policy Act of 1969 (NEPA), for the Hudson Tunnel Project (Project). In accordance with the Federal Consistency Requirements of the Coastal Zone Management Act, FRA has conducted a Coastal Zone Management Federal Consistency Review for the Preferred Alternative for the Project. This letter, and the enclosed analysis of consistency with relevant rules from the Coastal Zone Management Rules under N.J.A.C. 7:7, comprise the basis for our consistency determination.

The Preferred Alternative includes construction of a new two-track rail tunnel and rehabilitation of the existing passenger rail tunnel beneath the Hudson River between New Jersey and New York Penn Station. The existing passenger rail tunnel, the North River Tunnel, is currently used by Amtrak for intercity passenger rail service and by NJ TRANSIT for commuter rail service.

#### **PROPOSED PROJECT**

The Preferred Alternative for the Project is the construction of a new two-track rail tunnel (the Hudson River Tunnel) running approximately parallel to the existing rail tunnel beneath the Hudson River (the North River Tunnel), extending from the Northeast Corridor (NEC) in Secaucus, New Jersey, beneath the Palisades (North Bergen and Union City) and the Hoboken waterfront area, and beneath the Hudson River to connect to the existing approach tracks at Penn Station New York (PSNY) (see **Figure 1**). All above-grade components of the Preferred Alternative for the Project in New Jersey occur within New Jersey's inland coastal zone boundary. A small portion of the Project in Union City, New Jersey occurs outside of this boundary; the Project in this location will

be entirely below-grade. The Preferred Alternative will also include rehabilitation of the existing North River Tunnel. In October 2012, Superstorm Sandy inundated the North River Tunnel and today the tunnel remains compromised. Despite ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel. To perform the needed rehabilitation in the existing North River Tunnel, each tube of the tunnel will need to be closed for more than a year; if no new Hudson River passenger rail crossing is provided, closing a tube of the existing tunnel for rehabilitation would reduce the number of trains that could serve PSNY to a fraction of current service. In order to ensure rehabilitation is accomplished without notable reductions in weekday service, the Project will include construction of two new rail tubes beneath the Hudson River (the Hudson Tunnel) that can maintain the existing level of train service while the damaged North River Tunnel tubes are taken out of service one at a time for rehabilitation. Once the North River Tunnel rehabilitation is complete, both the old and new tunnels will be in service, providing redundant capability and increased operational flexibility for Amtrak and NJ TRANSIT.

Construction activities will include: new approach tracks in Secaucus and North Bergen, NJ; construction of a new tunnel portal and staging at Tonnelle Avenue in North Bergen, NJ; construction of a shaft, staging, and fan plant site in Hoboken, NJ; construction of the new Hudson Tunnel by tunnel boring machine (TBM); in-water ground improvement over 1.5 acres of sediment in the Hudson River; ground improvement at the Manhattan shoreline; construction of a shaft, staging, and fan plant site at Twelfth Avenue; and rehabilitation of the existing North River Tunnel. Construction activities associated with the new Hudson Tunnel will begin in 2019 and will be completed in 2026. Rehabilitation of the existing tunnel will begin in 2026 and be completed in early 2030.

#### *NEW JERSEY APPROACH TRACKS*

The western portion of the new surface alignment from Secaucus to North Bergen will include: construction of a new raised right-of-way (including segments of retained fill, sloped embankment, and viaducts); an adjacent access road in one segment; installation of new tracks and modification of existing tracks; installation of drainage systems; and installation of signals, power supply, and other related rail infrastructure. Construction of the embankment support structures will involve earthmoving and grading, bringing large quantities of earth, rock, and additional material to allow for compression and settling to adequately support the track system. In areas of retained fill and retained cut, retaining walls will be installed on foundations supported by deep piles. Two pile-supported bridges will be required, one over Secaucus Road and one over the Conrail and NYS&W tracks. Piles will be installed along the entire New Jersey alignment to support the associated overhead catenary, signals, communications, and other rail systems. Temporary construction staging areas and temporary construction access roads will be required for this work. A construction staging site will be established to the east and west of Tonnelle Avenue in North Bergen, where the alignment of the Preferred Alternative will cross beneath that roadway, and will be used for the construction of the surface tracks and for the tunnel beneath the Palisades. A new 20-foot-wide permanent access road required for emergency responders will be constructed along the south side of the new tracks in the sloped embankment section east of Secaucus Road.

### *HUDSON RIVER TUNNEL*

The tunnel section of the Preferred Alternative will begin at the western face of the Palisades at a new excavated tunnel portal. The tunnel through the Palisades will consist of two approximately 5,130-foot-long tubes, each constructed by a TBM operating eastward. The initial 50 feet of the tunnel will be constructed using controlled drilling and blasting, to excavate a starter tunnel in which the TBM can launch. Temporary fire-life safety systems will be installed within the new tunnel as it is excavated to protect workers during construction. This will include temporary tunnel ventilation, powered by large fans that will operate continuously during construction activities. Excavated rock and soil will be removed and transferred to the Tonnelle Avenue staging site, and either reused or disposed of at an appropriate off-site location.

A new ventilation shaft and fan plant for the Hudson Tunnel at the Hoboken shaft site will be used as a tunnel access point and staging site during construction of both the Palisades and Hudson River sections of the tunnel. The 130-foot-diameter vertical ventilation shaft will be excavated from the surface through earth and rock, and support walls will be installed to support the sides of the excavated area. The rock portion of the shaft and starter tubes at the bottom of the shaft will be excavated using controlled drill and blast. A soft-soil TBM, which will be used to construct the portion of the tunnel beneath the Hudson River, will be launched from the Palisades section of the tunnel. Ground improvement through injection of grout into the soil and voids in the rock will be used to prepare the ground for the TBMs. Once the Hoboken shaft is completed, it will be used as the terminus of the Palisades section of the tunnel. Following completion of the Hudson River section of the tunnel, construction of emergency access/egress components of the shaft and the ventilation fan plant building will occur via typical construction methods.

The tunnel beneath Hoboken and the Hudson River will consist of two approximately 7,200-foot-long tubes, each constructed by a TBM operating eastward. Underpinning and ground improvement through jet grout injection will be conducted along affected portions of the alignment in this location. All river tunnel construction work, with the exception of the in-water ground improvement discussed below, will be conducted underground beneath the river bed. Excavated material from the tunnel and cross passages will be removed at the rear of the TBMs and brought out of the tunnel at the Hoboken shaft site.

### *NORTH RIVER TUNNEL REHABILITATION*

Once construction of both tubes of the new tunnel is complete and Amtrak and NJ TRANSIT services are shifted to the new tunnel, rehabilitation of the North River Tunnel will begin in one tube at a time. The Tonnelle Avenue staging area will be used to transport debris and construction materials. Rehabilitation work will include reconstruction of the bench walls and track system; cabling work in the duct banks, along the tunnel crown, and above the bench walls; and any necessary work to address cracking and spalling on the interior face of the tunnel wall. Work will begin at the Manhattan end of the tunnel and move westward toward the portal in North Bergen. Virtually all of this work will occur underground, with only the materials delivery and debris removal being visible at the Tonnelle Avenue staging site. Upon completion of all rehabilitation activities, the rehabilitated tube will be recommissioned and returned to active rail

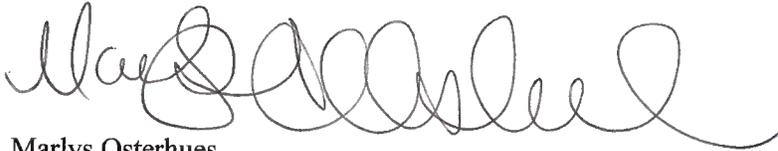
service, and rehabilitation activities in the second tube will commence.

**COMPLIANCE**

FRA has determined that the Project is consistent with the New Jersey Coastal Zone Management Rules (N.J.A.C. 7:7) to the maximum extent practicable. This letter and the supporting information provided in the attached assessment of the relevant rules (excerpted from the preliminary Draft Environmental Impact Statement) are the basis of our consistency determination. FRA is requesting concurrence from your office with our federal consistency determination made in accordance with 15 CFR 930.36.

If you have questions or require additional information regarding this request, please contact Amishi Castelli at [Amishi.Castelli@dot.gov](mailto:Amishi.Castelli@dot.gov) or [617-431-0416](tel:617-431-0416). Thank you for your time and consideration.

Sincerely,

A handwritten signature in cursive script, appearing to read "Marlys Osterhues".

Marlys Osterhues

Chief of Environmental and Corridor Planning

Federal Railroad Administration

Encl (3)

cc: A. Castelli, FRA

R. Palladino, NJ TRANSIT





## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE  
Governor  
Commissioner

Division of Land Use Regulation  
Mail Code 501-02A  
P.O. Box 420  
Trenton, New Jersey, 08625  
[www.nj.gov/dep/landuse](http://www.nj.gov/dep/landuse)

BOB MARTIN

KIM GUADAGNO  
Lt. Governor

JUN 30 2017

Marlys Osterhues, Chief  
Environment and Corridor Planning Division  
Office of Program Delivery  
USDOT Federal Railroad Administration  
1200 New Jersey Avenue, SE  
Washington, DC 20590

**CERTIFIED MAIL**

RE: Federal Consistency Determination  
File No.: 0909-17-0001.1 CDT 170001  
Hudson River Tunnel Project  
Secaucus, North Bergen,  
Hudson County

Dear Mrs. Osterhues:

The New Jersey Department of Environmental Protection (NJDEP), Division of Land Use Regulation (Division), acting under Section 307 of the Federal Coastal Zone Management Act (P.L. 92-583) as amended, finds the above referenced request consistent with to New Jersey Rules on Coastal Zone Management.

### **Project Description**

The Federal Railroad Administration and New Jersey Transit Corporation propose to construct a new two track rail tunnel (the Hudson River Tunnel) running parallel to the existing rail tunnel beneath the Hudson River (the North River Tunnel), extending from the Northeast Corridor (NEC) in Secaucus, New Jersey, continuing beneath the Palisades and the Hoboken waterfront area. The new tracks will travel beneath the Hudson River to connect to the existing approach tracks at Penn Station New York (PSNY). The work will also include the rehabilitation of the existing North River Tunnel following the construction of the Hudson River Tunnel. Construction activities west of the Palisades are not subject to the Coastal Zone Management Rules N.J.A.C. 7:7-1.1 *et seq.*, (amended on October 17, 2016) or this Federal Consistency Determination and will require regulatory review under the Flood Hazard Control Act (N.J.S.A. 58:16A-50) and Water Pollution Control Act (N.J.S.A. 58:10A)

The Division has determined that the project is consistent with New Jersey's Coastal Zone Management Rules N.J.A.C. 7:7-1.1 *et seq.*, (amended on October 17 2016), and the applicable Rules guiding issuance for a Section 401 Water Quality Certificate.

This Federal Consistency Determination is limited to the extent of the project located within the Coastal Zone Management Areas, specifically the new Hudson River Tunnel and existing North River Tunnel. This Federal Consistency Determination does not cover construction activities within non-tidal Flood Hazard Areas or Freshwater Wetlands.

This Federal Consistency is authorized pursuant to all parties following the guidelines set forth, and agreed upon, for the construction of the proposed structures. Pursuant to 15 CFR 930.44, the Division reserves the right to object and request remedial action if this proposal is conducted in a manner, or is having an effect on, the coastal zone that is substantially different than originally proposed.

Thank you for your attention to and cooperation with New Jersey's Coastal Zone Management Program. If you have any questions regarding this determination, please do not hesitate to call Matthew Resnick of our staff at (609) 777-3955.

Sincerely,



Christopher Jones, Manger  
Bureau of Urban Growth and Redevelopment  
Division of Land Use Regulation

6/30/17  
Date

C:



U.S. Department  
of Transportation

**Federal Railroad  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

May 12, 2017

Jeffrey Zappieri  
Supervisor, Consistency Review Unit  
Division of Coastal Resources  
New York State Department of State  
One Commerce Plaza  
99 Washington Avenue  
Albany, NY 12231-0001

Re: Request for concurrence with CZMA Consistency Review for the Hudson Tunnel Project, Secaucus, New Jersey, to Manhattan, New York

Dear Mr. Zappieri:

The Federal Railroad Administration (FRA) and New Jersey Transit Corporation (NJ TRANSIT) are acting as joint lead agencies for the preparation of a Draft Environmental Impact Statement (EIS), in compliance with the National Environmental Policy Act of 1969 (NEPA), for the Hudson Tunnel Project (Project). In accordance with the Federal Consistency Requirements of the Coastal Zone Management Act, FRA has conducted a Coastal Zone Management Federal Consistency Review for the Preferred Alternative for the Project. This letter, and the enclosed analysis of consistency with relevant rules from the Coastal Zone Management Rules under N.J.A.C. 7:7, comprise the basis for our consistency determination.

The Preferred Alternative includes construction of a new two-track rail tunnel and rehabilitation of the existing passenger rail tunnel beneath the Hudson River between New Jersey and New York Penn Station. The existing passenger rail tunnel, the North River Tunnel, is currently used by Amtrak for intercity passenger rail service and by NJ TRANSIT for commuter rail service. Enclosed with this letter are the Federal and New York City Waterfront Revitalization Program (WRP) Coastal Assessment Forms, including an addendum analyzing the consistency of the Project with the relevant policies from the New York City WRP.

#### **PROPOSED PROJECT**

The Preferred Alternative for the Project is the construction of a new two-track rail tunnel (the Hudson River Tunnel) running approximately parallel to the existing rail tunnel beneath the Hudson River (the North River Tunnel), extending from the Northeast Corridor (NEC) in Secaucus, New Jersey, beneath the Palisades (North Bergen and Union City) and the Hoboken waterfront area, and beneath the Hudson River to connect

to the existing approach tracks at Penn Station New York (PSNY) (see **Figure 1**). The Preferred Alternative will also include rehabilitation of the existing North River Tunnel. In October 2012, Superstorm Sandy inundated the North River Tunnel and today the tunnel remains compromised. Despite ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel. To perform the needed rehabilitation in the existing North River Tunnel, each tube of the tunnel will need to be closed for more than a year; if no new Hudson River passenger rail crossing is provided, closing a tube of the existing tunnel for rehabilitation would reduce the number of trains that could serve PSNY to a fraction of current service. In order to ensure rehabilitation is accomplished without notable reductions in weekday service, the Project will include construction of two new rail tubes beneath the Hudson River (the Hudson Tunnel) that can maintain the existing level of train service while the damaged North River Tunnel tubes are taken out of service one at a time for rehabilitation. Once the North River Tunnel rehabilitation is complete, both the old and new tunnels will be in service, providing redundant capability and increased operational flexibility for Amtrak and NJ TRANSIT.

Construction activities will include: new approach tracks in Secaucus and North Bergen, NJ; construction of a new tunnel portal and staging at Tonelle Avenue in North Bergen, NJ; construction of a shaft, staging, and fan plant site in Hoboken, NJ; construction of the new Hudson Tunnel by tunnel boring machine (TBM); in-water ground improvement over 1.5 acres of sediment in the Hudson River; ground improvement at the Manhattan shoreline; construction of a shaft, staging, and fan plant site at Twelfth Avenue; and rehabilitation of the existing North River Tunnel. Construction activities associated with the new Hudson Tunnel will begin in 2019 and will be completed in 2026. Rehabilitation of the existing tunnel will begin in 2026 and be completed in early 2030.

#### *HUDSON RIVER TUNNEL*

The tunnel section of the Preferred Alternative will begin at the western face of the Palisades in New Jersey at a new excavated tunnel portal. The tunnel through the Palisades will consist of two approximately 5,130-foot-long tubes, each constructed by a TBM operating eastward. The initial 50 feet of the tunnel will be constructed using controlled drilling and blasting, to excavate a starter tunnel in which the TBM can launch. Temporary fire-life safety systems will be installed within the new tunnel as it is excavated to protect workers during construction. Excavated rock and soil will be removed and transferred to the Tonelle Avenue staging site in New Jersey, and either reused or disposed of at an appropriate off-site location.

The tunnel beneath Hoboken and the Hudson River will consist of two approximately 7,200-foot-long tubes, each constructed by a TBM operating eastward. Underpinning and ground improvement through jet grout injection will be conducted along affected portions of the alignment in this location. All river tunnel construction work, with the exception of the in-water ground improvement discussed below, will be conducted underground beneath the river bed. Excavated material from the tunnel and cross passages will be removed at the rear of the TBMs and brought out of the tunnel at the Hoboken New Jersey shaft site.

### *IN-WATER GROUND IMPROVEMENT*

Beginning about 200 feet west of the New York pierhead line, an approximately 500-foot-long by 120-foot-wide section of the tunnel will be less than 10 feet below the bottom of the river. In this 1.5-acre area (the "low-cover area"), the river bottom will need to be modified through the addition of grout to the soil to provide stability to the ground above the tunnel (i.e., in-water ground improvement). In order to complete the in-water ground improvement using jet-grouting, a sheet pile cofferdam system will be installed via barge across the 550-foot length of the low-cover area; the cofferdams will be removed upon completion of jet grouting. This will be completed in three stages, using three separate cofferdam systems, each enclosing about a third of the work zone. The work will begin in the section closest to the Manhattan shore and move outward towards the navigation channel. In order to minimize the area of water that is disturbed at any one time, only one cofferdam will be present at any given time for the Preferred Alternative. Stages 1 and 2 of the in-water work will each take approximately 4.5 months to complete, each within a cofferdam comprising 24,000 square feet of open water (Stage 2 will begin when the cofferdam for Stage 1 has been removed). Stage 3 will take place within an 18,000-square-foot cofferdam and will be completed over 3.5 months following the removal of the Stage 2 cofferdam.

The sheet pile cofferdam walls will be installed via vibratory hammer based on up to four barges moored-in-place. Driving of the sheet pile cofferdam walls is expected to occur for 8 hours per day, 5 days per week, and for 3-4 weeks for each of the three cofferdam sections. Removal of the sheet pile walls will take 1-2 weeks and will also be conducted using a vibratory hammer. No driving or removal of sheet pile will occur between November 1st and April 30th. The areas within the three cofferdam segments will not be fully dewatered prior to construction activities; work will be conducted in-the-wet, in waters a few feet lower than that outside the cofferdam.

### *MANHATTAN SHORELINE GROUND IMPROVEMENT*

The TBMs will continue below the Hudson River bottom, through the foundations of the Manhattan bulkhead, beneath Hudson River Park and Twelfth Avenue, and to the Manhattan shaft site at Twelfth Avenue, where the TBMs will be removed. In advance of the TBMs passing through, ground improvements will be made in the Manhattan bulkhead area to improve tunneling conditions and avoid cut-and-cover construction through this area. Cement grout will be installed from the land side of the bulkhead, which consists of riprap, cobbles, and timber support piles, to fill large voids and improve stability prior to ground freezing. To allow tunneling beneath the surface, the soft soils in the Manhattan waterfront zone will be treated through ground freezing, a technique that involves installation of a network of underground pipes and then circulation of a cold liquid through the pipe network until the ground around the pipes freezes solid. The pipes will be installed vertically and diagonally to minimize surface disturbance. Freeze plants, typically housed within one or two work trailers, will be temporarily located on the nearby Twelfth Avenue staging site and/or within the West 30th Street Heliport.

### *MANHATTAN SHAFT AND FAN PLANT SITES AND TRACK CONNECTIONS*

The Manhattan shaft site is located on the east side of Twelfth Avenue between West 29th and West 30th Streets. A vertical shaft will be excavated from the surface to the

depth of the new tunnel, and a slurry plant will be located on the site to support the creation of slurry walls to support the shaft. Once the ventilation shaft is completed, the site will be used for staging of the tunnel segment from the shaft to the median of Twelfth Avenue, which will be conducted via sequential excavation method (SEM). Cut-and-cover construction will be required to cross West 30th Street and Tenth Avenue, near the connection to existing PSNY tracks. A fan plant to provide ventilation for the new tunnel segment from the Twelfth Avenue shaft to the new Manhattan portal at Tenth Avenue will be constructed near Tenth Avenue within an existing Amtrak easement area above the tracks of the A Yard and beneath the Lerner Building. Minor excavation and track modifications will be necessary to connect the Preferred Alternative to the existing track system at PSNY.

#### *NORTH RIVER TUNNEL REHABILITATION*

Once construction of both tubes of the new tunnel is complete and Amtrak and NJ TRANSIT services are shifted to the new tunnel, rehabilitation of the North River Tunnel will begin in one tube at a time. The Tonelle Avenue New Jersey staging area will be used to transport debris and construction materials. Rehabilitation work will include reconstruction of the bench walls and track system; cabling work in the duct banks, along the tunnel crown, and above the bench walls; and any necessary work to address cracking and spalling on the interior face of the tunnel wall. Work will begin at the Manhattan end of the tunnel and move westward toward the portal in North Bergen. Virtually all of this work will occur underground, with only the materials delivery and debris removal being visible at the Tonelle Avenue staging site. Upon completion of all rehabilitation activities, the rehabilitated tube will be recommissioned and returned to active rail service, and rehabilitation activities in the second tube will commence.

#### **COMPLIANCE**

FRA has determined that the Project is consistent with the New York coastal program policies and promotes the New York City Waterfront Revitalization Program policies to the maximum extent practicable. This letter and the supporting information provided in the attached Consistency Assessment Forms and assessment of the New York State Coastal management Policies and the New York City Waterfront Revitalization Program Policies (excerpt from the preliminary Draft Environmental Impact Statement) are the basis of our consistency determination. FRA is requesting concurrence from your office with our federal consistency determination made in accordance with 15 CFR 930.36.

If you have questions or require additional information regarding this request, please contact Amishi Castelli at [Amishi.Castelli@dot.gov](mailto:Amishi.Castelli@dot.gov) or [617-431-0416](tel:617-431-0416). Thank you for your time and consideration.

Sincerely,



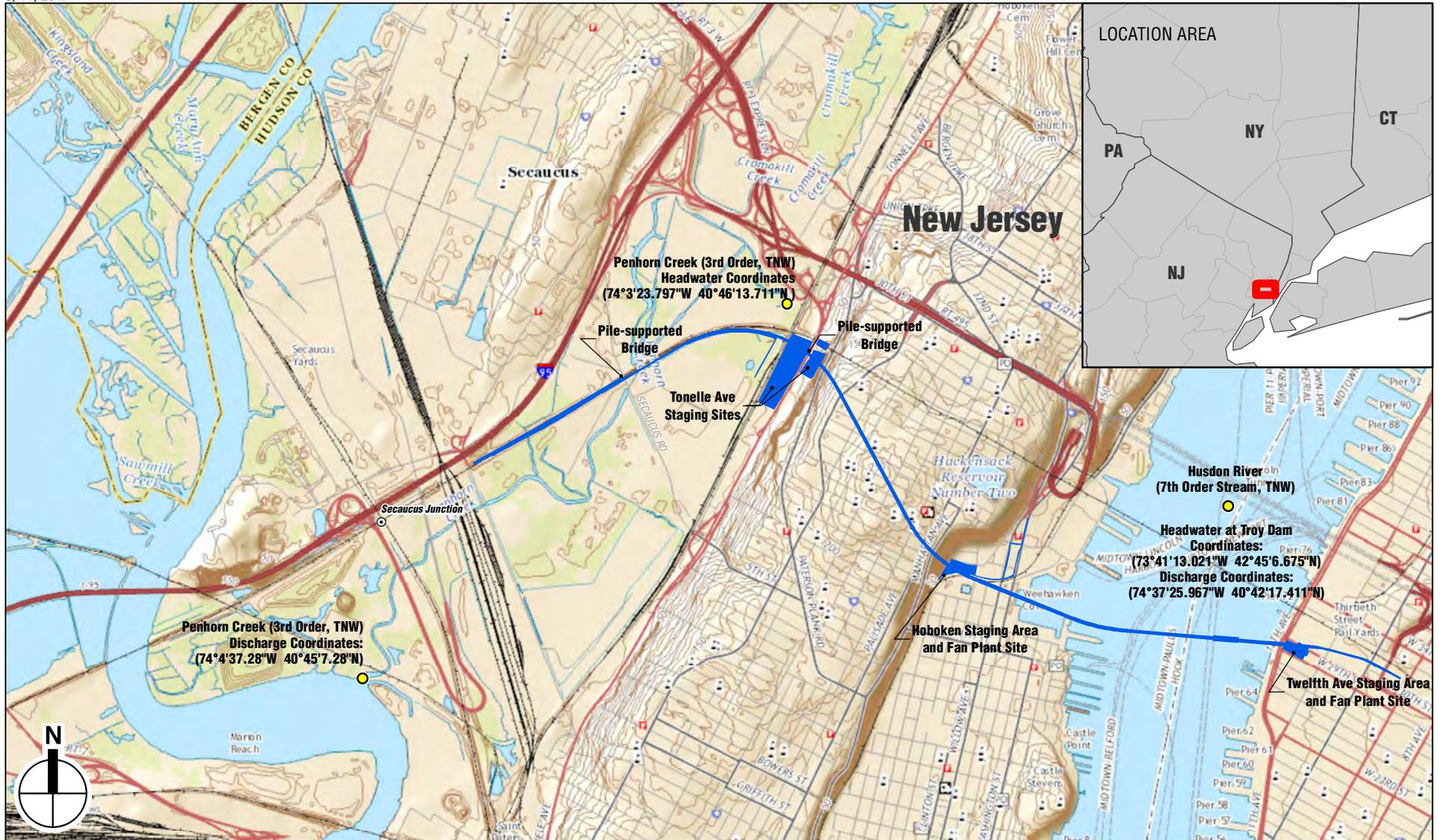
Marlys Osterhues

Chief of Environmental and Corridor Planning

Federal Railroad Administration

Encl (3)

cc: A. Castelli, FRA



Project Construction and Staging Areas



Project Location  
USGS 7.5 Minute Topographic Map  
Weehawken Quad and Central Park Quad  
**Figure 1**

STATE OF NEW YORK  
**DEPARTMENT OF STATE**

ONE COMMERCE PLAZA  
99 WASHINGTON AVENUE  
ALBANY, NY 12231-0001  
WWW.DOS.NY.GOV

ANDREW M. CUOMO  
GOVERNOR

ROSSANA ROSADO  
SECRETARY OF STATE

January 02, 2019

Timothy Hand for  
The Gateway Trans-Hudson Partnership  
C/O AECOM  
30 Knightsbridge Rd, Suite 520  
Piscataway, NJ 08854

Re: F-2018-0366  
U.S. Army Corps of Engineers/ NY District Permit  
Application – Gateway Trans Hudson Partnership  
Hudson Tunnel Project – Repairs to existing North River  
Tunnel and construction of new adjacent rail tunnel under the  
Hudson River  
Hudson River, City of NY, NY County.  
**Concurrence with Consistency Certification**

Dear Mr. Hand:

The Department of State has completed its review of your consistency certification regarding the consistency of the above-referenced activity with the New York Coastal Management Program.

Pursuant to 15 CFR Part 930.62, and based upon the project information submitted, the Department of State concurs with your consistency certification for this activity. This concurrence is without prejudice to and does not obviate the need to obtain all other applicable licenses, permits, or other forms of authorization or approval that may be required pursuant to existing State statutes.

Sincerely,



Gregory L. Capobianco  
Office of Planning, Development and  
Community Infrastructure

GLC/mm

cc: COE/ NY District – Steve Ryba  
DEC Region 2 – Steve Watts



Department  
of State



FINAL ENVIRONMENTAL IMPACT STATEMENT AND FINAL SECTION 4(f) EVALUATION

APPENDIX 21-2

# **Coastal Assessment Forms Submitted for Concurrence in 2017**

NEW YORK STATE DEPARTMENT OF STATE  
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: Mohammed Nasim, P.E., Amtrak

2. Address: 30th Street Station, 2955 Market Street-4S-059 Philadelphia, PA 19104

3. Telephone: Area Code ( ) 973-856-0321

B. PROPOSED ACTIVITY

1. Brief description of activity:

**The Hudson Tunnel Project (the "Project" and "Preferred Alternative") would consist of construction of a new rail tunnel under the Hudson River, including railroad infrastructure in New Jersey and New York connecting the new rail tunnel to the existing Northeast Corridor (NEC), and rehabilitation of the existing NEC Hudson River tunnel (the North River Tunnel) beneath the Hudson River. In order to maintain the existing level of train service while the damaged North River Tunnel tubes are taken out of service one at a time for rehabilitation, the Project would include construction of two new rail tubes beneath the Hudson River (the "Hudson River Tunnel"). The new two-track tunnel would be approximately parallel to the North River Tunnel, extending from the NEC in Secaucus, New Jersey, beneath the Palisades and Hoboken waterfront area, and beneath the Hudson River to connect to the existing approach tracks that lead to Penn Station New York (PSNY). In New York City, the Project would require: 1) a new tunnel alignment from the Manhattan bulkhead to the north side of West 30th Street, where it would connect to a concrete tunnel box being constructed as a separate project alongside the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR) John D. Caemmerer West Side Yard; 2) a new tunnel alignment continuing from that concrete tunnel box beneath Tenth Avenue to connect to the existing approach tracks that connect to PSNY; 3) new tracks within that concrete tunnel box; 4) a ventilation shaft and associated fan plant near Twelfth Avenue between West 29th and 30th Streets; and 5) a fan plant beneath and within the building at 450 West 33rd Street (on the east side of Tenth Avenue between 31st and 33rd Streets, beneath the building located at 450 West 33rd Street), which spans across the rail right-of-way. Surface construction would take place at the Twelfth Avenue shaft and fan plant site and at West 30th Street and Tenth Avenue for the tunnel alignment. The Hudson River Tunnel would be constructed using a combination of four techniques: tunnel boring machine, Sequential Excavation Method, conventional mining including "drill-and-blast," and supported excavation.**

2. Purpose of activity:

The Project is intended to preserve the current functionality of the NEC’s Hudson River rail crossing between New Jersey and New York and strengthen the resilience of the NEC, while maintaining uninterrupted commuter and intercity rail service during tunnel rehabilitation. The existing North River Tunnel is a critical NEC asset and is the only intercity passenger rail crossing into New York City from New Jersey and areas west and south. Service reliability through the tunnel was already suboptimal due to the tunnel’s age and antiquated standards, and was further compromised by inundation from Superstorm Sandy in 2012. Today the tunnel remains compromised. The North River Tunnel is currently safe for use by Amtrak and NJ TRANSIT trains traveling between New Jersey and New York City and beyond. However, it is in poor condition as a result of the storm damage and has required emergency maintenance that disrupts service for hundreds of thousands of rail passengers throughout the region. Despite the ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel. Rehabilitation would require closure of each tunnel tube, one at a time. If no new Hudson River rail crossing is provided during closure and rehabilitation of the North River Tunnel, the number of trains that could serve PSNY would be substantially reduced, and existing levels of train service would be disrupted. Once the North River Tunnel rehabilitation is complete, both the old and new tunnels would be in service, providing redundant capability and increased operational flexibility for Amtrak and NJ TRANSIT.

3. Location of activity

<u>New York</u> County	<u>New York City</u> City, Town, or Village	<u>Between West 29th and West 33rd Streets, Hudson River to approximately Ninth Avenue</u> Street or Site Description
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4. Type of federal permit/license required: Section 404 CWA, Section 10 Rivers and Harbors

5. Federal application number, if known: NAN-2016-01166-WCA

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application number, if known:

NYSDEC Article 15 (required)

C. COASTAL ASSESSMENT Check either “YES” or “NO” for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:

YES/NO

- a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)
- b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)
- c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)
- d. Reduction of existing or potential public access to or along coastal waters? (19, 20)
- e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9, 10)
- f. Siting of a facility essential to the exploration, development, and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)
- g. Siting of a facility essential to the generation or transmission of energy? (27)
- h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)
- i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)
- j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)
- k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)
- l. Adverse effect upon land or water uses within the State’s small harbors? (4)

X	
X	
	X
	X
	X
	X
	X
X	
	X
	X
X	
	X

2. Will the proposed activity affect, or be located in, on, or adjacent to any of the following:

YES/NO

- a. State designated freshwater or tidal wetland? (44)
- b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)
- c. State designated significant fish and/or wildlife habitat? (7)
- d. State designated significant scenic resource or area? (24)
- e. State designated important agricultural lands? (26)
- f. Beach, dune or Barrier Island? (12)
- g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)
- h. State, county, or local park? (19, 20)
- i. Historic resource listed on the National or State Register of Historic Places? (23)

	X
X	
X	
	X
	X
	X
	X
X	
X	

3. Will the proposed activity require any of the following:

YES/NO

- a. Waterfront site? (2, 21, 22)
- b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)
- c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)
- d. State water quality permit or certification? (30, 38, 40)
- e. State air quality permit or certification? (41, 43)

X	
	X
	X
X	
	X

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document\*)

X	
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D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document.\* The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy, and (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Mohammed Nasim, P.E., Amtrak

Address: 30th Street Station, 2955 Market Street-4S-059 Philadelphia, PA 19104

Telephone: Area Code ( ) 973-856-0321

Applicant/Agent Signature: \_\_\_\_\_ Date: \_\_\_\_\_

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Planning and Development, Attn: Consistency Review Unit, One Commerce Plaza-Suite 1010, 99 Washington Avenue – Suite 1010, Albany, New York 12231.**

- a. Copy of original signed form.
- b. Copy of the completed federal agency application.
- c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

\* These state and local documents are available for inspection at the offices of many federal agencies, Department of Environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

## **Additional Information**

As determined by the Federal Consistency Assessment Form, the Preferred Alternative requires detailed assessment for several New York State Coastal Management Program policies, including policies 2, 7, 11, 12, 15, 17, 20, 21, 22, 23, 25, 28, 32, 35, 36, 37, 38, 39, 41, 43, and 44. The consistency assessment is provided below for all questions that were answered “yes” in the CAF.

### ***Policy 2: Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.***

The Hudson Tunnel Project (the “Project” and “Preferred Alternative”) is intended to preserve the current functionality of Amtrak’s Northeast Corridor (NEC) service and NJ TRANSIT’s commuter rail service between New Jersey and Penn Station New York (PSNY) by repairing the deteriorating North River Tunnel, and to strengthen the NEC’s resiliency to support reliable service by providing redundant capability under the Hudson River for Amtrak and NJ TRANSIT NEC trains between New Jersey and PSNY. By design, the Preferred Alternative must be sited beneath the Hudson River and must include ventilation shafts and fan plant buildings adjacent to coastal waters. Once finished, the majority of the Preferred Alternative would be beneath the surface and would not affect land uses on the surface; this surface space would be available for expansion for water dependent uses in the future, if deemed appropriate. The new tunnel and its components would not impede existing water-dependent uses, including the portion of the river up to the pierhead line that is designated public open space within the boundaries of Hudson River Park to the south of the project site. During construction, water-based activities would be restricted from the 1.5-acre in-water ground improvement area, as ground stabilization via jet grouting or deep soil mixing is conducted within a series of cofferdams. Following construction, vessels would once again be free to travel through this area.

Therefore, the Preferred Alternative would be consistent with this policy.

### ***Policy 7: Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.***

The Preferred Alternative would result in the modification of 1.5 acres of bottom habitat within the Lower Hudson Reach due to soil improvement through jet grouting or deep soil mixing. Construction for the Preferred Alternative would include modification to the Hudson River bottom in an approximately 1.5-acre area in New York waters. In this area, the new Hudson River Tunnel would be relatively shallow beneath the river bottom, which could cause difficulties during tunnel boring. To ensure that the new Hudson River Tunnel has a minimum cover of 11 feet above the tunnel below the river bottom, a 1.5-acre area of river bottom in New York waters within the Hudson River would be strengthened using grout applied either through jet grouting or deep soil mixing, resulting in a mix of cement grout and water that will mix with and partially replace the soil. This would result in a stronger, solidified cemented soil with a consistency equivalent to a hard clay, i.e., a moderate-strength “soilcrete.” Approximately 0.8 acres would be altered from soft bottom to hard bottom with soilcrete added up to the elevation of the riverbed, and 0.7 acres of soilcrete would be elevated 1 to 2 feet above the mudline and also altered from soft bottom to hard bottom. As discussed in Chapter 11, “Natural Resources,” this portion of the river is a designated Significant Coastal Fish and Wildlife Habitat (SCFWH), largely based on its importance in providing wintering habitat for young-of-the-year and yearling-or-older striped bass. The Lower Hudson Reach SCFWH also supports a diverse and historically highly productive ecosystem of fish and invertebrates, and is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, and a migratory and feeding area for birds. Since striped bass spawning and larval habitat occur in freshwater regions well upriver of the soil improvement area, and striped bass juveniles and adults are widely distributed throughout the estuary, these life stages would not be adversely impacted by the Preferred Alternative. In-water construction activities in the 1.5-acre soil improvement area would have the potential to result in temporary increases in suspended sediment that would be localized and expected to dissipate quickly and would not result in adverse impacts to aquatic biota. Use of turbidity curtains during cofferdam removal would further minimize the effects of sediment resuspension. Installation of the sheet pile and king piles for the cofferdam structures used for the two or three phases of soil improvement would result in temporary increased in underwater noise levels that would not be expected to exceed the threshold for physiological injury to fishes. Fish would likely avoid portions of the river in proximity to the cofferdam while the king piles and sheet pile are driven; passage through non-ensouffled waters would be available both in the river channel to the west and in the shallower waters to the east of the low-cover area. The temporary loss of foraging habitat within and in the vicinity of the soil improvement area, when compared to the available suitable habitat that would still be available within the lower Hudson River,

would not result in an adverse impact to striped bass or other aquatic biota. Encrusting organisms would be expected to colonize the soil improvement area, and fish would be expected to return to the area following construction. The Preferred Alternative would not destroy or degrade habitat values, nor significantly impair the viability of the habitat for aquatic organisms associated with the SCFWH. After construction is complete, as compensation for the change in the nature and elevation of bottom habitat within the 0.7 acres, the Project Sponsor will monitor the recovery this area assess its recovery as fish foraging habitat. Monitoring of this area will be conducted in consultation with the U.S. Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), and New York State Department of Environmental Conservation (NYSDEC). The Project Sponsor will also monitor the recovery of the remaining 0.8 acres of soilcrete for five years post-construction. Additional mitigation required by NYSDEC for the modification to this 1.5 acres of bottom habitat within the Hudson River may include potential contribution to the Estuarium at Pier 26 within Hudson River Park, or the purchase of mitigation credits from the Saw Mill Creek Wetland Mitigation Bank on Staten Island. With implementation of measures recommended through these consultations, the permanent operation of the Preferred Alternative would not adversely affect the designation of this portion of the Hudson River as SCFWH. Therefore, the Preferred Alternative would be consistent with this policy.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 11: Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.***

The areas of concern for flooding associated with the Preferred Alternative in Manhattan would be: the proposed portal for the new Hudson River Tunnel and the existing portal for the North River Tunnel, both of which emerge below grade at approximately Tenth Avenue between West 31st and 33rd Streets; the existing ventilation shaft for the North River Tunnel within the West Side Yard; the Tenth Avenue fan plant beneath the building located at 450 West 33rd Street; and the proposed ventilation shaft and fan plant for the Hudson River Tunnel at Twelfth Avenue between West 29th and 30th Streets. Since the Preferred Alternative would not introduce any substantial changes in a coastal area such that it could affect wave impacts or otherwise affect flooding of other areas and uses, potential flooding at portals and ventilation structures is the central and most critical issue.

All Project features would be designed using a Design Flood Elevation (DFE) that is 5 feet higher than the Federal Emergency Management Agency (FEMA) base flood elevation (BFE). In addition, when Project elements can be designed without substantial financial implications to a more conservative standard than the DFE, they will be; otherwise, they will be designed so that additional protection can be included at a later date if storm levels in the future make that appropriate (e.g., designing foundations to support higher flood barriers in the future).

The new Hudson River Tunnel would include floodgates on each side of the river tunnel, to protect both the tunnel and landside areas (e.g., PSNY) from future flooding such as occurred during Superstorm Sandy. Such floodgates could be deployed in advance of anticipated flooding so they would completely seal off the tunnel, preventing water from passing through. In New York, a floodgate would be at the new tunnel's eastern portal at Tenth Avenue and another floodgate would be located at the Twelfth Avenue ventilation shaft.

The Twelfth Avenue ventilation shaft and associated fan plant for the new Hudson River Tunnel would be located within the 100-year floodplain and below the Project's DFE. Therefore, all entrances and openings would be raised above the DFE or any entrances below the DFE would be watertight. The shaft would include hardening to protect against water incursion and any equipment within the shaft or fan plant would be above the DFE or flood-resistant.

The Tenth Avenue fan plant, the new portal for the Hudson River Tunnel, the existing portal for the North River Tunnel, and an existing ventilation shaft for the North River Tunnel would all be located below both the BFE and the DFE, within the subsurface complex of tracks west of PSNY. These project elements would be protected from flooding by the Metropolitan Transportation Authority's (MTA) planned flood protection and drainage improvements around the West Side Yard. A new permanent wall is proposed, with additional deployable barriers to be implemented across access points in advance of storm and flood events. This perimeter wall will provide flood protection up to a level that is one foot lower than the Project's DFE and would protect the below-grade rail infrastructure west of PSNY, including the elements of the Proposed Project within this area.

Other aspects of the new Hudson River Tunnel's design also incorporate resiliency and flood protection measures. Such measures would include the use of ballastless (direct fixation) track, which is more resistant to salt water incursion than ballasted track, and the use of concrete for the liner and bench walls that would withstand salt water. For the North River Tunnel, the Project would harden the drainage system in the North River Tunnel to continue operating during a flooded condition. Amtrak has already hardened the pumping systems such that they would continue to operate in the event of tunnel flooding. In addition, as part of the rehabilitation with the Preferred Alternative, the Project Sponsor would relocate electronic control systems out of the tunnel to locations that are protected from flooding, and install electronics and cables within the tunnel that are more flood-resilient. In addition, the rehabilitated tunnel would have ballastless (i.e., direct fixation) track, which is more resistant to salt water incursion than ballasted track. These measures would allow for faster recovery in the event of tunnel flooding, avoiding the type of damage that resulted from Superstorm Sandy.

For the reasons described above, potential losses due to flooding have been minimized to the extent possible. Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 12: Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands, and bluffs.***

There are no natural protective features in the project location. Therefore this policy is not applicable.

***Policy 15: Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.***

The Preferred Alternative does not involve any mining, excavation, or dredging. Therefore, this policy is not applicable.

***Policy 17: Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.***

See the response to Policy 11. The Preferred Alternative would be consistent with this policy.

***Policy 19: Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.***

The Preferred Alternative would be located under both the High Line, a 1.45-mile-long linear park being developed on the structure of a former elevated freight rail line, and Hudson River Park, a 550-acre linear waterfront park along New York City's Hudson River waterfront. The Preferred Alternative would pass beneath the High Line where the park runs parallel to West 30th Street between Eleventh Avenue and Twelfth Avenue. Construction of the Project would not result in any physical disruption to the High Line, but construction noise could be disruptive to recreational uses on the park viaduct. Noise levels that exceed the FTA impact criteria could last for up to 12 months. However, the remainder of the High Line would not experience such elevated levels of noise as a result of construction, and the entire park would continue to be accessible by the public.

The boundaries of Hudson River Park extend from the western boundary of Route 9A, known as Twelfth Avenue near the Project site, offshore to the pierhead line in the Hudson River. In this area, the tunnel alignment from the New York Hudson River bulkhead to the Twelfth Avenue shaft would be subject to ground freezing with some cement grouting at the bulkhead and other locations. This construction method would allow below-grade tunneling here, which would avoid the potential for construction disruption that would otherwise be associated with cut-and-cover excavation of the tunnel segment from the water's edge to the Twelfth Avenue shaft site.

Ground freezing involves installation of a network of underground pipes and the circulation of a cold liquid (calcium chloride brine) through the pipe network until the ground around the pipes freezes solid. The freeze and grout pipes would be installed in a grid pattern from the surface. Pipes can be installed vertically and diagonally to minimize disturbance at the surface from pipe installation.

The freeze pipes would be installed in limited locations to limit disruption to Hudson River Park and the adjacent bikeway, which is under the jurisdiction of the New York State Department of Transportation but maintained by the Hudson River Park Trust (HRPT). Ground freezing pipes would be installed predominantly from the eastern sidewalk, eastern parking lane, and median of Route 9A and the West 30th

Street Heliport area within Hudson River Park. A narrow area of the Hudson River Park walkway (about half the width of the walkway, an area about 10 feet wide about 150 feet long, or 1,500 square feet) would be used for installation of the freeze pipes. A small area near the walkway could also be affected. The walkway would remain open during this time, with a minimum width of approximately 8 feet through the construction zone. The bikeway would not be affected by installation of the freeze pipes, except for a potential short-term closure (up to several days) for trenching of freeze pipes across the bikeway; any trench would be immediately decked over and the bikeway reopened. The freeze pipes installed to treat this area would be installed from locations to the east or west of the bikeway at an angle to pass beneath the bikeway.

During the five-month period when the equipment is being installed, the 1,500-square-foot walkway area in Hudson River Park would be closed to the public. Following installation, the freezing and tunneling would occur over an approximately nine-month period, during which the park could remain in normal use. The freeze pipes would be below ground and covered with steel plates so the covered area could be returned to park use, although there could be intermittent closures to access the pipes. Once the tunneling is complete, the same walkway area would be closed for a final four-month period to remove the equipment and restore the areas. Therefore, the total amount of time that the 1,500-square-foot walkway area would be closed would be nine months. The other half of the walkway would remain open. All of the areas disturbed by the freeze pipe installation would be restored after the freezing operation is completed and the tunnel segment has been excavated throughout this area.

In addition to the ground freezing, below-ground obstructions present in the bikeway would be removed prior to tunneling. Specifically, piles that formerly supported the viaduct that carried the West Side Highway may remain buried in this area, primarily beneath the southbound lanes of Twelfth Avenue and beneath the Route 9A bikeway. The piles would be removed by a pile extractor working from the surface of Twelfth Avenue. An MPT plan would be followed to minimize disruption traffic. Alternatively, the piles could be cut and removed manually from within the tunnel as it is excavated.

During the full 18 months of the ground freezing operation, equipment would be located within the southern end of the West 30th Street Heliport to support the freezing. This construction equipment would be visible to people in nearby areas of Hudson River Park. Construction barricades would be installed to block views of the construction zone for park users.

In-water ground improvement within the 1.5-acre low-cover area would be outside the pierhead line and therefore, outside the boundaries of Hudson River Park. This area would be reopened to recreational boating activities, which may originate in Hudson River Park, upon the completion of construction.

The tunnel alignment under Hudson River Park may require modification to the Hudson River Park Act in order to allow the easement beneath the park. The Preferred Alternative would have no permanent adverse effects on public access to either resource.

For the reasons discussed above, therefore, the Preferred Alternative would be consistent with this policy.

***Policy 20: Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.***

The Preferred Alternative would be located under Hudson River Park, which provides public access to the waterfront. As described under Policies 2 and 19, neither construction nor operation of the Preferred Alternative would impede existing water-dependent uses, including access to the publicly-owned portion of the river up to the pierhead line within the boundaries of Hudson River Park.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 21: Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water-related uses along the coast.***

The Preferred Alternative does not include plans for new recreational uses, but would not restrict existing recreational uses of the waterfront. As described under Policy 20, public access to Hudson River Park would not be interrupted or restricted by the Preferred Alternative. During construction, the 1.5-acre in-water ground improvement area would be temporarily restricted while ground stabilization via jet grouting is conducted within a series of cofferdams. Access to this area by boats would be restored to pre-construction conditions following completion of in-water construction activities.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 22: Development, when located adjacent to the shore, will provide for water-related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.***

The primary purpose of the Preferred Alternative is to preserve the current functionality of Amtrak's NEC service and NJ TRANSIT's commuter rail service between New Jersey and PSNY and to strengthen the NEC's resiliency to support reliable service by providing redundant capability under the Hudson River. The Preferred Alternative would involve tunneling beneath the land at the water's edge, and once construction is complete, the land at the surface would be available for any use deemed appropriate. While the Preferred Alternative would not provide for water-related recreation, it would not hinder existing recreational use of the waterfront in adjacent areas, such as Hudson River Park or on the river itself.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 23: Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archaeology or culture of the state, its communities, or the nation.***

The Preferred Alternative's impacts on historic and archaeological resources are being evaluated in accordance with Section 106 of the National Historic Preservation Act. Section 106 requires that Federal agencies take into account the effects of their undertakings on historic properties, including historic architectural resources and archaeological resources, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. Section 106 requires consultation with the appropriate State Historic Preservation Officers (SHPO), in this case the New York State Historic Preservation Officer (NYSHPO) as well as the New Jersey Historic Preservation Officer (NJHPO); Federally recognized Indian tribes that might attach religious and cultural significance to historic properties affected by the undertaking; representatives of local governments (including the New York City Landmarks Preservation Commission for this Project); and additional consulting parties with a demonstrated interest in the undertaking based on a legal or economic relation to affected properties, or an interest in the undertaking's effects on historic properties. The Lead Federal Agency, in consultation with the SHPO(s) and consulting parties, must determine whether a proposed undertaking would have any adverse effects on historic properties within the Project's APE and seek ways to avoid, minimize, or mitigate any adverse effects to historic properties.

The Preferred Alternative would result in an adverse effect on the following historic architectural resources in New York: the North River Tunnel; the New York Improvements and Tunnel Extension of the Pennsylvania Railroad; and the Hudson River Bulkhead, all of which have been determined to be eligible for listing on the National Register of Historic Places. Proposed mitigation for these adverse effects has been developed in consultation with the SHPOs and other involved parties and is included in a Programmatic Agreement (PA) for the Project.

In addition, the PA requires development of a Construction Protection Plan to protect certain other historic architectural resources located in proximity to the Project during construction activities for the Preferred Alternative. In New York, the Construction Protection Plan will protect the High Line, which would be located adjacent to a construction site for the Project, and the Master Printers Building at 406-416 Tenth Avenue, also located close to a Project construction zone.

In addition, archaeological resources may be located beneath Hudson River Park, Twelfth Avenue, the Project's Twelfth Avenue shaft site, and West 30th Street that may be affected by the Preferred Alternative if they are present. The Preferred Alternative has the potential to result in an adverse effect on the following archaeological resources, if present: historic piers, wharves, and fill-retaining devices; industrial and manufacturing resources; and domestic resources. Additional investigation and/or archaeological monitoring will be conducted to determine the presence or absence of this potential archaeological resource and, if necessary, its eligibility for the National Register of Historic Places. Measures to be followed to determine the effects of the Preferred Alternative on archaeological resources and develop mitigation for any adverse effects are set forth in the PA.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 25: Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.***

The majority of the Preferred Alternative would be located underground and would not be visible from the surface. The new Twelfth Avenue fan plant building would be designed to be compatible with the character of the surrounding area and any urban design goals that the City of New York has established for the area. The design of visible elements of the fan plant will be coordinated with the New York City Department of City Planning.

The area near the Twelfth Avenue fan plant site is currently undergoing substantial redevelopment. By 2030, when the Preferred Alternative would be complete, the block where the fan plant site is located will be developed with two tall towers at Eleventh Avenue. On the large blocks to the north between Tenth and Twelfth Avenues, many high-rise buildings and mid- to low-rise buildings will be present. A high-rise commercial building may also be developed on the same lot as the fan plant. Overall, this area of the Far West Side will be transformed into a densely developed neighborhood of large and bulky buildings. The Twelfth Avenue fan plant would be similar in bulk and height to many of the mid-rise buildings that will be present in the surrounding area and much shorter than the high-rise buildings that will be located on the same block and on the blocks to the north would be similar in design and context to the surrounding structures on the west shore of Manhattan, and would not adversely affect scenic resources.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 28: Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.***

No ice management activities would be conducted as part of the Preferred Alternative. Therefore, this policy is not applicable.

***Policy 30: Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.***

Any groundwater recovered during dewatering would be treated and discharged to the municipal sewer in accordance with NYCDEP requirements. No other direct or indirect discharges to the Hudson River would occur under the Preferred Alternative.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 32: Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.***

No sanitary waste systems would be included as part of the Preferred Alternative. Therefore, this policy is not applicable.

***Policy 35: Dredging and filling in coastal waters and disposal of dredged material will be undertaken in a manner that meets existing State permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.***

The Preferred Alternative would include ground stabilization via jet grouting or deep soil mixing in the 1.5-acre in-water ground improvement area within the Hudson River, which would be required to address tunnel construction risks associated with shallow sediment cover as the tunnel approaches Manhattan. Jet grouting or deep soil mixing in the in-water ground improvement area would be conducted within a series of two or three cofferdams, minimizing potential increases in suspended sediment and adverse impacts to water quality due to the Preferred Alternative. The resulting introduction of soilcrete in the in-water ground improvement area would be composed of a mixture of cement and native soil, and would not result in leaching of contaminants into the water column.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 36: Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.***

The Preferred Alternative would not involve the shipment and storage of petroleum or other hazardous materials. Therefore this policy is not applicable.

***Policy 37: Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics, and eroded soils into coastal waters.***

In accordance with best management practices for silt, a series of two or three cofferdams would be utilized for the duration of in-water ground stabilization activities. Sediment resuspension associated with installation and removal of the cofferdams would result in minor, short-term increases in suspended sediment. The average tidal current in the Hudson River is 1.4 knots. Therefore, any sediment resuspended during in-water construction would move away from the area, either a short distance upstream or downstream depending on tidal direction, would dissipate quickly, and would not result in significant adverse impacts to water quality. A turbidity curtain would be deployed during removal of the cofferdams to further minimize the effects of sediment resuspension. Any groundwater recovered during dewatering would be treated and discharged to the municipal sewer in accordance with NYCDEP requirements. No other direct or indirect discharges to the Hudson River would occur under the Preferred Alternative.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 38: The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.***

Neither surface waters nor groundwater are used for potable water supply in the area, and the Preferred Alternative would not result in surface or groundwater withdrawal. Drinking water for Manhattan is provided by New York City's system of upstate reservoirs. Therefore, this policy is not applicable.

***Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.***

During in-water ground stabilization activities, excess grout material and native soil that tend to accumulate during jet grouting would be removed for off-site transport prior to removal of the cofferdam. Similarly, rock and other material excavated from within the new Hudson Tunnel would be removed for beneficial reuse or off-site disposal, in accordance with federal, state, and local regulations.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 40: Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.***

The Preferred Alternative does not involve major steam electric generating or industrial facilities. Therefore, this policy is not applicable.

***Policy 41: Land use or development in the coastal area will not cause national or state air quality standards to be violated.***

Neither construction nor operation of the Preferred Alternative would result in any exceedances of National Ambient Air Quality Standards, nor would any existing exceedances be exacerbated.

The regulations at 40 CFR § 93.150 require Federal agencies to ensure that proposed actions conform to the SIPs and do not adversely impact air quality. For actions undertaken by the Federal Railroad Administration (FRA), the regulations related to general conformity apply. For actions undertaken by the Federal Transit Administration (FTA), including funding, regulations related to transportation conformity apply. Since FRA is the lead agency for the Preferred Alternative's environmental review in accordance with National Environmental Policy Act (NEPA) and FTA may issue funding for the Project, both general conformity and transportation conformity apply. However, the Interagency Consultation Groups (ICGs) for New Jersey and New York have reviewed the Preferred Alternative and determined that according to the transportation conformity regulations (40 CFR § 93.126), the Preferred Alternative is an exempt project and therefore does not require transportation conformity analysis.

The annual pollutant emissions associated with construction of the Preferred Alternative would be lower than the *de minimis* rates defined in the general conformity regulations. Therefore, no general conformity determination is required.

Therefore, the Preferred Alternative would be consistent with this policy.

***Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors: nitrates and sulfates.***

See the response to Policy 41. The Preferred Alternative would be consistent with this policy.

***Policy 44: Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.***

There are no tidal or freshwater wetlands in the vicinity of the Preferred Alternative in New York State. Therefore, this policy is not applicable.

## NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's Coastal Zone, must be reviewed and assessed for their consistency with the [New York City Waterfront Revitalization Program](#) (WRP) which has been approved as part of the State's Coastal Management Program.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

### A. APPLICANT INFORMATION

Name of Applicant: NJ TRANSIT for the Hudson Tunnel Project

Name of Applicant Representative: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Project site owner (if different than above): \_\_\_\_\_

### B. PROPOSED ACTIVITY

*If more space is needed, include as an attachment.*

#### I. Brief description of activity

The Hudson Tunnel Project (the "Project") would consist of construction of a new rail tunnel under the Hudson River, including railroad infrastructure in New Jersey and New York connecting the new rail tunnel to the existing Northeast Corridor ("NEC"), and rehabilitation of the existing NEC tunnel (the North River Tunnel) beneath the Hudson River. In order to maintain the existing level of train service while the damaged North River Tunnel tubes are taken out of service one at a time for rehabilitation, the Project would include construction of two new rail tubes beneath the Hudson River (the "Hudson Tunnel"). The new two-track tunnel would be approximately parallel to the North River Tunnel, extending from the NEC in Secaucus, NJ, beneath the Palisades and Hoboken waterfront area, and beneath the Hudson River to connect to the existing ladder tracks and Penn Station New York ("PSNY"). In New York City, the Project would require: two new tracks through the right-of-way beside the Western and Eastern Rail Yards and associated track connections; a ventilation shaft and fan plant near 12th Avenue between West 29th and 30th; and a fan plant beneath and within the Lerner Building at 10th Avenue between 31st and 33rd Streets which sits above the rail right-of-way. Surface construction would take place for the new surface track alignment, at the shaft and fan plant sites, and where ground improvement and underpinning of buildings, roadways, or other structures would be required. The Hudson Tunnel would be constructed using a combination of four techniques: tunnel boring machine, Sequential Excavation Method, conventional mining including "drill-and-blast," and cut-and-cover excavation.

#### 2. Purpose of activity

The Project is intended to preserve the current functionality of the NEC's Hudson River rail crossing between New Jersey and New York and strengthen the resilience of the NEC, while maintaining uninterrupted commuter and intercity rail service during tunnel rehabilitation. The existing North River Tunnel is a critical NEC asset and is the only intercity passenger rail crossing into New York City from New Jersey and areas west and south. Service reliability through the tunnel was already suboptimal due to the tunnel's age and antiquated standards, and was further compromised by damage from Superstorm Sandy in 2012. Today the tunnel remains compromised. The North River Tunnel is currently safe for use by Amtrak and NJ TRANSIT trains traveling between New Jersey and New York City and beyond. However, it is in poor condition as a result of the storm damage and has required emergency maintenance that disrupts service for hundreds of thousands of rail passengers throughout the region. Despite the ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel. Rehabilitation would require closure of each tunnel tube, one at a time. If no new Hudson River rail crossing is provided during closure and rehabilitation of the North River Tunnel, the number of trains that could serve PSNY would be substantially reduced, and existing levels of train service would be disrupted. Once the North River Tunnel rehabilitation is complete, both the old and new tunnels would be in service, providing redundant capability and increased operational flexibility for Amtrak and NJ TRANSIT.

**C. PROJECT LOCATION**

Borough: Manhattan Tax Block/Lot(s): Blocks 661, 665, 675, 676

Street Address: Between West 29th Street and West 33rd Street

Name of water body (if located on the waterfront): Hudson River

**D. REQUIRED ACTIONS OR APPROVALS**

Check all that apply.

**City Actions/Approvals/Funding**

**City Planning Commission**       Yes     No

<input type="checkbox"/> City Map Amendment	<input type="checkbox"/> Zoning Certification	<input type="checkbox"/> Concession
<input type="checkbox"/> Zoning Map Amendment	<input type="checkbox"/> Zoning Authorizations	<input type="checkbox"/> UDAAP
<input type="checkbox"/> Zoning Text Amendment	<input type="checkbox"/> Acquisition – Real Property	<input type="checkbox"/> Revocable Consent
<input type="checkbox"/> Site Selection – Public Facility	<input type="checkbox"/> Disposition – Real Property	<input type="checkbox"/> Franchise
<input type="checkbox"/> Housing Plan & Project	<input type="checkbox"/> Other, explain: _____	
<input type="checkbox"/> Special Permit		

(if appropriate, specify type:  Modification  Renewal  other) Expiration Date: \_\_\_\_\_

**Board of Standards and Appeals**       Yes     No

<input type="checkbox"/> Variance (use)	
<input type="checkbox"/> Variance (bulk)	
<input type="checkbox"/> Special Permit	

(if appropriate, specify type:  Modification  Renewal  other) Expiration Date: \_\_\_\_\_

**Other City Approvals**

<input type="checkbox"/> Legislation	<input type="checkbox"/> Funding for Construction, specify: _____
<input type="checkbox"/> Rulemaking	<input type="checkbox"/> Policy or Plan, specify: _____
<input type="checkbox"/> Construction of Public Facilities	<input type="checkbox"/> Funding of Program, specify: _____
<input type="checkbox"/> 384 (b) (4) Approval	<input type="checkbox"/> Permits, specify: _____
<input type="checkbox"/> Other, explain: _____	

**State Actions/Approvals/Funding**

<input checked="" type="checkbox"/>	State permit or license, specify Agency: <u>NYSDEC</u> Permit type and number: <u>Article 15</u>
<input type="checkbox"/>	Funding for Construction, specify: _____
<input type="checkbox"/>	Funding of a Program, specify: _____
<input type="checkbox"/>	Other, explain: _____

**Federal Actions/Approvals/Funding**

<input checked="" type="checkbox"/>	Federal permit or license, specify Agency: <u>USACE</u> Permit type and number: <u>Section 404, Section 10, 408</u>
<input checked="" type="checkbox"/>	Funding for Construction, specify: <u>US Department of Transportation</u>
<input type="checkbox"/>	Funding of a Program, specify: _____
<input type="checkbox"/>	Other, explain: _____

Is this being reviewed in conjunction with a [Joint Application for Permits?](#)       Yes       No

## E. LOCATION QUESTIONS

1. Does the project require a waterfront site?  Yes  No
2. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters?  Yes  No
3. Is the project located on publicly owned land or receiving public assistance?  Yes  No
4. Is the project located within a FEMA 1% annual chance floodplain? (6.2)  Yes  No
5. Is the project located within a FEMA 0.2% annual chance floodplain? (6.2)  Yes  No
6. Is the project located adjacent to or within a special area designation? See [Maps – Part III](#) of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).
  - Significant Maritime and Industrial Area (SMIA) (2.1)
  - Special Natural Waterfront Area (SNWA) (4.1)
  - Priority Martine Activity Zone (PMAZ) (3.5)
  - Recognized Ecological Complex (REC) (4.4)
  - West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) (2.2, 4.2)

## F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder or Not Applicable (N/A). For more information about consistency review process and determination, see **Part I** of the [NYC Waterfront Revitalization Program](#). When assessing each policy, review the full policy language, including all sub-policies, contained within **Part II** of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).

For those policies checked Promote or Hinder, provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.

		Promote	Hinder	N/A
<b>I</b>	<b>Support and facilitate commercial and residential redevelopment in areas well-suited to such development.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.4	In areas adjacent to SMIA's, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Promote	Hinder	N/A
<b>2</b>	<b>Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.1	Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>3</b>	<b>Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.	Support and encourage in-water recreational activities in suitable locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.3	Minimize conflicts between recreational boating and commercial ship operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>4</b>	<b>Protect and restore the quality and function of ecological systems within the New York City coastal area.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1	Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.5	Protect and restore tidal and freshwater wetlands.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.7	Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Maintain and protect living aquatic resources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Promote	Hinder	N/A
<b>5</b>	<b>Protect and improve water quality in the New York City coastal area.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1	Manage direct or indirect discharges to waterbodies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>6</b>	<b>Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in <i>New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms</i> ) into the planning and design of projects in the city's Coastal Zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>7</b>	<b>Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Prevent and remediate discharge of petroleum products.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>8</b>	<b>Provide public access to, from, and along New York City's coastal waters.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.3	Provide visual access to the waterfront where physically practical.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>9</b>	<b>Protect scenic resources that contribute to the visual quality of the New York City coastal area.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9.1	Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9.2	Protect and enhance scenic values associated with natural resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>10</b>	<b>Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Protect and preserve archaeological resources and artifacts.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## G. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Applicant/Agent's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the [NYS Department of State Office of Planning and Development](#) and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

### **New York City Department of City Planning**

Waterfront and Open Space Division  
120 Broadway, 31<sup>st</sup> Floor  
New York, New York 10271  
212-720-3525  
wrp@planning.nyc.gov  
www.nyc.gov/wrp

### **New York State Department of State**

Office of Planning and Development  
Suite 1010  
One Commerce Place, 99 Washington Avenue  
Albany, New York 12231-0001  
(518) 474-6000  
www.dos.ny.gov/opd/programs/consistency

## Applicant Checklist

- Copy of original signed NYC Consistency Assessment Form
- Attachment with consistency assessment statements for all relevant policies
- For Joint Applications for Permits, one (1) copy of the complete application package
- Environmental Review documents
- Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Worksheet

COMPLETE INSTRUCTIONS ON HOW TO USE THIS WORKSHEET ARE PROVIDED IN THE "CLIMATE CHANGE ADAPTATION GUIDANCE" DOCUMENT AVAILABLE AT [www.nyc.gov/wrp](http://www.nyc.gov/wrp)

Enter information about the project and site in highlighted cells in Tabs 1-3. Tab 4, "Summary Charts" contains primary results. Tab 5, "0.2%+SLR" produces charts to be used for critical infrastructure or facilities. Tab 6, "Calculations" contains background computations. Appendix A contains tide elevations for station across the city to be used for the elevation of MHHW if a site survey is not available. Non-highlighted cells have been locked.

Background Information	
Project Name	The Hudson Tunnel Project
Location	Secaucus, New Jersey, to Manhattan, New York
Type(s)	<input checked="" type="checkbox"/> Residential, Commercial, Community Facility <input type="checkbox"/> Parkland, Open Space, and Natural Areas <input type="checkbox"/> Tidal Wetland Restoration <input type="checkbox"/> Critical Infrastructure or Facility <input type="checkbox"/> Industrial Uses <input type="checkbox"/> Over-water Structures <input type="checkbox"/> Shoreline Structures <input checked="" type="checkbox"/> Transportation <input type="checkbox"/> Wastewater Treatment/Drainage <input type="checkbox"/> Coastal Protection
Description	Construction of a new two-track rail tunnel and rehabilitation of existing North River Tunnel crossing beneath the Hudson River between New Jersey and New York. The new Hudson Tunnel will cross from New Jersey beneath the Hudson River and connect to the existing approach tracks at Penn Station New York (PSNY). A ventilation shaft and fan plant will be constructed in Manhattan - the fan plant will be located near Tenth Avenue within an existing Amtrak easement area beneath the Lerner Building. Minor excavation and track modifications will be required to connect the new tunnel to the existing track system at PSNY.
Planned Completion Date	2026
Expected Project Lifespan	50 years

The New York City Waterfront Revitalization Program Climate Change Adaptation Guidance document was developed by the NYC Department of City Planning. It is a guidance document only and is not intended to serve as a substitute for actual regulations. The City disclaims any liability for errors that may be contained herein and shall not be responsible for any damages, consequential or actual, arising out of or in connection with the use of this information. The City reserves the right to update or correct information in this guidance document at any time and without notice.

For technical assistance on using this worksheet, email [wrp@planning.nyc.gov](mailto:wrp@planning.nyc.gov), using the message subject "Policy 6.2 Worksheet."

Last update: Sept. 7, 2018

**Establish current tidal and flood heights.**

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.61	<b>2.61</b>	<b>NAVD88</b>	<i>Appendix A, The Battery</i>
1% flood height	11.00	<b>11.00</b>	<b>NAVD88</b>	<i>NYC Flood Hazard Mapper</i>
Design flood elevation	-->			
<i>As relevant:</i>				
0.2% flood height	-->			

*Data will be converted based on the following datums:*

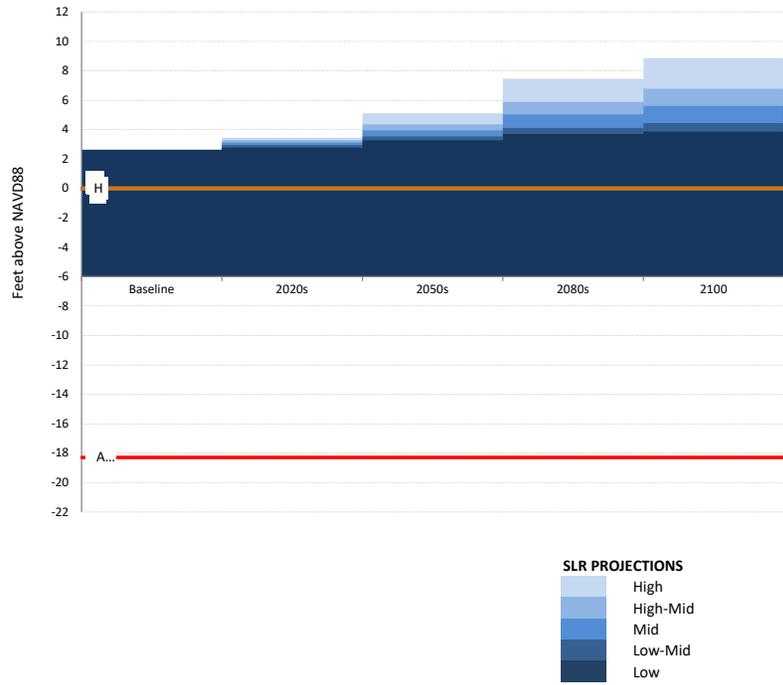
Datum	FT (NAVD88)
NAVD88	0.00
NGVD29	-1.10
Manhattan Datum	1.65
Bronx Datum	1.51
Brooklyn Datum (Sewer)	0.61
Brooklyn Datum (Highway)	1.45
Queens Datum	1.63
Richmond Datum	2.09

Describe key physical features of the project.

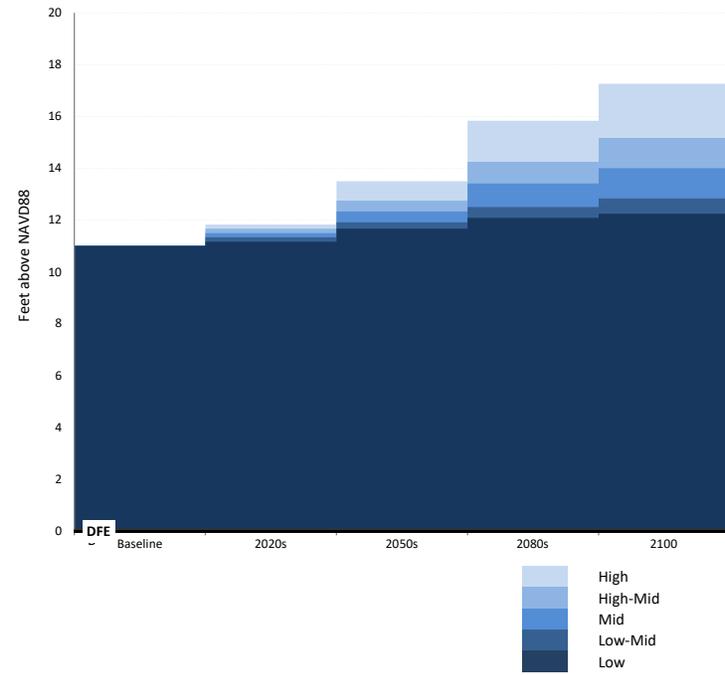
Feature (enter name)	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 0.2% flood height
<b>A Fan Plant, Tenth Ave</b>	<input checked="" type="checkbox"/> Vulnerable <input checked="" type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other	2070s	-18.3	Feet	NAVD88	-18.3	-18.3	-20.9	#VALUE!
Connects to the tunnel's tubes and ventilation duct system - located at Tenth Ave beneath the Lerner Building within the LIRR perimeter wall around West Side Yard. Provides regular and emergency ventilation to the tunnel tubes. Also include communications and systems rooms, signal equipment, controls for ventilation system, and connecting conduits.									
<b>B</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>C</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>D</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>E</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>F</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>G</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>H</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input checked="" type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									

Assess project vulnerability over a range of sea level rise projections.

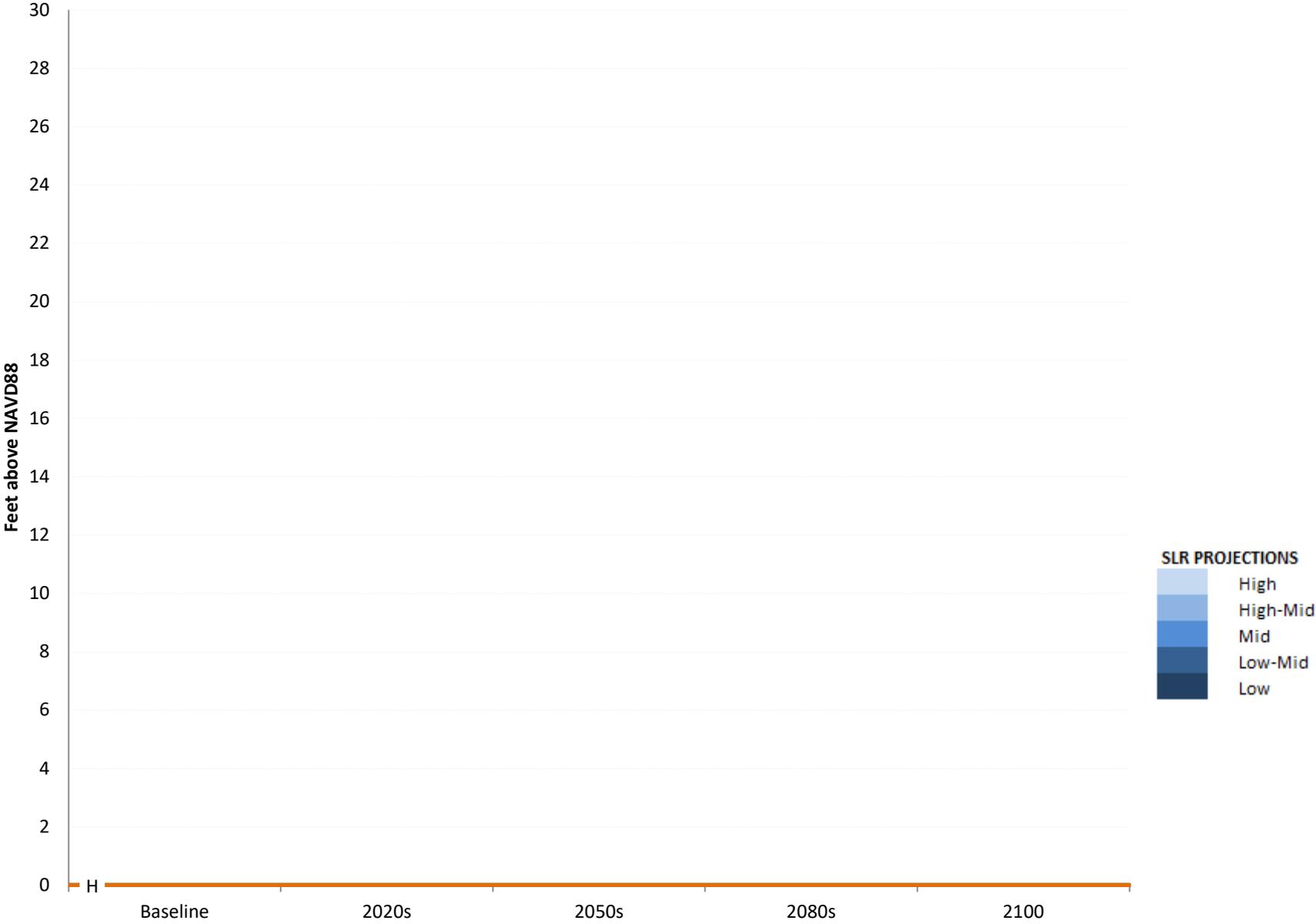
### Mean Higher High Water + Sea Level Rise



### 1% Flood Elevation + Sea Level Rise



# 0.2% Flood Elevation + Sea Level Rise



	SLR (ft)				
	Low	Low-Mid	Mid	High-Mid	High
Baseline	0.00	0.00	0.00	0.00	0.00
2020s	0.17	0.33	0.50	0.67	0.83
2050s	0.67	0.92	1.33	1.75	2.50
2080s	1.08	1.50	2.42	3.25	4.83
2100	1.25	1.83	3.00	4.17	6.25

**MHHW+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	2.61	2.61	2.61	2.61	2.61
2020s	2.78	2.94	3.11	3.28	3.44
2050s	3.28	3.53	3.94	4.36	5.11
2080s	3.69	4.11	5.03	5.86	7.44
2100	3.86	4.44	5.61	6.78	8.86

**1%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	11.00	11.00	11.00	11.00	11.00
2020s	11.17	11.33	11.50	11.67	11.83
2050s	11.67	11.92	12.33	12.75	13.50
2080s	12.08	12.50	13.42	14.25	15.83
2100	12.25	12.83	14.00	15.17	17.25

**0.2%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2020s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2050s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2080s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2100	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

	0	1
A Fan Plant, Tenth Ave	-18	-18.3
B	0	0
C	0	0
D	0	0
E	0	0
F	0	0
G	0	0
H	0	0

DFE

0.00

0.00

	<b>SLR (in)</b>				
	<b>Low</b>	<b>Low-Mid</b>	<b>Mid</b>	<b>High-Mid</b>	<b>High</b>
<b>2014</b>	0	0	0	0	0
<b>2020s</b>	2	4	6	8	10
<b>2050s</b>	8	11	16	21	30
<b>2080s</b>	13	18	29	39	58
<b>2100</b>	15	22	36	50	75



**NOAA Tide Station Data**

*(to be used only when a site survey is unavailable)*

<b>Station ID</b>	<b>Station Name</b>	<b>Source MHHW (Feet, NAVD88)*</b>
8518687	Queensboro Bridge	2.27
8530095	Alpine	2.11
8516614	Glen Cove	3.72
8516990	Willetts Point	3.72
8518639	Port Morris	3.33
8518699	Williamsburg Bridge	2.14
8518750	The Battery	2.28
8531680	Sandy Hook	2.41
8518490	New Rochelle	3.71
8531545	Keyport	2.66
8516891	Norton Point	2.08
8517201	North Channel	2.72
8517137	Beach Channel	2.10
8517756	Kingsborough	2.13
8519436	Great Kills	2.22
8531142	Port Reading	2.82
8519483	Bergen Point	2.56
8519050	USCG	2.28
8518902	Dyckman St	2.01
8517251	Worlds Fair Marina	3.59
8518668	Horns Hook	2.54
8518643	Randalls Island	2.60
8518526	Throggs Neck	3.68

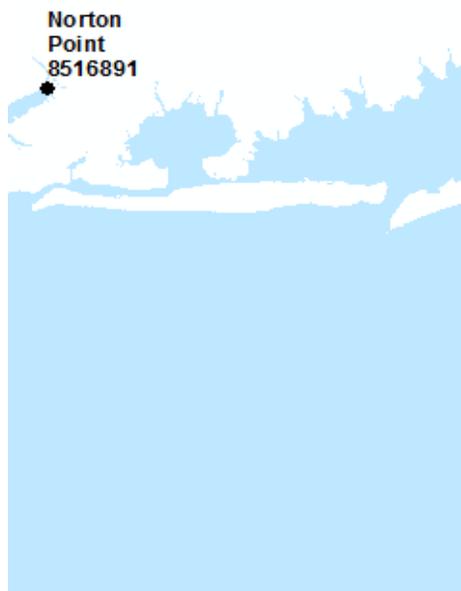
\* MHHW values include an addition 0.33 feet to account for changes in

<b>Adjusted MHHW (Feet, NAVD88)*</b>	<b>Source</b>
2.60	<a href="#">NOAA Tides and Currents</a>
2.44	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
3.66	<a href="#">NOAA Tides and Currents</a>
2.47	<a href="#">NOAA Tides and Currents</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.74	<a href="#">NOAA Tides and Currents</a>
4.04	<a href="#">NOAA Tides and Currents</a>
2.99	<a href="#">NOAA Tides and Currents</a>
2.41	<a href="#">NOAA VDATUM</a>
3.05	<a href="#">NOAA Tides and Currents</a>
2.43	<a href="#">NOAA VDATUM</a>
2.46	<a href="#">NOAA VDATUM</a>
2.55	<a href="#">NOAA VDATUM</a>
3.15	<a href="#">NOAA VDATUM</a>
2.89	<a href="#">NOAA VDATUM</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.34	<a href="#">NOAA Tides and Currents</a>
3.92	<a href="#">NOAA VDATUM</a>
2.87	<a href="#">NOAA VDATUM</a>
2.93	<a href="#">NOAA VDATUM</a>
4.01	<a href="#">NOAA Tides and Currents</a>

sea level since the 1983-2001 tidal epoch.







NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Worksheet

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Enter information about the project and site in highlighted cells in Tabs 1-3. Tab 4, "Summary Charts" contains primary results. Tab 5, "0.2%+SLR" produces charts to be used for critical infrastructure or facilities. Tab 6, "Calculations" contains background computations. Appendix A contains tide elevations for station across the city to be used for the elevation of MHHW if a site survey is not available. Non-highlighted cells have been locked.

Background Information	
Project Name	The Hudson Tunnel Project
Location	Secaucus, New Jersey, to Manhattan, New York
Type(s)	<input checked="" type="checkbox"/> Residential, Commercial, Community Facility <input type="checkbox"/> Parkland, Open Space, and Natural Areas <input type="checkbox"/> Tidal Wetland Restoration <input type="checkbox"/> Critical Infrastructure or Facility <input type="checkbox"/> Industrial Uses <input type="checkbox"/> Over-water Structures <input type="checkbox"/> Shoreline Structures <input checked="" type="checkbox"/> Transportation <input type="checkbox"/> Wastewater Treatment/Drainage <input type="checkbox"/> Coastal Protection
Description	Construction of a new two-track rail tunnel and rehabilitation of existing North River Tunnel crossing beneath the Hudson River between New Jersey and New York. The new Hudson Tunnel will cross from New Jersey beneath the Hudson River and connect to the existing approach tracks at Penn Station New York (PSNY). A ventilation shaft and fan plant will be constructed in Manhattan - the fan plant will be located near Tenth Avenue within an existing Amtrak easement area beneath the Lerner Building. Minor excavation and track modifications will be required to connect the new tunnel to the existing track system at PSNY.
Planned Completion Date	2026
Expected Project Lifespan	50 years

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For technical assistance on using this worksheet, email [wrp@planning.nyc.gov](mailto:wrp@planning.nyc.gov), using the message subject "Policy 6.2 Worksheet."

Last update: Sept. 7, 2018

**Establish current tidal and flood heights.**

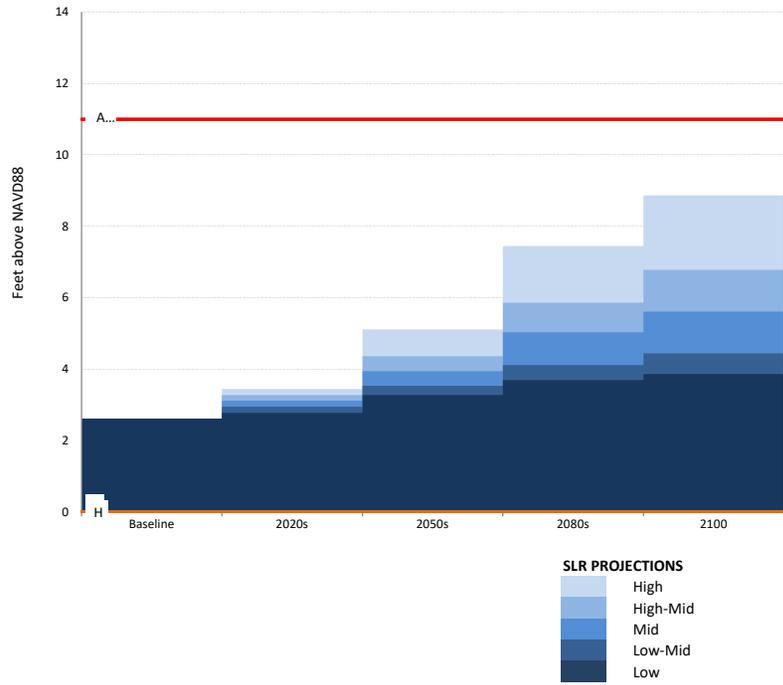
	FT (NAVD88)	Feet	Datum	Source
MHHW	2.61	<b>2.61</b>	<b>NAVD88</b>	<i>Appendix A, The Battery</i>
1% flood height	11.00	<b>11.00</b>	<b>NAVD88</b>	<i>NYC Flood Hazard Mapper</i>
Design flood elevation	-->			
<i>As relevant:</i>				
0.2% flood height	-->			

*Data will be converted based on the following datums:*

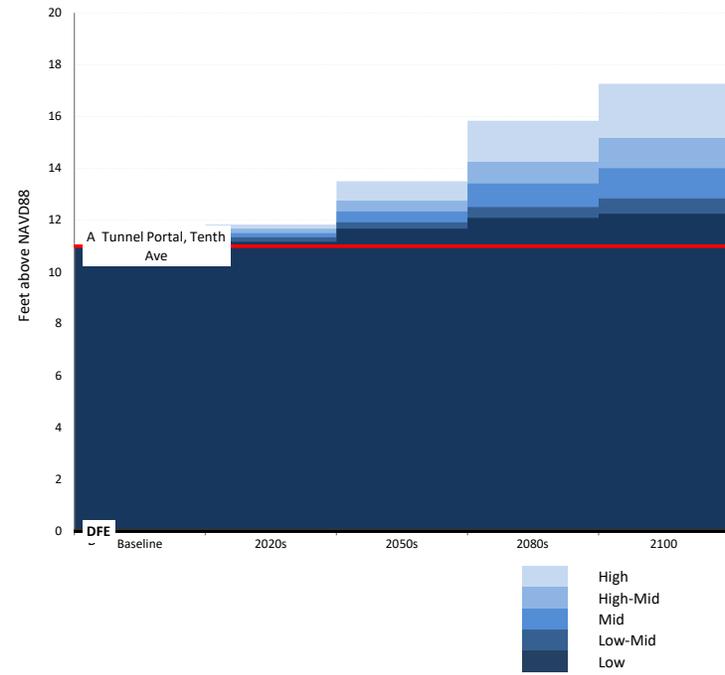
Datum	FT (NAVD88)
NAVD88	0.00
NGVD29	-1.10
Manhattan Datum	1.65
Bronx Datum	1.51
Brooklyn Datum (Sewer)	0.61
Brooklyn Datum (Highway)	1.45
Queens Datum	1.63
Richmond Datum	2.09



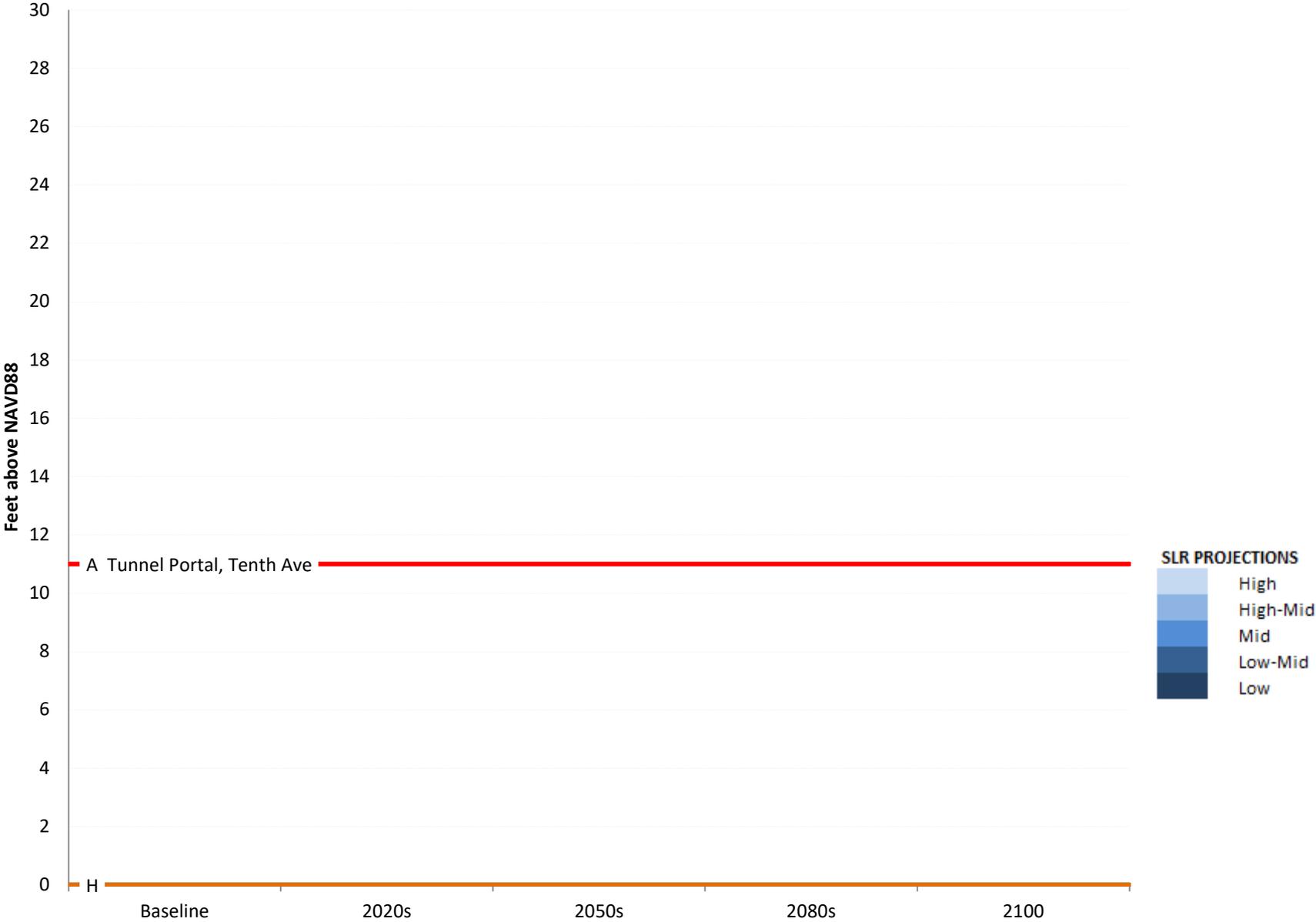
Mean Higher High Water + Sea Level Rise



1% Flood Elevation + Sea Level Rise



# 0.2% Flood Elevation + Sea Level Rise



	SLR (ft)				
	Low	Low-Mid	Mid	High-Mid	High
Baseline	0.00	0.00	0.00	0.00	0.00
2020s	0.17	0.33	0.50	0.67	0.83
2050s	0.67	0.92	1.33	1.75	2.50
2080s	1.08	1.50	2.42	3.25	4.83
2100	1.25	1.83	3.00	4.17	6.25

**MHHW+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	2.61	2.61	2.61	2.61	2.61
2020s	2.78	2.94	3.11	3.28	3.44
2050s	3.28	3.53	3.94	4.36	5.11
2080s	3.69	4.11	5.03	5.86	7.44
2100	3.86	4.44	5.61	6.78	8.86

**1%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	11.00	11.00	11.00	11.00	11.00
2020s	11.17	11.33	11.50	11.67	11.83
2050s	11.67	11.92	12.33	12.75	13.50
2080s	12.08	12.50	13.42	14.25	15.83
2100	12.25	12.83	14.00	15.17	17.25

**0.2%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2020s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2050s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2080s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2100	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

	0	1
A Tunnel Portal, Tenth Ave	11	11
B	0	0
C	0	0
D	0	0
E	0	0
F	0	0
G	0	0
H	0	0

DFE

0.00

0.00

	SLR (in)				
	Low	Low-Mid	Mid	High-Mid	High
<b>2014</b>	0	0	0	0	0
<b>2020s</b>	2	4	6	8	10
<b>2050s</b>	8	11	16	21	30
<b>2080s</b>	13	18	29	39	58
<b>2100</b>	15	22	36	50	75



**NOAA Tide Station Data**

*(to be used only when a site survey is unavailable)*

<b>Station ID</b>	<b>Station Name</b>	<b>Source MHHW (Feet, NAVD88)*</b>
8518687	Queensboro Bridge	2.27
8530095	Alpine	2.11
8516614	Glen Cove	3.72
8516990	Willetts Point	3.72
8518639	Port Morris	3.33
8518699	Williamsburg Bridge	2.14
8518750	The Battery	2.28
8531680	Sandy Hook	2.41
8518490	New Rochelle	3.71
8531545	Keyport	2.66
8516891	Norton Point	2.08
8517201	North Channel	2.72
8517137	Beach Channel	2.10
8517756	Kingsborough	2.13
8519436	Great Kills	2.22
8531142	Port Reading	2.82
8519483	Bergen Point	2.56
8519050	USCG	2.28
8518902	Dyckman St	2.01
8517251	Worlds Fair Marina	3.59
8518668	Horns Hook	2.54
8518643	Randalls Island	2.60
8518526	Throggs Neck	3.68

\* MHHW values include an addition 0.33 feet to account for changes in

<b>Adjusted MHHW (Feet, NAVD88)*</b>	<b>Source</b>
2.60	<a href="#">NOAA Tides and Currents</a>
2.44	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
3.66	<a href="#">NOAA Tides and Currents</a>
2.47	<a href="#">NOAA Tides and Currents</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.74	<a href="#">NOAA Tides and Currents</a>
4.04	<a href="#">NOAA Tides and Currents</a>
2.99	<a href="#">NOAA Tides and Currents</a>
2.41	<a href="#">NOAA VDATUM</a>
3.05	<a href="#">NOAA Tides and Currents</a>
2.43	<a href="#">NOAA VDATUM</a>
2.46	<a href="#">NOAA VDATUM</a>
2.55	<a href="#">NOAA VDATUM</a>
3.15	<a href="#">NOAA VDATUM</a>
2.89	<a href="#">NOAA VDATUM</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.34	<a href="#">NOAA Tides and Currents</a>
3.92	<a href="#">NOAA VDATUM</a>
2.87	<a href="#">NOAA VDATUM</a>
2.93	<a href="#">NOAA VDATUM</a>
4.01	<a href="#">NOAA Tides and Currents</a>

sea level since the 1983-2001 tidal epoch.







NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Worksheet

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Background Information	
Project Name	The Hudson Tunnel Project
Location	Secaucus, New Jersey, to Manhattan, New York
Type(s)	<input type="checkbox"/> Residential, Commercial, Community Facility <input type="checkbox"/> Parkland, Open Space, and Natural Areas <input type="checkbox"/> Tidal Wetland Restoration <input type="checkbox"/> Critical Infrastructure or Facility <input type="checkbox"/> Industrial Uses <input type="checkbox"/> Over-water Structures <input type="checkbox"/> Shoreline Structures <input checked="" type="checkbox"/> Transportation <input type="checkbox"/> Wastewater Treatment/Drainage <input type="checkbox"/> Coastal Protection
Description	Construction of a new two-track rail tunnel and rehabilitation of existing North River Tunnel crossing beneath the Hudson River between New Jersey and New York. The new Hudson Tunnel will cross from New Jersey beneath the Hudson River and connect to the existing approach tracks at Penn Station New York (PSNY). A ventilation shaft and fan plant will be constructed in Manhattan - the fan plant will be located near Tenth Avenue within an existing Amtrak easement area beneath the Lerner Building. Minor excavation and track modifications will be required to connect the new tunnel to the existing track system at PSNY.
Planned Completion Date	2026
Expected Project Lifespan	50 years

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Last update: Sept. 7, 2018

**Establish current tidal and flood heights.**

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.61	<b>2.61</b>	<b>NAVD88</b>	<i>Appendix A, The Battery</i>
1% flood height	12.00	<b>12.00</b>	<b>NAVD88</b>	<i>NYC Flood Hazard Mapper</i>
Design flood elevation	-->			
<i>As relevant:</i>				
0.2% flood height	-->			

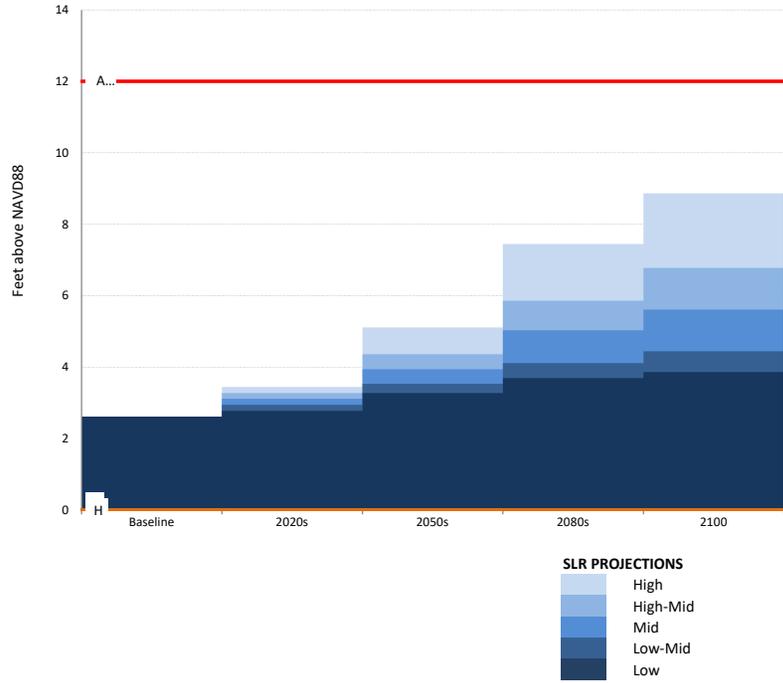
*Data will be converted based on the following datums:*

Datum	FT (NAVD88)
NAVD88	0.00
NGVD29	-1.10
Manhattan Datum	1.65
Bronx Datum	1.51
Brooklyn Datum (Sewer)	0.61
Brooklyn Datum (Highway)	1.45
Queens Datum	1.63
Richmond Datum	2.09

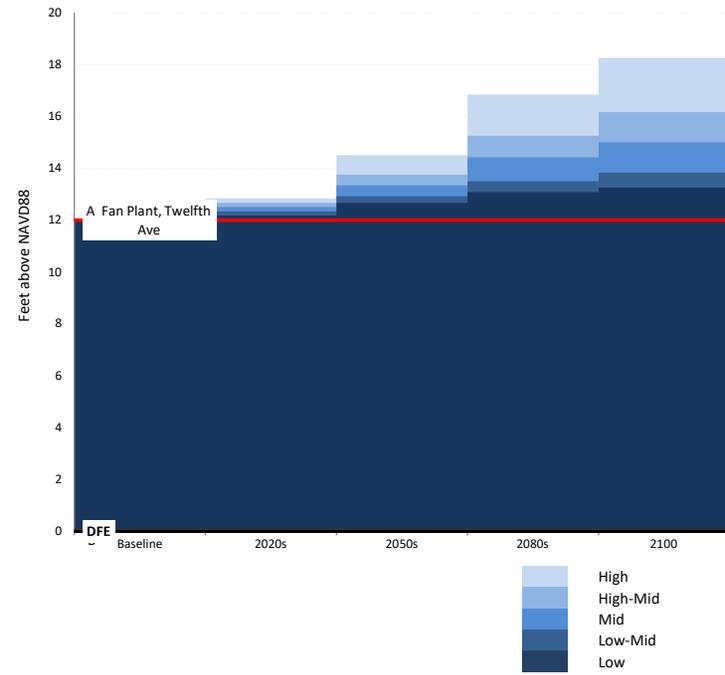
Describe key physical features of the project.

Feature (enter name)	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 0.2% flood height
<b>A Fan Plant, Twelfth Ave</b>	<input checked="" type="checkbox"/> Vulnerable <input checked="" type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other	1970s	12.0	Feet	NAVD88	12.0	12.0	9.4	#VALUE!
Connects to the tunnel's tubes and ventilation duct system - located between Eleventh and Twelfth Ave just east of Hudson River. Provides regular and emergency ventilation to the tunnel tubes. Also include communications and systems rooms, signal equipment, controls for ventilation system, and connecting conduits.									
<b>B</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>C</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>D</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>E</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>F</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>G</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									
<b>H</b>	<input type="checkbox"/> Vulnerable <input type="checkbox"/> Critical <input checked="" type="checkbox"/> Potentially Hazardous <input type="checkbox"/> Other			Feet	NAVD88				
Description of Planned Uses and Materials									

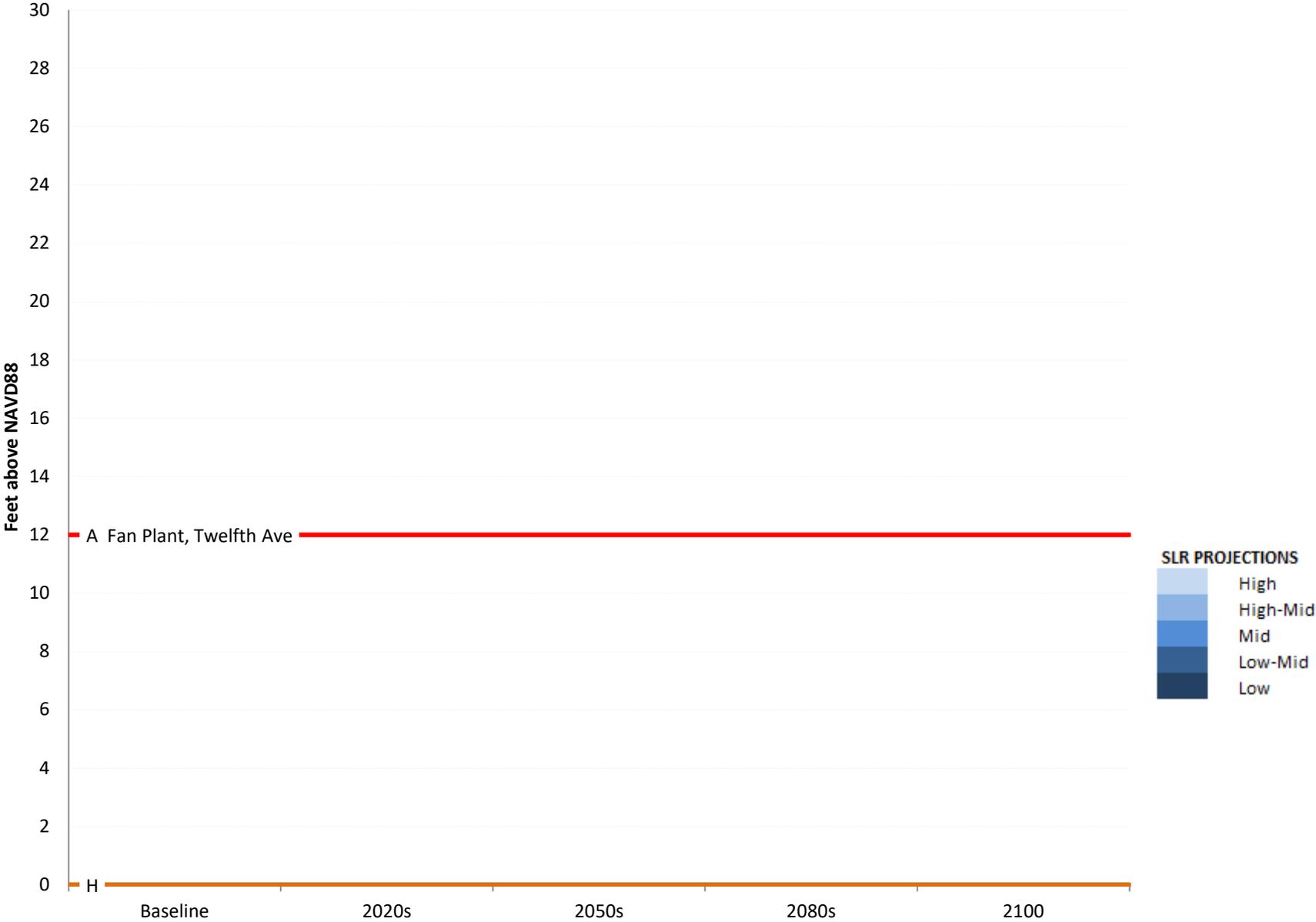
Mean Higher High Water + Sea Level Rise



1% Flood Elevation + Sea Level Rise



# 0.2% Flood Elevation + Sea Level Rise



	SLR (ft)				
	Low	Low-Mid	Mid	High-Mid	High
Baseline	0.00	0.00	0.00	0.00	0.00
2020s	0.17	0.33	0.50	0.67	0.83
2050s	0.67	0.92	1.33	1.75	2.50
2080s	1.08	1.50	2.42	3.25	4.83
2100	1.25	1.83	3.00	4.17	6.25

**MHHW+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	2.61	2.61	2.61	2.61	2.61
2020s	2.78	2.94	3.11	3.28	3.44
2050s	3.28	3.53	3.94	4.36	5.11
2080s	3.69	4.11	5.03	5.86	7.44
2100	3.86	4.44	5.61	6.78	8.86

**1%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	12.00	12.00	12.00	12.00	12.00
2020s	12.17	12.33	12.50	12.67	12.83
2050s	12.67	12.92	13.33	13.75	14.50
2080s	13.08	13.50	14.42	15.25	16.83
2100	13.25	13.83	15.00	16.17	18.25

**0.2%+SLR (ft above NAVD88)**

	Low	Low-Mid	Mid	High-Mid	High
Baseline	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2020s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2050s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2080s	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2100	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

	0	1
A Fan Plant, Twelfth Ave	12	12
B	0	0
C	0	0
D	0	0
E	0	0
F	0	0
G	0	0
H	0	0

DFE

0.00

0.00

	SLR (in)				
	Low	Low-Mid	Mid	High-Mid	High
<b>2014</b>	0	0	0	0	0
<b>2020s</b>	2	4	6	8	10
<b>2050s</b>	8	11	16	21	30
<b>2080s</b>	13	18	29	39	58
<b>2100</b>	15	22	36	50	75



**NOAA Tide Station Data**

*(to be used only when a site survey is unavailable)*

<b>Station ID</b>	<b>Station Name</b>	<b>Source MHHW (Feet, NAVD88)*</b>
8518687	Queensboro Bridge	2.27
8530095	Alpine	2.11
8516614	Glen Cove	3.72
8516990	Willetts Point	3.72
8518639	Port Morris	3.33
8518699	Williamsburg Bridge	2.14
8518750	The Battery	2.28
8531680	Sandy Hook	2.41
8518490	New Rochelle	3.71
8531545	Keyport	2.66
8516891	Norton Point	2.08
8517201	North Channel	2.72
8517137	Beach Channel	2.10
8517756	Kingsborough	2.13
8519436	Great Kills	2.22
8531142	Port Reading	2.82
8519483	Bergen Point	2.56
8519050	USCG	2.28
8518902	Dyckman St	2.01
8517251	Worlds Fair Marina	3.59
8518668	Horns Hook	2.54
8518643	Randalls Island	2.60
8518526	Throggs Neck	3.68

\* MHHW values include an addition 0.33 feet to account for changes in

<b>Adjusted MHHW (Feet, NAVD88)*</b>	<b>Source</b>
2.60	<a href="#">NOAA Tides and Currents</a>
2.44	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
4.05	<a href="#">NOAA Tides and Currents</a>
3.66	<a href="#">NOAA Tides and Currents</a>
2.47	<a href="#">NOAA Tides and Currents</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.74	<a href="#">NOAA Tides and Currents</a>
4.04	<a href="#">NOAA Tides and Currents</a>
2.99	<a href="#">NOAA Tides and Currents</a>
2.41	<a href="#">NOAA VDATUM</a>
3.05	<a href="#">NOAA Tides and Currents</a>
2.43	<a href="#">NOAA VDATUM</a>
2.46	<a href="#">NOAA VDATUM</a>
2.55	<a href="#">NOAA VDATUM</a>
3.15	<a href="#">NOAA VDATUM</a>
2.89	<a href="#">NOAA VDATUM</a>
2.61	<a href="#">NOAA Tides and Currents</a>
2.34	<a href="#">NOAA Tides and Currents</a>
3.92	<a href="#">NOAA VDATUM</a>
2.87	<a href="#">NOAA VDATUM</a>
2.93	<a href="#">NOAA VDATUM</a>
4.01	<a href="#">NOAA Tides and Currents</a>

sea level since the 1983-2001 tidal epoch.





