

5A.1 INTRODUCTION

Chapter 5 of this Environmental Impact Statement (EIS) evaluates the impacts of construction and operation of the Hudson Tunnel Project on transportation conditions. It is broken into two subchapters, Chapter 5A, “Traffic and Pedestrians,” and Chapter 5B, “Transportation.” Chapter 5A evaluates the Project’s effects on traffic (i.e., roadway) and pedestrian conditions both during construction and during operation once the Project is completed. Chapter 5B evaluates the Project’s effects during construction and operation on the transportation services operating in the Project area, including rail passenger service (intercity passenger rail service and commuter rail services); the Hudson-Bergen Light Rail and New York City subway service; surface bus operations; freight rail; ferry and other maritime services; and helicopter operations at the West 30th Street Heliport in Manhattan.

This chapter contains the following sections:

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5A.2 ANALYSIS METHODOLOGY**5A.2.1 REGULATORY CONTEXT**

Roadway and pedestrian conditions that may be affected by the Preferred Alternative are within the jurisdiction of the New Jersey Department of Transportation (NJDOT), New York State Department of Transportation (NYSDOT), New York City Department of Transportation (NYCDOT), and local municipal departments of transportation, highways, or public works in New Jersey.

5A.2.2 ANALYSIS TECHNIQUES

During development of this EIS, the Federal Railroad Administration (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 traffic and pedestrian conditions are summarized in this chapter. For the analyses of locations in New York City, FRA and NJ TRANSIT used the methodologies established by New York City's *City Environmental Quality Review (CEQR) Technical Manual*.

5A.2.2.1 TRAFFIC

The traffic analysis considers conditions at key intersections where the Preferred Alternative would have the most direct effects on the local traffic network and operations (see the discussion of the study area in Section 5A.2.3 below). The selection of key analysis intersections took into consideration truck haul routes identified by the Project design engineers for the delivery of construction materials and removal of excavated soils or construction debris to and from the construction staging areas, in both New Jersey and New York, and the likely routing of construction workers to and from the construction staging areas in New York and New Jersey. The traffic analysis evaluates the existing condition, future No Action condition, and Build condition, as follows:

- **Existing conditions (i.e., the affected environment):** this analysis was based on traffic counts conducted in June 2016. Traffic volumes were collected in June 2016 before the end of the school year, and balanced existing traffic volumes were developed for each peak hour. Physical inventories and observations were conducted at each of the analysis locations.
- **Future No Action condition (i.e., future affected environment, or condition without the Preferred Alternative)** at each intersection in the year when worst-case (i.e., peak) construction traffic would occur for the Preferred Alternative at that location. The analyses presented in this chapter assume that ongoing maintenance will allow the North River Tunnel to remain operational in the future at least until the EIS analysis year of 2030.
- **Impacts of the No Action Alternative:** this analysis evaluates the impacts of an alternative in which the Preferred Alternative is not implemented. The analyses presented in this chapter assume that ongoing maintenance will allow the North River Tunnel to remain operational in the future at least until the EIS analysis year of 2030.
- **Future Build condition (i.e., Impacts of the Preferred Alternative)** at the same intersections in the same years analyzed for the No Action condition. This analysis considered the impacts of construction of the Preferred Alternative.

As described in Chapter 2, "Project Alternatives and Description of the Preferred Alternative," and Chapter 4, "Analysis Framework," there would be no change in rail capacity and no corresponding change in traffic or pedestrian activity as a result of the Preferred Alternative compared with future No Action conditions. In addition, the Preferred Alternative would not result in any permanent changes to roadways or pedestrian elements (sidewalks, corners, or crosswalks). In New Jersey, new permanent maintenance roads would be created along the south side of the new railroad embankment, similar to the maintenance access roads that already exist along the Northeast Corridor (NEC) in the same area. These roads would not be publicly accessible and would be used only infrequently for maintenance purposes. Therefore, a quantitative analysis of traffic and pedestrian conditions once the Preferred Alternative is operational was not conducted.

5A.2.2.1.1 Analysis Years

To identify the peak (i.e., worst-case) condition for analysis in this chapter, FRA and NJ TRANSIT evaluated estimated truck and worker volumes associated with each construction activity. To identify the peak conditions for each staging area, FRA and NJ TRANSIT considered each type of construction activity, when it would occur, and how many worker and truck trips would occur during that activity. Using this information, FRA and NJ TRANSIT identified the year when the quarterly peak traffic volumes (i.e., peak traffic volumes over a three-month period) would occur at each construction staging site. These volumes were then conservatively assumed to occur for that entire year, and that year in which the peak quarter would occur was used as the analysis year. FRA and NJ identified a peak year for each staging area in this way.

The analysis years for the Tonnelle Avenue staging area were 2021 for construction of the new Hudson River Tunnel and 2029 for rehabilitation of the North River Tunnel. For the Hoboken staging area, the analysis year was 2022. For the Manhattan (Twelfth Avenue) staging area, the analysis year was 2021. The analysis years vary depending on the construction schedule. For the construction of the new tunnel, the activities occurring from the three different construction staging areas (i.e., Tonnelle Avenue and Hoboken in New Jersey, and Twelfth Avenue in Manhattan), and the associated numbers of workers and trucks required to undertake the various stages of construction at each of these locations, have peak activities that would occur at different times. For example, tunnel boring activity results in intensive truck activity to remove spoils and bring in tunnel liner segments and other materials. At the Tonnelle Avenue staging area, tunneling begins before it does in the vicinity of the Hoboken staging area. The rehabilitation of the North River Tunnel is scheduled to begin in 2026 after the opening of the new tunnel, with peak construction activity occurring in 2029. The construction scheduling assumptions and a detailed description of the various activities that would occur during construction of the new tunnel and the rehabilitation of the existing North River Tunnel are provided in Chapter 3, “Construction Methods and Activities.”

5A.2.2.1.2 Peak Periods

FRA and NJ TRANSIT identified five analysis hours for each study area: a morning hour when the peak commuter traffic on the study area’s roadways occurs (AM peak commuter hour), a morning hour when the peak truck volumes for Project construction would occur (AM peak construction hour), a midday hour when peak commuter traffic would occur (midday commuter peak), an evening hour when peak commuter traffic would occur (PM peak commuter hour), and an evening hour when peak construction truck vehicle volumes would occur (PM construction peak). At the Tonnelle Avenue staging area for analysis of the North River Tunnel rehabilitation construction, the analysis also includes a Saturday midday peak hour. FRA and NJ TRANSIT used these peak hours to ensure this EIS evaluates the worst-case combination of roadway traffic and construction traffic. FRA and NJ TRANSIT identified commuter peak hours for the weekday AM, midday, and PM, and Saturday afternoon peak periods. They also identified four construction peak hours to represent worst-case construction traffic peaks anticipated during construction of the Preferred Alternative, including its new tunnel and the rehabilitation of the North River Tunnel. The commuter peak hours were chosen based on the traffic counts and the construction peak hours were based on the potential construction shift changes (i.e., when workers would be driving to and from the sites) for the various activities. The peak hours considered were as follows:

- Weekday AM commuter peak hour
- Weekday AM construction peak hour
- Weekday midday commuter peak hour
- Weekday PM commuter peak hour

- Weekday PM construction peak hour for new tunnel construction
- Weekday PM peak hour for North River Tunnel rehabilitation
- Saturday midday commuter peak hour
- Saturday PM construction peak hour for North River Tunnel rehabilitation

Separate construction peak hours were considered for rehabilitation of the North River Tunnel, which would have a different weekday PM peak hour than the new tunnel construction and would have Saturday construction work, while the new tunnel construction would not.

5A.2.2.1.2.1 *New Jersey*

The analysis peak hours for the New Jersey analysis locations were as follows:

- Weekday AM peak hour
 - Commuter peak hour: 7:45-8:45 AM
 - Construction peak hour: 6:30-7:30 AM
- Weekday midday peak hour
 - Commuter peak hour: 1:00-2:00 PM
- Weekday PM peak hour
 - Commuter peak hour: 5:00-6:00 PM
 - New tunnel construction peak hour: 2:30-3:30 PM
 - North River Tunnel rehabilitation peak hour: 4:45-5:45 PM
- Saturday peak hour
 - Commuter peak hour: 2:00-3:00 PM
 - North River Tunnel rehabilitation peak hour: 4:45-5:45 PM

5A.2.2.1.2.2 *New York*

The identified peak hours for Manhattan were as follows:

- Weekday AM peak hour
 - Commuter peak hour: 7:45-8:45 AM
 - Construction peak hour: 6:30-7:30 AM
- Weekday midday peak hour
 - Commuter peak hour: 12:45-1:45 PM
- Weekday PM peak hour
 - Commuter peak hour: 3:45-4:45 PM
 - Construction peak hour: 2:30-3:30 PM

5A.2.2.1.3 *Intersection Analyses*

Traffic analyses were conducted using standard procedures detailed in the 2010 *Highway Capacity Manual* (HCM) and the most recent version of the traffic modeling software *Synchro* accepted by NJDOT and NYCDOT.¹

Traffic conditions at intersections are categorized in terms of their *level of service* (LOS), which is a standard technique for evaluating traffic. LOS indicates how well traffic flows through intersections. A LOS analysis is applied to intersections overall and to the individual movements

¹ Synchro 8.0, build 806, revision 77 (8.0.806.77).

at an intersection—e.g., through, left-turning, or right-turning movements at each intersection approach (i.e., lane group).

Six categories of LOS are used, LOS A through F, with LOS A representing the maximum traffic flow condition with little or no congestion and delay, and LOS F describing the worst operating condition with extensive congestion and delay. An intersection or movement operating at LOS A through mid-D (i.e., less than 45.0 seconds of delay for signalized intersections and less than 30.0 seconds of delay for unsignalized intersections) is considered to be operating at an acceptable uncongested level, while an intersection or movement operating at LOS mid-D (i.e., 45.0 seconds of delay or more for signalized intersections; 30.0 seconds of delay or more for unsignalized intersections), E, or F is considered to be operating at a congested level. Overall intersection delay is calculated for signalized intersections, while at unsignalized intersections, the delay for stop or yield-controlled movements is calculated.

FRA and NJ TRANSIT used increases in delay to identify traffic impacts for intersections in New Jersey. As analysis locations are located in multiple jurisdictions, some with no specific traffic impact criteria, uniform impact criteria were developed. FRA and NJ TRANSIT considered an adverse impact to occur when a location would be operating at the midpoint of LOS D (delay of 45.0 seconds for signalized intersections and 30.0 seconds for unsignalized intersections) or worse in the future No Action condition and the Preferred Alternative would increase delay by 10 or more seconds at that location. This criterion for adverse impact reflects local conditions and therefore was also used for purposes of NEPA. This criterion has been used by NJDOT for projects under their jurisdiction, and for similar multi-jurisdiction projects in northern New Jersey such as the Port Authority of New York & New Jersey's *Comprehensive Port Improvement Plan*.

For intersections in New York City, FRA and NJ TRANSIT used the criteria presented in New York City's 2014 *CEQR Technical Manual* to identify traffic impacts. 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 for intersections in the New York study area.

Using these criteria, the following impacts are considered significant per CEQR criteria:

- For lane groups with No Action conditions at acceptable levels (i.e., LOS A, B, or C): when a project would result in deterioration in the LOS to marginally unacceptable LOS D (i.e., the midpoint of LOS D) or worse (i.e., LOS E or F).
- For lane groups with No Action conditions at worse than mid-LOS D: when a project would result in an increase of 5 or more seconds of delay in the lane group over No Action levels.
- For lane groups with No Action conditions at LOS E: when the project would result in a 4-second or larger increase in delay in the lane group over No Action levels.
- For lane groups with No Action conditions at LOS F: when the project would result in a 3-second or larger increase in delay in the lane group over No Action levels.

5A.2.2.2 PEDESTRIANS

The analysis of pedestrian conditions considers crowding on sidewalks, crosswalks, and corners where pedestrians wait to cross the street. For this Project, the analysis considered the potential for construction activities to affect pedestrian conditions nearby.

5A.2.2.2.1 New Jersey

No pedestrian analysis was conducted for locations in New Jersey, since the Preferred Alternative would not result in construction-related sidewalk or road closures or encroachments that would affect existing pedestrian patterns.

5A.2.2.2.2 *New York*

For New York City, the pedestrian analysis included analysis of the effects of construction closures or other construction activity that could affect sidewalks, crosswalks, and corners. Observations and counts of existing pedestrian conditions were taken after mid-January 2017, following completion of the winter holiday period, and were therefore reflective of typical conditions. The analysis of existing conditions, future No Action conditions, and future Build conditions was conducted for the weekday AM, midday, and PM peak periods.

Peak hours analyzed for the weekday AM, midday, and PM peak periods were:

- Weekday AM peak hour: 8:00-9:00 AM
- Weekday midday peak hour: 12:00-1:00 PM
- Weekday PM peak hour: 5:30-6:30 PM

The analysis followed the methodologies presented in the 2010 HCM, pursuant to procedures detailed in the *CEQR Technical Manual*. FRA and NJ TRANSIT used the criteria outlined in the *CEQR Technical Manual* to identify adverse impacts. 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 for locations in New York City in this analysis. The impact criteria for pedestrian conditions presented in the *CEQR Technical Manual* consist of various sliding-scale formulas for different pedestrian elements, flow conditions, and types of neighborhoods.

The Preferred Alternative would have limited closures of streets during construction and therefore would not have the potential result in major diversion of bicycle activity or traffic. Therefore, no quantified analyses of bicycle movements were undertaken. A qualitative description of effects to bicycle traffic during construction is provided in Section 5A.6.4.2. The Preferred Alternative would not result in any permanent changes to streets once the construction is complete; therefore, no analysis has been undertaken for future conditions with the Preferred Alternative.

5A.2.3 STUDY AREAS

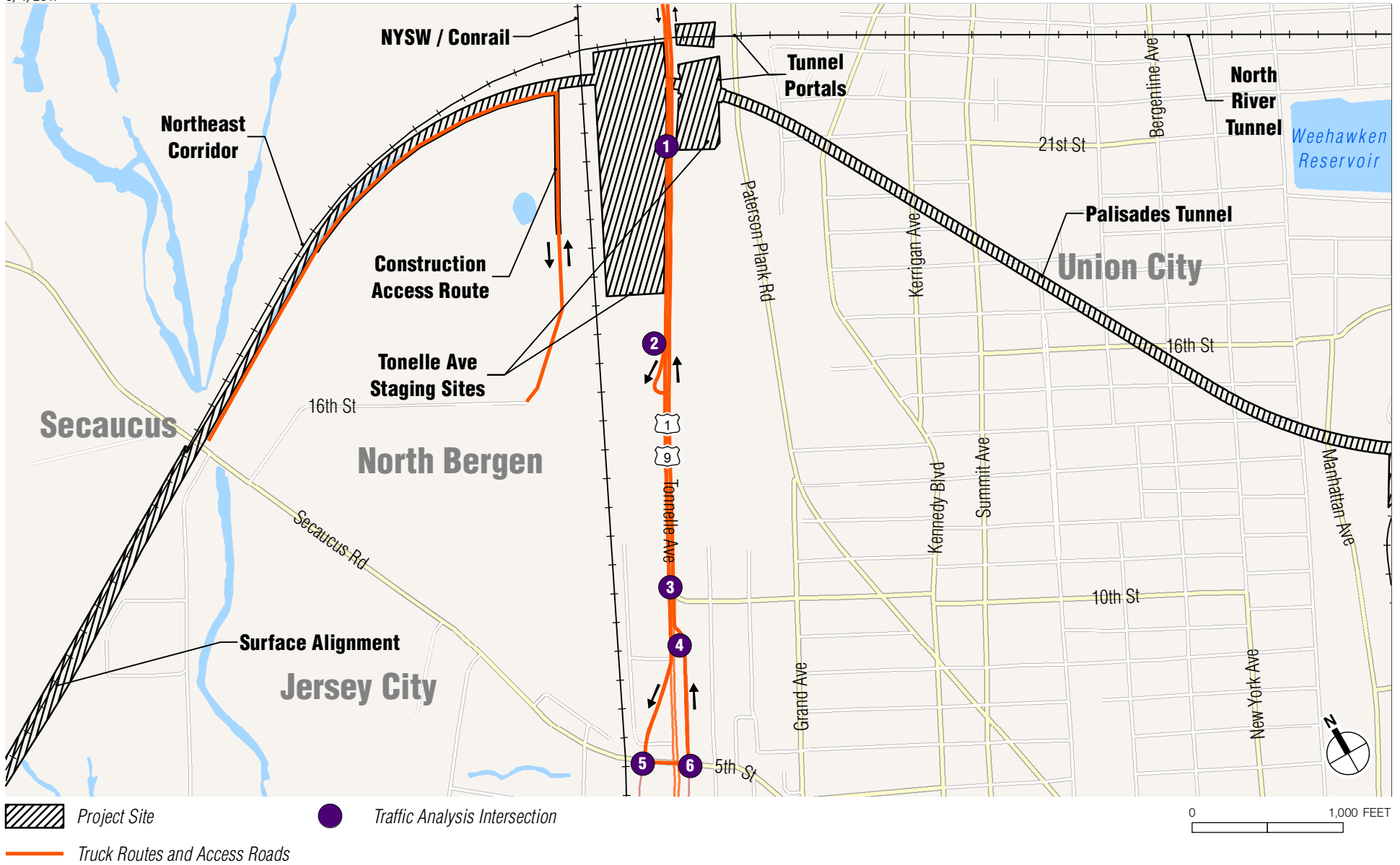
5A.2.3.1 *NEW JERSEY*

The traffic analysis comprised a total of 15 locations in New Jersey. These locations are in close proximity to the Preferred Alternative's construction staging areas, along the principal routes that workers would use to travel to and from the construction sites, and on the identified truck routes that would be used during construction to deliver materials and remove debris and excavated soils from the construction staging areas. The study area includes six intersections near the Tonnelle Avenue staging area and nine near the Hoboken staging area. No intersections were evaluated south of the Hoboken staging area because construction-related traffic would not be routed in that direction. The locations analyzed are illustrated in **Figure 5A-1**, **Figure 5A-2**, and **Figure 5A-3** and are listed below. As shown in the figures, two potential truck routes for accessing the Hoboken staging area were evaluated: the proposed truck route (**Figure 5A-2**: entering via the Park Avenue service road, exiting via the Willow Avenue service road) and an alternate truck route (**Figure 5A-3**: entrance and exit via the Willow Avenue service roads).

5A.2.3.1.1 *Traffic: Tonnelle Avenue Staging Area*

5A.2.3.1.1.1 *Analysis Locations Near the Tonnelle Avenue Staging Area*

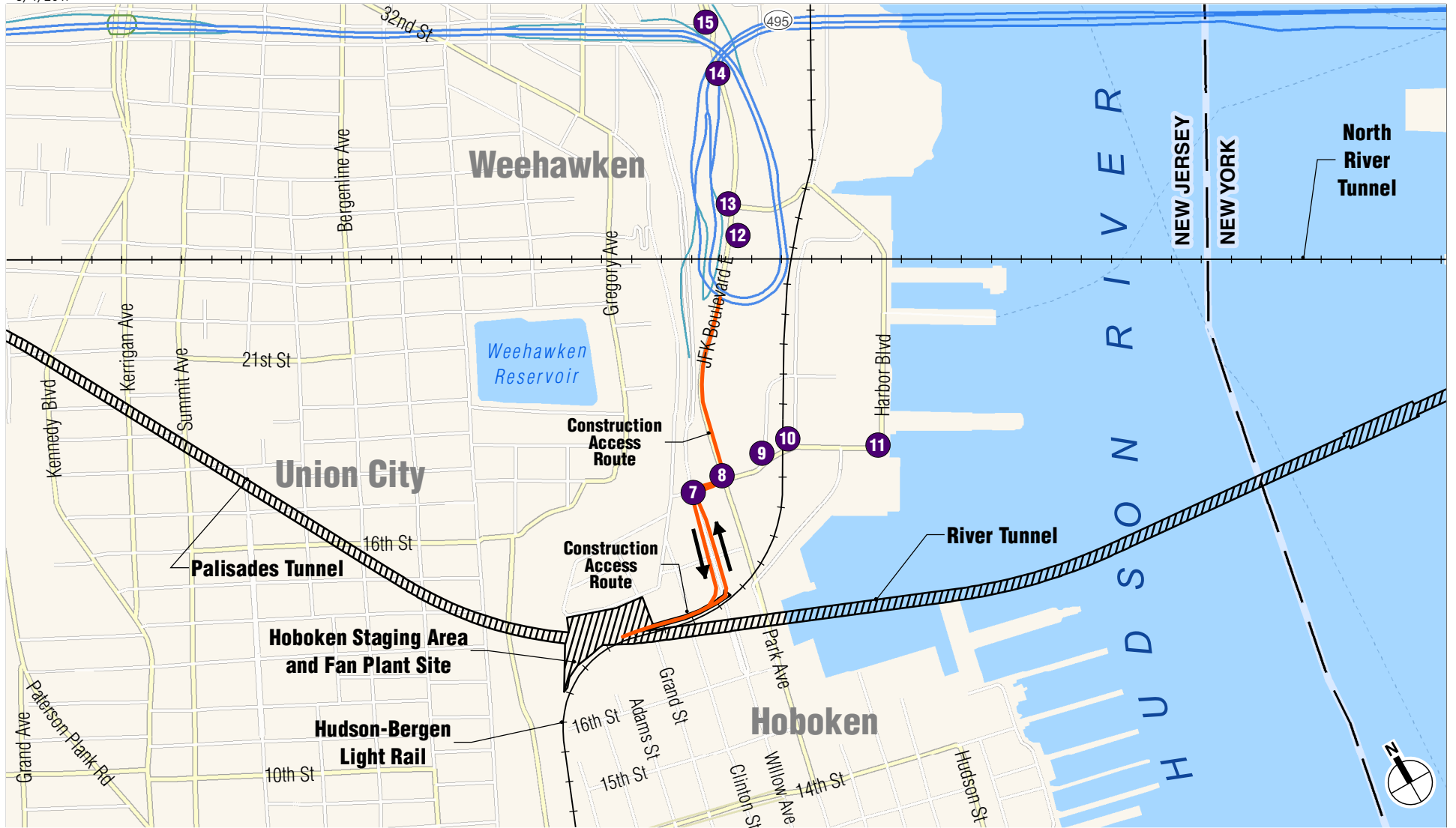
The Tonnelle Avenue staging area traffic study area and corresponding traffic controls at each of the study area intersections are summarized in **Table 5A-1**.



Traffic Analysis Intersections in New Jersey:
Tonelle Avenue Staging Site and Truck Routes
Figure 5A-1



Traffic Analysis Intersections in New Jersey:
Hoboken Staging Site and Truck Routes
Figure 5A-2



-  Project Site
-  Traffic Analysis Intersection
-  Truck Routes and Construction Access Roads

0 1,000 FEET



Traffic Analysis Intersections in New Jersey:
Hoboken Staging Site and Alternate Truck Routes
Figure 5A-3



Table 5A-1
Traffic Analysis Locations
Tonnelle Avenue Staging Area, New Jersey

	Intersection	Control
1	Tonnelle Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelle Avenue/milepost 57)	Signalized
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	Signalized
3	Tonnelle Avenue (U.S. Route 1/9) northbound at Tenth Street	Unsignalized
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	Unsignalized
5	Secaucus Road at Tonnelle Avenue (U.S. Route 1/9) northbound ramps	Signalized
6	Secaucus Road at Tonnelle Avenue (U.S. Route 1/9) southbound ramps	Signalized

5A.2.3.1.2 Traffic: Hoboken Staging Area

5A.2.3.1.2.1 Analysis Locations Near the Hoboken Staging Area

The 2022 Hoboken staging area traffic study area analysis locations and corresponding traffic controls at each of the study area intersections are summarized in **Table 5A-2**.

Table 5A-2
Traffic Analysis Locations
Hoboken Staging Area, New Jersey

	Intersection	Control
7	19th Street and Willow Avenue	Signalized
8	19th Street and Park Avenue	Signalized
9	19th Street and Lincoln Harbor Road	Signalized
10	19th Street and Waterfront Terrace	Signalized
11	19th Street and Harbor Boulevard	Unsignalized
12	JFK Boulevard and NJ TRANSIT Bus Parking Lot	Signalized
13	JFK Boulevard and Baldwin Avenue	Signalized
14	JFK Boulevard and South Marginal Highway	Signalized
15	JFK Boulevard and North Marginal Highway	Signalized

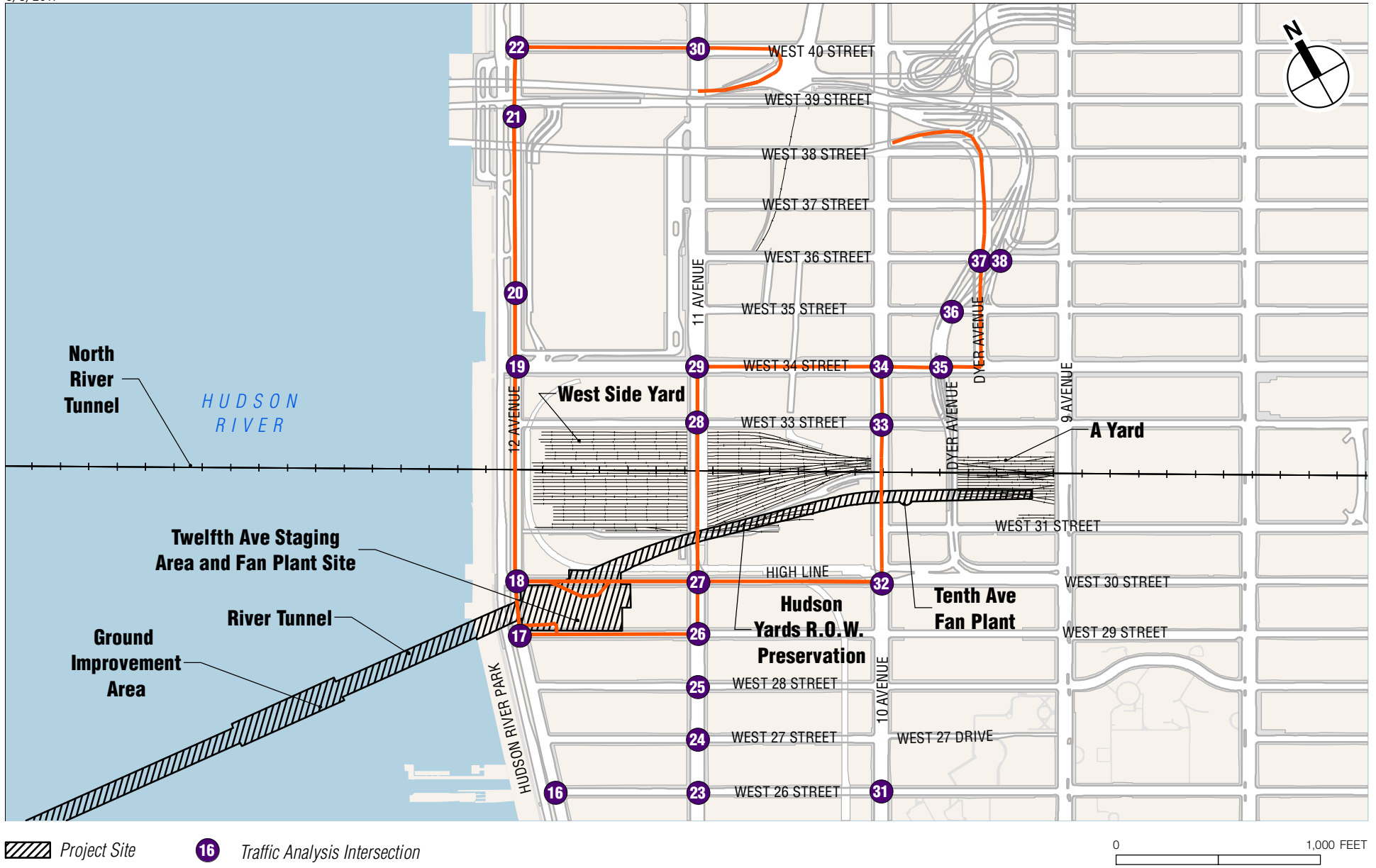
5A.2.3.1.3 Pedestrians

As noted above, no pedestrian analysis was conducted for locations in New Jersey.

5A.2.3.2 NEW YORK

5A.2.3.2.1 Traffic

The traffic analysis for New York comprises a total of 23 locations near construction areas, along the principal routes that workers would use to travel to and from the construction sites, and along truck haul routes in Manhattan that would be used during construction to deliver materials and remove debris and excavated soils from the Twelfth Avenue construction staging area. The Manhattan portion of the study area extends between Twelfth Avenue (Route 9A) on the west and Tenth Avenue on the east, and from West 26th Street on the south to West 40th Street on the north. The New York traffic analysis locations are shown in **Figure 5A-4** and summarized in **Table 5A-3**.



Traffic Analysis Intersections in New York:
Twelfth Avenue Staging Site and Truck Routes
Figure 5A-4

**Table 5A-3
Traffic Analysis Locations
New York**

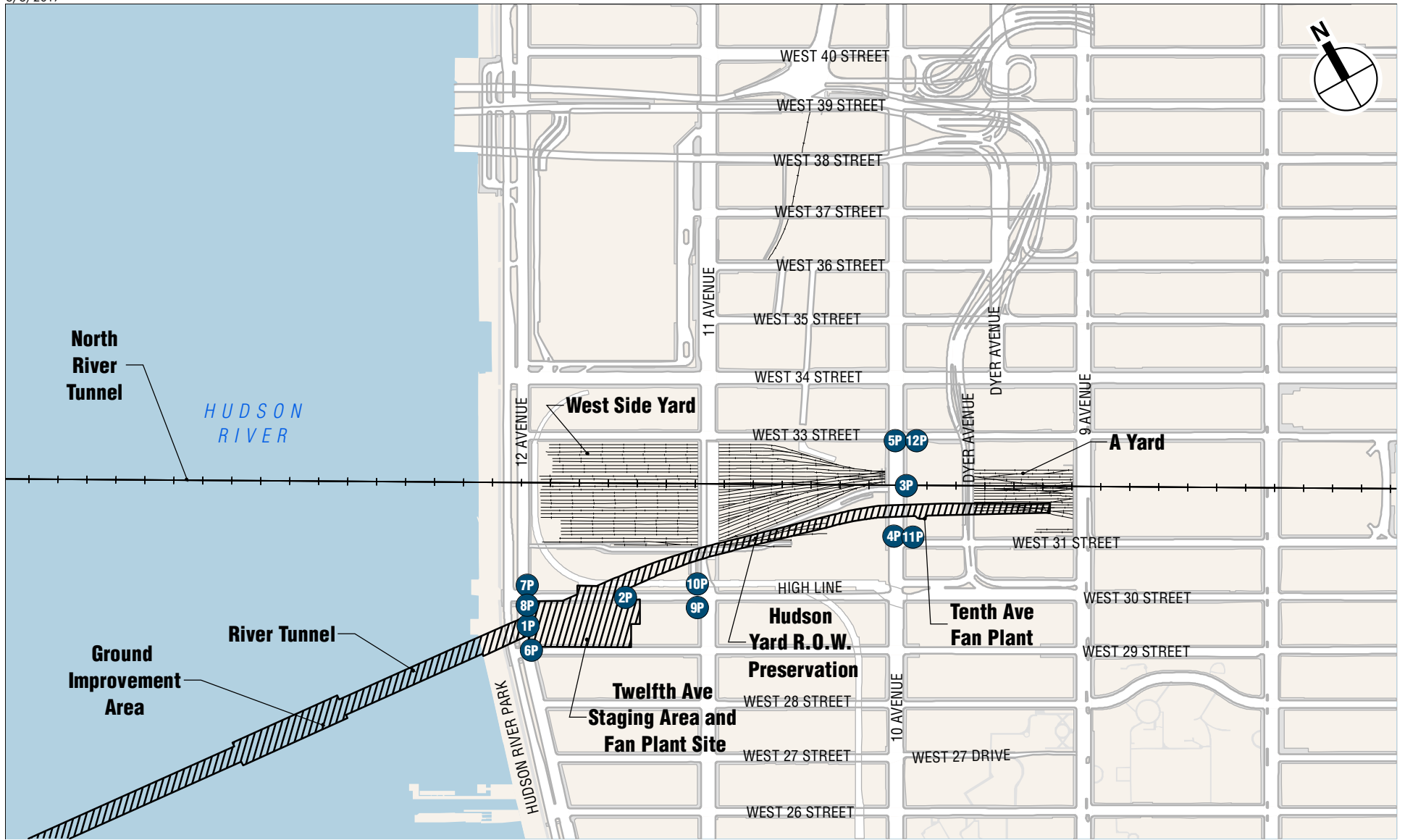
Intersection	Control
16 Twelfth Avenue and West 26th Street	Signalized
17 Twelfth Avenue and West 29th Street	Signalized
18 Twelfth Avenue and West 30th Street	Signalized
19 Twelfth Avenue and West 34th Street	Signalized
20 Twelfth Avenue and tow pound exit	Signalized
21 Twelfth Avenue and Pier 79 ferry	Signalized
22 Twelfth Avenue and West 40th Street	Signalized
23 Eleventh Avenue and West 26th Street	Signalized
24 Eleventh Avenue and West 27th Street	Signalized
25 Eleventh Avenue and West 28th Street	Signalized
26 Eleventh Avenue and West 29th Street	Signalized
27 Eleventh Avenue and West 30th Street	Signalized
28 Eleventh Avenue and West 33rd Street	Signalized
29 Eleventh Avenue and West 34th Street	Signalized
30 Eleventh Avenue and West 40th Street	Signalized
31 Tenth Avenue and West 26th Street	Signalized
32 Tenth Avenue and West 30th Street	Signalized
33 Tenth Avenue and West 33rd Street	Signalized
34 Tenth Avenue and West 34th Street	Signalized
35 Dyer Avenue and West 34th Street	Signalized
36 Dyer Avenue and West 35th Street	Signalized
37 Dyer Avenue southbound (SB) and West 36th Street	Signalized
38 Dyer Avenue northbound (NB) and West 36th Street	Signalized

5A.2.3.2.2 Pedestrians

Twelve pedestrian analysis elements were evaluated at locations where construction-related sidewalk or road closures or encroachments would affect existing pedestrian patterns. The pedestrian analysis locations are shown in **Figure 5A-5** and summarized in **Table 5A-4**. These included three sidewalk locations where pedestrian detours would be put in place, two crosswalks where pedestrian volumes would increase because of sidewalk closures, and seven corner locations adjacent to sidewalk closures.

**Table 5A-4
Pedestrian Analysis Locations
New York**

Sidewalks	
1P	East sidewalk along Twelfth Avenue between West 29th Street and West 30th Street
2P	South sidewalk along West 30th Street between Eleventh Avenue and Twelfth Avenue
3P	East sidewalk along Tenth Avenue between West 31st Street and West 33rd Street
Crosswalks	
4P	North crosswalk at Tenth Avenue and West 31st Street
5P	South crosswalk at Tenth Avenue and West 33rd Street
Corners	
6P	Northeast corner of Twelfth Avenue and West 29th Street
7P	Northeast corner of Twelfth Avenue and West 30th Street
8P	Southeast corner of Twelfth Avenue and West 30th Street
9P	Southwest corner of Eleventh Avenue and West 30th Street
10P	Northwest corner of Eleventh Avenue and West 30th Street
11P	Northeast corner of Tenth Avenue and West 31st Street
12P	Southeast corner of Tenth Avenue and West 33rd Street



 Project Site

 Pedestrian Analysis Elements





5A.3 AFFECTED ENVIRONMENT: EXISTING CONDITIONS

5A.3.1 NEW JERSEY

Traffic volumes were collected in June 2016 and balanced existing traffic volumes were developed for each peak hour. Turning movement volume data and Automatic Traffic Recorder (ATR) volumes are presented in **Appendix 5**.

At the pedestrian crossing of Tonnelles Avenue (U.S. Route 1/9) at Taco Bell (signalized), the traffic analysis assumed a worst-case scenario of 10 pedestrians per hour using the crosswalk (who could therefore conflict with vehicle movements), although no pedestrians were observed using the crosswalk during the data collection period.

The detailed results of the LOS analyses for each time period and location are provided in **Appendix 5**.

5A.3.1.1 TRAFFIC: TONNELLES AVENUE STAGING AREA

5A.3.1.1.1 Commuter Peak Hours

All of the analyzed intersections operate at mid-LOS D or better during each of the identified commuter peak hours, except for the following two intersections, which operate at LOS F:

- Tonnelles Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) operates at LOS F during the weekday AM and PM, and Saturday afternoon commuter peak hours; and
- Tonnelles Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) operates at LOS F during all commuter peak hours.

Three lane groups (which were generally turning movements) operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-5** below.

Table 5A-5
Summary of 2016 Existing Traffic Analysis Results
Tonnelles Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours			
	Weekday AM	Weekday Midday	Weekday PM	Saturday Midday
Signalized Intersections				
Lane Groups at LOS A/B/C	11	12	12	12
Lane Groups at D, below mid-LOS D ¹	3	2	2	2
Lane Groups at D, above mid-LOS D ²	1	1	1	1
Lane Groups at LOS E	0	0	0	0
Lane Groups at LOS F	0	0	0	0
Total	15	15	15	15
Unsignalized Intersections				
Lane Groups at LOS A/B/C	0	1	0	0
Lane Groups at D, below mid-LOS D ¹	0	0	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0	0
Lane Groups at LOS E	0	0	0	0
Lane Groups at LOS F	2	1	2	2
Total	2	2	2	2
Notes: LOS = Level-of-Service.				
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.				
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.				

5A.3.1.1.2 Construction Peak Hours

5A.3.1.1.2.1 New Tunnel Construction Peak Hours

All of the analyzed intersections operate at mid-LOS D or better during each of the identified construction peak hours, except for the following two intersections, which operate at LOS F:

- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) operates at LOS F during the weekday AM peak hour; and
- Tonnelle Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) operates at LOS F during all construction peak hours.

Four lane groups (which are generally turning movements) operate at a congested mid-LOS D, E, or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-6** below.

Table 5A-6
Summary of 2016 Existing Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
New Tunnel Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	12	12
Lane Groups at D, below mid-LOS D ¹	1	2
Lane Groups at D, above mid-LOS D ²	2	1
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	15	15
Unsignalized Intersections		
Lane Groups at LOS A/B/C	0	0
Lane Groups at D, below mid-LOS D ¹	0	1
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	2	1
Total	2	2
Notes: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.3.1.1.2.2 North River Tunnel Rehabilitation Peak Hours

All of the analyzed intersections operate at mid-LOS D or better during each of the identified construction peak hours, except for the following two intersections, which operate at LOS F:

- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) operates at LOS F during all construction peak hours; and
- Tonnelle Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) operates at LOS F during all construction peak hours.

Four lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-7** below.



Table 5A-7
Summary of 2016 Existing Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
North River Tunnel Rehabilitation—Construction Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday PM	Saturday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	12	12	12
Lane Groups at D, below mid-LOS D ¹	1	2	2
Lane Groups at D, above mid-LOS D ²	2	1	1
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	0	0	0
Total	15	15	15
Unsignalized Intersections			
Lane Groups at LOS A/B/C	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	2	2
Total	2	2	2
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.3.1.2 TRAFFIC: HOBOKEN STAGING AREA

5A.3.1.2.1 Commuter Peak Hours

All analyzed intersections operate at mid-LOS D or better during each of the identified commuter peak hours. Nine lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-8**.

Table 5A-8
Summary of 2016 Existing Traffic Analysis Results
Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	33	34	30
Lane Groups at D, below mid-LOS D ¹	3	2	4
Lane Groups at D, above mid-LOS D ²	1	2	3
Lane Groups at LOS E	0	1	0
Lane Groups at LOS F	2	0	2
Total	39	39	39
Unsignalized Intersections			
Lane Groups at LOS A/B/C	4	5	5
Lane Groups at D, below mid-LOS D ¹	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	0	0	0
Total	5	5	5
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.3.1.2.2 Construction Peak Hours

All the analyzed intersections operate at mid-LOS D or better during each of the identified construction peak hours. Three lane groups (which are generally turning movements) operate at a congested mid-LOS D, E, or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-9**.

Table 5A-9
Summary of 2016 Existing Traffic Analysis Results
Hoboken Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	32	34
Lane Groups at D, below mid-LOS D ¹	4	2
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	1	2
Lane Groups at LOS F	2	1
Total	39	39
Unsignalized Intersections		
Lane Groups at LOS A/B/C	5	5
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	5	5
Notes: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.3.1.3 PEDESTRIANS

No pedestrian elements were analyzed in New Jersey, since no construction-related sidewalk or road closures or encroachments would occur that would affect existing pedestrian patterns.

5A.3.2 HUDSON RIVER

Access to the in-water area within the Hudson River where construction for the Preferred Alternative would occur would be from the New York study area. As a result, all construction-related vehicles are accounted for as part of the analyses of New York intersections.

5A.3.3 NEW YORK

5A.3.3.1 TRAFFIC

Within the New York study area, most study area streets are typical of the Manhattan grid system (i.e., alternating eastbound and westbound streets). Tenth Avenue operates northbound, Eleventh Avenue operates predominantly southbound, and Twelfth Avenue (Route 9A) operates as a two-way street with a median in some locations. Dyer Avenue operates as a two-way street providing access to the Lincoln Tunnel. Additionally, there are a number of Lincoln Tunnel entrances and exits within the study area.

Traffic volumes were collected in June 2016 and balanced existing traffic volumes were developed for each peak hour. Turning movement volume data and ATR volumes are presented in **Appendix 5**.



In April 2017, NYCDOT converted Eleventh Avenue between West 34th Street and West 37th Street from one-way operation to two-way operation. Since the original traffic counts for the analyses presented in this DEIS were collected in June 2016, sample counts were conducted in May 2017 to quantify the effects of this change in street direction. This information was then applied to the analysis of future conditions presented below in Section 5A4.3.1.

5A.3.3.1.1 Commuter Peak Hours

Intersections analyzed operate at mid-LOS D or better during each of the commuter peak hours. Eighteen lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more peak hours. A summary of the traffic analysis results is presented in **Table 5A-10**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-10
Summary of 2016 Existing Traffic Analysis Results
New York
Commuter Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	56	59	59
Lane Groups at D, below mid-LOS D ¹	5	8	3
Lane Groups at D, above mid-LOS D ²	5	6	6
Lane Groups at LOS E	6	3	5
Lane Groups at LOS F	4	0	3
Total	76	76	76
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.3.3.1.2 Construction Peak Hours

All of the intersections analyzed operate at mid-LOS D or better during each of the commuter peak hours. Seventeen lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more peak hours. A summary of the traffic analysis results is presented in **Table 5A-11**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-11
Summary of 2016 Existing Traffic Analysis Results
New York
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	60	59
Lane Groups at D, below mid-LOS D ¹	3	2
Lane Groups at D, above mid-LOS D ²	4	7
Lane Groups at LOS E	7	4
Lane Groups at LOS F	2	4
Total	76	76
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.3.3.2 PEDESTRIANS

Pedestrian volume data was collected in January 2017 at each of the analyzed pedestrian elements. At the time that pedestrian volumes were collected, the west sidewalk of Tenth Avenue between West 33rd and West 31st Streets and the southwest corner of Tenth Avenue and 33rd Street were closed due to construction.

Analyzed pedestrian elements operate at LOS C or better during all peak hours. A summary of the traffic analysis results is presented in **Table 5A-12**. Detailed LOS analyses were prepared for each element and are presented in **Appendix 5**.

Table 5A-12
Summary of 2016 Existing Pedestrian Analysis Results
New York

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Sidewalks			
Sidewalks at LOS A/B/C	3	3	3
Sidewalks at LOS D	0	0	0
Sidewalks at LOS E	0	0	0
Sidewalks at LOS F	0	0	0
Total	3	3	3
Corner Reservoirs			
Corners at LOS A/B/C	7	7	7
Corners at LOS D	0	0	0
Corners at LOS E	0	0	0
Corners at LOS F	0	0	0
Total	7	7	7
Crosswalks			
Crosswalks at LOS A/B/C	2	2	2
Crosswalks at LOS D	0	0	0
Crosswalks at LOS E	0	0	0
Crosswalks at LOS F	0	0	0
Total	2	2	2
Note: LOS = Level-of-Service.			

5A.4 AFFECTED ENVIRONMENT: FUTURE CONDITIONS

The evaluation of the future affected environment, referred to in this chapter as the No Action condition, considers traffic and pedestrian conditions in the study areas during the future analysis years in the absence of the Preferred Alternative. This analysis serves as a baseline against which the impacts of the No Action and Preferred Alternatives are evaluated.

Despite the ongoing maintenance that would continue in the future, damage to the North River Tunnel caused by Superstorm Sandy will continue to degrade systems in the tunnel. This deterioration combined with the tunnel's age and intensity of use will likely lead to increasing need for unscheduled maintenance and instability of rail operations in the tunnel, and may lead to its eventual closure. However, given the uncertainty about the timing and extent of any closure of the tunnel, for purposes of analysis in this EIS, FRA has made the assumption that the North River Tunnel will remain functional and in operation at least through the EIS analysis year of 2030.

While not accounted for in this analysis, if North River Tunnel passenger rail service is disrupted for emergency repairs, passengers would be diverted to trans-Hudson bus or ferry services (described in Chapter 5B, "Transportation Services," Section 5B.5) and to automobiles, as occurred when the North River Tunnel was flooded from Superstorm Sandy. If this occurs, there



would be increased bus and ferry ridership, and increased use of automobiles to accommodate the diverted passengers. This may require additional bus and ferry service to accommodate diverted passengers, and would result in increased congestion on area roadways from passengers diverted to driving automobiles. Barring a closure of the North River Tunnel, which is not assumed to happen in this analysis, these changes would be intermittent and limited in duration.

5A.4.1 NEW JERSEY

5A.4.1.1 TRAFFIC

As discussed above in Section 5A.2.2.1.1, the analysis of future background conditions considers the future peak year for the Preferred Alternative's construction in each study area. For the New Jersey study areas, existing condition traffic volumes were increased using a 1 percent annual compounded growth rate, consistent with the methodology used for the *Access to the Region's Core Project Final Environmental Impact Statement (FEIS)*² and the NJDOT annual commuter growth rate for local roads in Hudson County. No changes to the roadway network or appreciable traffic associated with new development projects are anticipated by the analysis years. The conservative annual compounded growth factor assumed for these analyses of 1 percent per year applied to the area roadways, many of which have heavy existing traffic volumes, would account for the traffic generated by the known projects identified in Chapter 6A, "Land Use, Zoning, and Public Policy."

The analysis was conducted for the commuter peak hours and for the construction peak hours. The results of the LOS analyses for each time period and location are provided in **Appendix 5** and summarized below.

5A.4.1.1.1 Traffic: Tonnelle Avenue Staging Area

5A.4.1.1.1.1 2021 Weekday Commuter Peak Hours

In the future, three of the analyzed intersections are projected to operate at a congested mid-LOS D or worse during each of the identified commuter peak hours:

- Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply (signalized) is projected to operate at unacceptable LOS D during the weekday AM commuter peak hour;
- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (a stop-controlled westbound right turn) is projected to operate at LOS F during the weekday AM and PM commuter peak hours; and
- U.S. Route 1/9 and the entrance ramp from Secaucus Road (a stop-controlled westbound right turn) is projected to operate at LOS F during all weekday commuter peak hours.

Five lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-13**.

² Federal Transit Administration and NJ TRANSIT, *Access to the Region's Core FEIS*, October 2008, Appendix 3.3.

Table 5A-13
Summary of 2021 Future No Action Condition Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	10	12	11
Lane Groups at D, below mid-LOS D ¹	2	2	3
Lane Groups at D, above mid-LOS D ²	2	1	1
Lane Groups at LOS E	1	0	0
Lane Groups at LOS F	0	0	0
Total	15	15	15
Unsignalized Intersections			
Lane Groups at LOS A/B/C	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	1	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	1	2
Total	2	2	2
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.4.1.1.1.2 2021 Weekday Construction Peak Hours

Two of the analyzed intersections are projected to operate at a congested mid-LOS D or worse during each of the identified construction peak hours in the No Action condition:

- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) is projected to operate at LOS F during the weekday AM construction peak hour and at LOS E during the weekday PM construction peak hour; and
- Tonnelle Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) is projected to operate at LOS F during all weekday construction peak hours.

Four lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-14**.



Table 5A-14
Summary of 2021 No Action Condition Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	11	12
Lane Groups at D, below mid-LOS D ¹	2	2
Lane Groups at D, above mid-LOS D ²	2	1
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	15	15
Unsignalized Intersections		
Lane Groups at LOS A/B/C	0	0
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	1
Lane Groups at LOS F	2	1
Total	2	2
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.4.1.1.1.3 2029 Weekday and Saturday Commuter Peak Hours

Four of the analyzed intersections are projected to operate at a congested mid-LOS D or worse during one or more of the identified commuter peak hours in the No Action condition:

- Tonnelle Avenue (U.S. Route 1/9) at Taco Bell (signalized) is projected to operate at LOS E during the weekday AM commuter peak hour and at an unacceptable LOS D during the weekday PM commuter peak hour;
- Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply (signalized) is projected to operate at LOS E during the weekday AM and PM commuter peak hours;
- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) is projected to operate at LOS F during the weekday AM, weekday PM, and Saturday afternoon commuter peak hours, at an unacceptable LOS D during the weekday midday commuter peak hour; and
- Tonnelle Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) is projected to operate at LOS F during all commuter peak hours.

Seven lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-15**.

Table 5A-15
Summary of 2029 No Action Condition Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours			
	Weekday AM	Weekday Midday	Weekday PM	Saturday Midday
Signalized Intersections				
Lane Groups at LOS A/B/C	8	12	9	12
Lane Groups at D, below mid-LOS D ¹	3	2	1	2
Lane Groups at D, above mid-LOS D ²	2	1	2	1
Lane Groups at LOS E	0	0	3	0
Lane Groups at LOS F	2	0	0	0
Total	15	15	15	15
Unsignalized Intersections				
Lane Groups at LOS A/B/C	0	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0	0
Lane Groups at LOS E	0	0	0	0
Lane Groups at LOS F	2	1	2	2
Total	2	2	2	2
Notes: LOS = Level-of-Service.				
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.				
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.				

5A.4.1.1.1.4 2029 Weekday and Saturday Construction Peak Hours

Four of the analyzed intersections are projected to operate an unacceptable mid-LOS D or worse during each of the identified construction peak hours in the No Action condition:

- Tonnelle Avenue (U.S. Route 1/9) at Taco Bell (signalized) is projected to operate at an unacceptable LOS D during the weekday AM and PM construction peak hours;
- Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply (signalized) is projected to operate at LOS E during the weekday AM and PM construction peak hours;
- Tonnelle Avenue (U.S. Route 1/9) and 10th Street (stop-controlled westbound right turn) is projected to operate at LOS F during all construction peak hours; and
- Tonnelle Avenue (U.S. Route 1/9) and the entrance ramp from Secaucus Road (stop-controlled westbound right turn) is projected to operate at LOS F all construction peak hours.

Eight lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E, or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-16**.



Table 5A-16
Summary of 2029 No Action Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday PM	Saturday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	7	9	10
Lane Groups at D, below mid-LOS D ¹	2	3	4
Lane Groups at D, above mid-LOS D ²	3	1	1
Lane Groups at LOS E	3	2	0
Lane Groups at LOS F	0	0	0
Total	15	15	15
Unsignalized Intersections			
Lane Groups at LOS A/B/C	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	2	2
Total	2	2	2
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.4.1.1.2 Traffic: Hoboken Staging Area

5A.4.1.1.2.1 2022 Weekday Commuter Peak Hours

All but one of the analyzed intersections are projected to operate at mid-LOS D or better during each of the identified back commuter peak hours in the future No Action condition:

- 19th Street and Willow Avenue (signalized) is projected to operate at an unacceptable LOS D during the weekday PM commuter peak hour; and

Eight lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-17**.

Table 5A-17
Summary of 2022 No Action Condition Traffic Analysis Results
Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	32	34	30
Lane Groups at D, below mid-LOS D ¹	4	1	2
Lane Groups at D, above mid-LOS D ²	0	2	5
Lane Groups at LOS E	1	1	0
Lane Groups at LOS F	2	1	2
Total	39	39	39
Unsignalized Intersections			
Lane Groups at LOS A/B/C	4	5	5
Lane Groups at D, below mid-LOS D ¹	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	0	0	0
Total	5	5	5
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.4.1.1.2.2 2022 Weekday Construction Peak Hours

All but one of the analyzed intersections is projected to operate at mid-LOS D or better during each of the identified construction peak hours in the No Action condition:

- 19th Street and Willow Avenue (signalized) is projected to operate at an unacceptable LOS D during the weekday AM and PM construction peak hours.

Three lane groups (generally turning movements) are projected to operate at a congested mid-LOS D, E, or F during one or more construction peak hours. A summary of the traffic analysis results is presented in **Table 5A-18**.



Table 5A-18
Summary of 2022 No Action Condition Traffic Analysis Results
Hoboken Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	32	33
Lane Groups at D, below mid-LOS D ¹	4	3
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	1	1
Lane Groups at LOS F	2	2
Total	39	39
Unsignalized Intersections		
Lane Groups at LOS A/B/C	5	5
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	5	5
Notes: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.4.1.2 PEDESTRIANS

In the future, no changes would occur to pedestrian patterns in the New Jersey study area by the 2030 analysis year.

5A.4.2 HUDSON RIVER

In the future, no changes will occur related to the Hudson River that will affect vehicular traffic or pedestrian conditions in the New Jersey or New York study areas by the 2030 analysis year.

5A.4.3 NEW YORK

5A.4.3.1 TRAFFIC

Future No Action condition traffic volumes in the New York study area were projected for the analysis year of using a 0.25 percent annual growth rate applicable for Midtown Manhattan, as prescribed in the *CEQR Technical Manual*.

In addition to general background growth, the New York study area will experience extensive growth and redevelopment in the future with the construction and implementation of the new Hudson Yards development (the Western Rail Yard and Eastern Rail Yard projects) and other anticipated projects. As a result, traffic will also grow in the study area beyond general background growth. To account for this future growth and related changes to the roadway network, the following adjustments were made:

- In April 2017, NYCDOT converted Eleventh Avenue between West 34th Street and West 37th Street from one-way operation to two-way operation. Since the original traffic counts for the analyses presented in this DEIS were collected in June 2016, sample counts were conducted in May 2017 to quantify the effects of this change in street direction. These new

sample counts and traffic volume data from the *Western Rail Yard FEIS*³ (collected when Eleventh Avenue also operated as a two-way street) were used to adjust the existing traffic volumes to reflect the newly implemented two-way operation of this segment of Eleventh Avenue.

- Additional incremental traffic anticipated from the many development projects in the area other than the Western Rail Yard project were estimated by using the No Action increment reported in the *Western Rail Yard FEIS*.
- Two developments are proposed on the same block as the Preferred Alternative's Twelfth Avenue staging area (between West 30th and West 29th Streets and Eleventh and Twelfth Avenues) as part of the proposed rezoning for that block, referred to as Block 675 East.⁴ The anticipated traffic volumes from those developments were estimated and added to the study area network.
- With the completion of the Eastern Rail Yard project (between Tenth and Eleventh Avenues and West 31st and West 33rd Streets), the number of travel lanes of the southbound approach at Eleventh Avenue and West 30th Street (currently only three travel lanes due to construction) will revert to the pre-construction condition of four travel lanes. This change was assumed for the traffic analysis.
- With the completion of the Eastern Rail Yard project, West 33rd Street between Tenth and Eleventh Avenues will be reopened to automobile traffic. As such, existing and No Action Alternative incremental traffic volumes were rerouted to account for the reopening of this section of West 33rd Street.
- Construction of the Western Rail Yard project (between Eleventh and Twelfth Avenues and West 31st and West 33rd Streets) is anticipated to occur concurrently with the peak construction year of the Hudson Tunnel Project in Manhattan. The peak construction increment for that project, as reported in the *Western Rail Yard FEIS*, was conservatively added to the roadway network to account for the effects of construction of that project on the study area road network, assuming the Western Rail Yard peak construction would overlap with the peak construction for the Preferred Alternative in Manhattan. Additionally, West 33rd Street between Eleventh and Twelfth Avenues will be closed to facilitate construction of the Western Rail Yard project. This closure was assumed to occur and traffic volumes were rerouted accordingly.
- The relevant proposed mitigation measures from the *Western Rail Yard FEIS* construction analysis were also conservatively assumed to occur in the analysis year, and were incorporated into the No Action condition for the Hudson Tunnel Project where appropriate, as indicated in **Table 5A-19**.

³ Metropolitan Transportation Authority and New York City Planning Commission, *Western Rail Yard FEIS*, October 2009.

⁴ <https://www1.nyc.gov/assets/planning/download/pdf/applicants/env-review/block-675-east/scoping-notice.pdf>.



**Table 5A-19
Western Rail Yard Project Construction Mitigation
Assumed to be Implemented**

Intersection	Western Rail Yards Construction Mitigation
AM Peak Hour	
Tenth Avenue and West 30th Street	EB: G=31 NB: G=49
Tenth Avenue and West 34th Street	NB (6 Lanes): L, T,T,T,T,R - An additional lane from prohibiting parking on the east side of Tenth Ave., and restripe, and an additional lane from prohibiting parking on the west side of Tenth Ave., and restripe EB/WB: G=31 NB: G=49
Eleventh Avenue and West 30th Street	EB: (2 Lanes) T,TR - An additional lane from enforcement of parking prohibition and prohibiting standing on the north side of 30th St.
Twelfth Avenue and West 29th Street	WB: (2 Lanes, 11 feet each, L, R) - An additional lane from prohibiting parking on the north side of 29th St.
Midday Peak Hour	
Tenth Avenue and West 30th Street	EB: (2 Lanes) LT,T - An additional lane from prohibiting parking on the north side of 30th St.
Tenth Avenue and West 34th Street	NB (6 Lanes): L, T, T, T, T, R - An additional lane from prohibiting parking on the east side of Tenth Ave., and restripe, and an additional lane from prohibiting parking on the west side of Tenth Ave., and restripe
Eleventh Avenue and West 30th Street	EB: (2 Lanes) T,TR - An additional lane from enforcement of parking prohibition and prohibiting standing on the north side of 30th St.
PM Peak Hour	
Tenth Avenue and West 30th Street	EB: (2 Lanes) LT,T - An additional lane from prohibiting parking on the north side of 30th St.
Tenth Avenue and West 34th Street	NB (5 Lanes): L, T, T, T, R - An additional lane from prohibiting parking on the east side of Tenth Ave., and restripe, and an additional lane from prohibiting parking on the west side of Tenth Ave., and restripe EB/WB: G=32 NB: G=48
Eleventh Avenue and West 30th Street	EB: (2 Lanes) T,TR - An additional lane from enforcement of parking prohibition and prohibiting standing on the north side of 30th St.
Twelfth Avenue and West 29th Street	WB: (2 Lanes, 11 feet each, L, R) - An additional lane from prohibiting parking on the north side of 29th St. WB: G = 24 NB/SB: G = 114*
Notes:	"G" indicates amount of green phase time, in seconds L, T, R indicate "Left," "Through," and "Right"
Source:	Western Rail Yards Final Environmental Impact Statement.

The combination of background growth, traffic generated by new development projects in the area, construction trips associated with the Western Rail Yard project, and the opening and closing of two blocks of West 33rd Street as a result of construction at the Eastern and Western Rail Yard project sites, was added to the existing volumes to identify future used as the No Action condition traffic volumes.

5A.4.3.1.1 Commuter Peak Hours

Seven of the analyzed intersections will operate at worse than mid-LOS D during one or more of the identified commuter peak hours:

- Twelfth Avenue and West 30th Street will operate at LOS E during the weekday PM commuter peak hour;
- Twelfth Avenue and West 34th Street will operate at an unacceptable LOS D during the weekday PM commuter peak hour;

- Eleventh Avenue and West 34th Street will operate at LOS E during the weekday midday commuter peak hour;
- Tenth Avenue and West 30th Street will operate at LOS F during the weekday AM commuter peak hour and at an unacceptable LOS D during the weekday PM commuter peak hour;
- Tenth Avenue and West 33rd Street will operate at LOS E during the weekday AM commuter peak hour and at LOS F during the midday and PM commuter peak hours;
- Dyer Avenue and West 34th Street will operate at LOS E during the weekday AM commuter peak hour; and
- Dyer Avenue and West 35th Street will operate at an unacceptable LOS D during the weekday AM commuter peak hour.

Twenty-nine lane groups (generally turning movements) will operate at congested mid-LOS D, E, or F during one or more peak hours. A summary of the traffic analysis results is presented in **Table 5A-20**. The detailed results of the LOS analyses for each of the analysis time periods are provided in **Appendix 5**.

Table 5A-20
Summary of 2021 No Action Condition Traffic Analysis Results
New York
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
<i>Signalized Intersections</i>			
Lane Groups at LOS A/B/C	51	50	50
Lane Groups at D, below mid-LOS D ¹	3	14	4
Lane Groups at D, above mid-LOS D ²	6	4	7
Lane Groups at LOS E	10	4	8
Lane Groups at LOS F	7	5	8
Total	77	77	77
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.4.3.1.2 Construction Peak Hours

Four of the analyzed intersections will operate at worse than mid-LOS D during one or more of the identified commuter peak hours:

- Tenth Avenue and West 30th Street will operate at LOS F during the weekday AM construction peak hour;
- Tenth Avenue and West 33rd Street will operate at LOS F during the weekday PM construction peak hour;
- Dyer Avenue and West 34th Street will operate at LOS E during the weekday AM construction peak hour; and
- Dyer Avenue northbound and West 36th Street will operate at an unacceptable LOS D during the weekday PM construction peak hour.

Twenty-three lane groups (which are generally turning movements) will operate at a congested mid-LOS D, E, or F during one or more peak hours. A summary of the traffic analysis results is presented in **Table 5A-21**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.



Table 5A-21
Summary of 2021 No Action Condition Traffic Analysis Results
New York
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	56	55
Lane Groups at D, below mid-LOS D ¹	5	2
Lane Groups at D, above mid-LOS D ²	2	6
Lane Groups at LOS E	9	7
Lane Groups at LOS F	5	7
Total	77	77
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.4.3.2 PEDESTRIANS

Pedestrian volumes in the New York study area will increase in the No Action condition as a result of general background growth and pedestrian trip generation from new development projects.⁵ The redevelopment of the Hudson Yards area will substantially increase pedestrian volumes along Tenth Avenue, especially in the vicinity of the new No. 7 subway station at 34th Street and Eleventh Avenue. A temporary construction closure of the west sidewalk of Tenth Avenue between West 31st and West 33rd Street associated with the redevelopment of Hudson Yards (specifically, the Eastern Rail Yard project) will be removed upon the completion of the adjacent development project in 2019. Crosswalk volumes at these two intersections were adjusted to reflect the removal of this detour and the reopening of the sidewalk. The volume of the east sidewalk was adjusted to reflect this as well. The pedestrian volumes from the *Western Rail Yard FEIS* were used to estimate the No Action condition pedestrian volumes during the construction condition, given the overlap in study area and analysis years between the Hudson Tunnel Project and Western Rail Yard project. In addition, estimated pedestrian volumes that will result from the two proposed development projects on the same block as the Twelfth Avenue staging area (the Block 675 East rezoning) were also incorporated into the No Action condition pedestrian volumes.

5A.4.3.2.1 Sidewalks

In the future No Action condition, all analyzed sidewalks will operate at LOS B or better during all peak hours.

5A.4.3.2.2 Corners

All analyzed corners will operate at LOS D or better during all peak hours, with the exception of the southeast corner of Tenth Avenue and West 33rd Street, which will operate at LOS F during the weekday midday peak hour.

5A.4.3.2.3 Crosswalks

The north crosswalk of Tenth Avenue and West 31st Street will operate at LOS C during the weekday AM peak hour, LOS F during the weekday midday peak hour, and at LOS E during the weekday PM peak hour in the No Action condition. The south crosswalk of Tenth Avenue and

⁵ Pedestrian volumes for the No Action Alternative include pedestrian walk-only trips, as well as pedestrian linked trips to bus/subway/rail modes.

West 33rd Street will operate at LOS E during the weekday AM and PM peak hours and at LOS F during the weekday midday peak hour.

A summary of the pedestrian analysis results is presented in **Table 5A-22**. Detailed LOS analyses were prepared for each element and are presented in **Appendix 5**.

Table 5A-22
Summary of 2021 No Action Alternative Pedestrian Analysis Results
New York

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Sidewalks			
Sidewalks at LOS A/B/C	3	3	3
Sidewalks at LOS D	0	0	0
Sidewalks at LOS E	0	0	0
Sidewalks at LOS F	0	0	0
Total	3	3	3
Corner Reservoirs			
Corners at LOS A/B/C	6	5	7
Corners at LOS D	1	1	0
Corners at LOS E	0	0	0
Corners at LOS F	0	1	0
Total	7	7	7
Crosswalks			
Crosswalks at LOS A/B/C	1	0	0
Crosswalks at LOS D	0	0	0
Crosswalks at LOS E	1	0	2
Crosswalks at LOS F	0	2	0
Total	2	2	2
Note: LOS = Level-of-Service.			

5A.5 IMPACTS OF NO ACTION ALTERNATIVE

With the No Action Alternative, the North River Tunnel is assumed to remain operational with ongoing maintenance at least until the analysis years for this EIS. Traffic and pedestrian conditions would not change from the conditions described above in Section 5A.4.

However, it is possible that with the No Action Alternative, as the reliability of the trans-Hudson rail system worsens because of ongoing deterioration in the North River Tunnel and congestion on each trans-Hudson mode continues to increase to keep pace with future demand, the frequency and severity of each service disruption will be magnified compared to what is experienced today. As North River Tunnel passenger rail service is disrupted for emergency repairs, passengers would divert to trans-Hudson bus services, as well as to ferries, automobiles, and PATH rail service, as occurs today when there is a disruption to Amtrak or NJ TRANSIT service between New Jersey and New York. Each time the North River Tunnel is closed, the disruption would affect up to 20,500 daily weekday Amtrak passenger trips (one-way rides) and up to 192,000 daily weekday NJ TRANSIT passenger trips based on existing ridership, on up to approximately 450 trains per day, as a worst-case scenario. Even if only one tube of the North River Tunnel closes, this would disrupt up to 75 percent of the train service through the tunnel. Trans-Hudson passengers would either elect to shift to alternative mass transit services, which are operating at or near capacity during peak travel hours, or many passengers may elect to make the trip via automobile on the region's congested roadway system, or not to make the trip. This could result in additional congestion on area roadways.



5A.6 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE

5A.6.1 OVERVIEW

This analysis considers the effects of construction of the Preferred Alternative on traffic and pedestrian conditions in each study area for the years when peak construction traffic would occur. Traffic and pedestrian conditions during the construction period were compared against the future affected environment (the No Action condition) to determine the construction impacts of the Preferred Alternative.

5A.6.2 NEW JERSEY

5A.6.2.1 TRAFFIC

As described in Chapter 3, "Construction Methods and Activities," construction of the Preferred Alternative's new tunnel would begin in 2019 and would be completed in 2026. Peak traffic volumes associated with the construction of the new tunnel would occur in 2021 at the Tonnelle Avenue staging area and in 2022 at the Hoboken staging area. Construction activities for the new tunnel would normally occur five days a week.

Rehabilitation of the North River Tunnel would begin after the new tunnel opens for revenue service, with rehabilitation activities beginning in 2026 and completed in 2030. Peak traffic volumes associated with the North River Tunnel rehabilitation at the Tonnelle Avenue staging area would occur in 2029. Construction activities for the rehabilitation of the North River Tunnel would normally occur six days a week (i.e., weekdays and Saturday).

The traffic analysis was conducted for the study area's commuter peak hours and for the construction peak hours. Evaluation of construction impacts of the Preferred Alternative was conducted for the following:

- Tonnelle Avenue staging area: weekday AM and PM peak hours in 2021 to evaluate the effects of construction of the new tunnel;
- Tonnelle Avenue staging area: weekday AM and PM peak hours and Saturday PM peak hour in 2029, to evaluate the effects of rehabilitation of the North River Tunnel.
- Hoboken staging area: weekday AM and PM peak hours in 2022 to evaluate the effects of construction of the new tunnel.

Construction of the Preferred Alternative would add construction-related truck trips and construction worker commute trips to the study area roadway networks. Daily workforce and truck projections were used to determine the number of daily truck trips and worker commute trips that would access each construction site during the peak hours in their respective peak construction years. The Preferred Alternative would result in the following worst-case construction-related traffic volumes in the peak hours analyzed:

- Tonnelle Avenue staging area in 2021:
 - AM peak hour total of 204 combined worker and truck trips (40 trucks and 164 workers).
 - PM peak hour total of 318 combined worker and truck trips (40 trucks and 278 workers).
- Tonnelle Avenue staging area in 2029:
 - AM peak hour total of 237 combined worker and truck trips (32 trucks and 205 workers).
 - PM peak hour total of 444 combined worker and truck trips (34 trucks and 410 workers).

- Hoboken staging area in 2022:
 - AM peak hour total of 125 combined worker and truck trips (32 trucks and 93 workers).
 - PM peak hour total of 180 combined worker and truck trips (32 trucks and 148 workers).

Hourly truck trips were assumed to be constant throughout the workday.

The construction truck routes presented in Chapter 3 and shown in **Figure 5A-1**, **Figure 5A-2**, and **Figure 5A-3** were evaluated.

Construction worker trips were estimated using Reverse Journey-to-Work (RJTW) data from the U.S. Census Bureau and the American Community Survey (ACS). This data was used to determine automotive mode share and vehicle occupancy for construction workers in the census tracts surrounding the construction sites. In addition, the census tract of origin for worker trips to construction site census tracts was used to estimate the geographic distribution of construction workers' place of residence. Construction worker auto trip assignments were determined using this census data and the daily workforce projections for each construction site and peak construction year.

Traffic volumes for the commuter peak hour with construction of the Preferred Alternative would consist of the No Action condition volumes and the construction-related truck trips derived from the daily truck activity projections. Accounting for the timing of construction worker shift changes, and assuming that workers would all arrive and/or depart within the half hour before and the half hour after shift changes, it is anticipated that all construction workers would already be at the job site during the commuter peak hours.

Traffic volumes for the construction peak hour with construction of the Preferred Alternative would consist of the No Action condition volumes, construction-related truck trips derived from the daily truck activity projections, and construction worker commute trips derived from the daily workforce projections, described above. The construction peak hours were selected to include the half hour before and the half hour after shift changes. This time period includes commute trips to the job sites by the incoming shift and the commute trips away from the job site by the outgoing shift.

The detailed results of the LOS analyses for each peak time period analyzed and location are provided in **Appendix 5**.

5A.6.2.1.1 Traffic: Tonnelle Avenue Staging Area

5A.6.2.1.1.1 2021 Weekday Commuter Peak Hours

In 2021, the peak year for construction of the new Hudson River Tunnel, one lane group would experience adverse traffic impacts during all commuter peak hours:

- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound and entrance ramp from Secaucus Road would operate at LOS F during all weekday commuter peak hours.

A summary of the traffic analysis results for the 2021 commuter peak hours is presented in **Table 5A-23**.



Table 5A-23
Summary of 2021 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	10	12	11
Lane Groups at D, below mid-LOS D ¹	1	2	3
Lane Groups at D, above mid-LOS D ²	2	1	1
Lane Groups at LOS E	2	0	0
Lane Groups at LOS F	0	0	0
Total	15	15	15
Number of intersections with adverse impacts	0	0	0
Unsignalized Intersections			
Lane Groups at LOS A/B/C	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	1	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	1	2
Total	2	2	2
Number of intersections with adverse impacts	1	1	1
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.6.2.1.1.2 2021 Weekday Construction Peak Hours

In 2021, the peak year for construction of the new Hudson River Tunnel, a total of three lane groups in the Tonnelle Avenue study area would experience adverse traffic impacts during one or more construction peak hours:

- Northbound through movement at Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply would operate at an unacceptable LOS D during the weekday AM construction peak hour;
- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound and 10th Street would operate at LOS F during the weekday AM construction peak hour; and
- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound and entrance ramp from Secaucus Road would operate at LOS F during the weekday AM and PM construction peak hours.

A summary of the traffic analysis results for the 2021 construction peak hours is presented in **Table 5A-24**.

Table 5A-24

**Summary of 2021 Preferred Alternative Traffic Analysis Results
Tonnelles Avenue Staging Area, New Jersey
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	9	11
Lane Groups at D, below mid-LOS D ¹	3	3
Lane Groups at D, above mid-LOS D ²	2	0
Lane Groups at LOS E	1	1
Lane Groups at LOS F	0	0
Total	15	15
Number of intersections with adverse impacts	1	0
Unsignalized Intersections		
Lane Groups at LOS A/B/C	0	0
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	1
Lane Groups at LOS F	2	1
Total	2	2
Number of intersections with adverse impacts	2	1
Notes: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.6.2.1.1.3 2029 Weekday and Saturday Commuter Peak Hours

In 2029, the peak year for construction activities related to rehabilitation of the North River Tunnel, two lane groups would experience adverse traffic impacts during one or more commuter peak hours:

- Westbound right-turn movement at Tonnelles Avenue (U.S. Route 1/9) northbound and 10th Street (stop-controlled) would operate at LOS F during the weekday PM and Saturday PM commuter peak hours; and
- Westbound right-turn movement at the stop-controlled intersection of Tonnelles Avenue (U.S. Route 1/9) northbound and entrance ramp from Secaucus Road would operate at LOS F during all commuter peak hours.

A summary of the traffic analysis results for the 2029 commuter peak hours is presented in **Table 5A-25**.



Table 5A-25
Summary of 2029 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours			
	Weekday AM	Weekday Midday	Weekday PM	Saturday Midday
Signalized Intersections				
Lane Groups at LOS A/B/C	8	12	9	11
Lane Groups at D, below mid-LOS D ¹	3	2	1	3
Lane Groups at D, above mid-LOS D ²	2	1	2	1
Lane Groups at LOS E	0	0	3	0
Lane Groups at LOS F	2	0	0	0
Total	15	15	15	15
Number of intersections with adverse impacts	0	0	0	0
Unsignalized Intersections				
Lane Groups at LOS A/B/C	0	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0	0
Lane Groups at LOS E	0	0	0	0
Lane Groups at LOS F	2	1	2	2
Total	2	2	2	2
Number of intersections with adverse impacts	1	1	2	2
Notes: LOS = Level-of-Service.				
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.				
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.				

5A.6.2.1.1.4 2029 Weekday and Saturday Construction Peak Hours

In 2029, the peak year for construction activities associated with rehabilitation of the North River Tunnel, six lane groups would experience adverse traffic impacts during one or more construction peak hours:

- Northbound through movement at the Tonnelle Avenue (U.S. Route 1/9) at Taco Bell signalized intersection would operate at LOS E during the weekday AM and Saturday PM construction peak hours and at LOS F during the weekday PM construction peak hour;
- Southbound through movement at the Tonnelle Avenue (U.S. Route 1/9) at Taco Bell signalized intersection would operate at LOS E during the weekday AM construction peak hour and at an unacceptable LOS D during the PM construction peak hour;
- Northbound through movement at Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply would operate at LOS F during the weekday AM and PM construction peak hours and at LOS E during the Saturday PM construction peak hour;
- Southbound through movement at Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction Supply would operate at LOS F during the weekday PM construction peak hour;
- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound and 10th Street would operate at LOS F during all construction peak hours; and
- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound and entrance ramp from Secaucus Road would continue to operate at LOS F during all construction peak hours.

A summary of the traffic analysis results for the 2029 construction peak hours is presented in **Table 5A-26**.

Table 5A-26
Summary of 2029 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday PM	Saturday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	7	8	10
Lane Groups at D, below mid-LOS D ¹	2	2	2
Lane Groups at D, above mid-LOS D ²	1	2	1
Lane Groups at LOS E	4	0	2
Lane Groups at LOS F	1	3	0
Total	15	15	15
Number of intersections with adverse impacts	2	2	2
Unsignalized Intersections			
Lane Groups at LOS A/B/C	0	0	0
Lane Groups at D, below mid-LOS D ¹	0	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	2	2
Total	2	2	2
Number of intersections with adverse impacts	2	2	2
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.6.2.1.2 Traffic: Hoboken Staging Area

Traffic impacts associated with two different potential truck routes for accessing the Hoboken staging area were evaluated: the proposed truck route (**Figure 5A-2**: entering via the Park Avenue service road, exiting via the Willow Avenue service road) and an alternate truck route (**Figure 5A-3**: entrance and exit via the Willow Avenue service roads).

5A.6.2.1.2.1 2022 Weekday Commuter Peak Hours (Proposed Truck Route)

In 2022, the peak year evaluated for the Hoboken staging area, construction traffic associated with the Preferred Alternative using the proposed truck route would result in adverse traffic impacts at one lane group during one commuter peak hour:

- Eastbound right-turn movement at the intersection of JFK Boulevard and South Marginal Highway (channelized yield-controlled) would operate at LOS E during the weekday AM commuter peak hour.

A summary of the traffic analysis results for the 2022 commuter peak hours with the proposed truck route is presented in **Table 5A-27**.



Table 5A-27
Summary of 2022 Preferred Alternative Traffic Analysis Results
Proposed Truck Route: Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	31	34	30
Lane Groups at D, below mid-LOS D ¹	4	1	2
Lane Groups at D, above mid-LOS D ²	0	2	4
Lane Groups at LOS E	2	1	1
Lane Groups at LOS F	2	1	2
Total	39	39	39
Number of intersections with adverse impacts	1	0	0
Unsignalized Intersections			
Lane Groups at LOS A/B/C	4	5	5
Lane Groups at D, below mid-LOS D ¹	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	0	0	0
Total	5	5	5
Number of intersections with adverse impacts	0	0	0
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.6.2.1.2.2 2022 Weekday Commuter Peak Hours (Alternate Truck Route)

In 2022, construction traffic associated with the Preferred Alternative using the alternate truck route would result in adverse traffic impacts on two lane groups during one or more commuter peak hours:

- Westbound left-turn movement at the intersection of 19th Street and Willow Avenue would operate at LOS F during the weekday AM and PM commuter peak hours; and
- Eastbound right-turn movement at the intersection of JFK Boulevard and South Marginal Highway (channelized yield-controlled) would operate at LOS E during the weekday AM commuter peak hour.

A summary of the traffic analysis results for the 2022 commuter peak hours with the alternate truck route is presented in **Table 5A-28**.

Table 5A-28

Summary of 2022 Preferred Alternative Traffic Analysis Results
Alternate Truck Route: Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	31	34	30
Lane Groups at D, below mid-LOS D ¹	4	1	2
Lane Groups at D, above mid-LOS D ²	0	2	4
Lane Groups at LOS E	2	1	1
Lane Groups at LOS F	2	1	2
Total	39	39	39
Number of intersections with adverse impacts	2	0	1
Unsignalized Intersections			
Lane Groups at LOS A/B/C	4	5	5
Lane Groups at D, below mid-LOS D ¹	1	0	0
Lane Groups at D, above mid-LOS D ²	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	0	0	0
Total	5	5	5
Number of intersections with adverse impacts	0	0	0
Notes: LOS = Level-of-Service.			
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.			
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.6.2.1.2.3 2022 Weekday Construction Peak Hours (Proposed Truck Route)

In 2022, construction traffic associated with the Preferred Alternative using the proposed truck route would result in adverse traffic impacts on two lane groups during one or more construction peak hours:

- Northbound left-turn/through/right-turn lane group at the 19th Street and Willow Avenue intersection would operate at LOS F during the weekday AM and PM construction peak hours; and
- Westbound left-turn movement at the 19th Street and Park Avenue intersection would operate at LOS F during the weekday AM and PM construction peak hours.

A summary of the traffic analysis results for the 2022 construction peak hours with the proposed truck route is presented in **Table 5A-29**.



Table 5A-29
Summary of 2022 Preferred Alternative Traffic Analysis Results
Proposed Truck Route: Hoboken Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	31	32
Lane Groups at D, below mid-LOS D ¹	5	4
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	3	3
Total	39	39
Number of intersections with adverse impacts	2	2
Unsignalized Intersections		
Lane Groups at LOS A/B/C	5	5
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	5	5
Number of intersections with adverse impacts	0	0
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.6.2.1.2.4 2022 Weekday Construction Peak Hours (Alternate Truck Route)

In 2022, construction traffic associated with the Preferred Alternative using the alternate truck route would result in adverse traffic impacts on two lane groups during one or more construction peak hours:

- Northbound left-turn/through/right-turn lane group at the 19th Street and Willow Avenue intersection would operate at LOS F during the weekday AM and PM construction peak hours; and
- Westbound left-turn movement at the 19th Street and Willow Avenue intersection would operate at LOS F during the weekday AM and PM construction peak hours.

A summary of the traffic analysis results for the 2022 commuter peak hours with the alternate truck route is presented in **Table 5A-30**.

Table 5A-30

Summary of 2022 Preferred Alternative Traffic Analysis Results
Alternate Truck Route: Hoboken Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
Signalized Intersections		
Lane Groups at LOS A/B/C	32	33
Lane Groups at D, below mid-LOS D ¹	4	3
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	3	3
Total	39	39
Number of intersections with adverse impacts	1	1
Unsignalized Intersections		
Lane Groups at LOS A/B/C	5	5
Lane Groups at D, below mid-LOS D ¹	0	0
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	0
Lane Groups at LOS F	0	0
Total	5	5
Number of intersections with adverse impacts	0	0
Notes: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.6.2.2 PEDESTRIANS

Pedestrian conditions were not evaluated in the New Jersey study area, because construction activities associated with the Preferred Alternative would not result in any construction-related sidewalk or road closures or encroachments that would affect pedestrian patterns, including the locations of bus stops or other transit access (described in more detail in Chapter 5B, "Transportation Services").

5A.6.3 HUDSON RIVER

Access to the in-water construction site in the Hudson River would be via boat and barge from the New York study area. As a result, all associated construction-related vehicles for this area have been accounted for in the analysis of the New York study area.

5A.6.4 NEW YORK

5A.6.4.1 TRAFFIC

As described in Chapter 3, "Construction Methods and Activities," construction activities for the Preferred Alternative in New York would begin in 2019 and be completed in 2026. Construction would occur on a regular weekday (i.e., five days per week) schedule. Peak traffic volumes associated with construction activity at the Twelfth Avenue shaft site and Tenth Avenue cut-and-cover site would occur during 2021. Therefore, evaluation of construction impacts of the Preferred Alternative in New York was conducted for the 2021 peak construction year.

The Preferred Alternative would result in the following worst-case construction-related traffic volumes in the peak hours analyzed:

- AM peak hour total of 79 combined worker and truck trips (42 trucks and 37 workers).
- PM peak hour total of 116 combined worker and truck trips (42 trucks and 74 workers).

The truck volumes are assumed to be constant throughout the day for all working hours.

Construction of the Preferred Alternative would result in the addition of construction-related truck trips and construction worker commute trips to the study area roadway network. Daily workforce and truck projections were used to determine the number of daily truck trips and worker commute trips that would access each construction site. Hourly truck trips were assumed to be constant throughout the workday.

The construction truck routes presented in Chapter 3, “Construction Methods and Activities,” and shown in **Figure 5A-4** were evaluated.

Construction worker trips were estimated using RJTW data from the U.S. Census Bureau and ACS. This data was used to determine automotive mode share and vehicle occupancy for construction workers in the census tracts surrounding the construction sites and the census tract of origin for worker trips to construction site census tracts was used to determine an estimate of geographic distribution of construction workers’ place of residence. Construction worker auto trip assignments were determined using this census data and the daily workforce projections for each construction site and peak construction year.

This analysis conservatively assumes that West 30th Street between Eleventh and Twelfth Avenues would be closed for construction at the Twelfth Avenue shaft site between 2020 and 2023. Traffic was rerouted from Twelfth Avenue via West 34th Street and Eleventh Avenue to the intersection of West 30th Street and Eleventh Avenue.

The traffic analysis was conducted for the study area’s commuter peak hours and for the construction peak hours, using the hourly worker and truck estimates described above.

As described in Chapter 3, “Construction Methods and Activities,” Section 3.3.7.6, it is possible that construction on the Twelfth Avenue shaft site may delay the construction of a one-story parking garage and potential Emergency Medical Services (EMS) station on Block 675 Lot 12. That garage and EMS station are proposed as part of a new development, which the New York City Department of City Planning (NYCDPC) is analyzing in a separate CEQR EIS for a project referred to as Block 675 East. This EIS for the Hudson Tunnel Project assumes that the Hudson Tunnel Project’s space needs during construction do not allow completion of the shell of the one-story parking garage and EMS facility on Lot 12 by 2021. Instead, tunnel construction staging would occur on the western 205 feet of Lot 12 until the end of 2026 and the one-story parking garage would be constructed after that. Therefore, this EIS analyzes the impacts associated with this potential delay in the schedule for construction and completion of the one-story parking garage and potential EMS facility that would result because of the Hudson Tunnel Project.

Construction of the Block 675 Lot 12 parking garage and EMS facility would take approximately 18 months. As presented in Chapter 3, “Construction Methods and Activities,” Section 3.3.7.6, there would be an average of 62 construction workers per day in the peak month of construction for the Block 675 Lot 12 facility (month 13, during which the building envelope would be constructed). Truck trips would peak at 94 per month, or 5 per day (month 8, during construction of the foundation, when concrete trucks would arrive and depart the site). This level of construction activity would be substantially lower than that associated with the Preferred Alternative and is not large enough to result in adverse traffic impacts. Both the peak number of construction workers and the peak number of trucks would be substantially lower than the numbers of workers or trucks associated with the Preferred Alternative in New York during the peak construction year for the Preferred Alternative (2021). Therefore, the analysis of traffic impacts related to construction that was conducted for the Preferred Alternative represents worst-case conditions and no new analysis was conducted of construction conditions in New York in 2027 or 2028.

5A.6.4.1.1 Commuter Peak Hours

Traffic volumes for the commuter peak hour with construction of the Preferred Alternative would be composed of the future No Action condition volumes and the construction-related truck trips derived from the daily truck activity projections. Accounting for the timing of construction worker shift changes, it is anticipated that all construction workers would be at the job site during the commuter peak hours.

In 2021, construction traffic associated with the Preferred Alternative would result in adverse traffic impacts per CEQR criteria on a total of 10 lane groups (which are generally turning movements) during one or more commuter peak hours, as follows:

- Westbound right-turn movement at Twelfth Avenue and West 29th Street would operate at LOS F during the weekday AM, midday, and PM commuter peak hours;
- Northbound right-turn movement at Twelfth Avenue and West 34th Street would operate at LOS F during the weekday midday commuter peak hour;
- Southbound left-turn movement at Twelfth Avenue and West 34th Street would operate at LOS F during the weekday AM, midday, and PM commuter peak hours;
- Southbound left-turn/through movement at Eleventh Avenue and West 30th Street would operate at LOS E during the weekday AM and PM commuter peak hours and at LOS F during the midday commuter peak hour;
- Eastbound left-turn/through/right-turn movement at Eleventh Avenue and West 34th Street would operate at LOS F during the weekday AM, midday, and PM commuter peak hours;
- Westbound left-turn/through/right-turn movement at Eleventh Avenue and West 34th Street would operate at LOS E during the weekday PM background peak hour;
- Eastbound through/right-turn movement at Eleventh Avenue and West 40th Street would operate at an unacceptable LOS D during the midday commuter peak hour;
- Eastbound left-turn/through movement at Tenth Avenue and West 30th Street would operate at LOS F during the weekday PM commuter peak hour;
- Westbound right-turn movement at Tenth Avenue and West 34th Street would operate at LOS E during the weekday PM commuter peak hour; and
- Southbound right-turn movement at Dyer Avenue and West 34th Street would operate at LOS F during the weekday AM commuter peak hour and at an unacceptable LOS D during the weekday midday commuter peak hour.

A summary of the traffic analysis results is presented in **Table 5A-31**. The detailed results of the LOS analyses for each commuter peak time period analyzed are provided in **Appendix 5**.



Table 5A-31
Summary of 2021 Preferred Alternative Traffic Analysis Results
New York
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Signalized Intersections			
Lane Groups at LOS A/B/C	47	48	45
Lane Groups at D, below mid-LOS D ¹	7	12	6
Lane Groups at D, above mid-LOS D ²	3	4	7
Lane Groups at LOS E	11	3	9
Lane Groups at LOS F	7	8	8
Total	75	75	75
Number of intersections with adverse impacts	5	6	6
Notes: LOS = Level-of-Service. ¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay. ² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.			

5A.6.4.1.2 Construction Peak Hours

Traffic volumes for the construction peak hour construction condition analysis are composed of the future No Action condition volumes, construction-related truck trips derived from the daily truck activity projections, and construction worker commute trips derived from the daily workforce projections. The construction peak hours were selected to include the half hour before and the half hour after shift changes. This time period includes commute trips to the job sites by the incoming shift and the commute trips away from the job site by the outgoing shift.

In 2021, construction traffic associated with the Preferred Alternative would result in adverse traffic impacts per CEQR criteria on a total of nine lane groups (which are generally turning movements) during one or more construction peak hours, as follows:

- Westbound right-turn movement at Twelfth Avenue and West 29th Street would operate at LOS F during the weekday AM and PM construction peak hours;
- Northbound right-turn movement at Twelfth Avenue and West 34th Street would operate at an unacceptable LOS D during the weekday AM construction peak hour;
- Southbound left-turn movement at Twelfth Avenue and West 34th Street is projected to operate at LOS F during the weekday AM and PM construction peak hours;
- Southbound left-turn/through movement at Eleventh Avenue and West 30th Street is projected to operate at an unacceptable LOS D during the weekday PM construction peak hour;
- Eastbound left-turn/through/right-turn movement at Eleventh Avenue and West 34th Street would operate at LOS F during the weekday AM and PM construction peak hours;
- Eastbound through/right-turn movement at Eleventh Avenue and West 40th Street would operate at an unacceptable LOS D during the weekday PM construction peak hour;
- Eastbound left-turn/through movement at Tenth Avenue and West 30th Street would operate at LOS F during the weekday AM and PM construction peak hours;
- Northbound left-turn/through movement at Tenth Avenue and West 33rd Street would operate at LOS F during the weekday PM construction peak hour; and
- Southbound right-turn movement at Dyer Avenue and West 34th Street would operate at LOS F during the weekday AM construction peak hour.

A summary of the traffic analysis results is presented in **Table 5A-32**. The detailed results of the LOS analyses for each construction peak time period analyzed are provided in **Appendix 5**.

Table 5A-32
Summary of 2021 Preferred Alternative Traffic Analysis Results
New York
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM	Weekday PM
<i>Signalized Intersections</i>		
Lane Groups at LOS A/B/C	49	50
Lane Groups at D, below mid-LOS D ¹	9	4
Lane Groups at D, above mid-LOS D ²	3	6
Lane Groups at LOS E	9	8
Lane Groups at LOS F	5	8
Total	75	75
Number of intersections with adverse impacts	5	6
Note: LOS = Level-of-Service.		
¹ Below mid-LOS D means the LOS is less than 45.0 seconds of delay.		
² Above mid-LOS D means the LOS is greater than 45.0 seconds of delay.		

5A.6.4.2 PEDESTRIANS

Construction of the Preferred Alternative would not appreciably increase pedestrian volumes in the study area. However, sidewalk closures and pedestrian detours associated with construction of the Preferred Alternative would result in changes to pedestrian volumes from rerouted pedestrians using different sidewalks, and/or reduced pedestrian circulation space at a number of locations. Five sidewalk closures and their requisite detours would occur during the construction period:

- Twelfth Avenue between West 29th Street and West 30th Street – east sidewalk
 - Pedestrian walkway to be provided in parking lane along east sidewalk;
- West 30th Street between Eleventh and Twelfth Avenues – north and south sidewalks
 - Pedestrian walkway to be provided in parking lane along south sidewalk;
- Tenth Avenue between West 31st and West 33rd Streets – east and west sidewalks
 - Pedestrian walkway to be provided in parking lane along east sidewalk.

The closure of West 30th Street would also result in the closure of the eastbound bicycle lane. Cyclists would need to detour to other streets. Alternatively, cyclists could dismount and walk along the pedestrian walkway that would be provided along West 30th Street. In addition, construction activities for the Preferred Alternative in Hudson River Park related to ground freezing operations, as described in Chapter 3, “Construction Methods and Activities,” Section 3.3.6.1, would be managed to avoid adverse effects on the bikeway that runs parallel to Hudson River Park. An approximately 125-foot-long portion of the pedestrian walkway in Hudson River Park that runs parallel to the bikeway would be closed during installation and removal of the freeze pipes, but the walkway would remain open and would be at least eight feet wide during these two separately approximately three- to four-month time periods. None of the sidewalk closures or detours would affect the locations of bus stops or transit access (described in more detail in Chapter 5B, “Transportation Services”).

The analysis of pedestrian conditions assumes that with construction of the Preferred Alternative, all pedestrian walkways are a minimum of five feet in width including one foot of shy



distance (i.e., the area near buildings and street furniture that cannot be effectively used) on either side, for an effective width of three feet.

The closure of West 30th Street (and both sidewalks) between Eleventh and Twelfth Avenues would improve pedestrian conditions at the east crosswalk of Twelfth Avenue and West 30th Street and the west crosswalk of Eleventh Avenue and West 30th Street as a result of the creation of de facto unsignalized pedestrian crossings.

Pedestrian volumes from the north and south sidewalks of West 30th Street between Eleventh and Twelfth Avenues were assigned to the pedestrian walkway along the south sidewalk. For the purposes of corner analysis at the southeast corner of Twelfth Avenue and West 30th Street and the southwest corner of Eleventh Avenue and West 30th Street, the worst case scenario was assumed, in which all detoured volumes were routed around the corner.

Given that all northbound and southbound pedestrian traffic between West 33rd Street and West 31st Street on Tenth Avenue currently uses the east sidewalk due to a construction detour, existing volumes on the east sidewalk likely include demand for both the east and west sidewalks (i.e., pedestrians who would have used the west sidewalk are likely using the east sidewalk in the existing condition). These existing volumes were adjusted in the No Action condition to account for the reopening of the west sidewalk. With the closure of the west sidewalk in the construction condition, the pedestrian volumes from the *Western Rail Yard FEIS* accessing buildings via the west sidewalk would access these buildings from West 33rd Street, West 31st Street, or the pedestrian plaza between Tenth and Eleventh Avenues (Hudson Park and Boulevard). For the Preferred Alternative, the construction condition volume for the east sidewalk would be composed of existing volumes, commuter growth, and the *Western Rail Yard FEIS* pedestrian volumes for the east sidewalk.

5A.6.4.2.1 Sidewalks

Construction of the Preferred Alternative would result in an adverse impact per CEQR criteria on the east sidewalk of Tenth Avenue between West 31st Street and West 33rd Street during the weekday AM peak hour.

5A.6.4.2.2 Corners

Construction of the Preferred Alternative would result in an adverse impact per CEQR criteria at the southeast corner of the intersection of Tenth Avenue and West 33rd Street during the weekday midday peak hour. Pedestrian detours related to the Preferred Alternative would also result in minor changes in corner volumes at other analyzed corners.

5A.6.4.2.3 Crosswalks

Construction of the Preferred Alternative would result in adverse impacts per CEQR criteria at the south crosswalk of the intersection of Tenth Avenue and West 33rd Street during the weekday AM peak hour and at the north crosswalk of the intersection of Tenth Avenue and West 31st Street during the weekday PM peak hour. In the existing condition, these two crosswalks are currently serving as the pedestrian detour that routes pedestrians from the closed west sidewalk of Tenth Avenue between West 31st Street and West 33rd Street to the east sidewalk. This temporary construction detour will be removed upon the completion of the adjacent development projects in 2019. Crosswalk volumes at these two intersections were adjusted to reflect the removal of this detour and the reopening of the sidewalk. With construction of the Preferred Alternative, this detour would be re-instituted to allow for construction associated with the Preferred Alternative. Crosswalk volumes were therefore adjusted to reflect the re-implementation of this detour route. The closure of West 30th Street (and both sidewalks) between Eleventh and Twelfth Avenues would improve pedestrian conditions at the east crosswalk of Twelfth Avenue and West 30th Street and the west crosswalk of Eleventh Avenue

and West 30th Street as a result of the creation of de facto unsignalized pedestrian crossings. As such, these crosswalks were not analyzed.

A summary of the pedestrian analysis results is presented in **Table 5A-33**. Detailed LOS analyses were prepared for each element and are presented in **Appendix 5**.

Table 5A-33
Summary of 2021 Preferred Alternative Pedestrian Analysis Results
New York

Level of Service	Analysis Peak Hours		
	Weekday AM	Weekday Midday	Weekday PM
Sidewalks			
Sidewalks at LOS A/B/C	2	1	3
Sidewalks at LOS D	1	2	0
Sidewalks at LOS E	0	0	0
Sidewalks at LOS F	0	0	0
Total	3	3	3
Number of Sidewalks with adverse impacts	1	0	0
Corner Reservoirs			
Corners at LOS A/B/C	6	5	6
Corners at LOS D	1	1	1
Corners at LOS E	0	0	0
Corners at LOS F	0	1	0
Total	7	7	7
Number of Corners with adverse impacts	0	1	0
Crosswalks			
Crosswalks at LOS A/B/C	1	0	0
Crosswalks at LOS D	0	0	0
Crosswalks at LOS E	1	0	2
Crosswalks at LOS F	0	2	0
Total	2	2	2
Number of Crosswalks with adverse impacts	1	0	1
Note: LOS = Level-of-Service.			

5A.7 PERMANENT IMPACTS OF THE PREFERRED ALTERNATIVE

As described in Chapter 2, “Project Alternatives and Description of the Preferred Alternative,” and Chapter 4, “Analysis Framework,” there would be no change in rail capacity in the future as a result of the Preferred Alternative and no change to the peak hour service plans in comparison to the No Action Alternative. Therefore, there would also be no change in peak hour traffic or pedestrian activities compared with future peak hour No Action Alternative conditions.

In addition, the Preferred Alternative would not result in any permanent changes to roadways or pedestrian elements (sidewalks, corners, or crosswalks). In New Jersey, new permanent maintenance roads would be created along the south side of the new railroad embankment, similar to the maintenance access roads that already exist along the NEC in the same area. These roads would not be publicly accessible and would be used only infrequently for maintenance purposes. Therefore, the operation of the Preferred Alternative would not have the potential to result in any impacts to traffic or pedestrian conditions in the Project study area, and a quantified operational assessment of traffic and pedestrian conditions is not warranted.



5A.8 MEASURES TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

For all construction locations, Maintenance and Protection of Traffic (MPT) plans will be developed during final design by the Project Sponsor and/or construction contractors in consultation with the appropriate local transportation agencies, approved by those agencies, and implemented to maintain travel lanes, and detour through traffic away from construction activities and equipment to the extent practicable.

In addition, other measures to avoid, minimize or mitigate impacts are proposed for locations where adverse impacts are projected. Mitigation of an adverse impact per CEQR criteria is defined as the implementation of measures that lessen the impacts of the Preferred Alternative to the point that they do not exceed the thresholds defined in Section 5A.2.2.1.3 (traffic) and 5A.2.2.2 (pedestrian). Traffic mitigation measures may include changes to signal timing (e.g., shifting green time from underutilized phases to over-capacity approaches) or changes to pavement markings (e.g., restriping lanes). Pedestrian mitigation measures may include signal timing changes, widening of crosswalks and sidewalks, and removal of obstructions. The identified mitigation measures are subject to approval and implementation by NYCDOT in New York and by the appropriate local government agency in New Jersey, and may be revised after agency review. All of these potential mitigation measures were evaluated at each impacted intersection. As a result, both full and partial mitigation measures were identified.

For adverse traffic impacts in New Jersey, measures that would reduce the delay increment under the With Action with mitigation condition to fewer than 10 seconds of the No Action condition delay are considered to fully mitigate the impact. Measures that would improve delays under the With Action with mitigation condition, but not sufficiently to be fewer than 10 seconds of the No Action condition delay are considered to partially mitigate the impact.

For adverse traffic impacts in New York City per CEQR criteria, measures that would reduce the delay increment under the With Action (Preferred Alternative) to less than the delay increment under the No Action condition are considered to fully mitigate the impact. The reduction in delay increments needed for an impact to be considered fully mitigated varies depending on the No Action condition delays. For lane groups with No Action condition delays at acceptable levels (LOS A, B, or C), an impact is considered fully mitigated when the With Action with mitigation condition delay is reduced to mid-LOS D (delays of 45.0 seconds for signalized intersections and 30.0 seconds for unsignalized intersections). For lane groups with No Action condition delays at worse than mid-LOS D, an impact is considered fully mitigated when the delay increment under the With Action with mitigation condition is fewer than 5 seconds greater than the No Action condition delay. For lane groups with No Action condition delays at LOS E, an impact is considered fully mitigated when the delay increment under the With Action with mitigation condition is fewer than 4 seconds greater than the No Action condition. For lane groups with No Action condition delays at LOS F, an impact is considered fully mitigated when the delay increment under the With Action with mitigation condition is fewer than 3 seconds greater than the No Action condition. Mitigation measures are considered to be partial mitigation when they would improve delays under the With Action with mitigation condition as compared to the With Action without mitigation but would not sufficiently reduce delay increments to lower than the thresholds defined for each of the No Action condition LOS levels described above.

For adverse pedestrian impacts predicted to occur in New York City, guidance in the *CEQR Technical Manual* presents a sliding scale for determining whether mitigation measures can be considered to fully mitigate the impacts. As shown in **Table 5A-34** and **Table 5A-35**, the CEQR guidance calls for comparing conditions with the mitigation in place to those in the No Action condition (i.e., without the proposed project) to compare the amount of pedestrian space

available. Impacts are considered to be partially, but not fully, mitigated when the mitigation measures result in an amount of pedestrian space greater than the amount that would result from the proposed project, but less than what would be present in the No Action condition. The criteria vary depending on whether the impacts would occur in a Central Business District (CBD) area or not.

Table 5A-34
CEQR Impact Guidance for Sidewalks

Non-Platoon Flow				Platoon Flow			
Sliding Scale Formula: $Y \geq X/9.0 - 0.31$				Sliding Scale Formula: $Y \geq X/(9.5 - 0.321)$			
Non-CBD Areas		CBD Areas		Non-CBD Areas		CBD Areas	
No Action Ped. Space (X, SFP)	With Action Ped. Space Reduc. (Y, SFP)	No Action Ped. Space (X, SFP)	With Action Ped. Space Reduc. (Y, SFP)	No Action Ped. Space (X, SFP)	With Action Ped. Space Reduc. (Y, SFP)	No Action Ped. Space (X, SFP)	With Action Ped. Space Reduc. (Y, SFP)
-	-	-	-	43.5 to 44.3	≥ 4.3	-	-
-	-	-	-	42.5 to 43.4	≥ 4.2	-	-
-	-	-	-	41.6 to 42.4	≥ 4.1	-	-
-	-	-	-	40.6 to 41.5	≥ 4.0	-	-
-	-	-	-	39.7 to 40.5	≥ 3.9	-	-
-	-	-	-	38.7 to 39.6	≥ 3.8	38.7 to 39.2	≥ 3.8
-	-	-	-	37.8 to 38.6	≥ 3.7	37.8 to 38.6	≥ 3.7
-	-	-	-	36.8 to 37.7	≥ 3.6	36.8 to 37.7	≥ 3.6
-	-	-	-	35.9 to 36.7	≥ 3.5	35.9 to 36.7	≥ 3.5
-	-	-	-	34.9 to 35.8	≥ 3.4	34.9 to 35.8	≥ 3.4
-	-	-	-	34.0 to 34.8	≥ 3.3	34.0 to 34.8	≥ 3.3
-	-	-	-	33.0 to 33.9	≥ 3.2	33.0 to 33.9	≥ 3.2
-	-	-	-	32.1 to 32.9	≥ 3.1	32.1 to 32.9	≥ 3.1
-	-	-	-	31.1 to 32.0	≥ 3.0	31.1 to 32.0	≥ 3.0
-	-	-	-	30.2 to 31.0	≥ 2.9	30.2 to 31.0	≥ 2.9
-	-	-	-	29.2 to 30.1	≥ 2.8	29.2 to 30.1	≥ 2.8
25.8 to 26.6	≥ 2.6	-	-	28.3 to 29.1	≥ 2.7	28.3 to 29.1	≥ 2.7
24.9 to 25.7	≥ 2.5	-	-	27.3 to 28.2	≥ 2.6	27.3 to 28.2	≥ 2.6
24.0 to 24.8	≥ 2.4	-	-	26.4 to 27.2	≥ 2.5	26.4 to 27.2	≥ 2.5
23.1 to 23.9	≥ 2.3	-	-	25.4 to 26.3	≥ 2.4	25.4 to 26.3	≥ 2.4
22.2 to 23.0	≥ 2.2	-	-	24.5 to 25.3	≥ 2.3	24.5 to 25.3	≥ 2.3
21.3 to 22.1	≥ 2.1	21.3 to 21.5	≥ 2.1	23.5 to 24.4	≥ 2.2	23.5 to 24.4	≥ 2.2
20.4 to 21.2	≥ 2.0	20.4 to 21.2	≥ 2.0	22.6 to 23.4	≥ 2.1	22.6 to 23.4	≥ 2.1
19.5 to 20.3	≥ 1.9	19.5 to 20.3	≥ 1.9	21.6 to 22.5	≥ 2.0	21.6 to 22.5	≥ 2.0
18.6 to 19.4	≥ 1.8	18.6 to 19.4	≥ 1.8	20.7 to 21.5	≥ 1.9	20.7 to 21.5	≥ 1.9
17.7 to 18.5	≥ 1.7	17.7 to 18.5	≥ 1.7	19.7 to 20.6	≥ 1.8	19.7 to 20.6	≥ 1.8
16.8 to 17.6	≥ 1.6	16.8 to 17.6	≥ 1.6	18.8 to 19.6	≥ 1.7	18.8 to 19.6	≥ 1.7
15.9 to 16.7	≥ 1.5	15.9 to 16.7	≥ 1.5	17.8 to 18.7	≥ 1.6	17.8 to 18.7	≥ 1.6
15.0 to 15.8	≥ 1.4	15.0 to 15.8	≥ 1.4	16.9 to 17.7	≥ 1.5	16.9 to 17.7	≥ 1.5
14.1 to 14.9	≥ 1.3	14.1 to 14.9	≥ 1.3	15.9 to 16.8	≥ 1.4	15.9 to 16.8	≥ 1.4
13.2 to 14.0	≥ 1.2	13.2 to 14.0	≥ 1.2	15.0 to 15.8	≥ 1.3	15.0 to 15.8	≥ 1.3
12.3 to 13.1	≥ 1.1	12.3 to 13.1	≥ 1.1	14.0 to 14.9	≥ 1.2	14.0 to 14.9	≥ 1.2
11.4 to 12.2	≥ 1.0	11.4 to 12.2	≥ 1.0	13.1 to 13.9	≥ 1.1	13.1 to 13.9	≥ 1.1
10.5 to 11.3	≥ 0.9	10.5 to 11.3	≥ 0.9	12.1 to 13.0	≥ 1.0	12.1 to 13.0	≥ 1.0
9.6 to 10.4	≥ 0.8	9.6 to 10.4	≥ 0.8	11.2 to 12.0	≥ 0.9	11.2 to 12.0	≥ 0.9
8.7 to 9.5	≥ 0.7	8.7 to 9.5	≥ 0.7	10.2 to 11.1	≥ 0.8	10.2 to 11.1	≥ 0.8
7.8 to 8.6	≥ 0.6	7.8 to 8.6	≥ 0.6	9.3 to 10.1	≥ 0.7	9.3 to 10.1	≥ 0.7
6.9 to 7.7	≥ 0.5	6.9 to 7.7	≥ 0.5	8.3 to 9.2	≥ 0.6	8.3 to 9.2	≥ 0.6
6.0 to 6.8	≥ 0.4	6.0 to 6.8	≥ 0.4	7.4 to 8.2	≥ 0.5	7.4 to 8.2	≥ 0.5
5.1 to 5.9	≥ 0.3	5.1 to 5.9	≥ 0.3	6.4 to 7.3	≥ 0.4	6.4 to 7.3	≥ 0.4
< 5.1	≥ 0.2	< 5.1	≥ 0.2	< 6.4	≥ 0.3	< 6.4	≥ 0.3

Notes: SFP = square feet per pedestrian; Y = decrease in pedestrian space in SFP; X = No Action pedestrian space in SFP.
Sources: New York City Mayor's Office of Environmental Coordination, *CEQR Technical Manual*.



Table 5A-35

CEQR Impact Guidance for Corners and Crosswalks

Sliding Scale Formula: $Y \geq X/9.0 - 0.31$			
Non-CBD Areas		CBD Areas	
No Action Pedestrian Space (X, SFP)	With Action Pedestrian Space Reduction (Y, SFP)	No Action Pedestrian Space (X, SFP)	With Action Pedestrian Space Reduction (Y, SFP)
25.8 to 26.6	≥ 2.6	–	–
24.9 to 25.7	≥ 2.5	–	–
24.0 to 24.8	≥ 2.4	–	–
23.1 to 23.9	≥ 2.3	–	–
22.2 to 23.0	≥ 2.2	–	–
21.3 to 22.1	≥ 2.1	21.3 to 21.5	≥ 2.1
20.4 to 21.2	≥ 2.0	20.4 to 21.2	≥ 2.0
19.5 to 20.3	≥ 1.9	19.5 to 20.3	≥ 1.9
18.6 to 19.4	≥ 1.8	18.6 to 19.4	≥ 1.8
17.7 to 18.5	≥ 1.7	17.7 to 18.5	≥ 1.7
16.8 to 17.6	≥ 1.6	16.8 to 17.6	≥ 1.6
15.9 to 16.7	≥ 1.5	15.9 to 16.7	≥ 1.5
15.0 to 15.8	≥ 1.4	15.0 to 15.8	≥ 1.4
14.1 to 14.9	≥ 1.3	14.1 to 14.9	≥ 1.3
13.2 to 14.0	≥ 1.2	13.2 to 14.0	≥ 1.2
12.3 to 13.1	≥ 1.1	12.3 to 13.1	≥ 1.1
11.4 to 12.2	≥ 1.0	11.4 to 12.2	≥ 1.0
10.5 to 11.3	≥ 0.9	10.5 to 11.3	≥ 0.9
9.6 to 10.4	≥ 0.8	9.6 to 10.4	≥ 0.8
8.7 to 9.5	≥ 0.7	8.7 to 9.5	≥ 0.7
7.8 to 8.6	≥ 0.6	7.8 to 8.6	≥ 0.6
6.9 to 7.7	≥ 0.5	6.9 to 7.7	≥ 0.5
6.0 to 6.8	≥ 0.4	6.0 to 6.8	≥ 0.4
5.1 to 5.9	≥ 0.3	5.1 to 5.9	≥ 0.3
< 5.1	≥ 0.2	< 5.1	≥ 0.2

Notes: SFP = square feet per pedestrian; Y = decrease in pedestrian space in SFP; X = No Action pedestrian space in SFP.
Sources: New York City Mayor's Office of Environmental Coordination, *CEQR Technical Manual*.

In cases where feasible full mitigation measures could not be identified (traffic or pedestrian), an unmitigated adverse impact would exist.

5A.8.1 NEW JERSEY

5A.8.1.1 TRAFFIC

The detailed results of the mitigation condition LOS analyses for each peak time period analyzed and location are provided in **Appendix 5**.

5A.8.1.1.1 Tonnelle Avenue Staging Area

Table 5A-36 and **Table 5A-37** summarize the impacted intersections for the 2021 and 2029 traffic study areas.

Table 5A-36
Summary of 2021 Adverse Traffic Impacts
Tonnelle Avenue Staging Area, New Jersey

Intersection		Commuter Peak Hours			Construction Peak Hours	
EB/WB Street	NB/SB Street	Weekday AM	Weekday Midday	Weekday PM	Weekday AM	Weekday PM
Entrance Ramp from Secaucus Road	Tonnelle Avenue	WB-R	WB-R	WB-R	WB-R	WB-R
Wendy's and White Cap Const. Supply (1500 Tonnelle Avenue)	Tonnelle Avenue				NB-T	
10th Street	Tonnelle Avenue				WB-R	
Total Impacted Intersections/Lane Groups		1/1	1/1	1/1	3/3	1/1

Notes: T = Through, R = Right Turn, WB = Westbound, NB = Northbound.

Table 5A-37
Summary of 2029 Adverse Traffic Impacts
Tonnelle Avenue Staging Area, New Jersey

Intersection		Commuter Peak Hours				Construction Peak Hours		
EB/WB Street	NB/SB Street	Weekday AM	Weekday Midday	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday PM
Entrance Ramp from Secaucus Road	Tonnelle Avenue	WB-R	WB-R	WB-R	WB-R	WB-R	WB-R	WB-R
Taco Bell (2020 Tonnelle Avenue / milepost 57)	Tonnelle Avenue					NB-T SB-T	NB-T SB-T	NB-T
Wendy's and White Cap Const. Supply (1500 Tonnelle Avenue)	Tonnelle Avenue					NB-T	NB-T SB-T	NB-T
10th Street	Tonnelle Avenue			WB-R	WB-R	WB-R	WB-R	WB-R
Total Impacted Intersections/Lane Groups		1/1	1/1	2/2	2/2	4/5	4/6	4/4

Notes: T = Through, R = Right Turn, WB = Westbound, NB = Northbound, SB = Southbound.

Full mitigation measures were identified at one of the four study area intersections that experienced adverse impacts in one or more peak hours. Partial mitigation measures were also identified at one study area intersection. These measures are summarized in **Table 5A-38** and described below.



Table 5A-38
Proposed Mitigation Measures
During Construction of the Preferred Alternative,
Tonnelle Avenue Staging Areas, New Jersey

Intersection	Movement	Mitigation Measure
2021 (Construction of New Tunnel)		
2021 – AM Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB right-turn	Impact cannot be fully mitigated
2021 – AM Construction Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Const. Supply	NB Through	Change EB max green time from 40 sec to 25 sec
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2021 – Midday Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB right-turn	Impact cannot be fully mitigated
2021 – PM Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB right-turn	Impact cannot be fully mitigated
2021 – PM Construction Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB right-turn	Impact cannot be fully mitigated
2029 (Rehabilitation of North River Tunnel)		
2029 – AM Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – AM Construction Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) at Taco Bell	NB Through	Impact cannot be fully mitigated
	SB Through	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Const. Supply	NB Through	Change EB max green time from 40 sec to 25 sec
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – Midday Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – PM Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – PM Construction Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) at Taco Bell	NB Through	Impact cannot be fully mitigated
	SB Through	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Const. Supply	NB Through	Partial Mitigation: Change EB max green time from 40 sec to 24 sec
	SB Through	Partial Mitigation: Change EB max green time from 40 sec to 24 sec
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – Saturday Midday Commuter Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated
2029 – Saturday Midday Construction Peak Hour		
Tonnelle Avenue (U.S. Route 1/9) at Taco Bell	NB Through	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Const. Supply	NB Through	Partial Mitigation: Change EB max green time from 40 sec to 17 sec
Tonnelle Avenue (U.S. Route 1/9) NB and 10th Street	WB Right-turn	Impact cannot be fully mitigated
Tonnelle Avenue (U.S. Route 1/9) NB and Entrance Ramp	WB Right-turn	Impact cannot be fully mitigated

Tonnelle Avenue (U.S. Route 1/9) at Taco Bell (signalized)

- Feasible mitigation measures could not be identified to address the adverse impacts to the northbound through movement during the 2029 AM, PM, and Saturday construction peak hours.
- Feasible mitigation measures could not be identified to address the adverse impacts to the southbound through movement during the 2029 AM and PM construction peak hours.

Tonnelle Avenue (U.S. Route 1/9) at Wendy's & White Cap Construction (signalized)

- Changing the maximum green time of the eastbound phase from 40 seconds to 25 seconds mitigates the adverse impacts to the northbound through movement during the 2021 AM and 2029 AM construction peak hours.
- Changing the maximum green time of the eastbound phase from 40 seconds to 24 seconds partially mitigates the adverse impact to the northbound through movement during the 2029 PM construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact.
- Changing the maximum green time of the eastbound phase from 40 seconds to 17 seconds partially mitigates the adverse impact to the northbound through movement during the 2029 Saturday construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact.
- Changing the maximum green time of the eastbound phase from 40 seconds to 24 seconds partially mitigates the adverse impact to the southbound through movement during the 2029 PM construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact. Tonnelle Avenue (U.S. Route 1/9) northbound and 10th Street (stop-controlled)

Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street (stop-controlled)

- Feasible mitigation measures could not be identified to address the adverse impacts to the westbound right-turn movement during: 2029 PM and Saturday commuter peak hours, 2021 AM, 2029 AM, 2029 PM and 2029 Saturday construction peak hours.

Tonnelle Avenue (U.S. Route 1/9) northbound and entrance ramp from Secaucus Road (stop-controlled)

- Feasible mitigation measures could not be identified to address the adverse impacts to the westbound right-turn movement during all commuter and construction peak hours.

5A.8.1.1.2 Hoboken Staging Area

Table 5A-39 and Table 5A-40 summarizes the impacted intersections for the traffic study area.

**Table 5A-39
Summary of 2022 Adverse Traffic Impacts
Hoboken Staging Area, New Jersey
Proposed Truck Route**

Intersection		Commuter Peak Hours			Construction Peak Hours	
EB/WB Street	NB/SB Street	Weekday AM	Weekday Midday	Weekday PM	Weekday AM	Weekday PM
South Marginal Highway	JFK Boulevard	EB-R (Yield)				
Willow Avenue	19th Street				NB-LTR	NB-LTR
Park Avenue	19th Street				WB-L	WB-L
Total Impacted Intersections/Lane Groups		1/1	0/0	0/0	2/2	2/2
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound.						



Table 5A-40
Summary of 2022 Adverse Traffic Impacts
Hoboken Staging Area, New Jersey
Alternate Truck Route

Intersection		Commuter Peak Hours			Construction Peak Hours	
EB/WB Street	NB/SB Street	Weekday AM	Weekday Midday	Weekday PM	Weekday AM	Weekday PM
South Marginal Highway	JFK Boulevard	EB-R (Yield)				
Willow Avenue	19th Street	WB-L		WB-L	WB-L NB-LTR	WB-L NB-LTR
Total Impacted Intersections/Lane Groups		2/2	0/0	1/1	1/2	1/2
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound.						

Full mitigation measures were identified at two of the three study area intersections that experienced adverse impacts in one or more peak hours. These measures are summarized in **Tables 5A-41** and described below.

Table 5A-41
Proposed Mitigation Measures
During Construction of the Preferred Alternative,
Hoboken Staging Area, New Jersey

Intersection	Movement	Mitigation Measure
Proposed Truck Route		
2022 – AM Commuter Peak Hour		
JFK Boulevard and S. Marginal Highway	EB Right-turn (Yield)	Impact cannot be fully mitigated
2022 – AM Construction Peak Hour		
19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 1 sec green time from SB phase to NB phase
19th Street and Park Avenue	WB Left-turn	Provide leading protected WB left turn (22 sec) to match EB protected left turn
2022 – PM Construction Peak Hour		
19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 2 sec green time from SB phase to NB phase
19th Street and Park Avenue	WB Left-turn	Provide leading protected WB left turn (22 sec) to match EB protected left turn
Alternate Truck Route		
2022 – AM Commuter Peak Hour		
19th Street and Willow Avenue	WB Left-turn	Retime to 100 sec cycle. EB/WB phase 34 sec, NB phase 20 sec, SB phase 31 sec
JFK Boulevard and S. Marginal Highway	EB Right-turn (Yield)	Impact cannot be fully mitigated
2022 – PM Commuter Peak Hour		
19th Street and Willow Avenue	WB Left-turn	Shift 1 sec green time from SB phase to EB/WB phase
2022 – AM Construction Peak Hour		
19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 1 sec green time from SB phase to NB phase
	WB Left-turn	Shift 5 sec green time from SB phase to EB/WB
2022 – PM Construction Peak Hour		
19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 2 sec green time from SB phase to NB phase
	WB Left-turn	Shift 3 sec green time from SB phase to EB/WB
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.		

19th Street and Park Avenue (signalized)

- Shifting one second of green time from the southbound phase to the northbound phase would mitigate the adverse impact to the northbound left-turn/through/right-turn movement during the 2022 AM construction peak hour (proposed truck route).
- Shifting two seconds of green time from the southbound phase to the northbound phase would mitigate the adverse impact to the northbound left-turn/through/right-turn movement during the 2022 PM construction peak hour (proposed truck route).

19th Street and Willow Avenue (signalized)

- Retiming the signal to a 100 second cycle length with green time equal to 34 seconds for the eastbound/westbound phase, 20 seconds for the northbound phase, and 31 seconds for the southbound phase, would mitigate the adverse impact to the westbound left-turn movement during the 2022 AM commuter peak hour (alternate truck route).
- Shifting one second of green time from the southbound phase to the eastbound/westbound phase would mitigate the adverse impact to the westbound left-turn movement during the 2022 PM commuter peak hour (alternate truck route).
- Providing a leading protected westbound left-turn phase concurrent with the existing protected eastbound left-turn phase (22 seconds) would mitigate the adverse impacts to the westbound left-turn movement during the 2022 AM and PM construction peak hours (proposed truck route).
- Shifting five seconds of green time from the southbound phase to the eastbound and westbound phase would mitigate the adverse impact to the westbound left-turn movement during the 2022 AM construction peak hour (alternate truck route).
- Shifting three seconds of green time from the southbound phase to the eastbound and westbound phase would mitigate the adverse impact to the westbound left-turn movement during the 2022 PM construction peak hour (alternate truck route).

JFK Boulevard and S. Marginal Hwy (signalized)



































- Feasible mitigation measures could not be identified to address the adverse impact to the eastbound right-turn movement (yield-controlled) during the 2021 AM commuter peak hour (proposed and alternate truck routes).

5A.8.1.2 PEDESTRIANS















































No adverse impact to pedestrian conditions would occur in the New Jersey study area and therefore no mitigation measures are proposed.

Table 5A-42 through **Table 5A-44** present the summary of traffic impacts including mitigation for the 2021, 2022, and 2029 traffic study areas.

Table 5A-42
Tonnelles Avenue Staging Site
Traffic Mitigation Overview
Analysis Year 2021 (New Tunnel Construction)

Location		AM Commuter Peak	AM Construction Peak	Midday Roadway Peak	PM Commuter Peak	PM Construction Peak
1	Tonnelles Ave/Taco Bell					
2	Tonnelles Ave/Wendy's/ White Cap					
3	Tonnelles Ave/ northbound@10th St					
4	Tonnelles Ave/ northbound entrance ramp from Secaucus Rd					
5	Secaucus Rd/Tonnelles Ave southbound ramps					
6	Secaucus Rd/Tonnelles Ave northbound ramps					
Key: No significant impact:  Mitigated impact:  Partially mitigated impact:  Unmitigated impact: 						

**Table 5A-43
Tonnelle Avenue Staging Area
Traffic Mitigation Overview
Analysis Year 2029 (Rehabilitation of North River Tunnel)**

Location		AM Commuter Peak	AM Construction Peak	Midday Commuter Peak	PM Commuter Peak	PM Construction Peak	Saturday Commuter Peak	Saturday Construction Peak	
1.	Tonnelle Ave/Taco Bell								
2.	Tonnelle Ave/Wendy's/ White Cap								
3.	Tonnelle Ave/ northbound@10th St								
4.	Tonnelle Ave/ northbound entrance ramp from Secaucus Rd								
5.	Secaucus Rd/Tonnelle Ave southbound ramps								
6.	Secaucus Rd/Tonnelle northbound ramps								
Key:									
No significant impact:						Mitigated impact:			
Partially mitigated impact:						Unmitigated impact:			



**Table 5A-44
Hoboken Staging Site
Traffic Mitigation Overview
Analysis Year 2022 (New Tunnel Construction)**

Location	Park Ave / Willow Ave Truck Route					Alternate Truck Route				
	AM Commuter Peak	AM Construction Peak	Midday Commuter Peak	PM Commuter Peak	PM Construction Peak	AM Commuter Peak	AM Construction Peak	Midday Commuter Peak	PM Commuter Peak	PM Construction Peak
7 19th St/Willow Ave										
8 19th St/Park Ave										
9 19th St/Lincoln Harbor										
10 19th St/Waterfront Terr										
11 19th St/Harbor Blvd										
12 JFK Blvd/NJT bus lot										
13 JFK Blvd/Baldwin Ave										
14 JFK Blvd/S Marginal Rd										
15 JFK Blvd/N Marginal Rd										

Key:

No significant impact:		Mitigated impact:	
Partially mitigated impact:		Unmitigated impact:	

5A.8.2 NEW YORK

5A.8.2.1 TRAFFIC

Table 5A-45 summarizes the impacted intersections for the 2021 traffic study area.

Table 5A-45
Summary of 2021 Adverse Traffic Impacts
New York

Intersection		Commuter Peak Hours			Construction Peak Hours	
EB/WB Street	NB/SB Street	Weekday AM	Weekday Midday	Weekday PM	Weekday AM	Weekday PM
West 29th Street	Twelfth Avenue	WB-R	WB-R	WB-R	WB-R	WB-R
West 34th Street	Twelfth Avenue	SB-L	NB-R SB-L	SB-L	NB-R SB-L	WB-R SB-L
West 30th Street	Eleventh Avenue	SB-LT	SB-LT	SB-LT		
West 34th Street	Eleventh Avenue	EB-TR	EB-TR WB-LT	EB-TR	EB-TR	EB-TR WB-LT
West 40th Street	Eleventh Avenue		EB-TR			EB-TR
West 30th Street	Tenth Avenue			EB-LT	EB-LT	EB-LT
West 33rd Street	Tenth Avenue					NB-LT
West 34th Street	Tenth Avenue			WB-R		
West 34th Street	Dyer Avenue	SB-R	SB-R		SB-R	
Total Impacted Intersections/Lane Groups		5/5	6/8	6/6	5/6	6/8

Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.

Full mitigation measures were identified at six of the nine study area intersections that would experience adverse impacts in one or more peak hours. Partial mitigation measures were identified at two intersections. These measures are summarized in **Table 5A-46** and described below:

Twelfth Avenue and West 29th Street (signalized)

- Shifting four seconds of green time from the northbound/southbound phase to the westbound phase would mitigate the adverse impact to the westbound right-turn movement during the 2021 AM and PM commuter peak hours and the 2021 PM construction peak hour.
- Shifting three seconds of green time from the northbound/southbound phase to the westbound phase would mitigate the adverse impact to the westbound right-turn movement during the 2021 midday commuter peak hour.
- Shifting five seconds of green time from the northbound/southbound phase to the westbound phase would mitigate the adverse impact to the westbound right-turn movement during the 2021 AM construction peak hour.

Twelfth Avenue and West 34th Street (signalized)

- Feasible mitigation measures could not be identified to address the adverse impacts to the northbound right-turn movement during the 2021 midday commuter peak hour and 2021 AM construction peak hour.
- Shifting four seconds from the northbound phase to the westbound right-turn/southbound left-turn phase would partially mitigate the adverse impact to the southbound left-turn movement during the 2021 PM commuter and construction peak hours. Feasible mitigation measures could not be identified to address the adverse impacts during all other peak hours. This movement would remain an adverse impact during all peak hours.



Eleventh Avenue and West 30th Street (signalized)

- Shifting three seconds of green time from the eastbound phase to the southbound phase would mitigate the adverse impact to the southbound left-turn/through movement during the 2021 AM commuter peak hour.
- Shifting seven seconds of green time from the eastbound phase to the southbound phase would mitigate the adverse impact to the southbound left-turn/through movement during the 2021 midday commuter peak hour.
- Shifting two seconds of green time from the eastbound phase to the southbound phase would mitigate the adverse impact to the southbound left-turn/through movement during the 2021 PM commuter peak hour.
- Shifting one second of green time from the eastbound phase to the southbound phase would mitigate the significant adverse impact to the southbound left-turn/through movement during the 2021 PM construction peak hour.

Eleventh Avenue and West 34th Street (signalized)

- Shifting two seconds from the southbound phase to the eastbound/westbound phase and four seconds from the eastbound/westbound left-turn phase to the eastbound/westbound phase would partially mitigate the adverse impact to the eastbound left-turn/through/right-turn movement during the 2021 AM commuter peak hour. While delay per vehicle would decrease, this would remain an adverse impact.
- Shifting four seconds from the southbound phase to the eastbound/westbound phase would fully mitigate the significant adverse impact to the westbound left-turn/through/right-turn movement during the 2021 PM background peak hour. This same shift would partially mitigate the adverse impact to the eastbound left-turn/through/right-turn movement during the 2021 PM commuter peak hour and 2021 AM construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact.
- Shifting three seconds from the southbound phase to the eastbound/westbound phase and one second from the southbound phase to the westbound left-turn phase would partially mitigate the adverse impact to the eastbound through/right-turn movement during the 2021 PM construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact.
- Feasible mitigation measures could not be identified to address the adverse impact to the eastbound through/right-turn movement during the 2021 midday commuter peak hours.

Eleventh Avenue and West 40th Street (signalized)

- Shifting three seconds of green time from the northbound/southbound phase to the eastbound phase would mitigate the adverse impact to the eastbound through/right-turn movement during the 2021 midday commuter peak hours.
- Shifting one second of green time from the northbound/southbound phase to the eastbound phase would mitigate the significant adverse impact to the eastbound through/right-turn movement during the 2021 PM construction peak hour.

Tenth Avenue and West 30th Street (signalized)

- Shifting one second of green time from the northbound phase to the eastbound phase would mitigate the adverse impact to the eastbound left-turn/through movement during the 2021 PM commuter, and 2021 AM and PM construction peak hours.

Tenth Avenue and West 33rd Street (signalized)

- Feasible mitigation measures could not be identified to address the adverse impacts to the northbound left-turn/through movement during 2021 PM construction peak hour.

Tenth Avenue and West 34th Street (signalized)

- Feasible mitigation measures could not be identified to address the adverse impacts to the westbound right-turn movement during 2021 PM commuter peak hour.

Dyer Avenue and West 34th Street (signalized)

- Shifting two seconds of green time from the westbound right-turn phase to the westbound right-turn/southbound right-turn phase would mitigate the adverse impact to the southbound right-turn movement during the 2021 AM commuter and 2021 AM construction peak hours.
- Shifting one second of green time from the westbound right-turn phase to the westbound right-turn/southbound right-turn phase would mitigate the adverse impact to the southbound right-turn movement during the 2021 midday commuter peak hour.



**Table 5A-46
Proposed Mitigation Measures
During Construction of the Preferred Alternative,
New York Study Area**

Intersection	Movement	Mitigation Measure
AM Commuter Peak Hour		
Twelfth Avenue and West 29th Street	WB Right-turn	Shift 4 sec green time from NB/SB phase to WB phase
Twelfth Avenue and West 34th Street	SB Left-turn	Impact cannot be fully mitigated
Eleventh Avenue and West 30th Street	SB Left-turn/Through	Shift 3 sec green time from EB phase to SB phase
Eleventh Avenue and West 34th Street	EB Left-turn/Through/ Right-turn	Partial Mitigation: Shift 2 sec from SB phase to EB/WB phase and 4 sec from WBL to EB/WB
Dyer Avenue and West 34th Street	SB Right-turn	Shift 2 sec from WBR phase to WBR/SBR phase
AM Construction Peak Hour		
Twelfth Avenue and West 29th Street	WB Right-turn	Shift 5 sec from NB/SB phase to WB phase
Twelfth Avenue and West 34th Street	NB Right-turn	Impact cannot be fully mitigated
	SB Left-turn	Impact cannot be fully mitigated
Eleventh Avenue and West 34th Street	EB Left-turn/Through/ Right-turn	Partial Mitigation: Shift 4 sec from SB phase to EB/WB phase
Tenth Avenue and West 30th Street	EB Left-turn/ Through	Shift 1 sec from NB phase to EB phase
Dyer Avenue and West 34th Street	SB Right-turn	Shift 2 sec from WBR phase to WBR/SBR phase
Midday Commuter Peak Hour		
Twelfth Avenue and West 29th Street	WB Right-turn	Shift 3 sec from NB/SB phase to WB phase
Twelfth Avenue and West 34th Street	NB Right-turn	Impact cannot be fully mitigated
	SB Left-turn	Impact cannot be fully mitigated
Eleventh Avenue and West 30th Street	SB Left-turn/ Through	Shift 7 sec from EB phase to SB phase
Eleventh Avenue and West 34th Street	EB Left-turn/Through/ Right-turn	Impact cannot be fully mitigated
Eleventh Avenue and West 40th Street	EB Through/ Right-turn	Shift 3 sec from NB/SB phase to EB phase
Dyer Avenue and West 34th Street	SB Right-turn	Shift 1 sec from WBR phase to WBR/SBR phase
PM Commuter Peak Hour		
Twelfth Avenue and West 29th Street	WB Right-turn	Shift 4 sec from NB/SB phase to WB phase
Twelfth Avenue and West 34th Street	SB Left-turn	Impact cannot be fully mitigated
Eleventh Avenue and West 30th Street	SB Left-turn/ Through	Shift 2 sec from EB phase to SB phase
Eleventh Avenue and West 34th Street	EB Left-Turn/Through/ Right-turn	Partial mitigation: Shift 4 sec from SB phase to EB/WB phase
	WB Left-Turn/ Through/Right-Turn	Shift 4 sec from SB phase to EB/WB phase
Tenth Avenue and West 30th Street	EB Left-turn/ Through	Shift 1 sec from NB phase to EB phase
Tenth Avenue and West 34th Street	WB Right-turn	Impact cannot be fully mitigated
PM Construction Peak Hour		
Twelfth Avenue and West 29th Street	WB Right-turn	Shift 4 sec from NB/SB phase to WB phase
Twelfth Avenue and West 34th Street	SB Left-turn	Partial Mitigation: Shift 4 sec from NB to SBL/WBR
Eleventh Avenue and West 30th Street	SB Left-turn/Through	Shift 1 sec from EB phase to SB phase
Eleventh Avenue and West 34th Street	EB Left-turn/Through/ Right-turn	Partial Mitigation: Shift 3 sec from SB phase to EB/WB phase and 1 sec from SB to WBL phase
Eleventh Avenue and West 40th Street	EB Through/ Right-turn	Shift 1 sec from NB/SB phase to EB phase
Tenth Avenue and West 30th Street	EB Left-turn/ Through	Shift 1 sec from NB to EB phase
Tenth Avenue and West 33rd Street	NB Left-turn/ Through	Impact cannot be fully mitigated
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.		

Table 5A-47 summarizes conditions at each intersection, including mitigation. The detailed results of the mitigation condition LOS analyses are provided in **Appendix 5**.

Table 5A-47
New York Study Area
Traffic Mitigation Overview
Analysis Year 2021

Location		AM Commuter Peak	AM Construction Peak	Midday Commuter Peak	PM Commuter Peak	PM Construction Peak
16	Twelfth Ave/W 26th St					
17	Twelfth Ave/W 29th St					
18	Twelfth Ave/W 30th St					
19	Twelfth Ave/W 34th St					
20	Twelfth Ave/tow pound exit					
21	Twelfth Ave/Pier 79 ferry					
22	Twelfth Ave/W 40th St					
23	Eleventh Ave/W 26th St					
24	Eleventh Ave/W 27th St					
25	Eleventh Ave/W 28th St					
26	Eleventh Ave/W 29th St					
27	Eleventh Ave/W 30th St					
28	Eleventh Ave/W 33rd St					
29	Eleventh Ave/W 34th St					
30	Eleventh Ave/W 40th St					
31	Tenth Ave/W 26th St					
32	Tenth Ave/W 30th St					
33	Tenth Ave/W 33rd St					



**Table 5A-47 (cont'd)
New York Study Area
Traffic Mitigation Overview
Analysis Year 2021**

Location		AM Commuter Peak	AM Construction Peak	Midday Commuter Peak	PM Commuter Peak	PM Construction Peak
44	Tenth Ave/W 34th St					
35	Dyer Ave/W 34th St					
36	Dyer Ave/W 35th St					
37	Dyer Ave SB/W 36th St					
38	Dyer Ave NB/W 36th St					

Key:
 No significant impact: Mitigated impact:
 Partially Mitigated impact: Unmitigated impact:

5A.8.2.2 PEDESTRIANS

Table 5A-48 summarizes the impacted pedestrian elements for the 2021 pedestrian study area.

**Table 5A-48
Summary of 2021 Adverse Pedestrian Impacts
New York**

Intersection	Pedestrian Element	Analysis Peak Hours		
		Weekday AM	Weekday Midday	Weekday PM
Tenth Avenue between West 31st Street and West 33rd Street	East Sidewalk	X		
Tenth Avenue and West 33rd Street	Southeast Corner		X	
	South Crosswalk	X		
Tenth Avenue and West 31st Street	North Crosswalk			X
Total Impacted Pedestrian Elements		2	1	1

Note: X = Impacted.

Construction of the Preferred Alternative would result in one adverse impact to a sidewalk, one adverse impact to a corner area, and two adverse impacts to crosswalks. Mitigation measures were developed to address these adverse impacts where feasible. These measures are summarized in **Table 5A-49** and described below:

Table 5A-49
Proposed Mitigation Measures
During Construction of the Preferred Alternative,
New York Study Area

Intersection	Pedestrian Element	Mitigation Measure
AM Peak Hour		
Tenth Avenue between West 31st Street and West 33rd Street	East Sidewalk	Widen east sidewalk by one foot
Tenth Avenue and West 33rd Street	South Crosswalk	Widen the south crosswalk by one-and-a-half feet
Midday Peak Hour		
Tenth Avenue and West 33rd Street	Southeast Corner	Impact cannot be fully mitigated
PM Peak Hour		
Tenth Avenue and West 31st Street	North Crosswalk	Switch one second of walk time from the east crosswalk to the north and south crosswalks

5A.8.2.3 SIDEWALKS

The rerouting of pedestrian traffic from the west sidewalk to the east sidewalk and the creation of a five-foot pedestrian walkway on the east sidewalk of Tenth Avenue between West 30th and West 33rd Streets would result in an adverse impact at this location. Widening this walkway by one foot to a total width of six feet would mitigate this adverse impact.

5A.8.2.4 CORNER AREAS









































The Preferred Alternative would result in one adverse impact at the southeast corner of the intersection of Tenth Avenue and West 33rd Street during the weekday midday peak hour. No feasible low-cost mitigation measures could be identified at this location that would not introduce new adverse impacts to the traffic analysis. Removal of the street lamp located within the corner area or a corner extension at this location would mitigate this adverse impact, however these measures were deemed impractical due to the temporary nature of the pedestrian detour. As such, this location would remain an unmitigated adverse impact.

5A.8.2.5 CROSSWALKS

The pedestrian detour associated with the closure of the west sidewalk of Tenth Avenue between West 31st and West 33rd Streets would result in two adverse impacts to crosswalks. Widening the crosswalk by 1.5 feet would mitigate the adverse impact to the south crosswalk of the intersection of Tenth Avenue and West 33rd Street during the weekday AM peak hour. Switching one second of walk time from the east crosswalk to the north and south crosswalks would mitigate the adverse impact to the north crosswalk of the intersection of Tenth Avenue and West 31st Street during the weekday PM peak hour.

Table 5A-50 presents the mitigation overview for the 2021 pedestrian study area. The detailed results of the mitigation condition LOS analyses are provided in **Appendix 5**.

**Table 5A-50
New York Study Area
Pedestrian Mitigation Overview
Analysis Year: 2021**

Location		AM Peak	Midday Peak	PM Peak
1P	Sidewalk Twelfth Ave/W 29th St			
2P	Sidewalk W 30th St/Eleventh-Twelfth Aves			
3P	Sidewalk Tenth Ave/W 31st-W 33rd Sts			
4P	Crosswalk Tenth Ave/W 31st St N			
5P	Crosswalk Tenth Ave/W 33rd St S			
6P	Twelfth Ave/W 29th St northeast corner			
7P	Twelfth Ave/W 30th St northeast corner			
8P	Eleventh Ave/W 30th St southeast corner			
9P	Eleventh Ave/W 30th St southwest corner			
10P	Eleventh Ave/W 30th St northwest corner			
11P	Tenth Ave/W 31st St northeast corner			
12P	Tenth Ave/W 33rd St southeast corner			
Key:				
No significant impact:			Partially mitigated impact:	
Mitigated impact:			Unmitigated impact:	

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