Chapter 8: Open Space and Recreational Resources

8.1 INTRODUCTION

This chapter presents the analysis the Federal Railroad Administration (FRA) and the New Jersey Transit Corporation (NJ TRANSIT) conducted of the Hudson Tunnel Project's potential effects on publicly accessible parks, open spaces, and recreational resources. For the purposes of this analysis, parks, open space, and recreational facilities include publicly or privately owned land that is publicly accessible for leisure, play, or sport, or serves to protect or enhance the natural environment. This chapter considers the effects to open space and recreational facilities that could occur during the construction of the Preferred Alternative and the permanent effects of the Preferred Alternative once construction is complete. The Port Authority of New York and New Jersey (PANYNJ), in its role as Project Sponsor, has accepted and relied on the evaluations and conclusions of this chapter.

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

This chapter reflects the following changes made since the DEIS for the Hudson Tunnel Project:

- The chapter incorporates design modifications related to the permanent features of the Project (e.g., modifications to surface tracks and tunnel alignment) and changes to construction methods and staging.
- The chapter is updated to describe current conditions in the affected environment and any related updates to the analysis of potential impacts, including the addition of new parks in the study area: Paterson Plank Road Park in North Bergen, New Jersey, and two open spaces in Manhattan, Bella Abzug Park and the Hudson Yards Public Square and Garden.
- The chapter includes expanded discussion related to Hudson River Park, to respond to comments from the Hudson River Park Trust and design modifications affecting the park. In particular, this chapter incorporates revisions related to the potential new construction methodology in Hudson River Park.

This chapter contains the following sections:

8.2 ANALYSIS METHODOLOGY

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

8.2.1 REGULATORY CONTEXT

The FRA's *Procedures for Considering Environmental Impacts*[1] call for evaluation of a project's potential impact on sites devoted to recreational activities, including impacts on non-site-specific activities, such as bicycling, and impacts on non-activity-specific sites such as designated open space.

Parklands are protected under Section 4(f) of the Department of Transportation Act of 1966 (49 USC § 303, as amended), which prohibits the use of land from a publicly owned public park, recreation area, wildlife and/or waterfowl refuge, or any significant historic or archaeological site, as part of a Federally funded or approved transportation project, unless certain conditions are met. A Section 4(f) evaluation is provided in Chapter 24, "Final Section 4(f) Evaluation."

There are similar restrictions on the conversion of land acquired or developed under Section 6(f) of the U.S. Land and Water Conservation Fund Act of 1965 (54 USC § 200301 et seq.) and Section 110 of the Urban Park and Recreation Recovery (UPARR) Act of 1978 (54 USC § 200501 et seq.). However, there are no Section 6(f) or UPARR properties within the Project's study area.

In New Jersey, the New Jersey Department of Environmental Protection (NJDEP) administers the state's Green Acres Program for acquisition and development of parks and natural areas. Once a site has received funding through the program, it may not be disposed of (i.e., sold, donated, exchanged, granted, converted, including by surface or subsurface easements) or diverted to a use other than recreation or conservation without approval by the property owner, NJDEP Commissioner, and the New Jersey State House Commission (NJAC 7:36-25.2). In addition, in municipalities where Green Acres Program funding has been received, any recreation or conservation area or parkland in New Jersey that is encroached on by a project requires approval by NJDEP and the New Jersey State House Commission.

In New York, temporary or long-term use of publicly owned parkland under the jurisdiction of a municipality (i.e., city, county, town, or village) for non-park purposes constitutes alienation, and

[1] 64 Federal Register 28545, May 26, 1999.

requires the approval of the New York State Legislature. Parkland "alienation" occurs when a municipality wishes to sell, lease, or discontinue municipal parkland, including subsurface easements beneath parkland. Authorization is required in the form of legislation enacted by the New York State Legislature and approved by the governor. Alienation is not required for State parkland.[2]

Finally, the United States Coast Guard (USCG) will reserve a security zone in all waters within 25 yards of critical Project structures, such as ventilation facilities. At locations where tunnel ventilation facilities are adjacent to parkland, this may require that public access be restricted. However, the Preferred Alternative would not have critical above-ground structures within 25 yards of the water so this does not apply.

8.2.2 ANALYSIS TECHNIQUES

This analysis identifies all publicly accessible open spaces and recreational facilities in the study areas (defined below in Section 8.2.3). For the New Jersey portion of the study area, the inventory of open spaces uses information from the NJDEP Recreation and Open Space Inventory (ROSI) and the State of New Jersey Parcel Database, supplemented by field visits conducted in September and October 2016 and April 2020. In New York, the open space inventory uses information from the New York City Department of Parks and Recreation (NYC Parks), Hudson River Park Trust, and Geographic Information Systems (GIS) mapping layers, including GIS data from the New York City Department of City Planning (NYCDCP), supplemented by field visits conducted in November 2016 and April 2020. The analysis also identifies planned future changes to open spaces in the study areas.

This assessment considers the Preferred Alternative's potential effects to open space and recreational facilities, including physical changes resulting from construction of the Preferred Alternative and other activities that might alter the use of an open space so that it no longer serves the same user population, limits public access to an open space, or results in conditions (such as increased noise, air pollutant emissions, odor, or shadows) that would temporarily or permanently affect the usefulness of a public open space.

The analysis of Project components and elements located in New York City complies with the guidance of the *City Environmental Quality Review (CEQR) Technical Manual*. The *CEQR Technical Manual* was developed by the City of New York specifically for evaluation of the environmental impacts of projects proposed in New York, based on local conditions and issues. These criteria for adverse impacts are well suited for evaluation of effects in New York City and were therefore also used for purposes of NEPA. Under *CEQR Technical Manual* guidelines, environmental review of open spaces typically examines the potential effects of new project-generated shadows on sunlight-sensitive resources, which include publicly accessible open spaces. There is no requirement or guidance for assessing shadows impacts in New Jersey. Consistent with CEQR guidelines, therefore, this chapter includes a discussion of the Project's shadow impacts on nearby park spaces in New York (see Section 8.7.4.2).

8.2.3 STUDY AREAS

The open space assessment considers the area where construction or operation of the Preferred Alternative has the potential to affect open spaces and recreational areas. Based on a consideration of potential impacts of the Preferred Alternative, and consistent with the analyses of land use, zoning, and public policy (see Chapter 6A, "Land Use, Zoning, and Public Policy"), noise

[2] New York State Office of Parks, Recreation and Historic Preservation, *Handbook on the Alienation and Conversion of Municipal Parkland*, 2017, p. 4. https://parks.ny.gov/documents/publications/AlienationHandbook2017.pdf

(see Chapter 12A, "Noise"), and vibration (see Chapter 12B, "Vibration"), a study area of 500 feet from the Project site was used (see **Figures 8-1 and 8-2**). This study area was adjusted in Weehawken to include the portion of construction truck routes that would use local, non-arterial streets. Consistent with the land use assessment, no study area was included for the rehabilitation work that would occur within the North River Tunnel, since this would occur well below the surface within an existing tunnel and does not have the potential to adversely affect open spaces above. Similarly, once the North River Tunnel has been rehabilitated and trains are operating in the rehabilitated tunnel, there would be no potential for adverse effects to open spaces above, since rail operations would occur below the surface and would not have the potential to affect open spaces above (furthermore, conditions would be similar to existing conditions with respect to rail operations).

8.3 AFFECTED ENVIRONMENT: EXISTING CONDITIONS

8.3.1 NEW JERSEY

Nine parks and recreational resources are located in the New Jersey study area, shown in **Figure 8-1** and listed in **Table 8-1** below. As shown in **Table 8-1**, most of the parks and recreational resources in the New Jersey study area are listed on the NJDEP ROSI, indicating that they were funded through the state's Green Acres Program.

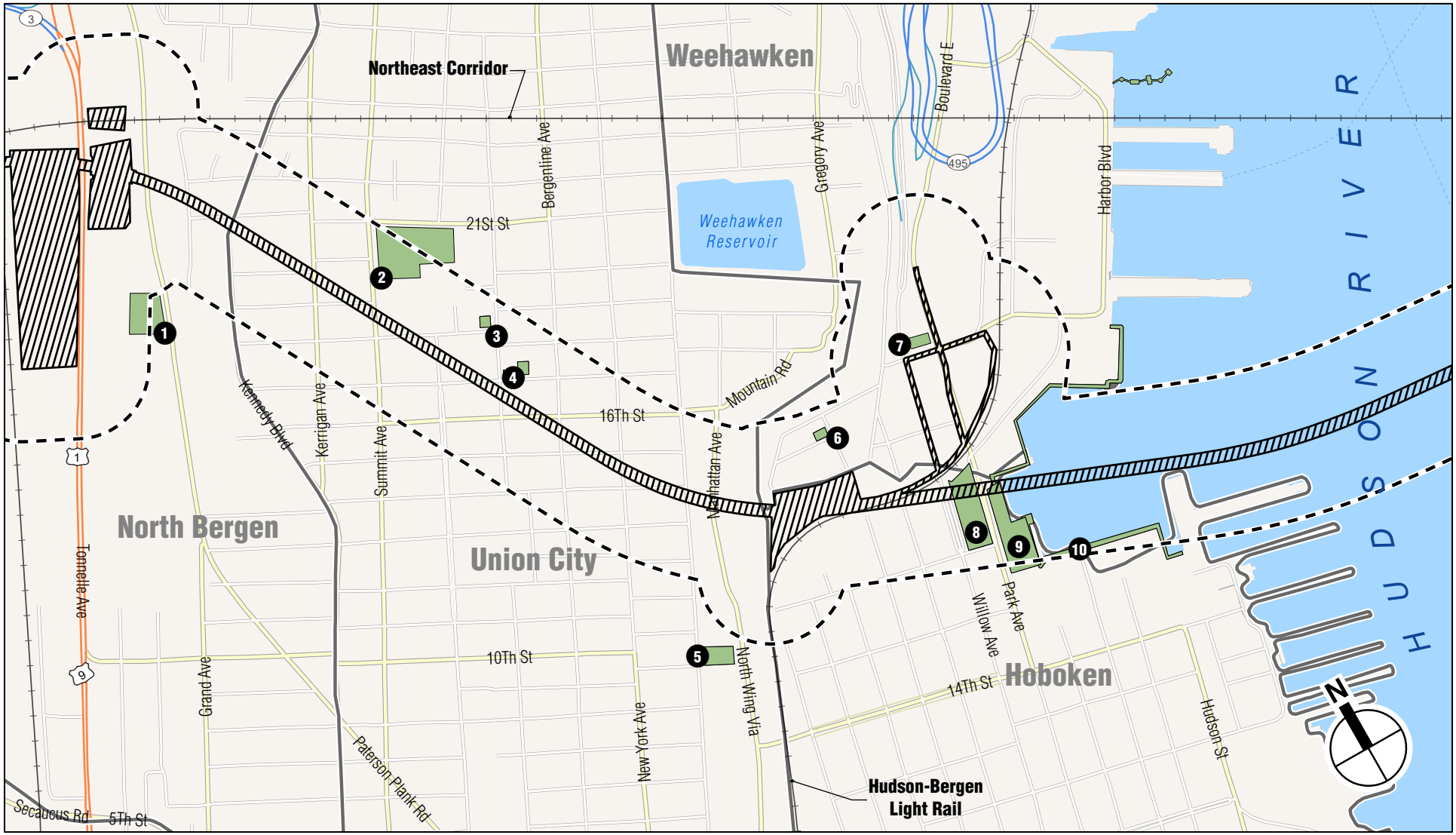
8.3.1.1 STUDY AREA WEST OF THE PALISADES

No parks or recreational resources are located in the portion of the study area west of the Palisades, including the area along the surface tracks of the Northeast Corridor (NEC) in Secaucus, Jersey City, or North Bergen and the area along Tonnelle Avenue in North Bergen.

8.3.1.2 STUDY AREA ON THE PALISADES

The portion of the study area on the Palisades in North Bergen and Union City includes five open space and recreational resources. The largest of these resources is the Midtown Athletic Complex, a 3.5-acre athletic facility operated by the Union City Board of Education (No. 2 in **Table 8-1** above). This publicly accessible facility is associated with a public school (the José Marti Freshman Academy) and hosts sporting events with playing fields available to the general public during set times by permit. The remaining resources in the Palisades study area are Paterson Plank Road Park, a local park on the western edge of the Palisades overlooking the Meadowlands, with playground facilities, lawns, and a gazebo (No. 1 in **Table 8-1**); a landscaped area (No. 3 in **Table 8-1**); a small playground (No. 4 in **Table 8-1**); and Firefighters' Memorial Park, a park along the eastern edge of the Palisades with active recreational features and a viewing area toward the Hudson River and Manhattan (No. 5 in **Table 8-1**). Firefighters' Memorial Park is slightly farther than 500 feet from the Project site's Hoboken fan plant site horizontally and approximately 200 feet higher vertically, but is included in the study area because parkgoers have a direct line of sight to the Hoboken fan plant site from the edge of the park. The park's eastern edge is on a bluff above the land below with wide views of the Hudson River and Manhattan beyond. Views of Hoboken and Weehawken are also available in the foreground below; views to the Hoboken fan plant site are available from the eastern edge of the park behind dense vegetation.

4/12/2021



Project Site

Municipal Boundaries

Study Area (500-foot boundary)

Open Space and Outdoor Recreation

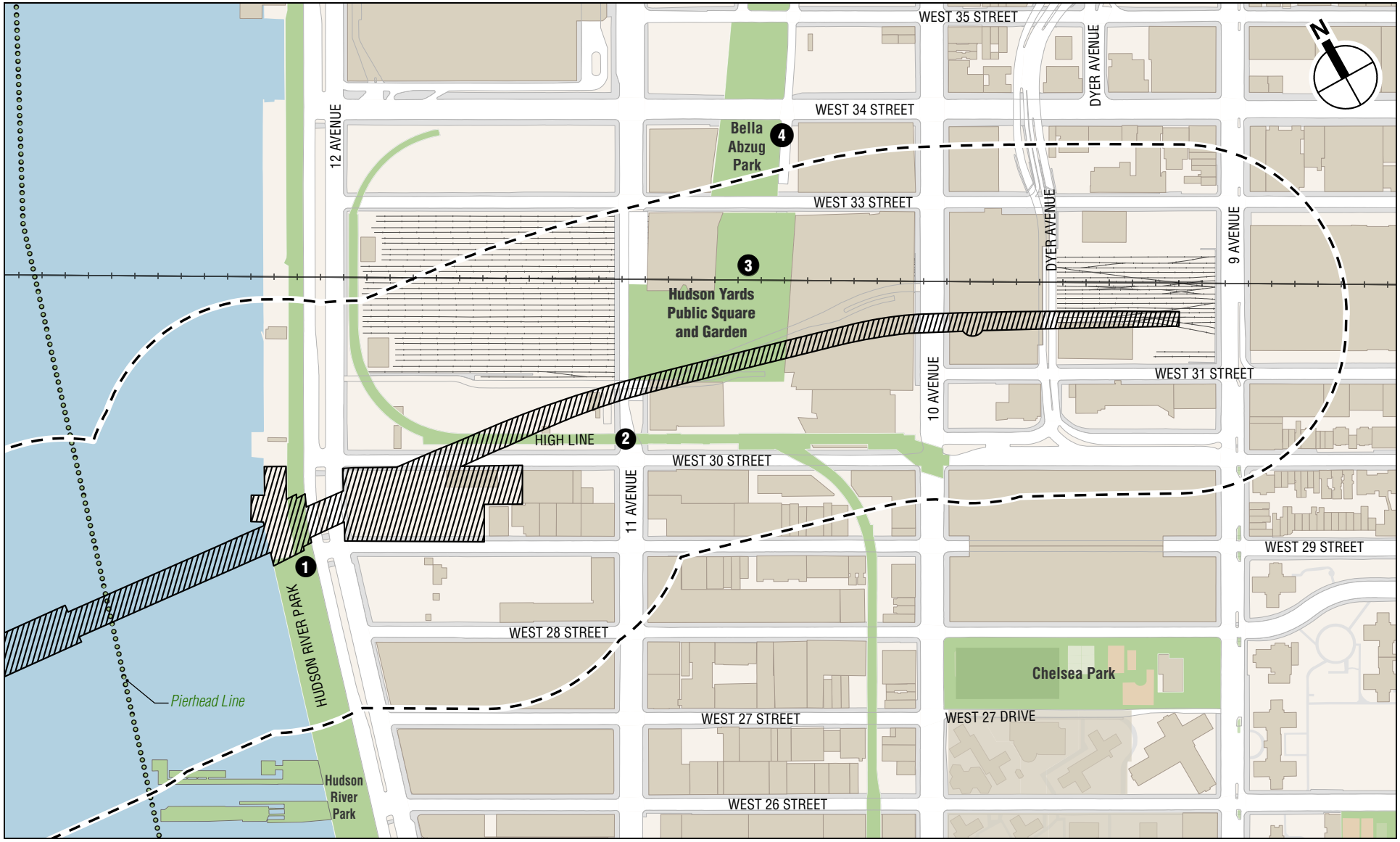
Parks and Recreational Facilities (see Table 8-1)

HUDSON TUNNEL PROJECT

Open Spaces in New Jersey Study Area

Figure 8-1

4/12/2021



Project Site

Study Area (500-foot boundary)

Existing Northeast Corridor

Open Space and Outdoor Recreation (see Table 8-2)

1 *Parks and Recreational Facilities (see Table 8-2)*

0 500 FEET

HUDSON TUNNEL PROJECT

Open Spaces in New York Study Area

Figure 8-2

Table 8-1
Parks and Recreational Facilities in New Jersey Study Area

No.	Park Name and Location	Jurisdiction	Description	Approximate Size
1	Paterson Plank Road Park Paterson Plank Rd, North Bergen	Township of North Bergen	Playground with splash pad, open lawn areas, and a gazebo	1.6 acres
2	Midtown Athletic Complex Jose Marti Freshman Academy 1800 Summit Ave, Union City	Union City Board of Education	Athletic fields for soccer and football, bleachers, athletic facility building; used by leagues and open to the public for recreational use during limited times by permit	3.5 acres
3	Landscaped Area 18th St and West St, Union City	Privately owned	Privately owned landscaped area with path open to the public	0.30 acres
4	Veterans Memorial Park/17th Street Playground* 17th St and West St, Union City	City of Union City	Playground with seating	0.29 acres
5	Firefighters' Memorial Park* 906 Palisade Ave, Union City	City of Union City	Outdoor Olympic-size pool, small children's water park, gazebo, restroom, wide vista toward Manhattan with memorial honoring firefighters who served on 9/11. Park is not open in the winter	0.45 acres
6	Pizzuta Park* Grand St and Chestnut St, Weehawken	Township of Weehawken	Playground with seating	0.13 acres
7	19th Street Basketball Courts* 19th St at Willow Ave, Weehawken	Township of Weehawken	Paved basketball and handball courts within fenced area	0.22 acres
8	1600 Park* 1600 Park Ave, Hoboken	City of Hoboken, with portion in Township of Weehawken	Multi-use playing field with baseball, soccer, and lacrosse facilities; also dog run, slide hill, and restrooms	2.5 acres
9	Harborside Park/Hoboken Cove Park* 15th St and Park Ave, Hoboken	City of Hoboken, with portion in Township of Weehawken	Active park with playground; additional 3 acres of mapped parkland that is undeveloped with future improvements planned	1 acre
10	Hudson River Waterfront Walkway, including Harbor Path*	Adjacent property owners; Hudson River Waterfront Conservancy (non-profit advocacy group) monitors compliance	30-foot-wide waterfront walkway being created along the Hudson River's edge from Bayonne to the George Washington Bridge; part of the East Coast Greenway Trail; fully developed in Project area	18.5 linear miles

Notes: See **Figure 8-1** for locations.
***** Listed on ROSI as park funded through Green Acres Program: www.nj.gov/dep/greenacres/openspace.html.
Source: Approximate sizes from New Jersey tax assessment database at www.njactb.org (2020).

8.3.1.3 STUDY AREA EAST OF THE PALISADES

East of the Palisades, the New Jersey study area includes two recreational resources in the neighborhood near the Hoboken fan plant site: Pizzuta Park (No. 6 in **Table 8-1**), which is a small playground on Grand Street at Chestnut Street within the residential neighborhood known as The Shades, and the 19th Street Basketball Courts (No. 7 in **Table 8-1**), a paved basketball/handball court surrounded on three sides by roadways: Willow Avenue, 19th Street, and Park Avenue/JFK Boulevard East.

The Hoboken portion of the New Jersey study area includes three parks and open spaces near the Hudson River. Two of these, 1600 Park and Harborside/Hoboken Cove Park (Nos. 8 and 9 in

Table 8-1, respectively), have recently been developed across Park Avenue from each other and include a combination of playground areas, landscaping, other active play facilities, and an athletic field. 1600 Park has two components: a slide hill (a constructed hill with a staircase and slide built into it) at its northern end and a playing field for team sports to the south. Across Park Avenue, Harborside/Hoboken Cove Park includes a 1-acre active park space and playground fronting on 15th Street. To the north, approximately 3 acres of Harborside/Hoboken Cove Park is currently undeveloped but planned for future improvement as part of the NJDEP Rebuild By Design project. The Rebuild By Design project proposes to improve this section of Harborside/Hoboken Cove Park with a signature park with playgrounds, lawns, game courts, and a viewing deck (see Section 8.4 below).

In addition, a continuous waterfront walkway runs along the Hoboken and Weehawken riverfront through the study area that is part of the 18.5-mile-long Hudson River Waterfront Walkway being implemented from Bayonne to Fort Lee (No. 10 in **Table 8-1**). Most of the walkway in Weehawken and Hoboken is completed; in the Project area, this linear open space has been completed and runs beside Harborside/Hoboken Cove Park, with a spur, the Harbor Path, running along the HBLR right-of-way from Weehawken Waterfront Park (north of the study area) to Weehawken Cove (Harborside/Hoboken Cove Park).

8.3.2 HUDSON RIVER

The Hudson River is a recreational resource used by pleasure boaters, including those in motorized and non-motorized boats. It is part of the Hudson River Greenway Water Trail, which includes 256 miles of the Hudson River and its tributaries, and was developed by the Greenway Conservancy, a public benefit corporation that coordinates efforts to promote tourism, strengthen agriculture, and establish a regional Hudson River Valley land and water trail system. The water trail extends from Lake Champlain to Battery Park City in Manhattan. North of New York City, the water trail features kayak and canoe launch points every 10 miles, and campsites every 15 miles. In the vicinity of the Project site, the water trail has boat access points at Pier 84 (44th Street) and Pier 66 (26th Street), part of New York's Hudson River Park (discussed in more detail below in Section 8.3.3).

Near the Project site, the Hudson River from the shoreline at the Manhattan bulkhead to the pierhead line (which is about 550 feet from the bulkhead) is part of Hudson River Park, discussed in Section 8.3.3 below. The Hudson River is used by recreational boaters, including non-motorized boats (sailboats, kayaks, and outrigger canoes) operating from the boathouse in Hudson River Park at Pier 66. There are also moorings in the river east of the pierhead line between the Pier 66 boathouse and approximately West 29th Street. Three boating programs operate at the boathouse under a permit from HRPT, Hudson River Community Sailing and two other clubs, New York Kayak Polo and New York Outriggers. These programs offer lessons and programs for school groups and others.

The water area of Hudson River Park is designated as an estuarine sanctuary. Management of the sanctuary is governed in accordance with the policies and guidance established in the *Hudson River Park Estuarine Sanctuary Management Plan*, which identifies management policies related to resource protection and preservation, public access and recreation, education, and research activities. The preservation objectives focus on controlling the solid waste and water pollution that may result from waterfront activities while improving water quality, aquatics, wildlife habitat, and promoting native species and sustainable design.

8.3.3 NEW YORK

There are four publicly accessible open spaces in the New York study area (see **Figure 8-2** and **Table 8-2)**. As shown on the figure, two of these parks are linear resources that continue well beyond the study area; the other two are in the Hudson Yards neighborhood, where a number of large development projects are currently being constructed or have recently been completed.

Table 8-2
Parks and Recreational Facilities in New York Study Area

No.	Park Name and Location	Jurisdiction	Description	Approximate Size
1	Hudson River Park	Hudson River Park Trust, a New York State public benefit corporation	4-mile-long waterfront park with walkway, esplanade, and landscaped areas; part of the Manhattan Waterfront Greenway	550 acres total, including about 400 acres of water; 33 acres in study area (6 acres of land and 27 acres of water or piers)
2	High Line	Owned by City of New York and operated by non-profit Friends of the High Line	1.5-mile long walkway and landscaped area on elevated former rail line	2.25 acres in study area
3	Hudson Yards Public Square and Garden	Privately owned public space, owned by Hudson Yards developer (The Related Companies)	Privately owned plaza that is open to the public, with landscape areas, seating, and the Vessel climbing sculpture	4.52 acres
4	Bella Abzug Park	NYC Parks	Public park with seating, restrooms, landscaped areas, a playground, and a fountain	2.15 acres

Note: See **Figure 8-2** for locations.
Sources: www.nycgovparks.org; www.hudsonriverpark.org; www.hudsonyardsnewyork.com; AKRF calculations, 2017-2021.

8.3.3.1 HUDSON RIVER PARK

8.3.3.1.1 Overview

Hudson River Park is an approximately 550-acre linear waterfront park under development along New York City's Hudson River waterfront. The park extends approximately four miles, from just north of Chambers Street in Lower Manhattan to West 59th Street, where it connects to a different linear park along the waterfront, Riverside Park South. Hudson River Park is the result of long-term efforts by New York City and New York State to transform the underutilized industrial Hudson River waterfront into a network of open space on upland areas and piers and waters of the Hudson River. Approximately 400 acres of the park (70 percent of the park's area) is water area in the Hudson River, designated as the Hudson River Park Estuarine Sanctuary. The park was established by the New York State legislature through the Hudson River Park Act of 1998, which identified the boundaries of Hudson River Park, established the Hudson River waters within the park as an estuarine sanctuary, and created the Hudson River Park Trust (HRPT) as a public benefit corporation with the mandate to design, construct, and maintain the park. HRPT is undertaking construction of Hudson River Park incrementally, as funding becomes available, such that the park is now approximately 80 percent complete. In areas that are not yet complete, interim recreational features are present, including a waterfront walkway that runs the length of the park.

The Hudson River Park Act that established Hudson River Park requires that the park be financially self-supporting to the extent practicable, stating, "the costs of the operation and maintenance of the park [shall] be paid by revenues generated within the Hudson River Park and

that those revenues [shall] be used only for park purposes." The Hudson River Park Act limits uses within the boundaries of the park to either recreational uses or specific "park/commercial" uses defined in the Act. One such permitted use is a non-tourism/non-recreational heliport that generates revenues in support of the park's operations.

In 2013, the Hudson River Park Act was amended to help the park address its ongoing financial constraints. The amendment allows the transfer by sale of any unused development rights on the park property to properties located up to one block east of the boundaries of the park, if and to the extent designated and permitted under local zoning ordinances. The 2013 amendment to the Hudson River Park Act also called for relocation of the non-tourism/non-recreational heliport to a new floating structure between West 29th and West 32nd Streets and permitted an interim commercial use east of the bulkhead in the park between West 29th and West 34th Streets up to July 1, 2024.

In addition, the Hudson River Park Act was amended in 2018 to allow HRPT to enter into a lease for a new below-grade rail tunnel beneath the park between West 27th and West 30th Streets (i.e., the new Hudson River Tunnel included as part of the Preferred Alternative for the Hudson Tunnel Project).

Hudson River Park occupies the area from the pierhead line to the western boundary of Manhattan's waterfront arterial, Route 9A (also known as Twelfth Avenue near the Project site). The Hudson River Park Act establishes the eastern boundary of the park as the western boundary of West Street/Eleventh Avenue/Twelfth Avenue, and when Route 9A is complete, as certified by the commissioner of the New York State Department of Transportation (NYSDOT), the eastern boundary of the park will be the western boundary of Route 9A. Hudson River Park is being developed in conjunction with the reconstruction of Route 9A into a landscaped urban boulevard, also a long-term project that began construction in 1994. At this time, the commissioner of NYSDOT has not yet certified the long-term reconstruction of Route 9A as complete and therefore the exact location of the boundary between the park and the roadway has not yet been established.

The park includes a waterfront esplanade that runs the length of the park, adjacent to a bikeway that is under the jurisdiction of NYSDOT as part of the adjacent Route 9A roadway, but is maintained by HRPT. Closer to the water, the park's waterside esplanade provides a safe, segregated alternative for pedestrians and runners, who are not intended users of the bikeway; in places where the permanent walkway has not yet been constructed, an interim walkway provides public access to the waterfront.

The Route 9A bikeway, outside of but adjacent to Hudson River Park, is generally a 16-foot-wide paved route that provides space for non-motorized vehicles (i.e., bicycles, rollerblades, and skateboards). The primary purpose of the bikeway is as a north-south transportation corridor. Lane markings clearly separate northbound and southbound users. The bikeway is heavily used during weekdays and weekends by recreational riders and commuters, both during the day and at night.

8.3.3.1.2 Study Area

Approximately 33 acres of Hudson River Park is located in the New York study area, consisting of approximately 6 acres of land and 27 acres of water or piers. In the New York study area, Hudson River Park includes a waterfront esplanade with benches, lawns, and landscaped areas in the area generally between West 26th and West 29th Streets, and a plaza with tables and chairs at approximately West 29th Street. Near West 26th Street, the park includes two piers, Pier 66A and Pier 66. Pier 66A is the home for two historic ships, the lightship *Frying Pan* and the fireboat *MV John J. Harvey*. Pier 66 has an esplanade extending the length of the pier and a boathouse dedicated to non-motorized recreational boating. Three boating programs operate at the boathouse under a permit from HRPT, Hudson River Community Sailing and two other clubs, New

York Kayak Polo and New York Outriggers. These programs offer lessons and programs for school groups and others. In addition, the water area of Hudson River Park between Pier 66 and West 29th Street includes sailboat moorings.

The land area of the park between West 29th Street and West 34th Street, including the Project site consists of an interim walkway beside the Route 9A bikeway; a privately operated commercial heliport, the West 30th Street Heliport, that occupies the area west of the walkway to the water's edge within the boundaries of the park; and a maintenance and storage area for HRPT north of the heliport. The two-lane Route 9A bikeway, which is outside of but adjacent to the park, is adjacent to the interim walkway with a landscaped buffer area between them.

The West 30th Street Heliport is located within the boundaries of Hudson River Park along the Project alignment on land that is publicly owned and designated for parkland use. A heliport has been present at this location since prior to establishment of the park in 1998 and although the heliport is within the park boundaries, it is a private commercial operation that is not open to the public for recreation. The heliport has 10 helipads and provides commercial, general aviation, and air taxi services. No tourist flights operate from the West 30th Street Heliport. The heliport, operating on a month-to-month basis under a permit, provides revenue to HRPT for operations and maintenance of Hudson River Park as permitted under the Hudson River Park Act. An amendment to the Hudson River Park Act calls for the relocation of the heliport to a floating structure between West 29th and West 32nd Streets, but the timing of such a relocation is unknown.

8.3.3.2 HIGH LINE

The New York study area also includes a portion of the High Line, a 1.5-mile-long linear park being developed on the structure of a former elevated freight rail line. The High Line begins on the south at Gansevoort Street and runs midblock, generally parallel to Tenth Avenue, to West 30th Street, where it turns west and runs parallel to West 30th Street and then curves north and east to bend around the end of the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR) John D. Caemmerer West Side Yard before terminating close to West 34th Street (see **Figure 8-2**). A spur runs east along West 30th Street to a piazza spanning Tenth Avenue. The High Line is owned by the City of New York and maintained, operated, and programmed by a non-profit conservancy, Friends of the High Line, in cooperation with NYC Parks. The High Line consists predominantly of a paved walking area lined with landscaped areas of native plantings evocative of the plants that grew on the abandoned freight right-of-way before it was converted into a park. The entire route is on a steel railroad viaduct approximately 25 to 30 feet above street level that cuts between and through buildings. Access is via staircases and elevators located approximately every few blocks. The High Line is a linear park with a range of different zones that offer a varied experience for visitors, including segments located in narrow corridors between buildings, segments running through buildings, and segments in wide open areas.

As shown in **Figure 8-2**, the High Line's northern segment (near the Project site) runs along Twelfth Avenue and then along the north side of West 30th Street. This part of the High Line is predominantly paved, with limited plantings and some seating areas; an adjacent area of former rail tracks and volunteer vegetation (i.e., vegetation that has not been intentionally planted) between the tracks is intentionally preserved beside the walkway. Since it is currently located higher than the undeveloped Project site on its south and the open rail yard on its north, the High Line today offers wide vistas of Hudson River Park and the Hudson River beyond. The walkway near the rail yard north of West 30th Street is an interim walkway pending completion of the Western Rail Yard development, which will integrate the High Line into its open space programming (see Section 8.4.3 below). Larger seating areas are located at wider portions of the High Line along West 30th Street. The area west of Eleventh Avenue is the Pershing Square Beams area, where the concrete deck has been stripped away, exposing the steel framework,

which has been turned into a play area. The study area includes three access points to the High Line: an elevator near West 30th Street and Tenth Avenue, a staircase at West 30th Street and Eleventh Avenue, and an accessible entrance on West 34th Street, where the elevated structure slopes down to meet the street level.

8.3.3.3 OPEN SPACES AT HUDSON YARDS

The portion of the study area in the Hudson Yards neighborhood includes two open space and recreational resources: Hudson Yards Public Square and Garden, and Bella Abzug Park. Hudson Yards Public Square and Garden is a privately owned public space located on a platform constructed over the West Side Yards as part of the Eastern Rail Yard project. It features landscaped areas, seating, and a large climbable sculpture, known as Vessel. This open space connects directly to the High Line in the south. To the north and across West 33rd street is Bella Abzug Park, a landscaped park with landscaping, seating, play areas, and fountains. Bella Abzug Park extends along Hudson Boulevard northward to West 36th Street. Only a small portion in the extreme southeast corner of the park is within the study area.

8.4 AFFECTED ENVIRONMENT: FUTURE CONDITIONS

This section describes changes to open space resources anticipated or being planned in the Project study area by the analysis year of 2033. This condition is the baseline against which the impacts of both the No Action and Preferred Alternatives are compared.

8.4.1 NEW JERSEY

In the New Jersey study area, NJDEP is proposing improvements at Harborside Park/Cove Park as part of the Rebuild By Design project. As discussed in Chapter 6A, "Land Use, Zoning, and Public Policy," the proposed Rebuild By Design project seeks to reduce frequent flooding in Hoboken due to major storm surges, high tides, and heavy rainfall events. That project proposes numerous green infrastructure elements, such as landscaped berms and levees and bioretention basins, to resist and delay flooding. As part of the Rebuild By Design project, the Harborside Park/Cove Park will be replaced with a new signature park that incorporates "flood resist" structures including a berm housing the Rebuild by Design flood wall, which will cross through the park. Potential enhancements to the park include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove.[3] In addition, design and landscaping improvements to the Hudson River Waterfront Walkway are also included in the Rebuild By Design project. Work in the park as part of the Rebuild By Design project is expected to be complete in 2022.

In addition, the City of Hoboken is planning additional recreational uses at Hoboken Cove, including a boathouse for kayaking, sailing, and other water uses.

8.4.2 HUDSON RIVER

In the future, recreational use of the Hudson River will continue. Dredging and other activities for maintenance of the channels and near-shore structures will continue; there are currently no plans to increase the navigational depth in either the main channel or wing channels. These activities will not adversely affect recreational use of the river.

8.4.3 NEW YORK

In the future, Amtrak will complete the construction of the Hudson Yards Right-of-Way Preservation Project beneath the West Side Yard, the large LIRR rail storage yard on the blocks

[3] https://www.nj.gov/dep/floodresilience/rbd-hudsonriver.htm

between Twelfth and Tenth Avenues from West 30th to West 33rd Street. As discussed in Chapter 4, "Analysis Framework," Section 4.3.3.1, Amtrak is constructing the Hudson Yards Right-of-Way Preservation Project as a separate initiative from the Hudson Tunnel Project to preserve a future location for through rail operations at the West Side Yard, since a large-scale redevelopment, Hudson Yards, is planned on a platform above the West Side Yard. Construction of the segment of the Hudson Yards Right-of-Way Preservation Project that passes beneath the High Line close to West 30th Street will require underpinning the foundations of the High Line to ensure that the park viaduct remains structurally sound.

As discussed in Chapter 6A, "Land Use, Zoning, and Public Policy," substantial new development will occur in the New York study area in the future that will introduce new open space and provide for improvements to existing parks. Above the West Side Yard, the Western Rail Yard project will introduce new open space resources as part of the creation of a large-scale development built on a platform constructed over the railyard. The newly constructed open spaces will include pedestrian paths, plazas, seating areas, lawns, and landscaping totaling approximately 5.45 acres. Improvements to the High Line will also occur in coordination with the Western Rail Yard development.

In addition, east of Tenth Avenue, another residential development project, Manhattan West, is also being developed on a platform over the tracks below. The Manhattan West project will introduce a central plaza containing an event space as well as pedestrian circulation areas totaling approximately 2 acres.

In addition to the new open spaces introduced by the Western Rail Yard and Manhattan West projects, there will be an addition to the High Line within the New York study area. In January 2021, New York State Governor Andrew M. Cuomo announced a plan to extend the High Line from its current terminus at Tenth Avenue and 30th Street to the central plaza of the Manhattan West project, which would provide a direct connection to the recently completed Moynihan Train Hall at Penn Station. This would add approximately 1,200 linear feet of new elevated walkway to the existing High Line.

Along the western edge of the New York study area, Hudson River Park will continue to be improved in the future. Hudson River Park is being gradually developed as funding becomes available. Two private developers are currently constructing high-density mixed-use developments on the eastern end of the block between West 29th and 30th Streets, Twelfth Avenue, and Eleventh Avenue (Manhattan Block 675, which is the same block where the Preferred Alternative's Twelfth Avenue fan plant site is located). The two development sites were rezoned in June 2018 to permit the proposed mixed-use developments and to allow a transfer of development rights from Hudson River Park to the development sites, and the developers subsequently purchased development rights from the park, providing revenue to the park.

According to the 2018 FEIS for the rezoning of the eastern portion of Block 675, HRPT will use the funding from the sale of the development rights to undertake improvements to the park, potentially including improvements in the segment of the park from West 29th to West 34th Street. HRPT has committed to work with Community Board 4 to prioritize improvements that could be funded by the transfer. Options include an over-water pedestrian platform and related upland park improvements between West 58th and West 59th Streets, construction of habitat beach and accessible walkway and related landscape improvements between West 34th and West 35th Streets, design of new temporary improvements and permanent park on the upland area between West 29th and West 34th Streets, construction of a section of the upland area between West 32nd and West 34th Streets, and upgrades to Chelsea Waterside Park. In addition, HRPT has stated

that it intends to set aside 20 percent of the total value of the transfers for future capital maintenance needs for the portion of the park within Community Board 4.[4]

The 2013 amendment to the Hudson River Park Act called for relocation of the West 30th Street Heliport to a floating structure between West 29th and West 32nd Streets.[5] The timing of the relocation is unknown.

8.5 IMPACTS OF NO ACTION ALTERNATIVE

With the No Action Alternative, no new passenger rail tunnel across the Hudson River would be constructed and the North River Tunnel would not be fully rehabilitated. For purposes of analysis in this EIS, FRA and NJ TRANSIT have assumed that with the No Action Alternative, the existing North River Tunnel would remain functional and in operation at least through the FEIS analysis year of 2033, with continued maintenance as necessary to address ongoing deterioration to the extent possible. This alternative would not result in any changes at or near open spaces in the Project study area and therefore would not result in any impacts to open spaces. With the No Action Alternative, the future changes to parks in the open space study area discussed above in Section 8.4 will occur.

8.6 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE

8.6.1 OVERVIEW

Potential impacts to parks, open spaces, and recreational resources during construction of the Preferred Alternative are discussed below.

8.6.2 NEW JERSEY

Construction of the Preferred Alternative would not require physical disruption of any parks, open spaces, or recreational resources in the New Jersey study area.

The parks on the Palisades in Union City above the tunnel alignment would be located at least 100 feet above any construction activities for the Preferred Alternative's hard rock tunnel through the Palisades and would be unaffected by construction activities. Moreover, as shown in **Figure 8-1,** the tunnel alignment would not be directly beneath these parks, but slightly to their south (for the Midtown Athletic Complex and 17th Street Playground) or north (for Firefighters' Memorial Park).

One park in the New Jersey study area would be located in proximity to the Preferred Alternative's Tonnelle Avenue construction staging area (see **Figure 8-1**): Paterson Plank Road Park, which is on the western slope of the Palisades above Tonnelle Avenue. Six parks in the New Jersey study area would be located in proximity to the Preferred Alternative's Hoboken construction staging area or local truck routes (see **Figure 8-1**): Firefighters' Memorial Park, Pizzuta Park, the 19th Street Basketball Courts, 1600 Park, Harborside/Hoboken Cove Park, and the Hudson River Waterfront Walkway. At these parks, construction activities at the Hoboken construction staging site would potentially be noticeable because of visible construction activities and noise, as

[4] Block 675 East Rezoning FEIS, April 2018, Chapter 6, "Open Space," p. 6-15. https://www1.nyc.gov/site/planning/applicants/env-review/block-675-east.page.

[5] 2013 Amendment to Hudson River Park Act (Chapter 517 of the Laws of 2013), Section 3(m)(v).

discussed below. No adverse air quality impacts would occur at any neighborhood parks (air quality during construction is discussed in Chapter 13, "Air Quality," Section 13.6.2).

Effects on local parks in New Jersey would be as follows:

- **Paterson Plank Road Park:** Construction activity at the Tonnelle Avenue staging site and for the surface alignment in the Meadowlands may be visible from the edge of this park, but in the context of the wide vistas available from this location, these construction activities would not be visually intrusive. The park is approximately 500 feet from the Tonnelle Avenue staging area. The noise analysis in Chapter 12A, "Noise," Section 12A.6.2.2, concludes that no adverse noise impact would occur at the park during construction. Since the construction at the Tonnelle Avenue staging site and in the Meadowlands would not result in negative visual effects or disruptive noise at the park, Project construction would not adversely affect recreational uses at the park.
- **Firefighters' Memorial Park:** Construction staging at the Hoboken staging site may be visible from the edge of this park, which is on a bluff overlooking Hoboken and Weehawken, but in the context of the wide vistas available from this location, the staging site would not be visually intrusive. The park is approximately 500 feet from the Hoboken staging site, the same distance as the noise receptor at 1404 Manhattan Avenue (receptor 2) evaluated in Chapter 12A, "Noise." Receptor 2 is also on the cliff of the Palisades overlooking the staging site. The noise analysis in Chapter 12A, "Noise," Section 12A.6.2.3, concludes that no adverse noise impact would occur at receptor 2, and therefore none would occur at Firefighters' Memorial Park either. Since the construction at the Hoboken staging site would not result in negative visual effects or disruptive noise at the park, it would not adversely affect recreational uses at the park.
- **Pizzuta Park:** This small playground is within the residential neighborhood near the Hoboken staging site, and is approximately one block (200 feet) from the construction staging site. This park would be separated from the construction area by a block of intervening buildings, which would serve as an effective visual and noise barrier between the park and the construction zone. In addition, as discussed in Chapter 12A, "Noise," Section 12A.6.2.3, the Preferred Alternative would include a noise barrier along the northern border of the Hoboken staging area, which would effectively buffer the nearby neighborhood from construction noise. With the barrier, adverse noise impacts would not occur to the residences across the street from the staging area; therefore, adverse noise impacts also would not occur to Pizzuta Park, a block farther away. Since the construction at the Hoboken staging area would not result in negative visual effects or disruptive noise at the park, it would not adversely affect recreational uses at the park.
- **19th Street Basketball Courts:** This paved court area fronts on heavily trafficked local streets on three sides, including Willow Avenue, 19th Street, and Park Avenue/JFK Boulevard East. The proposed truck route for construction trucks headed to and from the Hoboken construction staging site, using any of the three truck route options, would pass the basketball courts on both 19th Street and Park Avenue/JFK Boulevard East. With the revised construction approach evaluated in this FEIS, construction for the Preferred Alternative would add a maximum of eight trucks per hour in each direction to these streets for approximately seven years. This estimate of the duration of the adverse impact is conservative, and the actual duration would likely be shorter, since intensive trucking activity would not be required for all stages of construction. This additional truck traffic would not increase noise levels at the park

beyond the Federal Transit Administration (FTA) threshold constituting an adverse noise impact (see Chapter 12A, "Noise," Section 12A.6.2.3).[6]

- **1600 Park:** Construction activities for the Preferred Alternative would occur in close proximity to this park. This would include a construction truck route nearby and pile drilling to support the Willow Avenue viaduct adjacent to the park. The proposed truck routes for construction trucks traveling to and from the Hoboken construction staging site would include a new temporary access road along the north side of the existing HBLR tracks that would be approximately 150 feet from 1600 Park at its closest point. Trucking activity would be discernible from the northern end of the park (the location of its slide hill), but would not result in noise or visual impacts at the park. In addition, construction activities for the Preferred Alternative would include underpinning of the Willow Avenue viaduct adjacent to this park. The underpinning would include installation of piles, which would be drilled into place rather than driven, to reduce noise levels. As discussed in Chapter 12A, "Noise," Section 12A.6.2.3, the pile drilling at the Willow Avenue viaduct would result in noise levels at the park that exceed FTA construction noise impact thresholds for up to approximately two months on weekdays, 7 AM–11 PM. Given that this park is used for active recreation, which is generally not noise-sensitive, and the relatively short duration of the construction activity, this noise increase would not be an adverse impact. The Project Sponsor will coordinate with the City of Hoboken and Township of Weehawken, which have jurisdiction for this park, regarding pile installation for the underpinning of the Willow Avenue viaduct, to avoid disruption to special events in the park and to provide advance notification, so that the city and township can provide public notification of this activity and its expected duration.
- **Harborside/Hoboken Cove Park:** Construction activities for the Preferred Alternative would occur in close proximity to this park. This would include a construction truck route approximately 150 feet from the park and pile drilling to support the Willow Avenue viaduct approximately 250 feet from the park. Two of the proposed truck routes for construction trucks traveling to and from the Hoboken construction staging site (haul route Options 1 and 3) would include a new temporary access road along the north side of the existing HBLR tracks that would be approximately 150 feet from the undeveloped section of Harborside/Hoboken Cove Park at its closest point (a currently undeveloped stretch of waterfront along Park Avenue that will be developed in the future; the timing for this construction is not known).Trucking activity would be discernible from this area of the park, but would not result in noise impacts at the park. Based on the noise analysis presented in Chapter 12A, "Noise," Section 12A.6.2.3.1, the predicted truck volumes on the Project's truck routes would not result in construction noise impacts for parks along or near the routes. Pile drilling associated with underpinning the Willow Avenue underpinning, which would occur one block or approximately 250 feet away from the park at its nearest point, would produce noise levels at the park that exceed FTA construction noise impact thresholds. This would occur for approximately two months on weekdays, 7 AM–11 PM. Based on conceptual planning for the Rebuild By Design project, this section of the park will include predominantly active uses—playgrounds, lawns, game courts, and a viewing deck. Due to the relatively short duration of the noise exceedance at this future park and its predominantly active planned uses, which are generally not noise-sensitive, this construction noise would not adversely affect recreational use at Harborside/Hoboken Cove Park if the park is completed when construction for the Preferred Alternative occurs (see Chapter 12A, "Noise," Section 12A.6.2.3). The Project Sponsor will coordinate with the City of Hoboken and Township of Weehawken, which have jurisdiction for this park, regarding pile installation for

[6] As described in Chapter 12A, "Noise," the noise analysis for this FEIS was conducted following procedures described in the FTA guidance manual, *Transit Noise and Vibration Impact Manual*, FTA Report No. 0123, September 2018. The impact thresholds used for the analysis are the thresholds set forth in that document.

the underpinning of the Willow Avenue viaduct, to avoid disruption to special events in the park and to provide advance notification, so that the city and township can provide public notification of this activity and its expected duration.

- **Hudson River Waterfront Walkway:** Construction activities for the Preferred Alternative would occur in close proximity to this park. This would include a nearby construction truck r and pile drilling to support the Willow Avenue viaduct. One of the proposed truck routes for construction trucks traveling to and from the Hoboken construction staging site (haul route Option 3) would include a new temporary access road along the north and west side of the existing HBLR tracks that would be located approximately 100 feet from the Hudson River Waterfront Walkway at its closest point along the Harbor Path. Based on the noise analysis presented in Chapter 12A, "Noise," Section 12A.6.2.3.1, trucking activities along the Project's construction truck routes would not result in noise levels that would exceed FTA's construction noise impact thresholds for recreational uses at the park. The pile drilling at Willow Avenue would be approximately 320 feet from the park and would produce noise levels at the park that exceed FTA noise impact thresholds. This would occur for approximately two months on weekdays, 7 AM–11 PM. Due to the relatively short duration of the noise exceedance at this park and the small section (a few hundred feet) of the 18.5-mile-long walkway affected, the noise impact would not constitute an adverse construction noise impact at this park (see Chapter 12A, "Noise," Section 12A.6.2.3). The Project Sponsor will coordinate with the City of Hoboken and the Hudson River Waterfront Conservancy regarding pile installation for the underpinning of the Willow Avenue viaduct, to avoid disruption to special events on the walkway and to provide advance notification, so that the city can provide public notification of this activity and its expected duration.

In addition, the Preferred Alternative's tunnel alignment would pass directly beneath 1600 Park, Harborside/Hoboken Cove Park, and the Hudson River Waterfront Walkway. Tunneling activities would be approximately 100 feet below the surface in this area. While minor vibration from the tunnel boring machine (TBM) may be discernible for a few days as the TBM passes these parks, this would not be disruptive.

Where the tunnel alignment would pass directly beneath 1600 Park, Harborside Park/Hoboken Cove Park, and the Hudson River Waterfront Walkway, approval of this permanent subsurface easement would be required in accordance with New Jersey's Green Acres Program. This is discussed below in Section 8.7.2.

The Project Sponsor will coordinate with the City of Union City, Township of Weehawken, and City of Hoboken to ensure that construction activities do not cause disruption to special events in nearby parks.

8.6.3 HUDSON RIVER

Construction of the Preferred Alternative would include in-water construction activities for approximately 15 months. The construction zone would be outside of the pierhead line, which is the boundary of Hudson River Park. As discussed in Chapter 3, "Construction Methods and Activities," Section 3.3.5, the work area within the river would first be enclosed by a cofferdam—a temporary, watertight structure that would isolate the water affected by construction from the surrounding river water. Barges supporting construction equipment would be permanently moored around the cofferdam until the construction in the river is complete. In total, the affected area would be 1,200 feet long and 110 feet wide, with a buffer zone of 100 feet around the area where barges would be stationed. At its closest point, the in-water construction zone would be 70 to 100 feet from the pierhead line, which is the Hudson River Park boundary.

The in-water construction work would occur in stages to limit the area of the river affected at any one time, although the stages could overlap. The Project Partners will continue to refine the design

for the in-river work, in coordination with USACE and the USCG, to minimize the potential for adverse impacts on navigation in the Hudson River during construction and will identify the final staging approach in coordination with USACE and USCG.

While the in-water construction activities for the Project would not be within the park's water area, they would be fairly close (70 to 100 feet from the park boundary), and boaters moving between the navigation channel and the Pier 66 boathouse and nearby moorings would need to avoid the construction zone, which may be inconvenient but would not limit boaters' access to and from the channel. Construction for the Preferred Alternative would not affect any other areas of the Hudson River or limit boating activities in any other portion of the river. **Figure 8-3** illustrates the location of the boathouse and moorings relative to the construction zone.

Modifications to the river bottom would require a permit from the USACE and must meet conditions imposed by the USACE to protect the navigation channel and maritime safety. The Preferred Alternative would include measures during construction to warn maritime traffic, including recreational boaters, of the construction zone and to ensure the continued safety of boaters. Measures would include notifications to mariners via the USCG, installation of lighting on barges and the cofferdam, and automatic identification system (AIS) transponders affixed to barges and cofferdams to enable electronic locating of the cofferdam and tracking of the barges. These measures will be developed in coordination with the USCG as the design advances. Therefore, there would be minimal, temporary effects on recreational activities on the Hudson River that would not adversely affect the river's quality as a recreational resource during construction.

8.6.4 NEW YORK

Construction activities in New York would result in temporary disruptions at Hudson River Park and the High Line, as discussed below.

8.6.4.1 HUDSON RIVER PARK

Construction activities for the Preferred Alternative would have three different types of effects on Hudson River Park: (1) some construction would occur directly in Hudson River Park; (2) some construction would occur near the park and would be audible and visible in the park; and (3) some construction occurring both in and near the park would delay planned improvements in the park.

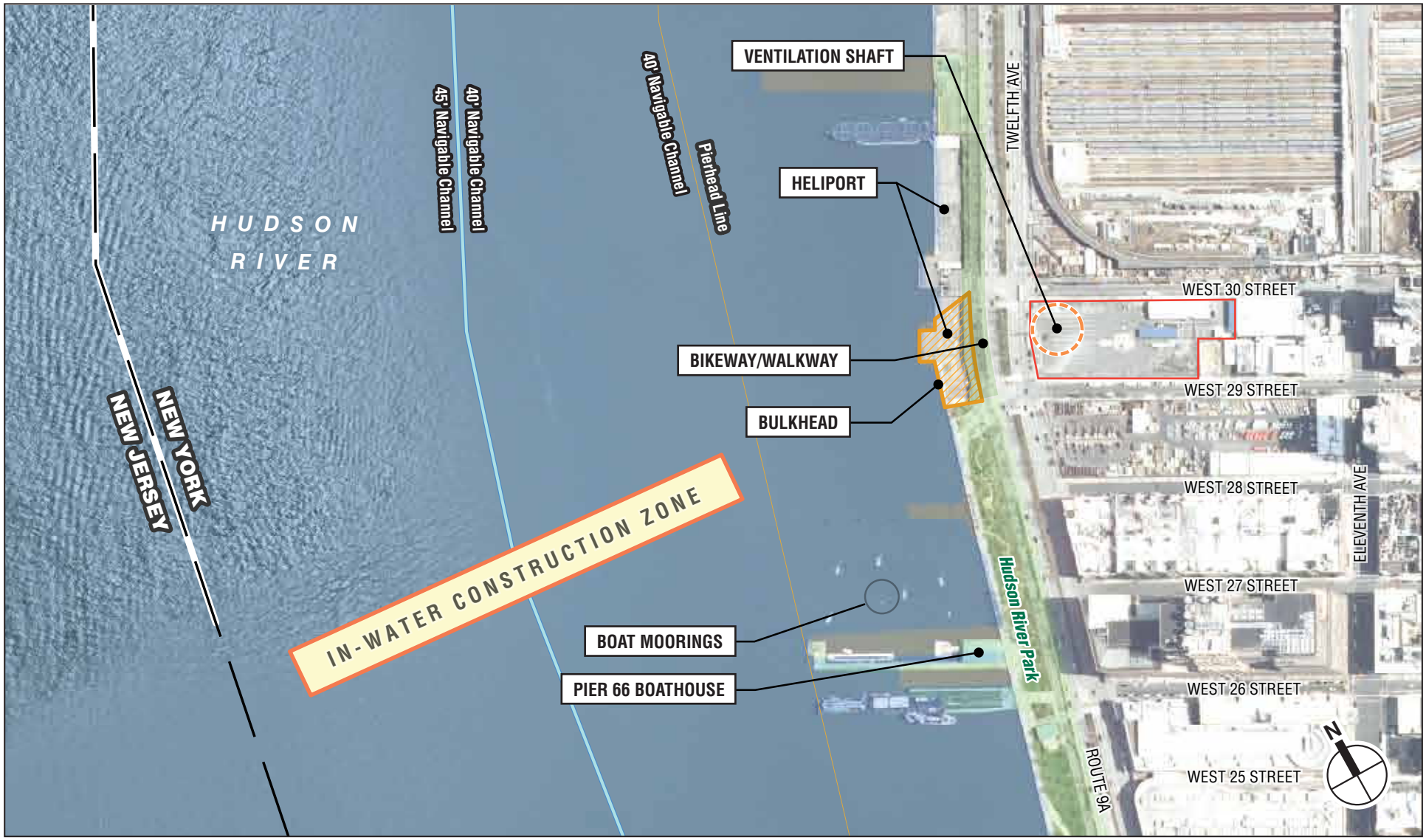
8.6.4.1.1 Construction Activities in Hudson River Park

To allow tunneling beneath the surface rather than through cut-and-cover excavation in Hudson River Park, construction for the Preferred Alternative would include soil improvements in the park. As described in Chapter 3, "Construction Methods and Activities," Section 3.3.6, the Project Partners are considering two options for ground improvement in this area, vertical ground freezing, which was described in the DEIS, and a combination of Sequential Excavation Method (SEM) tunnel excavation[7] and ground freezing, which is a new option developed for consideration following completion of the DEIS to minimize risk to the Manhattan bulkhead. The Project Sponsor, together with the other Project Partners, will make the final decision on the construction method for this area during final design, in conjunction with the Project contractor.

Both construction options would involve ground freezing, a technique that involves installation of a network of underground pipes and then circulation of a freezing agent through the pipe network until the ground around the pipes freezes solid. In addition to freezing, permeation grouting

[7] SEM excavation is a mining technique in which a tunnel is sequentially excavated below ground in phases.

4.15.21



In-Water Construction Zone
Shaft Site
Twelfth Avenue Staging Site
Hudson River Park Staging Area
Hudson River Park

HUDSON TUNNEL PROJECT

Hudson River Park Features near Proposed Construction Zones

Figure 8-3

(primarily cement with some additives) would be conducted to fill voids in the foundation of the bulkhead.

Both ground improvement approaches would affect Hudson River Park for approximately 18 months, because of the time needed to establish a construction zone, implement ground improvement in advance of tunneling with the TBMs, wait for completion of the tunneling, and demobilize after the need for ground improvement is complete. This work would require a temporary construction zone and staging area in the southern portion of the West 30th Street Heliport, in the area between approximately West 29th Street and West 30th Street, which is directly above the proposed tunnel alignment. This construction zone would temporarily displace the heliport operations from this area and would narrow or close a portion of the paved pedestrian walkway in Hudson River Park.

The effects on the recreational features of the park would vary slightly between the two construction options, as described below.

- **Vertical Ground Freezing Option:** With a vertical ground freezing scheme, the freeze pipes would be installed in a grid pattern from the surface, both vertically and diagonally (i.e., at an incline) to minimize disturbance at the surface from pipe installation. In the park, freeze pipes would be installed in the southern portion of the West 30th Street Heliport. Freeze plants, typically housed within one or two work trailers, would be located on the nearby Twelfth Avenue staging site and potentially within the heliport. Pipes would connect the freeze plants to the underground pipes in the tunnel alignment. Once in place, trenches carrying the freeze pipes would be covered with steel plates or other temporary cover so the area above could be returned to use.

  During installation of the freeze pipes for the vertical freeze option, a portion of the paved pedestrian walkway in Hudson River Park would be closed when freeze pipes are being installed and removed, a total duration of approximately nine months. The affected area is approximately 10 feet wide and 150 feet long, or a total of about 1,500 square feet. A small park area near the walkway could also be affected. The walkway would be narrower but would remain open during this time, with a minimum width of approximately 8 feet through the construction zone. 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. The adjacent Route 9A bikeway would not be affected by installation of the freeze pipes. During the full 18-month construction period, both the park walkway and the Route 9A bikeway would be subject to potential intermittent short-term closures (up to several days) for trenching of freeze pipes across them. In this case, detours would be established during the closure, and any trench excavated for this purpose would be immediately decked over and the walkway and bikeway reopened.

  Figure 3-9 in Chapter 3, “Construction Methods and Activities,” Section 3.3.6, shows the area where vertical ground freezing would be implemented using this approach.

- **SEM Excavation with Ground Freezing Option:** With this option, there would be a temporary construction shaft in the southern part of the West 30th Street Heliport. The shaft would be approximately 110 feet long, to encompass both tubes of the new tunnel, and 25 feet wide, to provide enough space for workers and materials to enter and exit. Once the temporary shaft is in place, it would first serve as the location from which freeze pipes could be routed. Then, once the tunnel alignment has been treated through freezing and grouting, the shaft would also be the starting point for SEM tunnel excavation.

  With this approach, a larger staging area would be needed to accommodate the temporary shaft above the tunnel alignment. Consequently, this option would involve closing the full width of the park walkway for approximately 200 linear feet (an area about 20 feet wide and 200 feet

long, or 4,000 square feet). To allow continued walkway access, the walkway would be detoured eastward into the adjacent Route 9A bikeway and an eight-foot-width of the bikeway would be converted into a temporary walkway. This would narrow the bikeway from 15 feet to 10 feet for the length of the staging area, about 200 feet. Pavement markings would separate the park walkway from the Route 9A bikeway. During excavation of the shaft at the heliport and subsequent construction activities there, trucks would enter and leave the staging area, to bring materials and remove excavated materials. To align with the adjacent street directions, trucks would use a one-way circulation pattern through the staging area, with trucks entering through a gate from 29th Street and exiting through a gate to 30th Street. Since this would involve truck traffic crossing the park walkway and Route 9A, flaggers would be present to protect pedestrians and bikers. During approximately two months of the construction, there would be approximately four trucks per hour entering and then leaving the staging area; during the rest of the 18-month construction period in the park, approximately one to two trucks per hour would enter and then leave the staging area.

Figure 3-10 in Chapter 3, "Construction Methods and Activities," Section 3.3.6, shows the area that would be affected by the SEM with ground freezing option.

With either construction option, the staging area would be fenced with a solid fence to block views of the construction zone from the adjacent park. Even with this construction fence, the construction equipment in the staging area would be visible to people in nearby areas of Hudson River Park. Construction activities would at times be noisy and disruptive, although this part of the park is already noisy given the presence of a busy urban arterial highway on one side and an active heliport on the other.

Following completion of the construction, the Project Sponsor will restore the affected area of Hudson River Park in coordination with HRPT. The Project Sponsor will undertake this restoration at no cost to HRPT or relevant New York State and City agencies.

The 2013 amendment to the Hudson River Park Act requires relocation of the West 30th Street Heliport to a new floating structure between West 29th and West 32nd Streets and conversion of the heliport area to park use. The timing for that relocation is not known. As noted in Section 8.4.3, HRPT is planning future improvements to the segment of Hudson River Park between West 29th and West 34th Streets. Park improvements could not be made while the construction activities for the Preferred Alternative that occupy park space are occurring. HRPT is coordinating with the Project Partners and has stated that it would not complete new park facilities in the area required for Hudson Tunnel Project construction prior to completion of the tunneling.

If the heliport has not yet been relocated prior to the onset of construction activities for the Project, both construction options would involve closing the southern part of the heliport for use as a construction staging area. This would displace the heliport's above-ground fuel tank, two fueling pads, one to two landing pads, and a driveway and parking area during the approximately 1.5-year duration of the construction activities. The Project Sponsor, in cooperation with the other Project Partners, will coordinate with the heliport operator and HRPT regarding relocation of the fueling facility to identify a suitable location for the fuel tank. The new location for the fuel tank may be a new permanent location, if that location can be identified (possibly near West 30th Street), or a temporary new location either within the heliport property or potentially on a new fueling barge that would be moored at the heliport, and would need to comply with all applicable regulatory restrictions related to siting such a facility.

Construction activities may affect the throughput capacity and volume of flights using the heliport. In addition, it may be necessary to reroute helicopters headed to and from the West 30th Street Heliport to avoid conflicts between aircraft and tall construction equipment during construction at

the heliport and during the in-water construction activities. The Project Sponsor will obtain a construction permit from the Federal Aviation Administration for this work.

If heliport operations are adversely affected and this affects the payments that the heliport operator makes to HRPT, this could in turn adversely affect HRPT's ability to maintain Hudson River Park. The Project Sponsor, in cooperation with the other Project Partners, will coordinate with the heliport operator and HRPT, which receives revenues from the heliport, to minimize disruption to the heliport operation to the extent practicable. The temporary use of a portion of the heliport would comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (the Uniform Act; see Chapter 6B, "Property Acquisition").

Where activities for the Preferred Alternative would directly affect Hudson River Park, the Project Sponsor, in cooperation with the other Project Partners, will seek to mitigate and minimize Project impacts to the greatest extent possible, such as by requiring restoration or improvement of the park upon the Project Sponsor's completion of work that occupies or affects the park.

8.6.4.1.2 Construction Activities Near Hudson River Park

Construction activities associated with the Preferred Alternative occurring at other nearby locations would result in temporary impacts at Hudson River Park. This would include the in-water construction that would occur approximately 70 feet from the pierhead line (park boundary) for up to approximately 26 months, and construction activities on the Twelfth Avenue staging site and adjacent area of West 30th Street, together with construction-related traffic along Twelfth Avenue, for approximately seven years. **Figure 8-3** illustrates the location of the boathouse and moorings relative to the construction zone.

As noted above in Section 8.6.3, measures would be taken during construction to warn maritime traffic, including recreational boaters such as those operating from the boathouse at Pier 66, of the construction zone and to ensure the continued safety of boaters. When the Twelfth Avenue shaft site is used as a staging site for surface construction activities, a temporary barrier along the site's western edge would be used to buffer the park from construction noise and views of construction equipment. Taller equipment would be visible above the wall, as would the fan plant structure as it is erected. Overall, construction activities may result in an adverse visual impact but this effect would be temporary.

Construction at the Manhattan waterfront and Twelfth Avenue shaft site would produce noise levels at Hudson River Park that would be noticeable and audible, but would be below FTA's noise impact criteria (see Chapter 12A, "Noise," Section 12A.6.3.2.1). Construction noise at this location would not affect Hudson River Park visitors' ability to utilize or enjoy the park. Moreover, extensive construction has been occurring across Route 9A from the park in many locations, and the park is located on a busy and noisy traffic arterial; therefore, additional construction activities associated with the Preferred Alternative would not change the character or usefulness of the park's recreational resources.

8.6.4.1.3 Construction-Related Delays to Hudson River Park Improvements

Hudson River Park is being gradually developed as funding becomes available. The two private developers for the east end of Block 675 have purchased development rights from the park, consistent with the recently approved rezoning and special permits there (note that there is no involvement in these agreements on the part of the Project). According to the 2018 FEIS for the rezoning of the eastern portion of Block 675, HRPT will use the anticipated funding from the sale of the development rights to undertake improvements to the park, potentially including improvements in the segment of the park from 29th to 34th Street. Park improvements could not be made while the construction activities for the Preferred Alternative that occupy park space are

occurring. HRPT is coordinating with the Project Partners and has stated that it would not complete new park facilities in the area required for Hudson Tunnel Project construction prior to completion of the tunneling. Therefore, the construction activities for the Preferred Alternative would delay improvements in the area near 29th Street where tunnel construction activities are proposed.

Construction activities for the Preferred Alternative would occur across Twelfth Avenue from Hudson River Park on Manhattan Block 675, where the Twelfth Avenue staging area for the Preferred Alternative would be in construction for approximately seven years. NYCDCP and HRPT have identified Lot 1 on Block 675 as a future site for use of transferred development rights from the park pursuant to the Hudson River Park Act; at this time, there is no committed potential purchaser for those rights. Any developer seeking such a transfer of development rights to Lot 1 would be required to seek a rezoning and special permits to allow the transfer. Since Lot 1 is proposed as the Twelfth Avenue staging area for the Hudson Tunnel Project, the sale of development rights from Hudson River Park to a future developer on Lot 1 may be delayed as a result of the Project's construction activities. Any developer of Lot 1 and potential purchaser of development rights from HRPT will have to take the construction staging of the Preferred Alternative into consideration. Until any such sale, the proceeds will not be available to HRPT to improve the park. Amtrak will need to negotiate several necessary agreements with HRPT for entry permits, as well as temporary and permanent easements. The relevant agreements could include negotiated provisions that take into account potential financial losses and funding delays.

8.6.4.2 HIGH LINE

No physical disruption to the High Line would occur during construction of the Preferred Alternative. The new tunnel route would pass beneath the High Line within the concrete casing currently being constructed underneath the West Side Yard by the Hudson Yards Right-of-Way Preservation Project, a separate project from the Preferred Alternative. All Project-related construction activities beneath the High Line would occur entirely within the concrete tunnel structure.

The Preferred Alternative's construction would include construction activities in close proximity close to the High Line. This would include construction staging activities on the Twelfth Avenue staging site for approximately seven years, the presence of a construction truck route on Twelfth Avenue for approximately seven years, utility relocation work in West 30th Street for approximately nine months, and pile installation in the Twelfth Avenue shaft for approximately five months and for the sewer relocation at West 30th Street for seven months. In addition, if excavation for the new tunnel across West 30th Street is conducted via cut-and-cover excavation, construction for the Preferred Alternative would involve pile driving in West 30th Street for approximately seven months (see Chapter 3, "Construction Methods and Activities," Section 3.3.8.1).

These construction activities would be noticeable at the High Line and could be temporarily disruptive to people on the High Line. In the future, in the same period while the Preferred Alternative is under construction, extensive construction will also be occurring in the surrounding area. With the Preferred Alternative, a noise wall would surround the Twelfth Avenue staging site, which would also serve to partially block views into the site. Taller equipment would be visible above the wall, as would the fan plant structure as it is erected. People on the High Line would have views over the wall into the site. Overall, construction activities may result in an adverse visual impact but this effect would be temporary.

As discussed in Chapter 12A, "Noise," Section 12A.6.3.2.4, construction activities at the Twelfth Avenue shaft, excavation within West 30th Street using underground Sequential Excavation Method (SEM) techniques, and fan plant construction would all result in noise levels at the High Line that would exceed nuisance levels (as defined by the *CEQR Technical Manual*) for approximately four years. This would occur in areas on the High Line within approximately 400

feet of the construction activity and would constitute a significant adverse noise impact according to CEQR criteria, but would not exceed FTA construction noise impact criteria. In addition, if cut-and-cover excavation with pile driving occurs in West 30th Street rather than SEM mining, the pile driving would result in noise levels that exceed the FTA noise impact threshold for approximately seven months at the High Line. This would occur for the area within approximately 200 feet of the pile driving activities. This noise level would not constitute an adverse impact on the High Line according to FTA impact thresholds, because of the relatively short duration of the activity (i.e., less than 12 months). These noise levels would potentially disrupt any passive recreation that occurs on the High Line along its West 30th Street segment, such as at the seating areas.

The High Line is a 1.5-mile-long linear park with a range of different zones that offer a varied experience for visitors. While construction activity for the Preferred Alternative would result in noise increases as described above, this would affect only about 800 linear feet of the High Line (i.e., the area within 400 feet of the construction zone both to the east and to the west/north), leaving the rest of this long park available for recreation without increased noise. Overall, therefore, construction activities for the Preferred Alternative would not result in an adverse impact on recreational use on the High Line.

The western half of West 30th Street would be the site of construction work and would be partially closed to traffic and pedestrians for approximately two years to facilitate construction of the Preferred Alternative. This would not affect the access points to the High Line at Tenth and Eleventh Avenues.

8.6.4.3 OPEN SPACES AT HUDSON YARDS

Compared to Hudson River Park and the High Line, Hudson Yards Public Square and Garden and Bella Abzug Park are more distant from construction activities and are surrounded by large new buildings that would shield them from Project construction activities. Hudson Yards Public Square and Garden sits directly above the Project alignment, but at that location, the only Project construction activity involves fitting out the previously constructed tunnel box developed through the Hudson Yards Right-of-Way Preservation Project, and would not be discernible in the park. The park is approximately 500 feet from the Twelfth Avenue staging site, farther than the noise receptor at 312 Eleventh Avenue (receptor 8) evaluated in Chapter 12A, “Noise.” The noise analysis in Chapter 12A, “Noise,” Section 12A.6.3.2, concludes that no adverse noise impact would occur at receptor 8, and therefore none would occur at Hudson Yards Public Square and Garden either.

Hudson Yards Public Square and Garden is approximately 400 feet from the Tenth Avenue cut-and-cover area, the same as the noise receptor at 413 Tenth Avenue (receptor 8b) evaluated in Chapter 12A, “Noise;” Bella Abzug Park is approximately 600 feet from that construction site. The noise analysis in Chapter 12A, “Noise,” Section 12A.6.3.2, concludes that no adverse noise impact would occur at receptor 8b, and therefore none would occur at Hudson Yards Public Square and Garden or Bella Abzug Park, either.

Construction activity at the Twelfth Avenue staging site may be visible from the edge of Hudson Yards Public Square and Garden, but in the context of the busy urban environment visible from this location, these construction activities would not be visually intrusive. Construction activity at the Twelfth Avenue staging site would not be visible from Bella Abzug Park due to the presence of multiple large skyscrapers in between the park and the staging site; construction activity at the Tenth Avenue cut-and-cover area would not be visible from either park for the same reason.

Since the construction at the Twelfth Avenue staging site and the Tenth Avenue cut-and-cover area would not result in negative visual effects or disruptive noise at the park, Project construction would not adversely affect recreational uses at the park.

8.7 PERMANENT IMPACTS OF THE PREFERRED ALTERNATIVE

8.7.1 OVERVIEW

Once construction of the Preferred Alternative is complete, the parks, recreational resources, and open spaces in the study area would remain unchanged (any areas that would be altered as part of the Preferred Alternative's construction would be restored to their pre-construction condition). The Preferred Alternative's potential effects on those resources are discussed below.

8.7.2 NEW JERSEY

8.7.2.1 EFFECTS ON OPEN SPACE

Operation of Preferred Alternative's new rail tunnel beneath the study area would not affect the public's use and enjoyment of parks in the study area. The new tunnel would be deep below the parks and rail operations would not be discernible.

8.7.2.2 GREEN ACRES PROGRAM APPROVALS

The Preferred Alternative's tunnel alignment would pass directly beneath three open spaces that are part of NJDEP's Green Acres Program: 1600 Park, Harborside/Hoboken Cove Park, and the Hudson River Waterfront Walkway. Each of these parks is partly in the City of Hoboken and partly in the Township of Weehawken. No surface work would be undertaken at these parks; however, subsurface easements must be obtained from the City of Hoboken and Township of Weehawken for the subsurface tunnel construction, and approval of the subsurface easements must be obtained in accordance with the Green Acres Program.

The Project Sponsor, in cooperation with the other Project Partners, would coordinate with the NJDEP Green Acres Program during final design of the Preferred Alternative to initiate the Green Acres Program approval process. Green Acres representatives must make a recommendation to the Commissioner of the NJDEP and the New Jersey State House Commission for their approval of the disposal/diversion of use, including proposed compensation for the easements. The acquisition of the easements would not have an impact on the public's access to or use of these parks.

The NJDEP Commissioner and State House Commission must find that the disposal or diversion of parkland is for a project that would fulfill a compelling public need and yield a significant public benefit. The diversion of parkland must be compensated with eligible replacement land, parkland improvements, or monetary compensation.

Once a site has received funding through the Green Acres Program, it may not be disposed of (i.e., sold, donated, exchanged, granted, converted, including by surface or subsurface easements) or diverted to a use other than recreation or conservation without approval by the property owner, NJDEP Commissioner, and the New Jersey State House Commission.[8] Diversions of parkland from recreational purposes include, but are not limited to, "bridges; through roads or other transportation improvements; rights-of-way; public or private utility or other non-recreation easements (surface or subsurface)."

[8] NJAC 7:36-25.2.

8.7.3 HUDSON RIVER

Once the Preferred Alternative is complete, the new tunnel would not affect recreational activities on the river, as the tunnel would be located underneath the river and there would be no activities that would affect recreational boaters or other recreational users on the river's surface. The modified section of the river bottom would be well below the regulated navigational channel depths of 45 feet in the main channel and 40 feet in the New York wing channel, and therefore would not affect recreational boating activities.

Within the boundaries of Hudson River Park (which includes the portion of the Hudson River from the New York bulkhead to the pierhead line), the West 30th Street Heliport could be relocated to an in-water site consistent with the Hudson River Park Act, which calls for relocation of the heliport to a floating structure located between West 29th and West 32nd Streets. Any pile supports for such a structure could not be located in the approximately 125-foot-wide area where the new Hudson River Tunnel would be buried beneath the river bottom. This area would be located close to West 29th Street, but would still allow relocation of the West 30th Street Heliport to an in-water site consistent with the Hudson River Park Act.

8.7.4 NEW YORK

8.7.4.1 EFFECTS ON OPEN SPACE

The Preferred Alternative's Twelfth Avenue fan plant would be located across Twelfth Avenue from Hudson River Park and across West 30th Street from the High Line. This new structure, with a height that may potentially be up to approximately 150 feet (equivalent to a 15-story building), would change the appearance of the site. However, the area around the Twelfth Avenue fan plant is currently undergoing substantial redevelopment and by 2033, when the Preferred Alternative would be complete, the block where the fan plant site is located (Block 675) 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, as well as numerous existing buildings to the south and east, as described in Chapter 10, "Visual and Aesthetic Resources," Section 10.3.3.1.1.

At Hudson River Park, the permanent location of the tunnel beneath the park would mean that no deep foundations (any type of driven, vibrated, augured, or bored pile or caisson) could be located above or within a 25-foot horizontal distance of the footprint of the tunnel or any ground treatment area bordering the tunnel. No other restrictions would apply to this area, and this park space could be landscaped or developed for other recreational uses. As noted in Section 8.7.3, the presence of the below-grade tunnel alignment would still allow relocation of the West 30th Street Heliport to an in-water site consistent with the Hudson River Park Act.

8.7.4.2 SHADOWS ON OPEN SPACES

New York City's *CEQR Technical Manual* calls for analysis of shadows for new structures higher than 50 feet that are being reviewed in the CEQR process, or of any height if adjacent to a sunlight-sensitive resource. As noted above, depending on the final configuration and massing of the Twelfth Avenue fan plant, this building may be up to approximately 150 feet tall.

The CEQR methodology calls for identifying parks, natural resources, and sun-sensitive features of historic resources (such as stained glass windows) that may be affected by shadows from the

new building being analyzed and provides a recommended methodology for determining the area where a proposed new building's shadows may fall and for how long they would fall. Therefore, in accordance with New York City CEQR procedures, an analysis was prepared following the guidelines of the *CEQR Technical Manual* (see **Figures 8-4 through 8-9** and **Appendix 8**).

The analysis begins with a two-step screening evaluation (see **Figure 8-4**):

- Tier 1, in which the longest the longest shadow that a proposed structure could cast is calculated, and, using this length as the radius, a perimeter is drawn around the project site. This perimeter is used to identify whether any open spaces are present in the area where new shadows may be cast.
- Tier 2 identifies the area within the Tier 1 perimeter in which shadows can never be cast be a project, because of the path that the sun travels across the sky in New York City.

Based on those two steps, a detailed shadow analysis was conducted for the Hudson River Park, the Route 9A bikeway, and the High Line using a three-dimensional model.

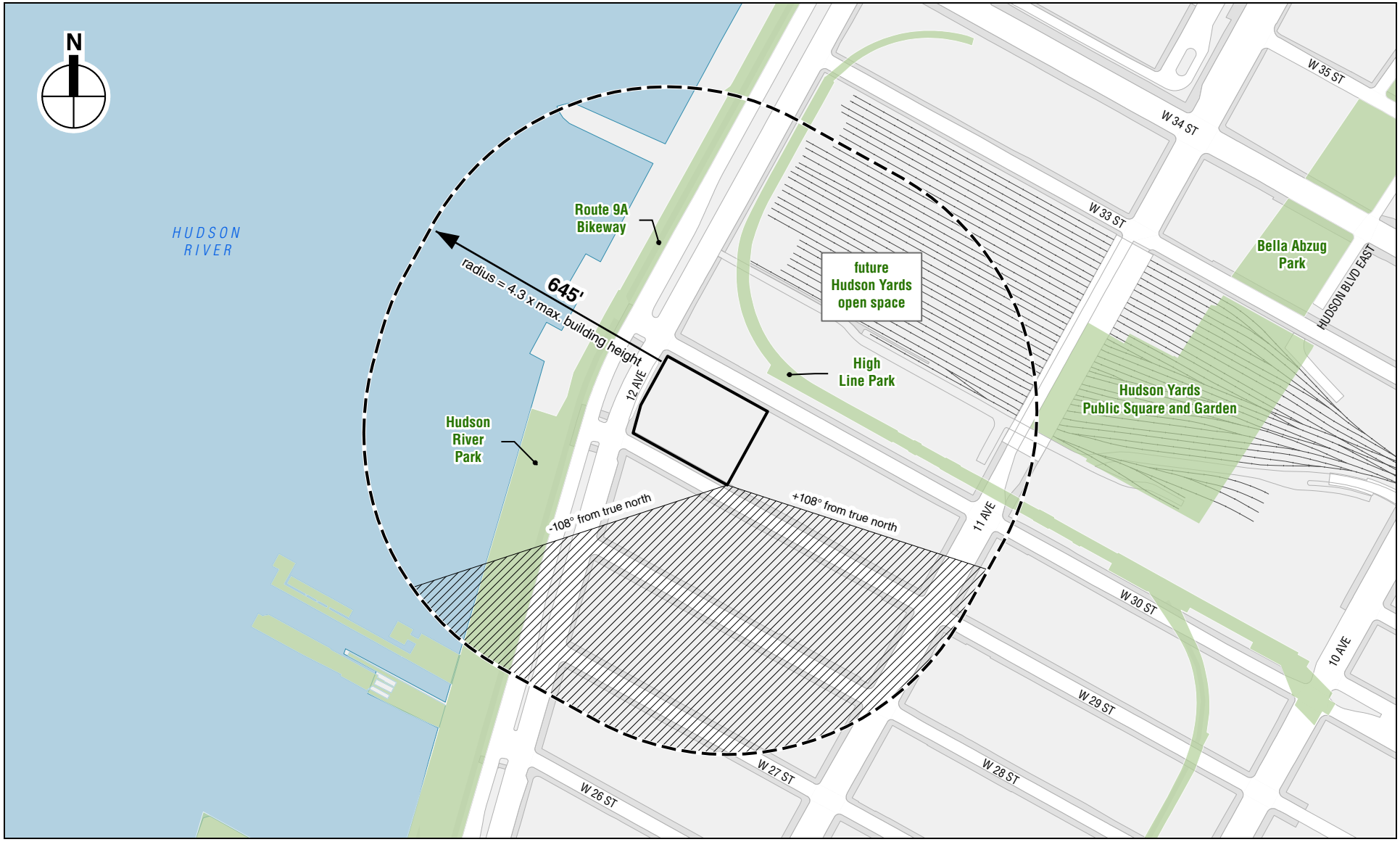
Shadows can be cast to the west (in the morning), to the north (in the midday), and to the east (in the late afternoon). For the Preferred Alternative, shadows from the fan plant would fall on Hudson River Park including the waters of the Hudson River, the Route 9A bikeway, and the High Line, since these are located within the area where the Twelfth Avenue fan plant's shadows would be cast. In addition, depending on the final site plan for new development that will be built as part of the Western Rail Yard development north of West 30th Street between Eleventh and Twelfth Avenues, the fan plant may also cast shadows onto new parks within that development, if they are not already shaded by the development's own buildings.

The Twelfth Avenue fan plant site is currently vacant and therefore no shadows fall on the Hudson River Park, Hudson River, the Route 9A bikeway, or the High Line from the site. If the new fan plant is 150 feet tall, these shadows would be cast on these spaces all year long. In the morning, shadows would fall on the river and Hudson River Park, and in the midday and late afternoon, on the High Line. The analysis considered two potential locations for a Twelfth Avenue fan plant: a northwest location, in which the fan plant would be located at the corner of Twelfth Avenue and West 30th Street, and a West 29th Street location, in which the fan plant would be located on West 29th Street east of Twelfth Avenue. While the fan plant ultimately may be in a different location on the block, these two locations represent a range of reasonable worst-case conditions in terms of potential shadows impacts. The analysis also assumed the fan plant is 150 feet tall.

Incremental new shadows from the Twelfth Avenue fan plant would fall on of Hudson River Park, the Hudson River, the Route 9A bikeway, and the High Line in the immediate vicinity of the Project site, but would not change the overall character or recreational quality of these recreational resources. Based on the shadows analysis provided in **Appendix 8** and illustrated in **Figures 8-4 through 8-8**, minor incremental shadows on these parks would be as follows:

- Small incremental shadows would fall on the Hudson River Park walkway, waters of the Hudson River, and Route 9A bikeway on winter and early spring and fall mornings. The shadow would be larger with a fan plant at the northwest location, but in either location the incremental shadows would be relatively small. This area of the park would receive many hours of direct sunlight through the midday and afternoon hours.
- Incremental shadow would move across portions of the High Line for nearly two hours in the fall, winter and early spring, and an hour and a half on the May 6 / August 6 analysis day. The extent of new shadow would be small and it would move over the course of the duration, affecting different plantings and amenities at different times. All the affected areas would receive four hours or more of direct sunlight over the course of the day throughout the growing season, so the health of the plantings would not be significantly affected. Large adjacent areas

4/15/2021



Area Containing Potential Locations of Fan Plant Building

Tier 1: Longest Shadow Study Area Boundary

Tier 2: Area South of Site that Could Never be Shaded by Proposed Building

Publicly Accessible Open Space

Historic Resources with Sunlight-Sensitive Features (none located in map extent)

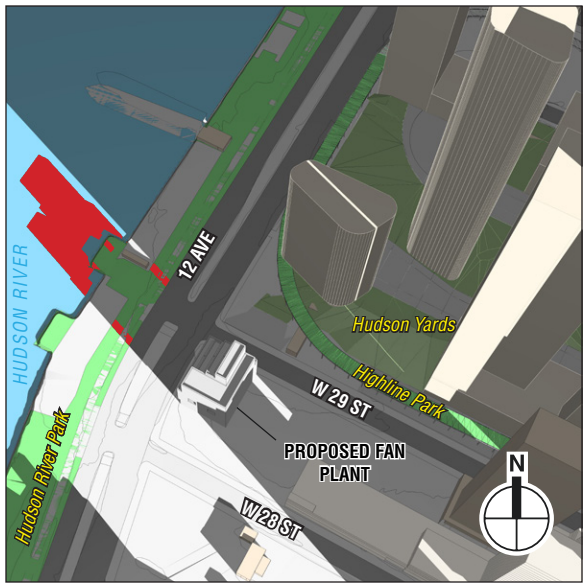
0 200 FEET

HUDSON TUNNEL PROJECT

Shadows - Tier 1 and Tier 2 Assessments

Figure 8-4

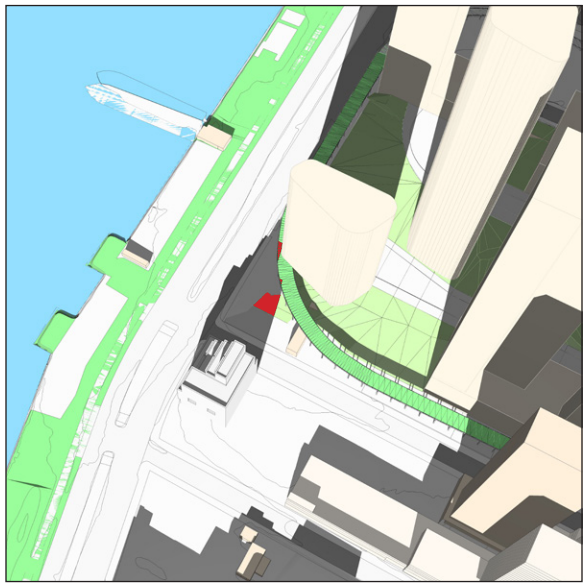
4.14.21



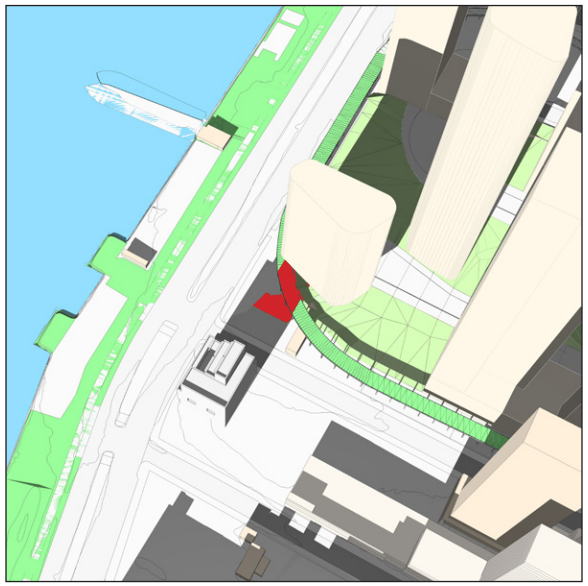
9:00 AM

10:00 AM

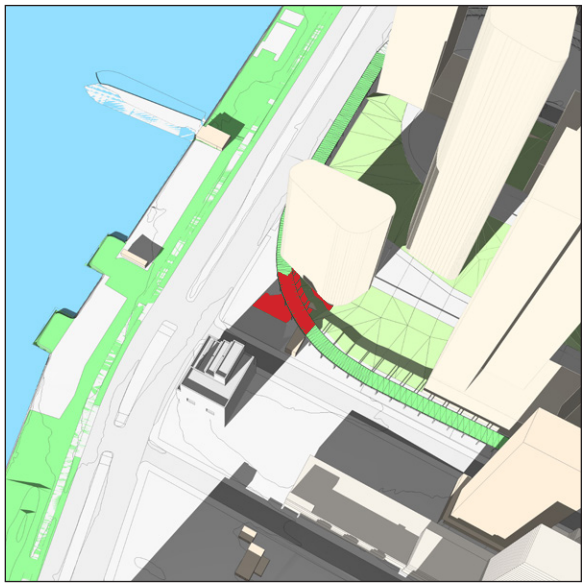
11:00 AM



1:00 PM



2:00 PM



2:53 PM

Incremental Shadow *Publicly Accessible Open Space*

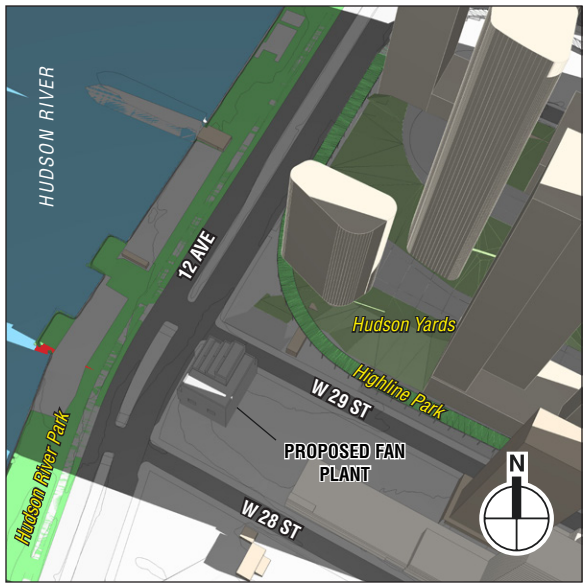
Note: All Times are Eastern Standard Time

HUDSON TUNNEL PROJECT

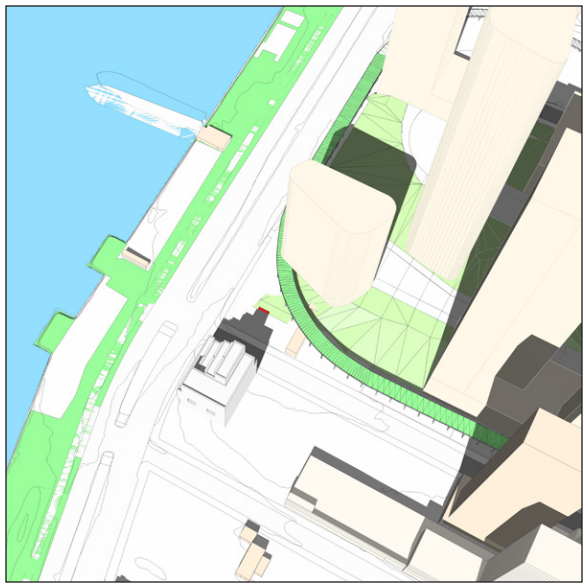
Northwest Location - December 21

Figure 8-5

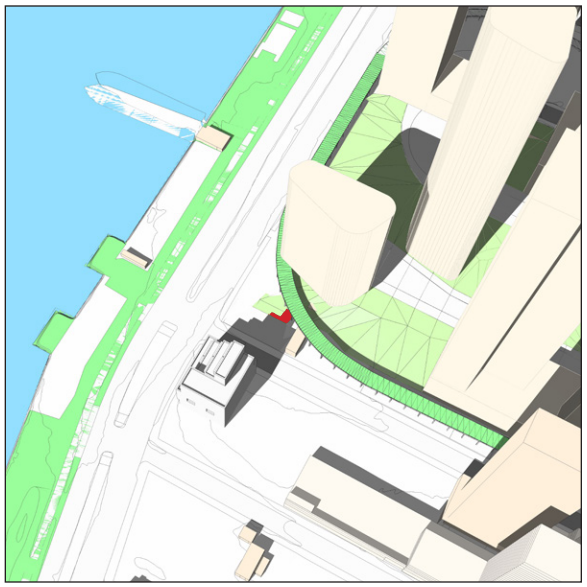
4.14.21



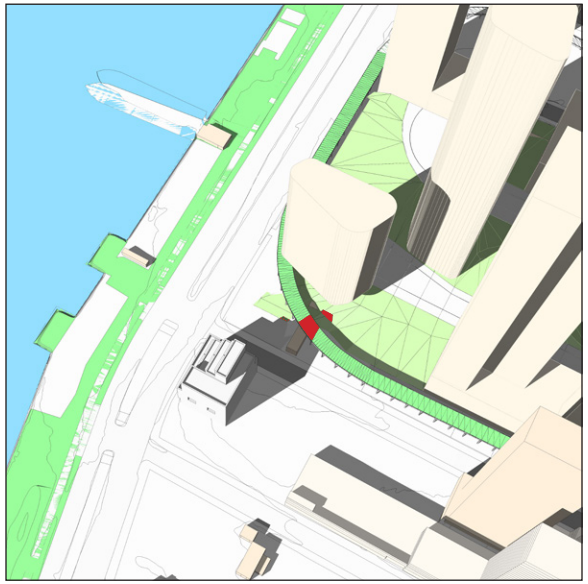
8:00 AM



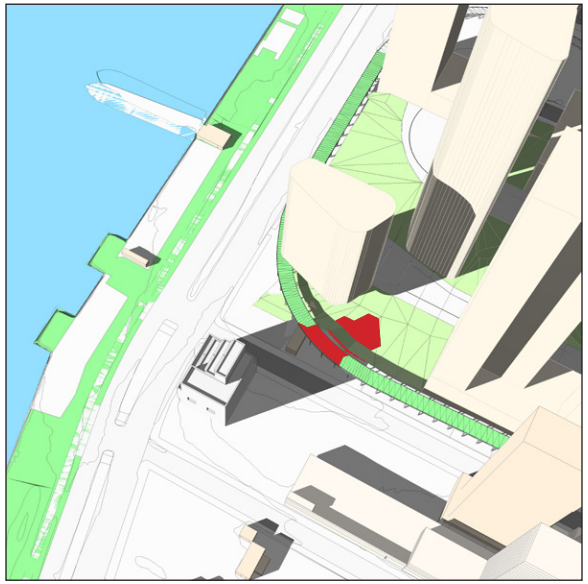
1:00 PM



2:00 PM



3:00 PM



4:00 PM

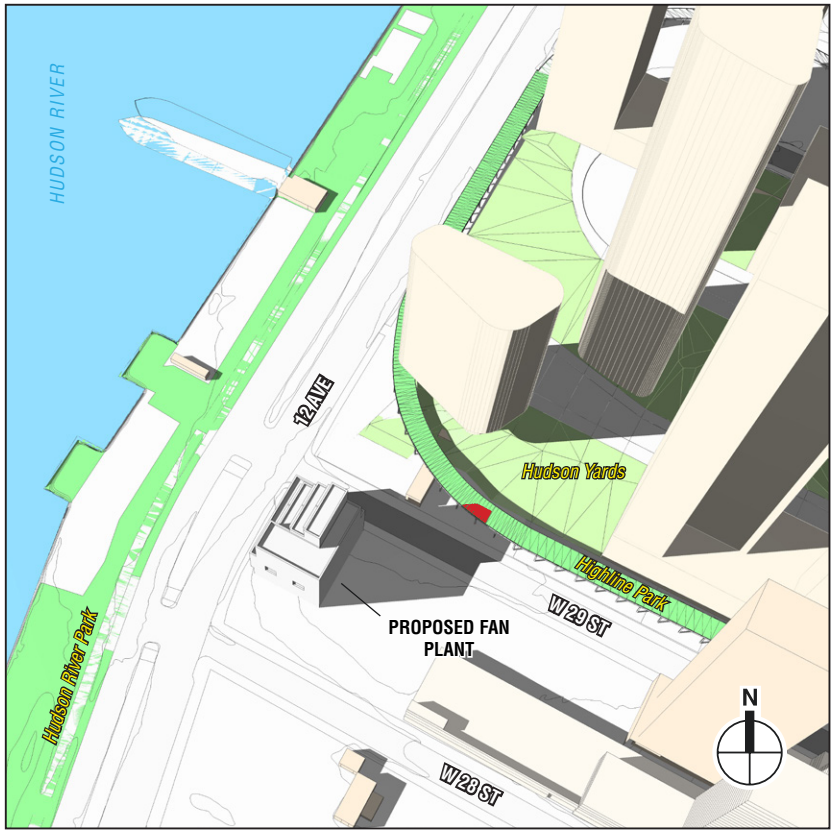
Incremental Shadow *Publicly Accessible Open Space*

Note: All Times are Eastern Standard Time

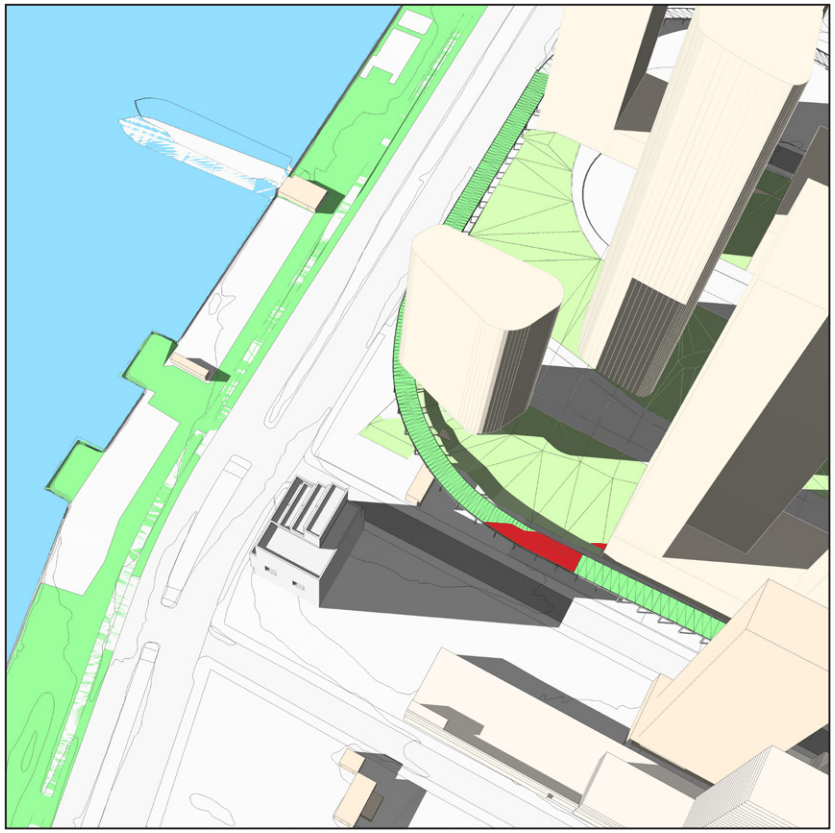
HUDSON TUNNEL PROJECT

Northwest Location -
March 21 / September 21

Figure 8-6



4:00 PM



5:00 PM

Incremental Shadow

Publicly Accessible Open Space

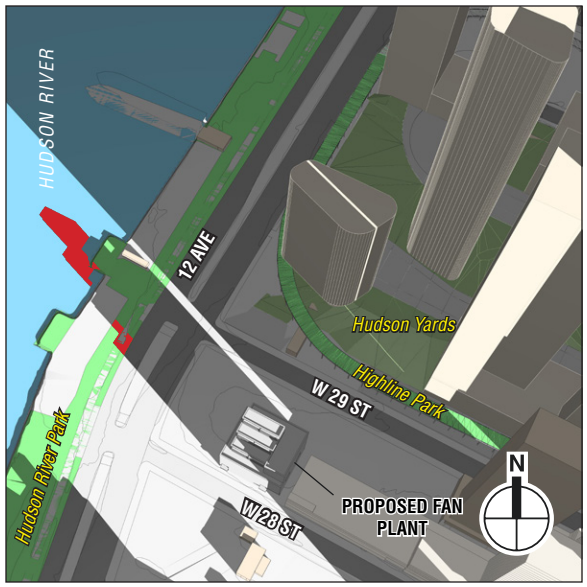
Note: All Times are Eastern Standard Time

HUDSON TUNNEL PROJECT

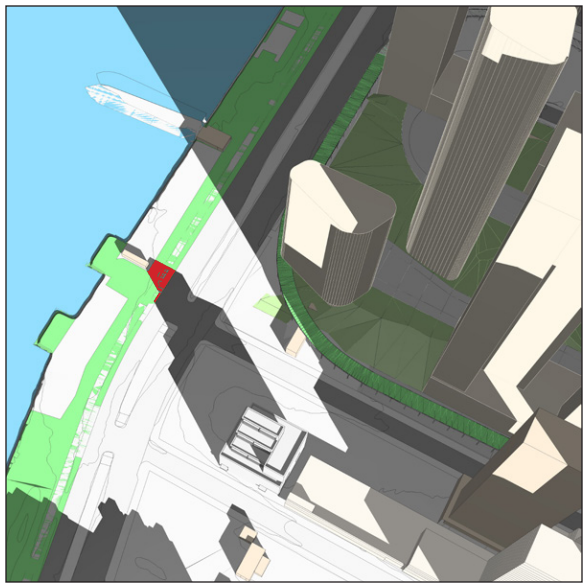
Northwest Location - May 6 / August 6

Figure 8-7

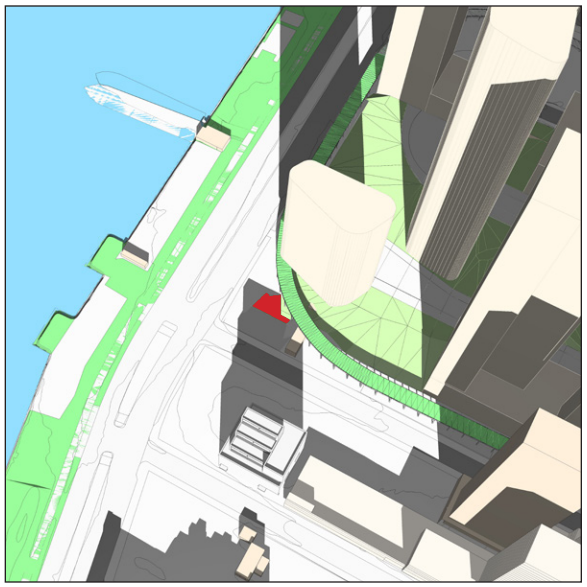
4.14.21



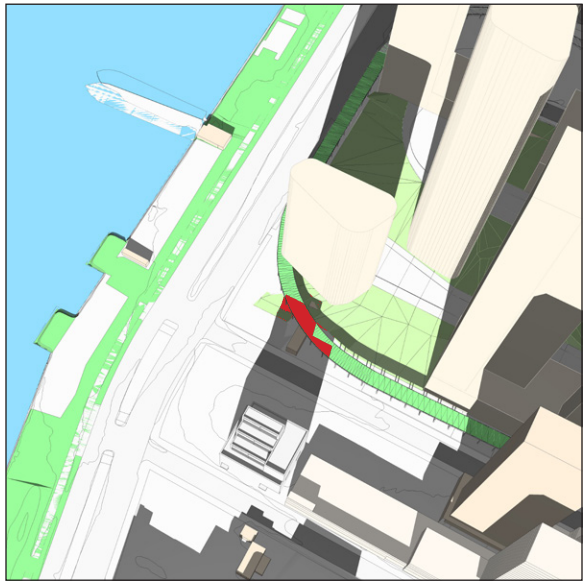
9:00 AM



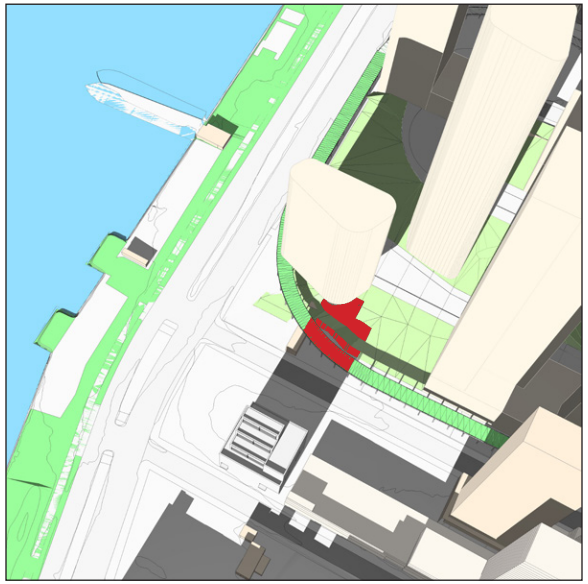
10:00 AM



12:00 PM



1:00 PM



2:00 PM

Incremental Shadow

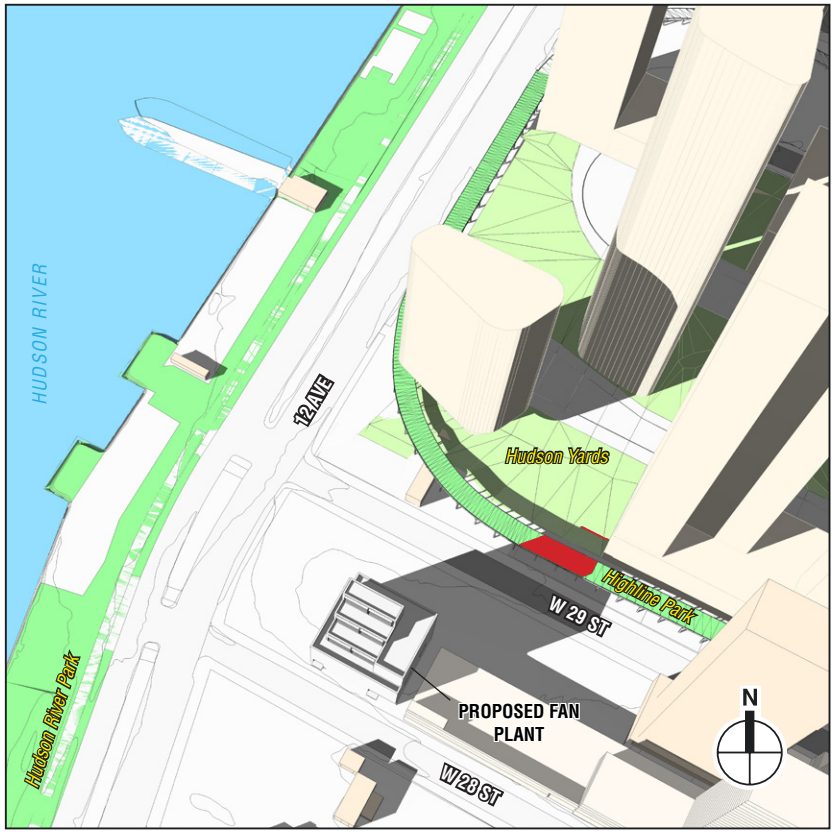
Publicly Accessible Open Space

Note: All Times are Eastern Standard Time

HUDSON TUNNEL PROJECT

West 29th Street Location - December 21

Figure 8-8



4:00 PM

Incremental Shadow

Publicly Accessible Open Space

Note: All Times are Eastern Standard Time

HUDSON TUNNEL PROJECT

West 29th Street Location - March 21/ September 21

Figure 8-9

of the High Line would be in sun at the times when incremental shadow would occur, for users seeking sunlight. Therefore, the new shadow would not cause significant adverse shadow impacts to this resource.

The analysis of historic resources provided in Chapter 9, "Historic and Archaeological Resources," did not identify any historic resources with sunlight-dependent features that may be affected by shadows from the fan plant.

8.7.4.3 APPROVALS

The Preferred Alternative would not require any use of publicly owned parkland under the jurisdiction of the local municipality (i.e., parkland controlled by the City of New York) that would constitute parkland alienation. The tunnel alignment under Hudson River Park is permitted under a 2018 modification to the Hudson River Park Act that allows the easement beneath the park.

8.8 MEASURES TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

The Project Sponsor will implement a number of measures to avoid or minimize adverse impacts on nearby open spaces resulting from the Preferred Alternative. The lead Federal agency will be responsible for ensuring that the Project Sponsor implements these measures, which will be defined in the ROD. These will include the following:

- Mitigation measures will be used to reduce noise levels at construction sites, which will also reduce disruption to recreational users at nearby parks, as discussed in Chapter 12A, "Noise," Section 12A.9.
- In Hoboken, the Willow Avenue underpinning will involve drilled pile installation rather than the use of impact pile drivers to the extent practicable, reducing construction-period noise levels at 1600 Park, Harborside/Hoboken Cove Park, and Hudson River Waterfront Walkway.
- The Project Sponsor will coordinate with the City of Hoboken and Township of Weehawken regarding pile installation for the underpinning of the Willow Avenue viaduct, to coordinate construction activities to avoid disruption to special events in nearby parks, and to provide advance notification, to the extent practicable, so that the city and township can notify the public of this activity and its expected duration.
- During the in-water construction for the Project in the Hudson River, measures will be taken during construction to warn maritime traffic, including recreational boaters, of the construction zone and to ensure the continued safety of boaters (e.g., installation of lighting on barges and the cofferdam (see Chapter 3, "Construction Methods and Activities," Section 3.3.5.6, for more details).
- In New York, tunnel excavation from the bulkhead to the Twelfth Avenue shaft site will be conducted below ground, with ground improvement such as ground freezing to prepare the area. This will avoid the need for cut-and-cover excavation across Hudson River Park.
- The Project Sponsor and the other Project Partners will continue to coordinate with HRPT regarding the effects to Hudson River Park during construction for the Preferred Alternative and will seeking to avoid and minimize adverse effects wherever possible.
- During construction in and under Hudson River Park, a minimum 8-foot-wide segment of the Hudson River Park walkway will be maintained open (potentially shifted to the Route 9A bikeway to avoid the construction zone) and a minimum 10-foot-wide segment of the Route 9A bikeway will remain open (except possibly for short-term trenching for installation of freeze pipes).

- Construction barricades will be installed to block views of the construction zone within the West 30th Street Heliport for park users. Construction fencing will be clad with aesthetically attractive or artistically enhanced fabric selected in consultation with HRPT.
- The Project Sponsor will restore the area of Hudson River Park and the Route 9A bikeway affected by construction of the Preferred Alternative in coordination with HRPT at no cost to HRPT. ✴