

Chapter 4:

Analysis Framework

4.1 INTRODUCTION

FRA prepared this EIS to comply with NEPA, (42 USC 4321 et seq.), CEQ's Implementing Regulations for NEPA (40 CFR Parts 1500-1508), 23 CFR Part 771, and 23 USC 139. This EIS identifies the direct, indirect, and cumulative effects to the human and natural environment resulting from the construction and operation of the Preferred Alternative. This includes the FRA's evaluation of the Overbuild as an indirect impact resulting from construction of the Platform. This chapter describes the analysis framework that FRA used to evaluate potential environmental impacts in the EIS.

Whenever applicable and practicable, FRA conducted the analyses in accordance with the environmental review policies and guidance of relevant Federal agencies as well as New York State and local environmental laws and regulations. Where relevant, this EIS also meets the requirements of CEQR, which applies to New York City agencies that may issue approvals for portions of the Project. To the extent practicable, the analyses FRA has conducted comply with the *CEQR Technical Manual*,¹ which addresses environmental processes and procedures as they relate to projects in New York City, as the basis of quantitative and qualitative analysis. The CEQR criteria for adverse impacts are well suited for evaluation of effects in New York City, and therefore, were also used for purposes of NEPA, unless specific, more stringent NEPA criteria exist. FRA intends for the EIS analysis to support the review of the document by Federal, state, and local agencies from which permits or approvals are required for the Project.

4.2 SCOPE OF ENVIRONMENTAL ANALYSIS

4.2.1 ALTERNATIVES FOR ANALYSIS

CEQ's NEPA regulations state that Federal agencies should "Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" (40 CFR § 1502.2). This EIS considers the impacts of the No Action Alternative and the Preferred Alternative. Chapter 3, "Alternatives," describes the alternatives development process FRA used to arrive at the Preferred Alternative for this Project.

¹ <https://www1.nyc.gov/site/oec/environmental-quality-review/technical-manual.page>

4.2.2 PROJECT SITE AND STUDY AREA

The Project Site is the 13-acre Western Rail Yard site (shown in Figure 1-1), which includes the area for both the Platform and Tunnel Encasement. For the EIS resource category technical analyses, FRA considered a Study Area representing the area where the Preferred Alternative has the potential for community or environmental effects during construction and operation. In general, the Study Area included the Project Site and an approximate ½-mile radius around the Project Site. The Study Area is generally bounded by West 42nd Street to the north, Eighth Avenue to the east, West 21st Street to the south, and the Hudson River to the west (see Figure 1-2). Each chapter describes the specific Study Area used for that resource where Study Areas differed due to the varying type and range of potential impacts resulting from different resource categories.

4.3 APPROACH FOR ENVIRONMENTAL ANALYSIS

This EIS analyzes the direct and indirect effects of the Preferred Alternative on its environmental setting both during construction and once completed. The Preferred Alternative would be constructed by 2026, and FRA has conservatively assumed the Overbuild would be completed by 2030. Since construction and operation of the Preferred Alternative would take place in the future, its environmental setting is not the current environment, but instead the environment as it would exist during construction.

The Affected Environment is the natural, cultural, and social conditions of an area that may be impacted by a proposed Federal action. The EIS used a wide range of data sources to describe the Affected Environment within the Study Area of each resource, which are summarized in the methodology description for each resource (see **Appendix B**). Each analysis describes the Affected Environment, independent of the No Action or Preferred Alternative. FRA determined the Affected Environment by first assessing the 2019 existing conditions and then including the projects that FRA assumed are reasonably anticipated to occur in the Study Area by 2026, as well as the changes likely to occur because of growth in population and traffic. The projects include both development projects within the project Study Area and transportation and infrastructure projects in the region that may affect the Preferred Alternative. The exception to this analysis framework for the Affected Environment are the transportation analyses, which consider an existing Affected Environment representing 2019 conditions, and an Affected Environment Future Conditions in 2023 representing the peak construction year for the Preferred Alternative, as described in detail in Chapter 6, “Transportation.”

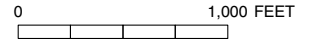
4.3.1 TRANSPORTATION AND INFRASTRUCTURE PROJECTS

The transportation and infrastructure projects that this EIS incorporates as part of the Affected Environment analysis are summarized below, included in **Table 4-1**, and shown on **Figure 4-1**.



- Project Site (Western Rail Yard)
- Study Area (1/2-mile perimeter)

A Transportation and Infrastructure Project



- **Hudson Tunnel Project:** The Hudson Tunnel Project proposes a new two-track passenger rail tunnel to carry the NEC under the Hudson River between New Jersey and Penn Station New York, referred to as the Hudson River Tunnel, and rehabilitation of the existing NRT. Upon completion of the project, the NEC will comprise four tracks (two in the new Hudson River Tunnel and two in the NRT) between New Jersey and Penn Station New York under the Hudson River, which would provide operational flexibility and redundancy for Amtrak and NJ TRANSIT passenger rail operations. The new Hudson River Tunnel would be parallel to, and south of, the existing NEC between Secaucus, New Jersey and New York Penn Station. The western terminus of the new tunnel and related tracks and infrastructure would be at approximately County Road in Secaucus, New Jersey, and the eastern terminus would be at approximately Ninth Avenue in Manhattan, New York. A staging and laydown area and fan plant would be located on Block 675, Lot 1, on the east side of Twelfth Avenue between West 29th and West 30th Streets. In addition, the Hudson Tunnel Project would also require the use of a portion of the adjacent property on West 29th Street (Block 675 Lot 12). FRA is advancing the EIS of this project with NJ TRANSIT and Port Authority of New York and New Jersey. The DEIS indicates that the construction of the new Hudson Tunnel would be completed in 2026 and placed into service, and the rehabilitation of the existing NRT would be completed in 2030. The DEIS was published for public review in June 2017, and the Final EIS is presently under development. As the project was delayed, construction of the project is now anticipated to begin in 2022, with construction overlapping with construction of the Preferred Alternative. The new tunnel is now planned to be complete in 2030 and the rehabilitated tunnel planned to be complete in 2033.
- **West Side Yard/Hudson Yards Perimeter Protection:** During Superstorm Sandy, flood waters entered West Side Yard/Hudson Yards from the Hudson River, damaging critical infrastructure including trackbeds, switches, and signals, and entering the NRT's two tubes from their Manhattan portal at Tenth Avenue and their ventilation shaft at Eleventh Avenue. To protect this infrastructure from future flooding, the LIRR is planning a flood protection project that will include perimeter protection and drainage improvements around West Side Yard/Hudson Yards, which also encompasses the NRT's vent shaft and portal. For perimeter protection, LIRR is proposing a new, permanent wall, with additional deployable barriers to be implemented across driveways and access points in advance of storm events. This project will protect not only the West Side Yard/Hudson Yards, but also the other existing railroad infrastructure connected to the yard, including the portal and ventilation shaft for the NRT, the smaller rail storage yards east of Tenth Avenue, and the tracks and platforms at New York Penn Station. The new perimeter wall will also protect the proposed new Manhattan portal for the proposed Hudson River Tunnel and the proposed Tenth Avenue fan plant. Installation of the perimeter protection is planned to be constructed in phases beginning in 2022 with estimated completion in 2026.

- **Moynihan Station Project:** The Moynihan Station Project will create a new passenger rail station within the historic James A. Farley Post Office Building (Farley Building), which is across Eighth Avenue from New York Penn Station and was designed by the same architecture firm as the original Penn Station building. Like the existing Penn Station facilities, the Farley Building is above the tracks and platforms of New York Penn Station. The project will create a new grand train hall for passengers and improved passenger amenities. The project is advancing in phases, and the first phase is now complete. Phase 1 included the West End Concourse Expansion to create access to New York Penn Station's tracks and platforms through the Farley Building, expand and rehabilitate the underground connecting corridor between the new West End Concourse and existing New York Penn Station, and new and reconfigured entrances for the Eighth Avenue subway lines (A/C/E) at New York Penn Station. The next phase, now in construction, will include a new train hall, internal pedestrian circulation space, and commercial development in the Farley Building, including transit-oriented and destination retail as well as other commercial uses. The transportation infrastructure component of the project was substantially completed in December 2020, with the train hall and associated passenger circulation elements opened for public use on January 1, 2021; final completion is planned for 2021.
- **East Side Access Project:** MTA is currently constructing the East Side Access project, which will allow LIRR trains to terminate at Grand Central Terminal in addition to New York Penn Station. The project includes a new lower-level LIRR terminal beneath the existing terminal at Grand Central, a new tunnel from Queens to Grand Central, and many other improvements. The project is planned for completion by the end of 2022. Once complete, LIRR is anticipating a substantial increase in service with trains serving both Manhattan terminals. While service to Midtown will increase overall, LIRR will decrease service to New York Penn Station.
- **North River Tunnel (NRT) Interim Reliability Improvements:** Amtrak is performing a feasibility study and options analyses on different repairs or improvements to the NRT that will improve service reliability and safety over the upcoming decade. Concepts that are determined to be feasible while maintaining service and result in a net decrease in operational risk will be moved into a preliminary engineering phase in fiscal year 2021. These improvements will then be progressed as needed and programmed. The measures that Amtrak has identified as priorities include leak mitigation for water infiltrating the tunnel and affecting systems, which is contributing to signal failures and deterioration of metal components and cables; drainage and track improvements to address deterioration and geometry issues; implementation of an enhanced inspection and asset management program that will identify problems more quickly; detailed signal system investigations with targeted equipment replacement; stray current monitoring and mitigation; and other proactive steps in advance of problems.
- **Dock Bridge Replacement Project:** Amtrak is proposing the replacement of the Dock Bridge, a pair of vertical lift bridges crossing the Passaic River at Newark, New Jersey. The existing bridges carry Amtrak, New Jersey Transit, and Port Authority Trans-Hudson (PATH) trains. Construction of a fixed bridge is anticipated to be completed by 2024.
- **NYCDOT Parking-Protected Bicycle Lane:** A parking-protected bicycle lane on the east curb of Ninth Avenue will be installed between West 31st and West 33rd Streets. A mid-block crossing will also be installed on Ninth Avenue between West 31st and West 33rd Streets. Three travel lanes will be maintained starting at 34th Street. Construction of this project is expected to be completed by 2022.

- **NYCDOT Street Modifications:** The west sidewalk on Eighth Avenue, between West 33rd and West 39th Streets, will be widened and the roadway will be narrowed to two travel lanes with left-turn bays and on-street parking. The existing parking-protected bicycle lane will be maintained. Signal timing and signal phasing modifications will be implemented. Construction of this project is expected to be completed by 2021.
- **NYCDOT Bicycle Lane Extension:** The existing bicycle lane on Seventh Avenue, which currently terminates at West 30th Street, will be extended north through the Study Area. The taxi stand at Penn Station will also be modified. DOT is currently working on the design plans for these changes, which will be incorporated into the future conditions analyses. Construction of this project is expected to be completed by 2022.
- **New York City Economic Development Corporation (NYCEDC) W. 33rd Street Viaduct:** NYCEDC is leading the effort to regrade West 33rd Street between Eleventh and Twelfth Avenues in order to accommodate construction over Hudson Yards. The street is currently a partial viaduct that connects to the Eleventh Avenue Viaduct and transitions into a street supported by a retaining wall towards Twelfth Avenue. NYCEDC is in the process of procuring a design team for this work, which will be coordinated with the Platform construction and is expected to be completed within the next five years by 2026.
- **Metro-North Penn Station Access:** While this project would result in service to Midtown increasing overall, LIRR will decrease service to New York Penn Station. Taking advantage of capacity formerly used by LIRR, MTA is planning to add new Metro-North Railroad service to New York Penn Station, a project known as Penn Station Access (Metro-North is an operating agency within MTA). That project is currently in environmental review with Federal Transit Administration (FTA) as the lead agency. The completion date for this project is not yet determined.

Table 4-1
Affected Environment – Transportation and Infrastructure Projects

Map ID No.*	Address/ Name	Inside or Outside ½-Mile Study Area?	Block	Lot	Program	Build Year ¹
A	Hudson Tunnel	Inside	N/A	N/A	New rail tunnel, associated ventilation infrastructure, and full rehabilitation of the NRT	2026 ²
B	NYCDOT Parking-Protected Bicycle Lane	Inside	N/A	N/A	A parking-protected bicycle lane on the east curb of Ninth Avenue will be installed between West 31st and West 33rd Streets. A mid-block crossing will be installed on Ninth Avenue between West 31st and West 33rd Streets.	2022
C	Moynihan Station – Train Hall and Platform Access	Inside	755	40	Includes 297,809 gsf of transportation infrastructure improvements, including platform access, and new Train Hall	2021
D	NRT Interim Reliability Improvements	Inside	N/A	N/A	Various reliability Improvements for the NRT in advance of planned complete rehabilitation connected with the Hudson Tunnel Project.	TBD
E	West Side Yard/Hudson Yards Perimeter Protection	Inside	676 and 702	5, 125, 150, 175, 180	Resiliency project to construct protection for the West Side Yard	2026
F	NYCEDC W. 33rd Street Viaduct	Inside	N/A	N/A	West 33rd Street will be regraded between Eleventh and Twelfth Avenues in order to accommodate construction over Hudson Yards.	2026
G	NYCDOT Street Modifications	Outside	N/A	N/A	The west sidewalk on Eighth Avenue, between West 33rd and West 39th Streets, will be widened, and the roadway will be narrowed to two travel lanes with left-turn bays.	2021
H	NYCDOT Bicycle Lane Extension	Outside	N/A	N/A	The existing bicycle lane on Seventh Avenue will be extended north of West 30th Street, and the adjacent taxi stand will be modified.	2022
I	East Side Access Project	Outside	N/A	N/A	The project provides for LIRR trains to travel to travel to Grand Central Terminal in addition to New York Penn Station	2022
J	Metro-North Penn Station Access	Outside	N/A	N/A	The project provides for Metro-North trains to travel to travel to New York Penn Station	TBD
K	Dock Bridge Replacement Project	Outside	N/A	N/A	The Dock Bridge Project would replace a pair of vertical lift bridges crossing the Passaic River.	2024

Notes:

* See **Figure 4-1**.

¹ Projects for which an expected date of completion is not available are assumed to be complete by 2026. Assumptions of completion dates provide for a conservative analysis of potential project effects.

² Completion of the Hudson Tunnel project has been delayed from the 2026 completion indicated in the DEIS, but construction would still overlap with construction of the Preferred Alternative. This EIS has retained the earlier completion date for a conservative analysis of potential impacts.

Sources: New York City Department of City Planning (correspondence dated January 4, 2021); AKRF research; Amtrak; media coverage.

4.3.2 DEVELOPMENT PROJECTS

As confirmed by the New York City Department of City Planning (NYCDCP), there are a total of 27 known development projects that are expected to be completed by 2026 and are included in the Affected Environment (see **Table 4-2** and **Figure 4-2**). These projects represent a total of up to approximately 23.4 million gsf of new development, including: up to 12.4 million gsf of new office space, up to 682,767 gsf of new retail space, up to 400,863 gsf of new community facility space, 4,539 new residential units, and 2,106 new hotel rooms. The amount of development surrounding Western Rail Yard reflects the zoning and public policy initiatives to accommodate and attract new development to the Far West Side, which included the opening of the 34th Street-Hudson Yards Station (at Eleventh Avenue) on the No. 7 Line Extension in 2015. The majority of these development projects have resulted from the implementation of several notable zoning initiatives in the Study Area, include the following: Special Hudson Yards District; Special West Chelsea District; Special Garment Center District; Special Clinton District; and Special Hudson River Park District, as shown on **Figure 4-2**.

4.3.3 EVALUATION OF IMPACTS

The CEQ regulations define impacts and effects that must be addressed and considered by Federal agencies in satisfying the requirements of NEPA. The CEQ also defines considerations of how to address both the context and intensity of such impacts and effects. FRA has characterized impacts and effects in the EIS according to the methodologies described in **Appendix B**.

FRA analyzed and assessed the potential impacts of the No Action Alternative and the Preferred Alternative on environmental resources in each resource category. As described in Chapter 3, the No Action Alternative includes only those projects that are necessary to keep the Western Rail Yard and the associated LIRR facilities in service and provide continued maintenance. The No Action Alternative generally represents the conditions against which the effects of the Preferred Alternative are measured.

As mentioned above, the potential impacts of the Preferred Alternative were assessed during construction and once operational.

- **Construction Conditions:** For assessing temporary impacts of the Preferred Alternative during construction, FRA identified an analysis year during the period of peak construction as the “Peak Construction Condition,” and this analysis year has been specified in the relevant resource chapters in the EIS. Based on the construction schedules provided by the Project Sponsor, construction activities for the Preferred Alternative, including construction of the Platform and its associated infrastructure, and the Tunnel Encasement, would occur over an approximately 5-year period (late 2021 to late 2026). For most resource category analyses, that entire construction period was discussed and analyzed. However, it is possible that the year the Preferred Alternative’s construction activity would be the most intensive could be different years for different resource categories. For example, the peak construction traffic year may not be the same as the peak construction air quality analysis year; the peak construction analysis year has been determined from construction information provided by the Project Sponsor, including the construction schedules and stages, site logistics diagrams, and the way the construction equipment utilization information overlaps for each component of the Preferred Alternative. Each resource category includes the peak construction analysis year identified by FRA for that resource analysis.



	<i>Project Site (Western Rail Yard)</i>		<i>Study Area (1/2-mile perimeter)</i>		<i>Development Project in the Affected Environment</i>	
	<i>Special Clinton District</i>		<i>Special Garment Center District</i>			
	<i>Special Hudson River Park District</i>		<i>Special Hudson Yards District</i>			
	<i>Special West Chelsea District</i>					

Development Projects in the Affected Environment

**Table 4-2
Affected Environment – Development Projects**

Map ID No. ¹	District	Address/Name	Block	Lot	Program	Build Year ¹
1	Special West Chelsea	220 Eleventh Avenue	697	1	170,311 gsf office	2021
5	Special West Chelsea	500 West 22nd Street	693	37	10 DU, 4,278 gsf retail, 25,307 gsf community facility	2026
7	Special West Chelsea	517 West 29th Street	701	24	60 DU, 10 parking spaces	2026
10	Special West Chelsea	162 Eleventh Avenue	694	1	13 DU, 242 gsf retail	2026
26	Special West Chelsea	555 West 22nd Street	694	5	145 DU, 49,160 gsf retail	2026
27	Special West Chelsea	540 West 21st Street	692	53	34 DU, 50,041 gsf retail	2026
6	Special West Chelsea	430 West 37th Street	734	16	304 DU, 14,580 gsf retail	2026
2	Special Hudson Yards	400 Eleventh Avenue	706	1	520,740 gsf office	2021
3	Special Hudson Yards	509 West 34th Street	706	17	2.55 million gsf office	2022
4	Special Hudson Yards	431 West 33rd Street	731	22	24 DU, 6,280 gsf retail	2026
9	Special Hudson Yards	Hudson Yards Site 7	707	20, 26, 45, 41, 31 and 39	255 DU, 22,011 gsf retail, 1.66 million gsf office	2025
10	Special Hudson Yards	162 Eleventh Avenue	694	1	13 DU, 242 gsf retail	2026
12	Special Hudson Yards	550 West 41st Street	1069	1	499 DU, 72,552 gsf retail	2026
13	Special Hudson Yards	Moynihan Station Development Project	755	40	123,000 gsf retail, 228,242 gsf community facility, 672,524 gsf office	2026
16	Special Hudson Yards	355 West 39th Street	763	7501	25 DU, 1,843 gsf retail, 723 gsf community facility	2026
17	Special Hudson Yards	460 West 41st Street	1050	1	60 DU, 62,607 gsf community facility	2026
18	Special Hudson Yards	555 West 38th Street	710	1	591 DU, 1,886 gsf retail	2026
19	Special Hudson Yards	450 11th Avenue	708	65	379 hotel rooms	2026
20	Special Hudson Yards	415 Tenth Avenue	705	39	2,581,748 gsf office	2026
23	Special Hudson Yards	442 West 33rd Street	729	61	164 hotel rooms	2026
24	Special Hudson Yards	401 West 31st Street	729	51	790 DU, 4,053,312 gsf office	2026
11	Special Garment Center	319 West 35th Street	759	29	166 DU, 3,909 gsf retail	2026
14	Special Garment Center	351 West 38th Street	762	6	490 hotel rooms	2025
15	Special Garment Center	338 West 39th Street	762	61	177 hotel rooms	2026
21	Special Hudson River Park	610 West 30th Street	675	39	277 DU, 160,906 gsf retail, 61 parking spaces	2026
22	Special Hudson River Park	601 West 29th Street	675	12	931 DU, 10,920 gsf retail, 186 parking spaces	2026
8	n/a Other Development Project	495 Eleventh Avenue	685	38	275 DU, 16,879 gsf retail, 755 hotel rooms, 49,748 gsf community facility, 25,168 gsf office, 55 parking spaces	2024
25	n/a Other Development Project	300 West 30th Street	753	42	80 DU, 5,750 gsf retail	2026

Notes:

DU= Dwelling Units

* See **Figure 4-2**.

¹ Projects for which an expected date of completion is not available are assumed to be complete 2026 if currently under construction. Assumptions of completion dates provide for a conservative analysis of potential project effects.

² Gsf was calculated based on the zoning square footage, multiplied by 1.15 (assuming a zoning to gross conversion factor of 15 percent).

Sources: New York City Department of City Planning (April, July, and October 2020), Department of Buildings; AKRF research and field visits (May, September, and December 2020); media coverage.

- **Operational Conditions:** FRA assessed the operational impacts of the Preferred Alternative once it is operational. This analysis considers the year 2026 as the timeframe when the construction is completed and the Preferred Alternative would be operational.

Each chapter of the EIS summarizes the regulations that apply to the analysis and the methodologies used for the assessment; methodologies are detailed in the Methodology Report (see **Appendix B**).

4.3.4 MEASURES TO AVOID, MINIMIZE, OR MITIGATE IMPACTS

If applicable, each resource category analysis identifies measures that the Project Sponsor would take to minimize, avoid, or mitigate adverse construction impacts or operational impacts of the Preferred Alternative. FRA identified such measures for adverse impacts wherever practicable in the EIS may ultimately include them in a ROD. The Project Sponsor would be responsible for ensuring that these measures are implemented as part of the design, construction and/or operation of the Preferred Alternative, as applicable. The Project Sponsor (or its agents, i.e., Project Contractor) is responsible for meeting any permit requirements, design requirements, and mitigation commitments.

4.4 FORMAT OF THIS EIS

Subsequent chapters of this EIS each evaluate a different resource category. In general, for each resource category, the EIS discusses the Affected Environment; No Action Alternative Impacts; Operational Impacts of the Preferred Alternative; and Construction Impacts of the Preferred Alternative.² In addition, there are several summary type chapters included in the EIS that provide additional information relevant to the environmental review process or the preparation of the EIS itself.³ **Appendix A** includes information on where the analyses normally provided in a CEQR analysis can be found in this NEPA EIS. Potential indirect and cumulative effects of the Preferred Alternative, including those of the Overbuild, are considered in Chapter 20, “Indirect, Cumulative, and Other Impacts.” *

² Chapters 16, 19, 22, and 23 do not follow the general DEIS outline discussing, the Affected Environment, No Action Alternative Conditions, Permanent Impacts of the Preferred Alternative, and Construction Impacts of the Preferred Alternative.

³ Chapters 24, 25, 26, 27, and 28 provide information on the NEPA process, supplemental supporting information to aid the reader, or information about the preparation and distribution of the EIS.