

5A.1 INTRODUCTION

Chapter 5 of this Environmental Impact Statement (EIS) presents the evaluation the Federal Railroad Administration (FRA) and the New Jersey Transit Corporation (NJ TRANSIT) conducted of the impacts of construction and operation of the Hudson Tunnel Project on transportation conditions. The Port Authority of New York and New Jersey (PANYNJ), in its role as Project Sponsor, has accepted and relied on the evaluations and conclusions of this chapter.

This chapter is divided into two subchapters, Chapter 5A, “Traffic and Pedestrians” (this chapter) and Chapter 5B, “Transportation Services.” Chapter 5A presents an evaluation of 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 presents an evaluation of 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.

Since publication of the Draft EIS (DEIS), the Preferred Alternative has changed from what was presented in the DEIS as a result of design advancement and changes made in response to comments received on the DEIS. The National Railroad Passenger Corporation (Amtrak) has continued to advance the design of the Preferred Alternative, including incorporating design refinements based on further engineering analysis and information, resulting in some modifications to the design presented in the DEIS. FRA and NJ TRANSIT, in response to concerns raised during the public comment period and working with Amtrak and the PANYNJ, have identified ways to reduce the impacts of Project construction, including impacts on local communities near the construction staging areas in New Jersey and Manhattan.

As a result of these changes, FRA and NJ TRANSIT incorporated a number of revisions to this chapter since the DEIS, as follows:

- The chapter incorporates design modifications related to the permanent features of the Project (e.g., modifications to surface tracks and tunnel alignment) and changes to construction methods and staging. As a result of this change, FRA and NJ TRANSIT revised the analysis using updated peak construction traffic volumes in each study area.
- A new potential mitigation feature was evaluated for the Tonelle Avenue staging area in North Bergen, New Jersey: creation of a new signalized intersection on Tonelle Avenue at the staging area driveway, so that northbound traffic exiting the driveway would not have to head south to make a U-turn before continuing north.
- A new truck route in Weehawken, New Jersey, was evaluated connecting to the Hoboken staging area.
- Pedestrian safety analyses were conducted for the New Jersey and New York study areas in response to comments from the public during the comment period on the DEIS.
- Traffic analyses in New York were revised to reflect a modification to the construction methods that would allow at least one lane of West 30th Street to remain open through construction,

whereas the DEIS analyses were based on the assumption that West 30th Street would be closed during construction.

- Pedestrian analyses in New York were revised to reflect that sidewalks along Tenth Avenue would not be closed during construction, whereas the DEIS analyses evaluated the effects of sidewalk closures.

This chapter contains the following sections:

- 5A.1 Introduction
- 5A.2 Analysis Methodology
 - 5A.2.1 Regulatory Context
 - 5A.2.2 Analysis Techniques
 - 5A.2.3 Study Areas
- 5A.3 Affected Environment: Existing Conditions
 - 5A.3.1 New Jersey
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 - 5A.9.2 Tonnelle Avenue Staging Area Study Area
 - 5A.9.3 Hoboken Staging Area Study Area
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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.

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

5A.2.2 ANALYSIS TECHNIQUES

During development of this EIS, FRA and NJ TRANSIT developed methodologies to evaluate 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 considered truck routes ("haul routes") 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 absent the Preferred Alternative)** at each intersection in the year when worst-case (i.e., peak) traffic associated with construction of the Preferred Alternative would occur 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 2033.
- **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 2033.
- **Impacts of the Preferred Alternative:** at the same intersections in the same years analyzed for the Future No Action condition, corresponding to the year when worst-case traffic associated with construction of the Preferred Alternative would occur. This analysis only considered the impacts of construction of the Preferred Alternative. Once the Preferred Alternative is complete, train operations would not differ notably from the No Action Alternative; therefore no change to commuter patterns or traffic conditions would result (for more information, see Chapter 4, "Analysis Framework," Section 4.2.1.2).

In the DEIS, FRA and NJ TRANSIT prepared the detailed analyses in this chapter using an anticipated construction start date for the Preferred Alternative of 2019. However, FRA, NJ TRANSIT, and the PANYNJ now anticipate that construction would begin later. Construction of the new Hudson River Tunnel could begin in 2022 and be complete in 2030; rehabilitation of the North River Tunnel could begin in 2030 and be complete in 2033, an overall delay of three years.

The traffic analysis was based on existing conditions in 2016 and future analysis years during the peak construction activities. For the DEIS, FRA and NJ TRANSIT used future analysis years of 2021, 2022, and 2029 (see Section 5A.2.2.1.1 below). To estimate traffic conditions during those future years, FRA and NJ TRANSIT assumed a steady growth in traffic volumes would occur in each study area from 2016 to the analysis year, largely because of the addition of new developments in and near the study areas. They assumed annual compounded growth of



1 percent per year in the New Jersey study areas and 0.25 percent per year in the New York study area, as discussed in Sections 5A.4.1 and 5A.4.3.1, respectively. However, given the pause in normal activities, including construction, that has occurred as a result of the COVID-19 global pandemic, traffic patterns have been disrupted and traffic volumes are currently generally lower than in 2016. As conditions return to normal and delayed construction projects are completed later than originally planned, traffic conditions will gradually reach the levels FRA and NJ TRANSIT assumed in this analysis. For this reason, for this FEIS, FRA and NJ TRANSIT assumed that the total growth they originally assumed would occur between 2016 and the DEIS future analysis years is still appropriate, even though the analysis years are now three years later (2024, 2025, and 2032) due to the later start of Project construction.

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 therefore, no corresponding permanent change in traffic or pedestrian activity as a result of the Preferred Alternative as compared to 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, a new permanent maintenance road would be created along the south side of the new railroad alignment through the Meadowlands, similar to the maintenance access road that already exists along the Northeast Corridor (NEC) in the same area. This road would not be publicly accessible and would be used only infrequently for maintenance or emergency purposes. Therefore, FRA and NJ TRANSIT did not conduct a quantitative analysis of traffic and pedestrian conditions considering conditions once the Preferred Alternative is operational.

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, based on the conceptual construction schedule presented in Chapter 3, “Construction Methods and Activities,” which has been updated since the publication of the DEIS to reflect design refinements and changes to the methods and schedule of construction for the Preferred Alternative. 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 the year in which the peak quarter would occur was used as the analysis year. FRA and NJ TRANSIT identified a peak year for each staging area in this way.

For the DEIS, the analysis years for the Tonnelle Avenue staging area study 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 study area, the analysis year was 2022. For the Manhattan (Twelfth Avenue) staging area study area, the analysis year was 2021. For this FEIS, because of the delay in the start of Project construction, those peaks would instead occur in 2024 and 2032 at the Tonnelle Avenue staging area, 2025 at the Hoboken staging area, and 2024 at the Twelfth Avenue staging area. The analysis years vary for the different study areas because of the different construction activities that would occur there. 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 Hours

FRA and NJ TRANSIT identified five analysis hours for each study area for new tunnel construction: a morning hour when the combined peak construction worker and truck volumes for

Project construction would occur (AM construction peak hour), a morning hour when the peak commuter traffic on the study area's roadways occurs (AM commuter peak hour), a midday hour when peak commuter traffic would occur (midday commuter peak hour), an evening hour when the combined peak construction worker and truck vehicle volumes would occur (PM construction peak hour), and an evening hour when peak commuter traffic would occur (PM commuter peak hour). The construction peak hours 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.

Most activities for construction of the new tunnel would occur Monday through Friday, and therefore FRA and NJ TRANSIT analyzed traffic conditions during that construction on weekdays. At the Tonnelle Avenue staging area for analysis of the North River Tunnel rehabilitation construction, rehabilitation activities would also occur on Saturdays and therefore FRA and NJ TRANSIT also analyzed traffic conditions for that study area during the Saturday midday peak hour and a Saturday PM construction peak hour representing the worker shift change for the North River Tunnel rehabilitation.

FRA and NJ TRANSIT used these peak hours in this EIS to evaluate 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 construction peak hour
- Weekday AM commuter peak hour
- Weekday midday commuter peak hour
- Weekday PM commuter peak hour
- Weekday PM construction peak hour for new tunnel construction
- Weekday PM construction peak hour for North River Tunnel rehabilitation
- Saturday midday commuter peak hour for North River Tunnel rehabilitation
- 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.

The analysis peak hours were as follows:

New Jersey

- Weekday peak hours
 - Weekday AM construction peak hour: 6:30-7:30 AM
 - Weekday AM commuter peak hour: 7:45-8:45 AM: 6:30-7:30 AM
 - Weekday midday commuter peak hour: 1:00-2:00 PM
 - Weekday PM new tunnel construction peak hour: 2:30-3:30 PM
 - Weekday PM North River Tunnel rehabilitation construction peak hour: 4:45-5:45 PM
 - Weekday PM commuter peak hour: 5:00-6:00 PM



- Saturday peak hours
 - Saturday midday commuter peak hour: 2:00-3:00 PM
 - Saturday PM North River Tunnel rehabilitation construction peak hour: 4:45-5:45 PM

New York

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

5A.2.2.1.3 Intersection and Level of Service (LOS) 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. The LOS analysis for signalized intersections, including the calculation of volume/capacity (V/C) ratios, and stopped delay values, is computed in accordance with the standard procedure prescribed in the HCM. A LOS analysis is applied to intersections overall and to the individual movements or lane groups at an intersection—e.g., through, left-turning, or right-turning movements at each intersection approach (i.e., lane group).

The HCM defines six categories of LOS, 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. According to the definitions of the traffic operations associated with each of the LOS categories, and the criteria presented in New York City's *CEQR Technical Manual*, 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 (approaching the limit of roadway/intersection/lane group capacity); or F (exceeding the limit of roadway/intersection/lane group capacity) is considered to be operating at a congested level for lane groups/intersections. Overall intersection delay is calculated for signalized intersections, while at unsignalized intersections, the delay for stop or yield-controlled movements is calculated.

For intersections in New Jersey, FRA and NJ TRANSIT used increases in delay to identify traffic impacts. 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 has been used by NJDOT for projects under their jurisdiction, and for similar multi-jurisdiction projects in northern New Jersey such as the PANYNJ's *Comprehensive Port Improvement Plan*, and was therefore also used to identify traffic impacts for purposes of NEPA in the New Jersey study area.

¹ Synchro 9.2, build 914, revision 6 (9.2.914.6).

For intersections in New York City, FRA and NJ TRANSIT used the criteria presented in the *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 to identify traffic impacts 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

FRA and NJ TRANSIT did not conduct pedestrian analysis related to crowding of sidewalks, corners, and crosswalks 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. For this FEIS, FRA and NJ TRANSIT did conduct an analysis of pedestrian safety, as discussed below in Section 5A.2.2.3, to respond to comments on that topic made during the public review of the DEIS.

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, corners, and crosswalks. 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.2.2.3 SAFETY ASSESSMENT

In response to public comments received on the DEIS, for this FEIS FRA and NJ TRANSIT have included an analysis of study area crash patterns, and the potential for Project-related construction truck and worker vehicles to affect high-accident locations.

5A.2.2.3.1 New Jersey

FRA and NJ TRANSIT obtained data on traffic accidents that occurred between January 1, 2017 and December 31, 2019 at intersections in the Tonnelles Avenue and Hoboken/Weehawken traffic study areas from the NJDOT. The information provides, by intersection, the total number of crashes, the total number of reportable crashes (involving fatality, injury or more than \$500 in property damage²), the number of fatalities and injuries during the study period, as well as a yearly breakdown of pedestrian- and bicycle-related injuries or fatalities at each intersection. FRA and NJ TRANSIT then applied the *CEQR Technical Manual* criteria, where a high crash location is a location where 48 or more total crashes, or five or more combined pedestrian and/or bicycle-related crashes, have occurred in any consecutive 12-month period. The incremental traffic associated with construction activities was estimated; based on the existing crash information, an assessment was made to determine if the additional construction-related traffic would be likely to affect crash patterns.

5A.2.2.3.2 New York

FRA and NJ TRANSIT obtained data on traffic accidents that occurred between January 1, 2014 and December 31, 2016 at intersections in the Manhattan traffic study area from NYCDOT. The information provides, by intersection, the total number of crashes, the total number of reportable crashes (involving fatality, injury or more than \$1,000 in property damage), the number of fatalities and injuries during the study period, as well as a yearly breakdown of pedestrian- and bicycle-related injuries or fatalities at each intersection. FRA and NJ TRANSIT then applied the *CEQR Technical Manual* criteria, where a high crash location is one where 48 or more total crashes, or five or more combined pedestrian and/or bicycle-related crashes, have occurred in any consecutive 12-month period. The incremental traffic associated with construction activities was estimated, based on the existing crash information, an assessment was made to determine if the additional construction-related traffic would be likely to affect crash patterns.

5A.2.3 STUDY AREAS

5A.2.3.1 NEW JERSEY

The traffic analysis comprised a total of 19 existing locations in New Jersey. Fifteen of these locations are in the primary study area, which includes locations that are in close proximity to the Preferred Alternative's construction staging areas, along the principal routes that workers would

² The New Jersey *NJTR-1 Crash Report Manual* (2017) defines reportable as \$500 or more in damage.

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 primary study area includes six intersections near the Tonnelle Avenue staging area and nine near the Hoboken staging area.

The primary and secondary study area traffic analysis locations analyzed in New Jersey are illustrated in **Figure 5A-1**, **Figure 5A-2**, **Figure 5A-3**, and **Figure 5A-4**, including numerical intersection identification numbers (Map ID#s), and are listed below.

As shown in the figures, three potential truck routes (haul routes) for accessing the Hoboken staging area were evaluated: haul route Option 1, entering via the Park Avenue service road, exiting via the Willow Avenue service road (**Figure 5A-2**); haul route Option 2, with its entrance and exit via the Willow Avenue service roads (**Figure 5A-3**); haul route Option 3, which would extend along the north and west side of the Hudson-Bergen Light Rail (HBLR) tracks from Park Avenue, continuing behind the Dykes Lumber property, and joining 19th Street at a reconfigured intersection beside the HBLR at-grade crossing (**Figures 5A-4a and 5A-4b**). This reconfigured intersection would operate in tandem with the existing intersection signals on 19th Street at Lincoln Harbor Road and Waterfront Terrace. This chapter includes an analysis of traffic conditions with that new truck route, including its intersection at 19th Street.

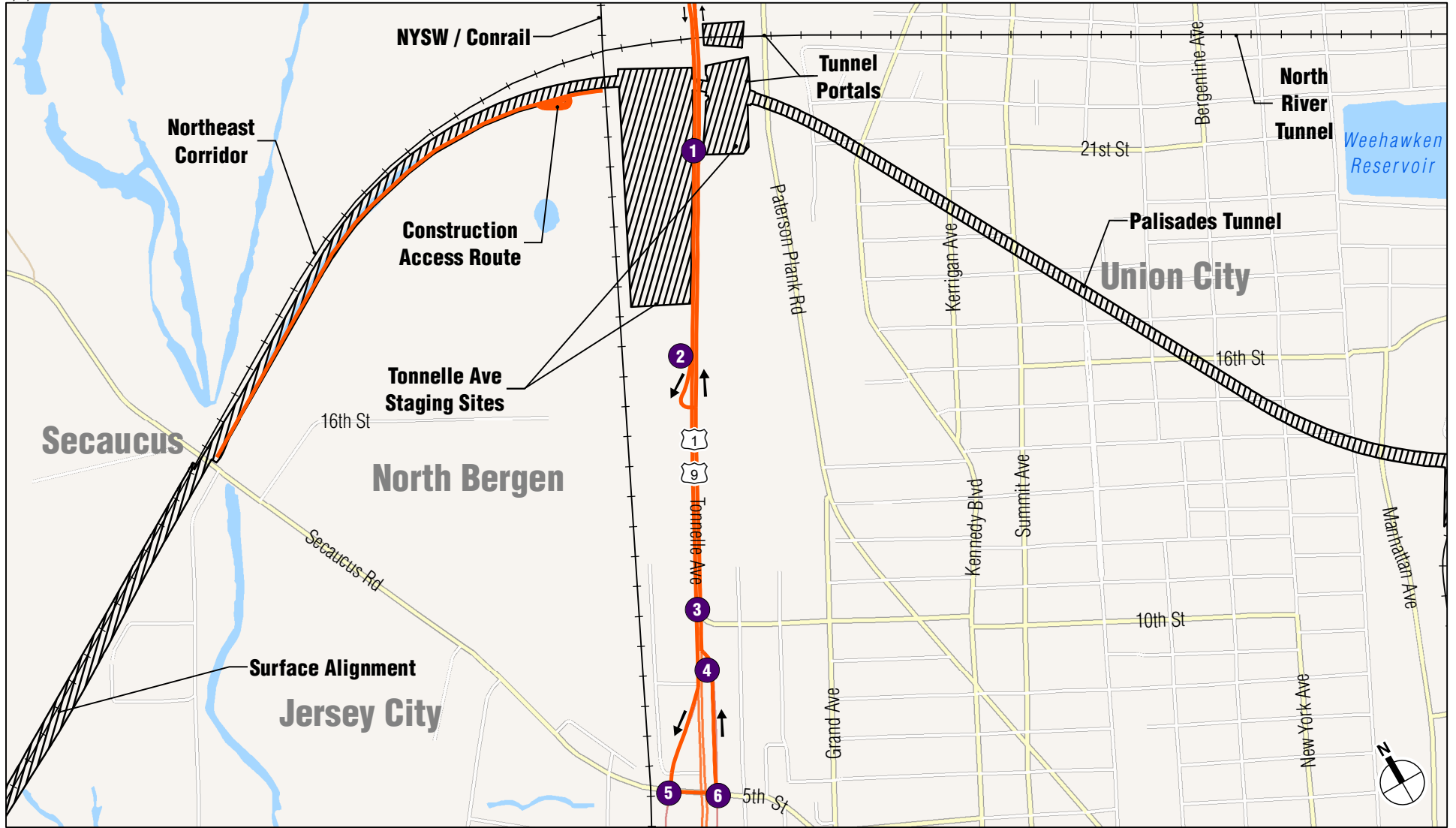
In the DEIS, the traffic analysis did not include evaluation of any intersections south of the Hoboken staging area, because construction-related traffic would not be routed in that direction. For this FEIS, FRA and NJ TRANSIT undertook an additional analysis for the Hoboken staging area to examine the effects of having worker parking off-site from the Hoboken staging area, with workers traveling to and from remote parking locations in shuttle vans. For each worker shift change, this analysis considers the effects of all of the workers on each shift driving directly to or from the parking garages instead of to the staging area, and two shuttle van trips in each direction between the Hoboken staging area and the remote parking garages. For purposes of this analysis, FRA and NJ TRANSIT assumed that workers would park at parking garages south of the construction staging area in Hoboken. They analyzed three garage locations, all near 14th and 15th Streets. The potential locations for the off-site worker parking are shown in **Figure 5A-5**. FRA and NJ TRANSIT have analyzed the impacts of these workers traveling to the potential off-site parking areas in this chapter, including the impacts at the secondary study area intersections in Hoboken as well as impacts in the primary study area from the changes in traffic patterns (since workers would no longer be traveling to the Hoboken staging area). This analysis also considers the effects of truck traffic associated with construction of the Preferred Alternative on each of the three potential truck route options.

5A.2.3.1.1 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**.

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

Map ID #	Intersection Location	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 10th 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) southbound ramp	Signalized
6	Secaucus Road at Tonnelle Avenue (U.S. Route 1/9) northbound ramp	Signalized

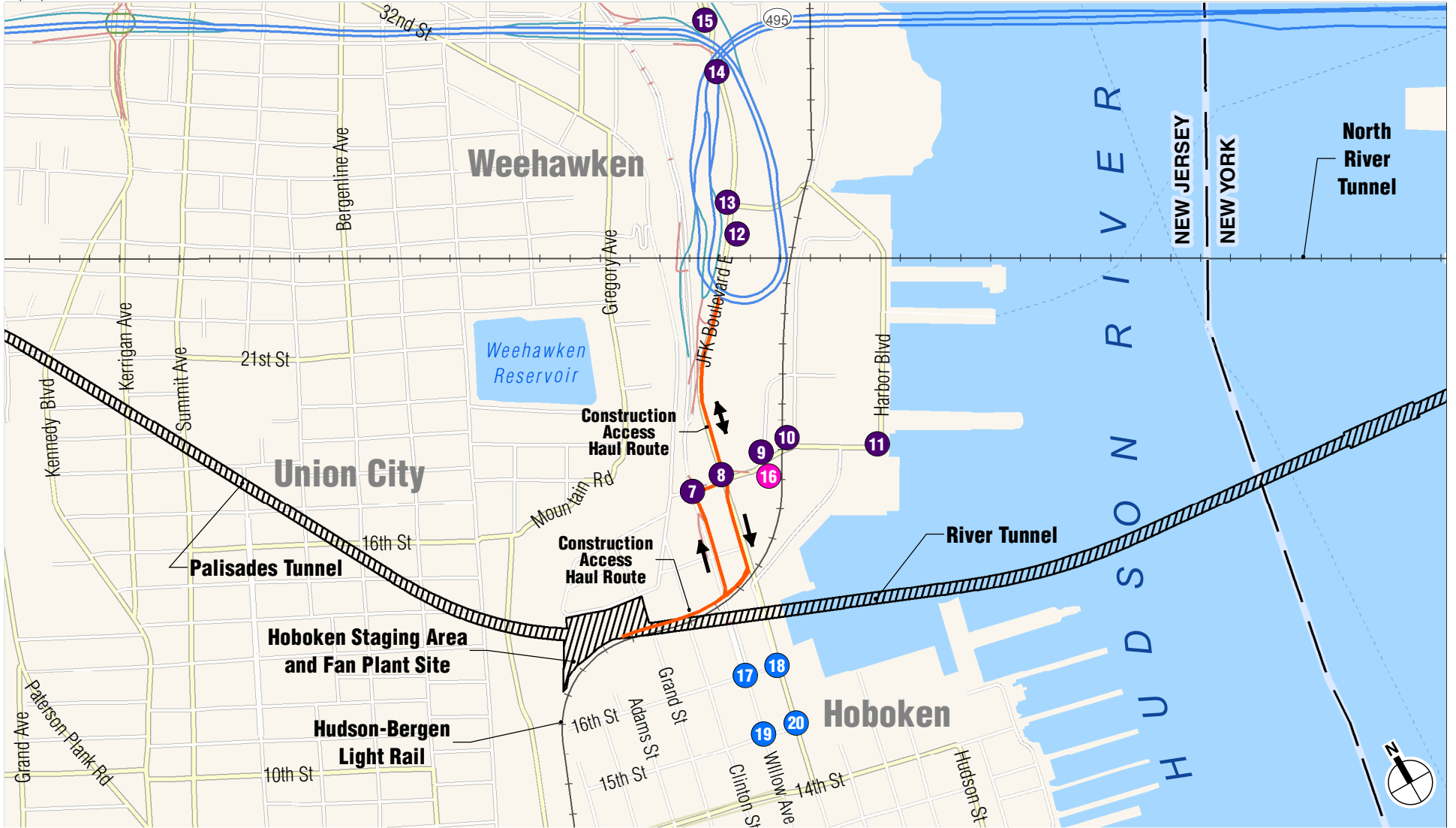







-  Project Site
-  1 Primary Study Area Traffic Analysis Intersection
-  Truck Routes and Access Roads

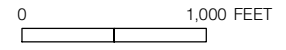
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Traffic Analysis Intersections in New Jersey:
Tonnelle Avenue Staging Site and Truck Routes
Figure 5A-1

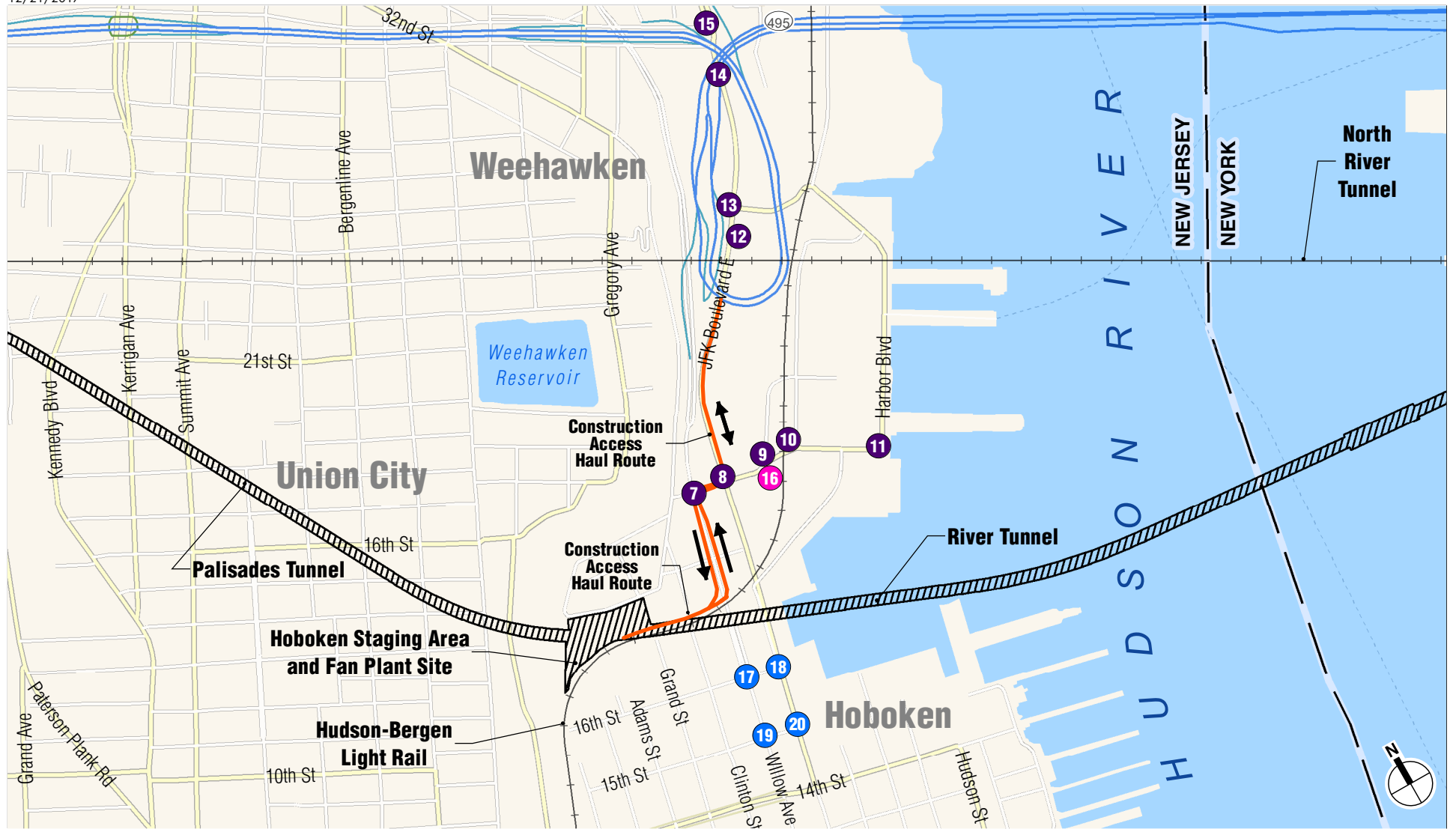







-  Project Site
-  Haul Route Option 1
-  Primary Study Area Traffic Analysis Intersection
-  Proposed New Intersection
-  Secondary Study Area Traffic Analysis Intersection

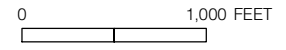


Traffic Analysis Intersections in New Jersey:
 Hoboken Staging Site and Haul Route Option 1
Figure 5A-2



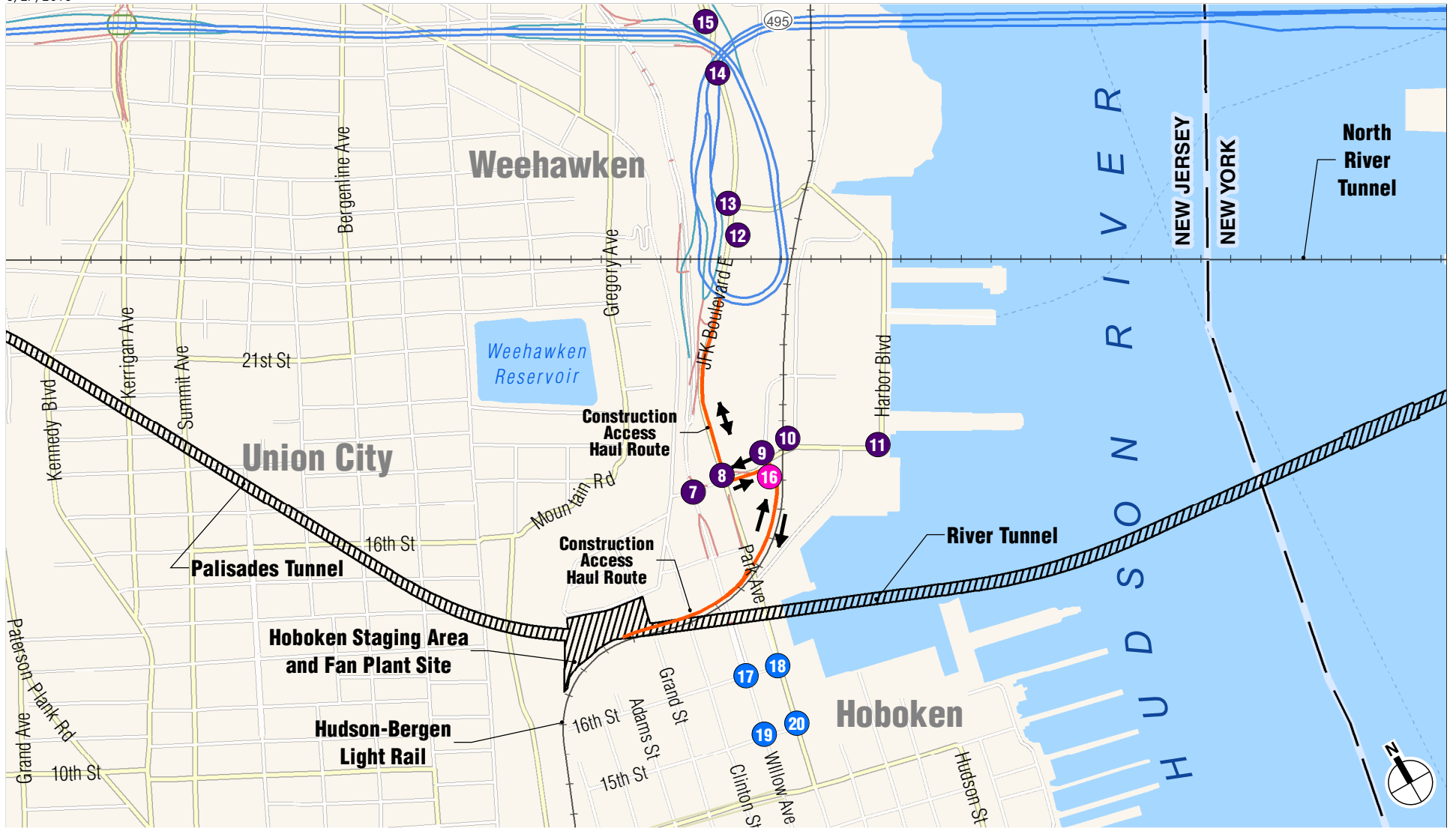







-  Project Site
-  Haul Route Option 2
-  Primary Study Area Traffic Analysis Intersection
-  Proposed New Intersection
-  Secondary Study Area Traffic Analysis Intersection



Traffic Analysis Intersections in New Jersey:
 Hoboken Staging Site and Haul Route Option 2
Figure 5A-3



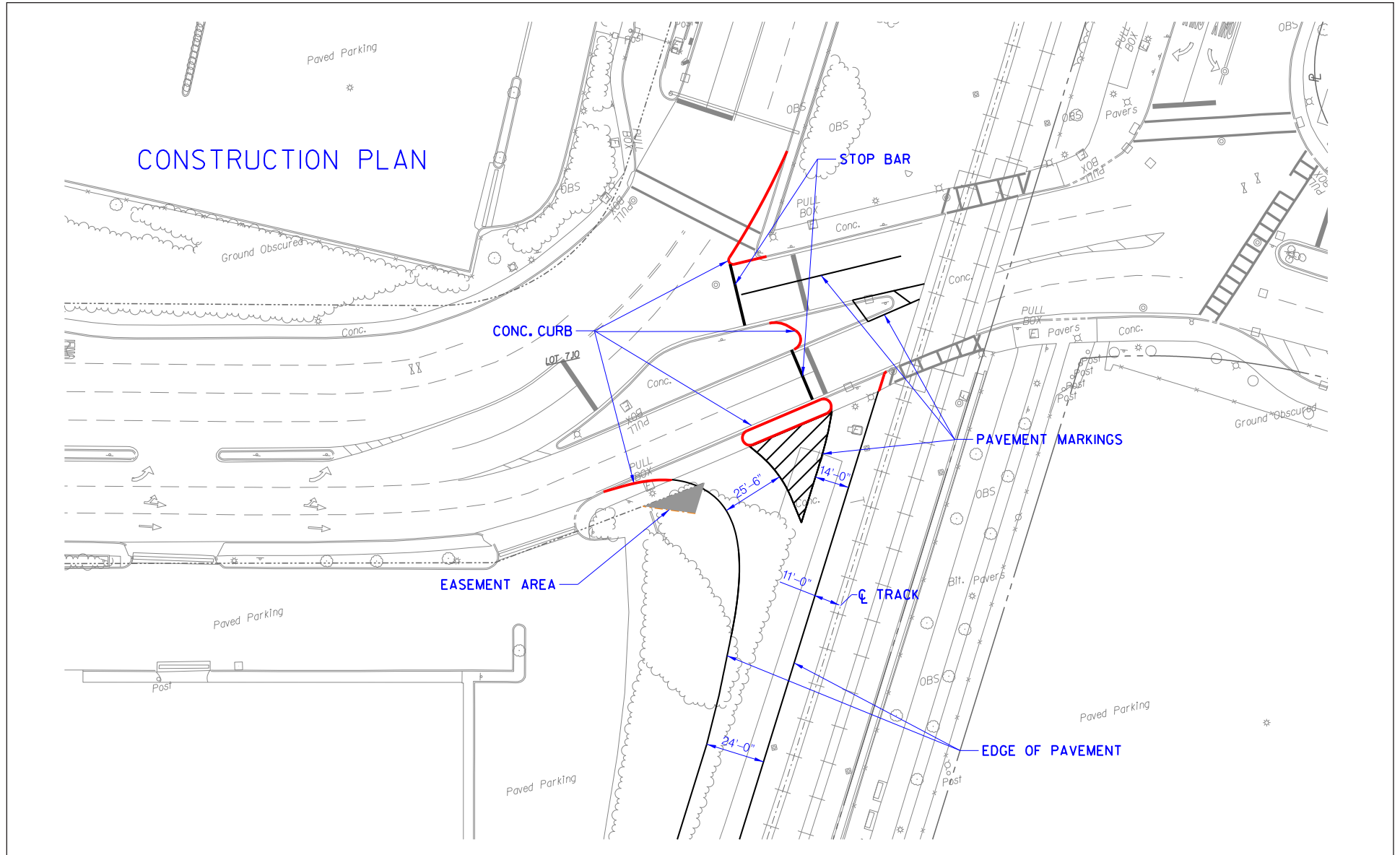


-  Project Site
-  Haul Route Option 3
-  Primary Study Area Traffic Analysis Intersection
-  Proposed New Intersection
-  Secondary Study Area Traffic Analysis Intersection






0 1,000 FEET

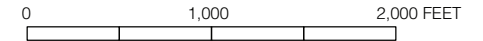


Traffic Analysis Intersections in New Jersey:
 Hoboken Staging Site and Haul Route Option 3
Figure 5A-4a





-  Project Site
-  Primary Study Area Traffic Analysis Intersection
-  Proposed New Intersection
-  Secondary Study Area Traffic Analysis Intersection
-  Public Parking Facility - potential location for off-site construction worker parking



Potential Off-Site Worker Parking Locations
Figure 5A-5



The Tonnelle Avenue staging area study area for the crash analysis covered the traffic study area and the intersections and roadway segments along the Project truck routes described in Chapter 3, "Construction Methods and Activities." These locations are identified in **Table 5A-2**.

**Table 5A-2
Safety Assessment Study Locations
Tonnelle Avenue Staging Area, New Jersey**

North-South Roadway	East-West Roadway
Intersections	
Tonnelle Avenue Ramp	Secaucus Road
Tonnelle Avenue (U.S. Route 1/9)	10th Street
Tonnelle Avenue (U.S. Route 1/9)	Taco Bell Entrance/Exit
Tonnelle Avenue (U.S. Route 1/9)	Wendy's & White Cap Construction Supply (at 1500 Tonnelle Avenue)
Tonnelle Avenue (U.S. Route 1/9)	Dell Avenue
Road Segments	
Tonnelle Avenue (U.S. Route 1/9)	Between Route 3 and NJ TRANSIT Access Road
Tonnelle Avenue (U.S. Route 1/9)	Between the Taco Bell & Wendy's
Tonnelle Avenue (U.S. Route 1/9)	Between 10th Street and Wendy's
Tonnelle Avenue (U.S. Route 1/9)	Between NB Tonnelle Ave Ramp and 10th Street
Tonnelle Avenue (U.S. Route 1/9)	On Northbound Off Ramp to Secaucus Road
Tonnelle Avenue (U.S. Route 1/9)	Unknown (Cross Street not listed on Crash Report)

5A.2.3.1.2 Hoboken Staging Area

The Hoboken staging area traffic study area analysis locations and corresponding traffic controls at each of the study area intersections are summarized in **Table 5A-3**.

**Table 5A-3
Traffic Analysis Locations
Hoboken Staging Area, New Jersey**

Map ID #	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
16*	19th Street and new construction access road *	Future Signalized
Secondary Study Area Intersections		
17	16th Street and Willow Avenue	Signalized
18	16th Street and Park Avenue	Signalized
19	15th Street and Willow Avenue	Signalized
20	15th Street and Park Avenue	Signalized

Note: * = Proposed new intersection would be constructed as part of the Project if this truck route is used.

The Hoboken/Weehawken staging site study areas for the crash analysis covered the traffic study area and the intersections and roadway segments along the Project truck routes described in Chapter 3, "Construction Methods and Activities." These locations are identified in **Table 5A-4**.

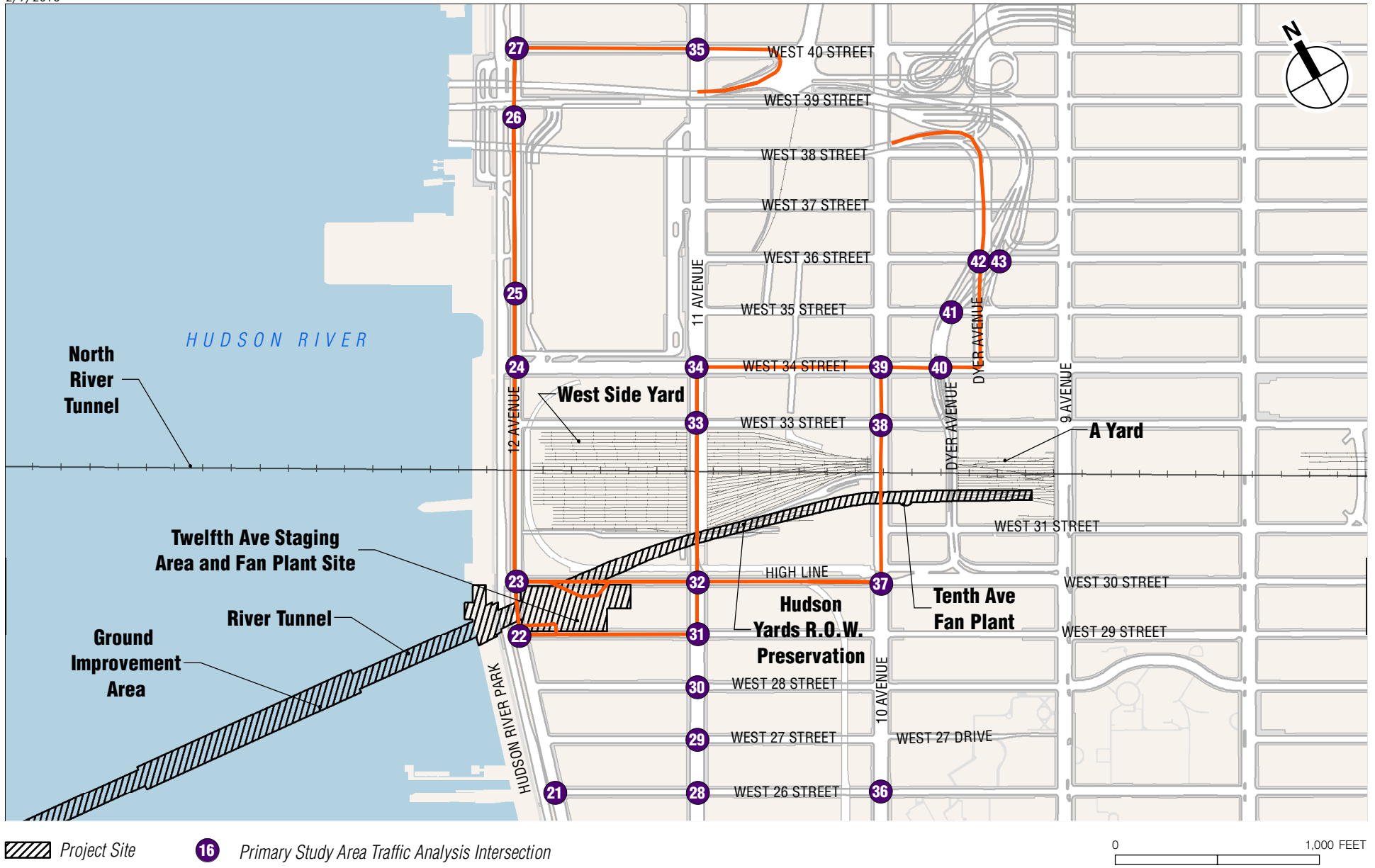
**Table 5A-4
Safety Assessment Study Locations
Hoboken Staging Area, New Jersey**

North-South Roadway	East-West Roadway
<i>Intersections</i>	
JFK Boulevard East	Baldwin Avenue
JFK Boulevard East	N. Marginal Highway
JFK Boulevard East	S. Marginal Highway
Pleasant Avenue	N. Marginal Highway
Pleasant Avenue	S. Marginal Highway
Park Avenue	19th Street
Willow Avenue	18th Street
Willow Avenue	19th Street
<i>Road Segments</i>	
Willow Avenue	Between 16th Street and 18th Street (Overpass)
Willow Avenue	Between 19th and 18th Street (Overpass)
Park Avenue	Between Baldwin Avenue and S. Marginal Highway
Park Avenue	Between 19th Street and LT Helix Overpass
Park Avenue	Between Park Avenue service road divergence and HBLR
Park Avenue	Between 19th Street and Park Avenue service road diverge

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 for trucks traveling to and 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, including Map ID#s, are shown in **Figure 5A-6** and summarized in **Table 5A-5**.



Traffic Analysis Intersections in New York:
Twelfth Avenue Staging Site and Truck Routes
Figure 5A-6

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

Map ID #	Intersection	Control
21	Twelfth Avenue and West 26th Street	Signalized
22	Twelfth Avenue and West 29th Street	Signalized
23	Twelfth Avenue and West 30th Street	Signalized
24	Twelfth Avenue and West 34th Street	Signalized
25	Twelfth Avenue and tow pound exit	Signalized
26	Twelfth Avenue and Pier 79 ferry	Signalized
27	Twelfth Avenue and West 40th Street	Signalized
28	Eleventh Avenue and West 26th Street	Signalized
29	Eleventh Avenue and West 27th Street	Signalized
30	Eleventh Avenue and West 28th Street	Signalized
31	Eleventh Avenue and West 29th Street	Signalized
32	Eleventh Avenue and West 30th Street	Signalized
33	Eleventh Avenue and West 33rd Street	Signalized
34	Eleventh Avenue and West 34th Street	Signalized
35	Eleventh Avenue and West 40th Street	Signalized
36	Tenth Avenue and West 26th Street	Signalized
37	Tenth Avenue and West 30th Street	Signalized
38	Tenth Avenue and West 33rd Street	Signalized
39	Tenth Avenue and West 34th Street	Signalized
40	Dyer Avenue and West 34th Street	Signalized
41	Dyer Avenue and West 35th Street	Signalized
42	Dyer Avenue southbound (SB) and West 36th Street	Signalized
43	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, including Map ID#s, are summarized in **Table 5A-6** and shown in **Figure 5A-7**. These included three sidewalk locations and two crosswalks and seven corner locations adjacent to sidewalk closures.



 Project Site

 Pedestrian Analysis Elements

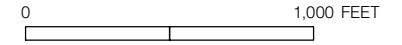


Table 5A-6
Pedestrian Analysis Locations
New York

Map ID#	Location
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

5A.2.3.2.3 Safety Assessment

The Manhattan study area for the crash analysis encompassed the study area for the Project construction sites in Manhattan, including the intersections and roadway segments along the Project truck routes. These locations are identified in **Table 5A-7**.



**Table 5A-7
Safety Assessment Study Locations, New York**

North-South Roadway	East-West Roadway
<i>Intersection</i>	
Tenth Avenue	W. 26th Street
Tenth Avenue	W. 30th Street (Lincoln Tunnel entrance)
Tenth Avenue	W. 31st Street
Tenth Avenue	W. 33rd Street
Tenth Avenue	W. 34th Street
Eleventh Avenue	W. 26th Street
Eleventh Avenue	W. 27th Street
Eleventh Avenue	W. 28th Street
Eleventh Avenue	W. 29th Street
Eleventh Avenue	W. 30th Street
Eleventh Avenue	W. 33rd Street
Eleventh Avenue	W. 34th Street
Eleventh Avenue	W. 40th Street
Twelfth Avenue	W. 26th Street
Twelfth Avenue	W. 27th Street
Twelfth Avenue	W. 28th Street
Twelfth Avenue	W. 29th Street
Twelfth Avenue	W. 30th Street
Twelfth Avenue	W. 33rd Street
Twelfth Avenue	W. 34th Street
Twelfth Avenue	W. 39th Street
Twelfth Avenue	W. 40th Street
Dyer Avenue	W. 34th Street
Dyer Avenue	W. 35th Street (Lincoln Tunnel entrance)
Dyer Avenue	W. 36th Street (Lincoln Tunnel entrance)
<i>Mid-Block Road Segments</i>	
Mid-Block Segment	Between
Tenth Avenue	from W. 29th to W. 30th Street
Tenth Avenue	from W. 31st to W. 33rd Street
Tenth Avenue	from W. 34th to W. 35th Street
Eleventh Avenue	from W. 30th to W. 33rd Street
Eleventh Avenue	from W. 35th to W. 36th Street
Eleventh Avenue	from W. 38th to W. 39th Street
Twelfth Avenue	from W. 28th to W. 29th Street
Twelfth Avenue	from W. 29th to W. 30th Street
Twelfth Avenue	from W. 34th to W. 39th Street
W. 26th Street	from Tenth to Eleventh Avenue
W. 26th Street	from Eleventh to Twelfth Avenue
W. 26th Street	from Ninth to Tenth Avenue
W. 27th Street	from Eleventh to Twelfth Avenue
W. 30th Street	from Tenth to Eleventh Avenue
W. 30th Street	from Eleventh to Twelfth Avenue
W. 30th Street	from Lincoln Tunnel approach to Tenth Avenue
W. 33rd Street	from Lincoln Tunnel approach to Tenth Avenue
W. 34th Street	from Tenth to Eleventh Avenue
W. 34th Street	from Eleventh to Twelfth Avenue
W. 34th Street	from Ninth Avenue to Dyer Avenue
W. 35th Street	from Ninth Avenue to Lincoln Tunnel entrance
W. 36th Street	from Ninth Avenue to Lincoln Tunnel entrance

5A.3 AFFECTED ENVIRONMENT: EXISTING CONDITIONS

5A.3.1 NEW JERSEY

FRA and NJ TRANSIT collected existing traffic volumes in June 2016 and then developed balanced existing traffic volumes 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 TONNELLES AVENUE STAGING AREA

5A.3.1.1.1 Traffic: Commuter Peak Hours

All of the analyzed intersections in the Tonnelles Avenue staging area study area operate at mid-LOS D or better during each of the 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.

A summary of the traffic analysis results is presented in **Table 5A-8** below. As shown in the table, four lane groups (which were generally turning movements) operate at a congested mid-LOS D, E, or F during one or more commuter peak hours. Of the 15 lane groups at signalized intersections examined in the study area, 1 operates at a congested mid-LOS D during the weekday AM, midday, and PM commuter peak hours and the Saturday midday commuter peak hour, representing approximately 7 percent of the lane groups in any given commuter peak hour examined. For the two unsignalized intersections in the study area, two lane groups operate at a congested LOS F during the weekday AM and PM commuter peak hours and the Saturday midday commuter peak hour, with one lane group operating at a congested LOS F during the weekday midday commuter peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.



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

Level of Service	Analysis Peak Hours			
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5:00-6:00	Saturday Midday Commuter Peak Hour 2:00-3:00PM
Lane Groups at 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
Lane Groups at 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 Traffic: Construction Peak Hours for New Tunnel

All of the analyzed intersections in the Tonnelle Avenue staging area study area operate at mid-LOS D or better during each of the construction peak hours for construction of the new tunnel, 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.

A summary of the traffic analysis results is presented in **Table 5A-9**. As shown in the table, 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 (see **Table 5A-9**). Of the 15 lane groups at signalized intersections examined in the study area, 2 and 1 operate at a congested mid-LOS D during the weekday AM and PM construction peak hours, respectively. This represents a range of approximately 14 and 7 percent of the lane groups for those hours respectively. For the two unsignalized intersections in the study area, two lane groups operate at a congested LOS F during the weekday AM construction peak hour, and one lane group operates at a congested LOS F during the weekday PM commuter peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-9
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 Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.3.1.1.3 Traffic: Construction Peak Hours for North River Tunnel Rehabilitation

All of the analyzed intersections in the Tonnelle Avenue staging area study area operate at mid-LOS D or better during each of the construction peak hours for the North River Tunnel rehabilitation, 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.

A summary of the traffic analysis results is presented in **Table 5A-10** below. As shown in the table, four lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more construction peak hours. Of the 15 lane groups at signalized intersections examined in the study area, 2 operate at a congested mid-LOS D during the weekday AM construction peak hour, 1 operates at that level during the PM construction peak hour, and 1 operates at that level in the Saturday midday construction peak hour, representing approximately 6 to 13 percent of the lane groups in any given commuter peak hour examined. For the two unsignalized intersections in the study area, two lane groups operate at a congested LOS F during the weekday AM and PM construction peak hours and the Saturday PM construction peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.



Table 5A-10
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 Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM	Saturday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.3.1.1.4 Safety Assessment

FRA and NJ TRANSIT collected data on vehicle accidents in the Tonnelle Avenue staging site study area, which is presented in **Table 5A-11**. The table provides, by intersection or roadway segment, the total number of reportable crashes (involving fatality, injury or more than \$500 in property damage), the number of fatalities and injuries during the study period, as well as a yearly breakdown of pedestrian- and bicycle-related injuries or fatalities at each intersection.

Overall, a total of 26 reportable crashes occurred at the intersections or roadway segments examined in the Tonnelle Avenue crash study area during the three-year reporting period, none of which resulted in any fatalities. None of these crashes were pedestrian or bicycle-related crashes, and the 26 total crashes over the three-year period did not rise above the 48-crash per 12-month period per intersection criterion to qualify as a high crash location.

Table 5A-11
Tonnelle Avenue Staging Area Crash Summary,
2017-2019

Location	Total Crashes	Total Fatalities	Total Injuries	Total Ped/Bike Injuries
<i>Intersections</i>				
Tonnelle Ave northbound ramp from Secaucus Road	0	0	0	0
Tonnelle Ave at 10th Street	0	0	0	0
Tonnelle Ave at Taco Bell Entrance/Exit	1	0	0	0
Tonnelle Ave at Wendy's & White Cap Construction Supply	7	0	1	0
Tonnelle Ave at Dell Avenue	0	0	0	0
<i>Road Segments</i>				
Tonnelle Ave between Route 3 and NJ Transit Access Road	3	0	0	0
Tonnelle Ave between Taco Bell & Wendy's	12	0	0	0
Tonnelle Ave between 10th Street and Wendy's	1	0	0	0
Tonnelle Ave between NB Tonnelle Ave ramp and 10th Street	1	0	0	0
Tonnelle Ave on northbound off ramp to Secaucus Road	1	0	0	0
Tonnelle Ave at unknown (cross street not listed on crash report)	0	0	5	0
Total	26	0	6	0
Note: During this time there were no crashes involving bicycles or pedestrians in this study area.				
Source: NJDOT, January 1, 2017 to December 31, 2019 crash data.				

5A.3.1.2 HOBOKEN STAGING AREA

5A.3.1.2.1 Traffic: Commuter Peak Hours

A summary of the traffic analysis results for the Hoboken staging area commuter peak hours is presented in **Table 5A-12**. All analyzed intersections operate at mid-LOS D or better during each of the 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. Of the 39 lane groups at signalized intersections examined in the study area, 3, 3, and 5 operate at a congested mid-LOS D, E or F during the weekday AM, midday, and PM commuter peak hours, respectively. This represents a range of approximately 8 to 13 percent of the lane groups in any given commuter peak hour examined. For the one unsignalized intersection in the study area, none of the lane groups operate at congested mid-LOS D or worse during the weekday AM, midday, and PM commuter peak hours. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

5A.3.1.2.2 Traffic: Construction Peak Hours

A summary of the traffic analysis results for the Hoboken staging area construction peak hours is presented in **Table 5A-13**. As shown in the table, all the analyzed intersections operate at mid-LOS D or better during each of the 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. Of the 39 lane groups at signalized intersections examined in the study area, 3 operate at a congested mid-LOS D, E, or F during both the weekday AM and PM construction peak hours, representing approximately 8 percent of the lane groups in any given commuter peak hour examined. For the one unsignalized intersection in the study area, none of the lane groups operate at congested mid-LOS D or worse during the weekday AM or PM construction peak hours. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.



**Table 5A-12
Summary of 2016 Existing Traffic Analysis Results
Hoboken Staging Area, New Jersey
Commuter Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5:00-6:00
Lane Groups at 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
Lane Groups at 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.			

**Table 5A-13
Summary of 2016 Existing Traffic Analysis Results
Hoboken Staging Area, New Jersey
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.3.1.2.3 Traffic: Secondary Study Area for Off-Site Worker Parking Analysis, Weekday Construction Peak Hours

All of the analyzed intersections in the secondary study area that FRA and NJ TRANSIT analyzed for potential effects of construction workers driving to park will operate at mid-LOS D or better during each of the construction peak hours in the existing condition:

One lane group is projected to operate at a congested LOS E during the PM construction peak hour. Of the 18 lane groups at signalized intersections examined within the secondary study area, 1 operates at a congested LOS E during the weekday PM construction peak hour, representing approximately 6 percent of the signalized intersection lane groups in any given construction peak hour examined. For the three unsignalized intersections in the study area, none of the lane groups operate at a congested mid-LOS D or worse during the weekday AM or PM commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-14**.

Table 5A-14
Summary of 2016 Existing Traffic Analysis Results
Secondary Study Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	16	15
Lane Groups at D, below mid-LOS D ¹	2	2
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	1
Lane Groups at LOS F	0	0
Total	18	18
Lane Groups at Unsignalized Intersections		
Lane Groups at LOS A/B/C	7	7
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	7	7
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.3.1.2.4 Safety Assessment

FRA and NJ TRANSIT collected data on vehicle accidents for the Hoboken/Weehawken staging site area, presented in **Table 5A-15**. The table provides, by intersection or roadway segment, the total number of reportable crashes (involving fatality, injury or more than \$500 in property damage), the number of fatalities and injuries during the study period, as well as a yearly breakdown of pedestrian- and bicycle-related injuries or fatalities at each intersection.



**Table 5A-15
Hoboken Staging Area Crash Summary,
2017-2019**

Location	Total				Crashes by Year					
	Total Crashes	Total Fatalities	Total Injuries	Total Ped/Bike Injuries	Pedestrian			Bicycle		
					2014	2015	2016	2014	2015	2016
Intersections										
JFK Blvd East at Baldwin Ave	2	0	0	0	0	0	0	0	0	0
JFK Blvd East at N. Marginal Highway	4	0	0	0	0	0	0	0	0	0
JFK Blvd East at S. Marginal Highway	2	0	0	0	0	0	0	0	0	0
Pleasant Ave at N. Marginal Highway	3	0	0	0	0	0	0	0	0	0
Pleasant Ave at S. Marginal Highway	11	0	2	1	0	0	1	0	0	0
Park Ave at 19th St	47	0	9	0	0	0	0	0	0	0
Willow Ave at 18th St	1	0	0	0	0	0	0	0	0	0
Willow Ave at 19th St	41	0	10	1	1	0	1	0	0	0
Road Segments										
Willow Ave between 16th and 18th Sts (Overpass)	2	0	0	0	0	0	0	0	0	0
Willow Ave between 19th and 18th Sts (Overpass)	4	0	0	0	0	0	0	0	0	0
Park Ave between Baldwin Ave and S. Marginal Highway	1	0	0	0	0	0	0	0	0	0
Park Ave between 19th St and LT Helix Overpass	7	0	3	0	0	0	0	0	0	0
Park Ave between Park Ave service road divergence and Hudson-Bergen Light Rail	8	0	1	0	0	0	0	0	0	0
Park Ave between 19th St and Park Ave service road diverge	0	0	0	0	0	0	0	0	0	0
Total	133	0	25	2	1	0	2	0	0	0
Source: NJDOT, January 1, 2017 to December 31, 2019 crash data.										

Overall, a total of 133 reportable crashes occurred at the intersections or roadway segments examined in the Hoboken/Weehawken crash study area during the three-year reporting period, none of which resulted in fatalities. Three of these crashes were pedestrian-related and none were bicycle crash-related. The intersection of Park Avenue and 19th Street experienced the most reportable crashes (47) of any intersection in the crash study area over the reporting period, of which none were pedestrian or bicycle crashes. This intersection did not exceed the high crash location threshold of 48 total crashes during any 12-month period. The intersection of Pleasant Avenue and South Marginal Highway had one pedestrian crash; and the Willow Avenue and 19th Street intersection had two pedestrian crashes. None of the locations in the study area met the criteria to qualify as a pedestrian/bicycle high crash location.

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.

FRA and NJ TRANSIT collected existing traffic volumes in June 2016 and then developed balanced existing traffic volumes 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. Subsequent to the original 2016 traffic counts, FRA and NJ TRANSIT conducted sample counts in May 2017 to quantify the effects of this change in street direction. They then applied this new information to the analysis of future conditions presented below in Section 5A.4.3.1.

5A.3.3.1.1 Commuter Peak Hours

Intersections in the New York study area 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-16**. Of the 77 lane groups at signalized intersections examined in the study area, 15, 9, and 15 operate at a congested mid-LOS D, E, or F during the weekday AM, midday, and PM commuter peak hours, respectively. This represents a range of 12 to 20 percent of the lane groups in any given weekday commuter peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-16
Summary of 2016 Existing Traffic Analysis Results
New York Study Area
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 12:45- 1:45 PM	Weekday PM Commuter Peak Hour 3:45 – 4:45 PM
Lane Groups at Signalized Intersections			
Lane Groups at LOS A/B/C	56	59	60
Lane Groups at D, below mid-LOS D ¹	6	9	2
Lane Groups at D, above mid-LOS D ²	5	6	7
Lane Groups at LOS E	6	3	5
Lane Groups at LOS F	4	0	3
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.3.3.1.2 Construction Peak Hours

All of the intersections in the New York study area operate at mid-LOS D or better during each of the commuter peak hours. A summary of the traffic analysis results is presented in **Table 5A-17**. Seventeen lane groups (generally turning movements) operate at a congested mid-LOS D, E, or F during one or more peak hours. Of the 77 lane groups at signalized intersections examined in the study area, 13 and 15 operate at a congested mid-LOS D, E, or F during the construction AM and PM peak hours, respectively, representing 17 and 20 percent of the lane groups in the AM



and PM construction peak hours, respectively. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-17
Summary of 2016 Existing Traffic Analysis Results
New York Study Area
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
<i>Lane Groups at Signalized Intersections</i>		
Lane Groups at LOS A/B/C	60	60
Lane Groups at D, below mid-LOS D ¹	4	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	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.3.3.2 PEDESTRIANS

FRA and NJ TRANSIT collected pedestrian volume data in January 2017. When they collected this information, 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 pedestrian analysis results is presented in **Table 5A-18**. Detailed LOS analyses were prepared for each element and are presented in **Appendix 5**.

Table 5A-18
Summary of 2016 Existing Pedestrian Analysis Results
New York Study Area

Level of Service	Analysis Peak Hours		
	Pedestrian Weekday AM Peak Hour 8-9 AM	Pedestrian Weekday Midday Peak Hour Noon-1 PM	Pedestrian Weekday PM Peak Hour 5:30-6:30 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.3.3.3 SAFETY ASSESSMENT

FRA and NJ TRANSIT collected data on vehicle accidents for the New York study area, presented in **Table 5A-19**. The table provides, by intersection, the total number of crashes, the total number of reportable crashes (involving fatality, injury or more than \$1,000 in property damage), the number of fatalities and injuries during the study period, as well as a yearly breakdown of pedestrian- and bicycle-related injuries or fatalities at each intersection.

Overall, a total of approximately 376 reportable crashes occurred in the New York safety study area during the three-year reporting period. Two fatalities and 344 injuries occurred, of which 40 were pedestrian-related and 32 were bicycle crash-related. The intersection of Twelfth Avenue and 34th Street experienced the highest number of reportable crashes (38) of any intersection in the crash study area over the reporting period. Three locations met the *CEQR Technical Manual* criteria for a high crash location, one where 48 total crashes or five or more combined pedestrian and/or bicycle-related crashes have occurred in any consecutive 12-month period. These are the intersections of Tenth Avenue and 26th Street (5 crashes), Tenth Avenue and 34th Street (5 crashes), and Twelfth Avenue and 40th Street (6 crashes).



Table 5A-19

New York Study Area Crash Summary, 2014-2016

Location	Study Period (2014-2016)			Crashes by Year						High Crash Location
	Total Crashes	Total Fatalities	Total Injuries	Pedestrian			Bicycle			
				2012	2013	2014	2012	2013	2014	
Tenth Ave at W. 26th St	12	1	10	2	3	1	0	1	0	*
Tenth Ave at W. 30th St (Lincoln Tunnel entrance)	13	0	14	1	0	0	0	0	1	
Tenth Ave at W. 31st St	13	0	10	0	0	0	0	1	0	
Tenth Ave at W. 33rd St	16	0	17	3	0	1	0	0	1	
Tenth Ave at W. 34th St	26	0	24	3	1	3	1	0	0	*
Eleventh Ave at W. 26th St	4	0	5	0	1	0	0	0	0	
Eleventh Ave at W. 27th St	4	0	2	0	0	0	1	0	0	
Eleventh Ave at W. 28th St	6	0	8	2	0	2	0	0	0	
Eleventh Ave at W. 29th St	7	0	5	0	1	1	0	0	0	
Eleventh Ave at W. 30th St	8	0	8	0	0	0	0	0	0	
Eleventh Ave at W. 33rd St	5	0	6	0	0	0	0	0	0	
Eleventh Ave at W. 34th St	21	0	26	0	1	2	0	1	1	
Eleventh Ave at W. 40th St	36	0	18	2	0	1	0	0	0	
Twelfth Ave at W. 26th St	13	0	15	0	0	0	0	0	0	
Twelfth Ave at W. 27th St	5	0	2	0	0	0	0	0	0	
Twelfth Ave at W. 28th St	3	0	4	0	0	0	0	0	0	
Twelfth Ave at W. 29th St	6	0	1	0	0	0	0	0	0	
Twelfth Ave at W. 30th St	21	0	25	1	0	0	0	0	1	
Twelfth Ave at W. 33rd St	9	0	4	0	1	0	0	0	0	
Twelfth Ave at W. 34th St	38	0	52	1	0	0	0	0	3	
Twelfth Ave at W. 39th St	16	0	12	0	0	0	0	1	2	
Twelfth Ave at W. 40th St	26	0	24	1	1	0	3	3	4	*
Dyer Ave at W. 34th St	9	0	9	0	0	0	0	0	0	
Dyer Ave at W. 35th St (Lincoln Tunnel entrance)	12	0	2	0	0	0	0	0	0	
Dyer Ave at W. 36th St (Lincoln Tunnel entrance)	9	0	5	0	0	0	1	0	0	
Tenth Ave from W. 29th to W. 30th St	1	0	0	0	0	0	0	0	0	
Tenth Ave from W. 31st to W. 33rd St	1	0	1	0	1	0	0	0	0	
Tenth Ave from W. 34th to W. 35th St	1	0	0	0	0	0	0	0	0	
Eleventh Ave from W. 30th to W. 33rd St	1	0	1	0	0	0	0	0	0	
Eleventh Ave from W. 35th to W. 36th St	1	0	0	0	0	0	0	0	0	
Eleventh Ave from W. 38th to W. 39th St	1	0	1	1	0	0	0	0	0	
Twelfth Ave from W. 28th to W. 29th St	1	0	1	0	0	0	0	0	0	
Twelfth Ave from W. 29th to W. 30th St	1	0	0	0	0	0	0	0	0	
Twelfth Ave from W. 34th to W. 39th St	3	1	2	0	0	0	0	1	0	
W. 26th St from Tenth to Eleventh Ave	2	0	4	0	0	0	0	0	0	
W. 26th St from Eleventh to Twelfth Ave	2	0	1	0	0	0	0	1	0	
W. 26th St from Ninth to Tenth Ave	3	0	4	0	0	0	1	0	0	
W. 27th St from Eleventh to Twelfth Ave	1	0	1	0	0	0	0	0	0	
W. 30th St from Tenth to Eleventh Ave	1	0	2	0	0	0	0	0	0	
W. 30th St from Eleventh to Twelfth Ave	1	0	0	0	0	0	0	0	0	
W. 30th St from Lincoln Tunnel approach to Tenth Ave	1	0	0	0	0	0	0	0	0	
W. 33rd St from Lincoln Tunnel approach to Tenth Ave	1	0	0	0	0	0	0	0	0	
W. 34th St from Tenth to Eleventh Ave	4	0	6	0	1	0	0	0	0	
W. 34th St from Eleventh to Twelfth Ave	6	0	6	1	0	0	0	0	2	
W. 34th St from Ninth Ave to Dyer Ave	3	0	5	0	0	0	0	0	0	
W. 35th St from Ninth Ave to Lincoln Tunnel entrance	1	0	0	0	0	0	0	0	0	
W. 36th St from Ninth Ave to Lincoln Tunnel entrance	1	0	1	0	0	0	0	0	1	
Total	376	2	344	18	11	11	7	9	16	

Source: NYCDOT January 1, 2014 to December 31, 2016 crash data.

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 absent the implementation 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 and NJ TRANSIT have made the assumption that the North River Tunnel will remain functional and in operation at least through the EIS analysis year of 2033.

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. Unless the North River Tunnel is closed for an extended period of time or permanently, which is not assumed to happen in this analysis, these changes would be intermittent and limited in duration.

5A.4.1 NEW JERSEY

The analysis of future background conditions considers the future peak year for the Preferred Alternative's construction in each study area. For the DEIS, 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. For this FEIS, because of the delay in the start of Project construction, those peaks would instead occur in 2024 and 2032 at the Tonnelle Avenue staging area, 2025 at the Hoboken staging area, and 2024 at the Twelfth Avenue staging area.

For the New Jersey study areas, FRA and NJ TRANSIT increased existing condition traffic volumes using a 1 percent annual compounded growth rate, consistent with the methodology used for the Access to the Region's Core (ARC) Project FEIS³ and the NJDOT annual commuter growth rate for local roads in Hudson County. They used this rate to predict volumes in 2021, 2022, and 2029, as noted above. 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." For this FEIS, because of the later start of Project construction, those peaks would instead occur in 2024 and 2032 at the Tonnelle Avenue staging area, 2025 at the Hoboken staging area, and 2024 at the Twelfth Avenue staging area. As discussed above (see Section 5A.2.2.1), FRA and NJ TRANSIT have assumed for this FEIS that the total growth they assumed would occur between 2016 and the future analysis years they

³ Federal Transit Administration and NJ TRANSIT, *Access to the Region's Core FEIS*, October 2008, Appendix 3.3.



considered in the DEIS is still appropriate for this FEIS, even though the analysis years are now three years later. In Weehawken and Hoboken, New Jersey, Hudson County is planning a rehabilitation of the Willow Avenue bridge over the HBLR. The design and procurement for that work has not yet begun and the schedule for the project is unknown. Because the rehabilitation project would occur in a congested area on a heavily traveled roadway, it is possible that some of the construction work would occur on off-peak or weekend hours to minimize adverse effects to peak period commuter traffic. In addition, because the Willow Avenue bridge rehabilitation project would have the potential to cause diversions and additional traffic congestion, Hudson County would develop and implement a maintenance and protection of traffic (MPT) plan during the duration of project construction. The MPT plan would be designed to minimize adverse traffic effects during construction to the greatest extent practicable while the rehabilitation work is undertaken.

To provide a future baseline condition, FRA and NJ TRANSIT conducted an analysis of future conditions in the absence of the Preferred Alternative (the No Action condition) 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 *TONNELLE AVENUE STAGING AREA STUDY AREA*

5A.4.1.1.1 *Traffic: 2024 Weekday Commuter Peak Hours*

In the future, three of the analyzed intersections in the Tonnelle Avenue staging area study area will operate at a congested mid-LOS D or worse during each of the 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.

A summary of the traffic analysis results is presented in **Table 5A-20**. 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. Of the 15 lane groups at signalized intersections examined in the study area, 3 will operate at a congested mid-LOS D to LOS E during the weekday AM commuter peak hour, and 1 will operate at a congested mid-LOS D during each of the weekday midday and PM commuter peak hours. This represents a range of approximately 7 to 20 percent of the signalized intersection lane groups in any given commuter peak hour examined. For the two unsignalized intersections in the study area, two lane groups will operate at a congested LOS F during the weekday AM and PM commuter peak hours, and one lane group will operate at LOS F during the midday peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-20
Summary of 2024 Future No Action Condition
Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5:00-6:00
Lane Groups at 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
Lane Groups at 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.4.1.1.2 Traffic: 2024 Weekday Construction Peak Hours

Two of the analyzed intersections in the Tonnelle Avenue staging area study area will operate at a congested mid-LOS D or worse during each of the 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.

A summary of the traffic analysis results is presented in **Table 5A-21**. 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. Of the 15 lane groups at signalized intersections examined in the study area, 2 and 1 will operate at a congested mid-LOS D during the weekday AM and PM construction peak hours, respectively, representing approximately 7 to 13 percent of the signalized intersection lane groups in any given construction peak hour examined. For the two unsignalized intersections in the study area, two lane groups will operate at a congested LOS E or F during the weekday AM and PM construction peak hours. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.



Table 5A-21
Summary of 2024 No Action Condition Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.4.1.1.3 Traffic: 2032 Weekday and Saturday Commuter Peak Hours

Four of the analyzed intersections in the Tonnelle Avenue staging area study area will operate at a congested mid-LOS D or worse during one or more of the commuter peak hours in the No Action condition:

- Tonnelle Avenue (U.S. Route 1/9) at Taco Bell (signalized) will 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) will 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) will 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) will operate at LOS F during all commuter peak hours.

A summary of the traffic analysis results is presented in **Table 5A-22**. 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. Of the 15 lane groups at signalized intersections examined in the study area, 4 lane groups will operate at a congested mid-LOS D, E, or F during the weekday AM commuter peak hour; 1 lane group will operate at a congested mid-LOS D, E, or F during the weekday midday commuter peak hour; 5 lane groups will operate at a congested mid-LOS D, E, or F during the weekday PM commuter peak hour; and 1 lane group will operate at a congested mid-LOS D, E, or F during the Saturday midday commuter peak hour. This represents a range of approximately 7 to 33 percent of the signalized intersection lane groups in any given commuter

peak hour examined. For the two unsignalized intersections in the study area, two lane groups will operate at a congested LOS F during the weekday AM and PM commuter peak hours and the Saturday midday commuter peak hour, with one lane group operating at a congested LOS F during the weekday midday commuter peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-22
Summary of 2032 No Action Condition Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours			
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5:00-6:00	Saturday Midday Commuter Peak Hour 2:00-3:00PM
Lane Groups at 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
Lane Groups at 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.4.1.1.4 Traffic: 2032 Weekday and Saturday Construction Peak Hours

Four of the analyzed intersections in the Tonnelle Avenue staging area study area will operate an unacceptable mid-LOS D or worse during each of the 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.

A summary of the traffic analysis results is presented in **Table 5A-23**. 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. Of the 15 lane groups at signalized intersections examined in the study area, 6 lane groups will operate at a congested mid-LOS D or LOS E during the weekday



AM construction peak hour; 3 lane groups will operate at a congested mid-LOS D or LOS E during the weekday PM construction peak hour; and 1 lane group will operate at a congested mid-LOS D or LOS E during the Saturday midday construction peak hour. This represents a range of approximately 7 to 40 percent of the signalized intersection lane groups in any given construction peak hour examined. For the two unsignalized intersections in the study area, two lane groups will operate at a congested LOS F during both the weekday AM and PM construction peak hours and the Saturday midday construction peak hour. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

**Table 5A-23
Summary of 2032 No Action Alternative Traffic Analysis Results
Tonelle Avenue Staging Area, New Jersey
Construction Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM	Saturday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.4.1.1.5 Safety Assessment

As discussed in Section 5A.3.1.1.4, and indicated in **Table 5A-11**, one intersection in the Tonelle Avenue study area had a maximum of three crashes in a given year (Tonelle Avenue at Wendy's and White Cap Construction Supply), one of which involved an injury. None of those crashes involved pedestrians or bicyclists. No changes to traffic volumes are expected (with the exception of minimal annual background growth) that will affect safety conditions at these locations by the future analysis years.

5A.4.1.2 HOBOKEN STAGING AREA

5A.4.1.2.1 Traffic: 2025 Weekday Commuter Peak Hours

All but one of the analyzed intersections in the Hoboken staging area study area will operate at mid-LOS D or better during each of the 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.

A summary of the traffic analysis results is presented in **Table 5A-24**. 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. Of the 39 lane groups at signalized intersections examined in the study area, 3, 4, and 7 will operate at a congested mid-LOS D, E, or F during the weekday AM, midday, and PM commuter peak hours, respectively. This represents a range of approximately 8 to 18 percent of the signalized intersection lane groups in any given commuter peak hour examined. For the one unsignalized intersection in the study area (19th Street at Harbor Boulevard), none of the five lane groups will operate at a congested mid-LOS D or worse during the weekday AM, midday, or PM commuter peak hours. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

**Table 5A-24
Summary of 2025 No Action Condition Traffic Analysis Results
Hoboken Staging Area, New Jersey
Commuter Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5:00-6:00
Lane Groups at 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
Lane Groups at 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.4.1.2.2 Traffic: 2025 Weekday Construction Peak Hours

All of the analyzed intersections in the Hoboken staging area study area will operate at mid-LOS D or better during each of the construction peak hours in the No Action condition, with one exception, as follows:

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

A summary of the traffic analysis results is presented in **Table 5A-25**. 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. Of the 39 lane groups at signalized intersections examined in the study area, 3 will operate at a congested LOS E or F during both the weekday AM and PM construction peak hours. This represents approximately 8 percent of the signalized intersection lane groups in any given construction peak hour examined. For the one unsignalized intersection in the study area, none of the five lane groups will operate at a congested mid-LOS D or worse



during the weekday AM or weekday PM construction peak hours. The detailed results of the LOS analyses for each time period and analysis location are provided in **Appendix 5**.

Table 5A-25
Summary of 2025 No Action Condition Traffic Analysis Results
Hoboken Staging Area, New Jersey
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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
Lane Groups at 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.4.1.2.3 Traffic: Hoboken Secondary Study Area for Off-Site Worker Parking Analysis, 2025 Weekday Construction Peak Hours

All of the analyzed intersections in the Hoboken secondary study area for worker parking will operate at mid-LOS D or better during each of the construction peak hours in the future No Action condition.

A summary of the traffic analysis results is presented in **Table 5A-26**. One lane group is projected to operate at a congested LOS E during the PM construction peak hour. Of the 18 lane groups at signalized intersections examined within the secondary study area, 1 will operate at a congested LOS E during the weekday PM construction peak hour, representing approximately 6 percent of the signalized intersection lane groups in that peak hour. For the three unsignalized intersections in the study area, none of the lane groups will operate at a congested mid-LOS D or worse during the weekday AM or PM construction peak hours.

**Table 5A-26
Summary of 2025 No Action Condition Traffic Analysis Results
Hoboken Secondary Study Area, New Jersey
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	15	15
Lane Groups at D, below mid-LOS D ¹	3	2
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	0	1
Lane Groups at LOS F	0	0
Total	18	18
Lane Groups at Unsignalized Intersections		
Lane Groups at LOS A/B/C	7	7
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	7	7
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.4.1.2.4 Safety Assessment

As discussed in Section 5A.3.1.2.4, and indicated in **Table 5A-15**, the intersection of Park Avenue and 19th Street in Weehawken experienced the most reportable crashes (47) of any intersection in the Hoboken/Weehawken crash study area over the reporting period, 9 of which involved injuries; none of these crashes was a pedestrian or bicycle crash. During the three-year reporting period, most locations that had crashes resulting in injuries did not involve pedestrians or bicycles; only the intersections of Pleasant Avenue and South Marginal Highway (one crash), and Willow Avenue and 19th Street (two crashes) had pedestrian crashes. No changes to traffic volumes are expected (with the exception of background growth) that will affect safety conditions at these locations.

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 2033 analysis year.

5A.4.3 NEW YORK

5A.4.3.1 TRAFFIC

FRA and NJ TRANSIT projected the future No Action condition traffic volumes in the New York study area 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 is undergoing extensive growth and redevelopment today that will continue 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, FRA and NJ TRANSIT made the following adjustments to the future traffic volumes:

- In April 2017, NYCDOT converted Eleventh Avenue between West 34th Street and West 37th Street from one-way operation to two-way operation. To adjust the original traffic counts collected in June 2016, FRA and NJ TRANSIT conducted sample counts in May 2017 to quantify the effects of this change in street direction. They used these new sample counts and available traffic volume data that was collected when Eleventh Avenue also operated as a two-way street to adjust the existing traffic volumes to reflect the newly implemented two-way operation of this segment of Eleventh Avenue. Specifically, they used traffic data included in the 2009 Western Rail Yard FEIS, an EIS prepared by the Metropolitan Transportation Authority (MTA) and the New York City Planning Commission for the proposed development of mixed-use buildings above the rail yard.⁴
- Based on construction information for the Preferred Alternative and information on the schedule for construction of the Western Rail Yard project (between Eleventh and Twelfth Avenues and West 31st and West 33rd Streets), construction activities are likely to overlap between the two projects. FRA and NJ TRANSIT added the peak construction increment for the Western Rail Yard project, as reported in the 2009 Western Rail Yard FEIS, to the roadway network to account for the effects of construction of that project on the study area road network. Additionally, West 33rd Street between Eleventh and Twelfth Avenues will be closed to facilitate construction of the Western Rail Yard project. FRA and NJ TRANSIT accounted for this closure in the analysis of future conditions and rerouted traffic volumes accordingly.
- FRA and NJ TRANSIT also assumed that the relevant proposed mitigation measures from the 2009 Western Rail Yard FEIS construction analysis would be in place and incorporated them into the analysis where appropriate, as indicated in **Table 5A-27**.
- FRA and NJ TRANSIT also estimated the additional incremental traffic that would result from the many other development projects occurring in the area by using the estimates for future growth for any of those projects that were evaluated in the Western Rail Yard FEIS, and added that traffic to the study area network.
- FRA and NJ TRANSIT prepared new estimates of traffic volumes that would result from the two new private developments that will be completed on the same block as the Preferred Alternative's Twelfth Avenue staging area (Manhattan Block 675, between West 30th and West 29th Streets and Eleventh and Twelfth Avenues). They added the estimated traffic volumes from those developments to the study area network.
- When FRA and NJ TRANSIT collected traffic data in the study area in 2016 and 2017, the Eastern Rail Yard project (between Tenth and Eleventh Avenues and West 31st and West 33rd Streets) was under construction. To accommodate that construction, Eleventh Avenue was reduced to three travel lanes approaching West 30th Street, and West 33rd Street between Tenth and Eleventh Avenues was closed entirely. For the analysis of future conditions for this EIS, FRA and NJ TRANSIT routed traffic volumes to those streets based on the full width of Eleventh Avenue (four travel lanes) and West 33rd Street being open again.

⁴ Metropolitan Transportation Authority and New York City Planning Commission, Western Rail Yard FEIS, October 2009. <https://www1.nyc.gov/site/planning/applicants/env-review/western-rail-yard.page>. This EIS was prepared in connection with approvals by MTA and the New York City Planning Commission related to development of buildings above the rail yard, and differs from the EIS that FRA is now preparing for the Western Rail Yard Infrastructure Project.

**Table 5A-27
Western Rail Yard Project Construction Mitigation
Incorporated into the Analysis**

Intersection	Western Rail Yard 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*
<p>Notes: G = the amount of green phase time, in seconds L = left, T = through, R = right</p> <p>Source: Metropolitan Transportation Authority and New York City Planning Commission, Western Rail Yard FEIS, October 2009.</p>	

To identify the future traffic volumes for the No Action condition (i.e., the future affected environment in the absence of the Preferred Alternative), FRA and NJ TRANSIT added to the existing traffic volumes 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.



5A.4.3.1.1 2024 Commuter Peak Hours

Eight of the analyzed intersections in the New York study area will operate at worse than mid-LOS D during one or more of the 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;
- Tenth Avenue and West 34th Street will operate at an unacceptable LOS D during the weekday PM commuter peak hour;
- 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.

A summary of the traffic analysis results is presented in **Table 5A-28**. Twenty-nine lane groups (generally turning movements) will operate at congested mid-LOS D, E, or F during one or more peak hours. Of the 80 lane groups at signalized intersections examined in the study area, 19, 15, and 23 will operate at a congested mid-LOS D, E, or F during the weekday AM, midday, and PM commuter peak hours, respectively. This represents a range of approximately 19 to 29 percent of the lane groups in any given weekday commuter peak hour. The detailed results of the LOS analyses for each of the analysis time periods are provided in **Appendix 5**.

Table 5A-28
Summary of 2024 No Action Condition Traffic Analysis Results
New York Study Area
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 12:45- 1:45 PM	Weekday PM Commuter Peak Hour 3:45 – 4:45 PM
Lane Groups at Signalized Intersections			
Lane Groups at LOS A/B/C	52	52	53
Lane Groups at D, below mid-LOS D ¹	9	13	4
Lane Groups at D, above mid-LOS D ²	3	7	7
Lane Groups at LOS E	9	3	7
Lane Groups at LOS F	7	5	9
Total	80	80	80
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.			
As noted in Table 5A-27, the future analysis assumes implementation of mitigation described in the 2009 Western Rail Yard FEIS, resulting in a total of three additional lane groups in comparison to existing conditions.			

5A.4.3.1.2 2024 Construction Peak Hours

Four of the analyzed intersections in the New York study area will operate at worse than mid-LOS D during one or more of the construction 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.

A summary of the traffic analysis results is presented in **Table 5A-29**. 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. Of the 80 lane groups at signalized intersections examined in the study area, 15 and 20 will operate at a congested mid-LOS D, E, or F during the weekday AM and PM construction peak hours, respectively. This represents a range of approximately 19 to 25 percent of the signalized intersection lane groups in any given weekday construction peak hour. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

Table 5A-29
Summary of 2024 No Action Condition Traffic Analysis Results
New York Study Area
Construction Peak Hours

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
<i>Lane Groups at Signalized Intersections</i>		
Lane Groups at LOS A/B/C	58	58
Lane Groups at D, below mid-LOS D ¹	7	2
Lane Groups at D, above mid-LOS D ²	2	6
Lane Groups at LOS E	8	7
Lane Groups at LOS F	5	7
Total	80	80
<p>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. As noted in Table 5A-27, the future analysis assumes implementation of the mitigation described in the 2009 Western Rail Yard FEIS, resulting in a total of three additional lane groups in comparison to existing conditions.</p>		

5A.4.3.2 PEDESTRIANS

Pedestrian volumes in the New York study area will increase in the future as a result of general background growth and new pedestrian trips from new development projects.⁵ The redevelopment

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



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. When FRA and NJ TRANSIT evaluated existing pedestrian conditions for 2016, the west sidewalk of Tenth Avenue between West 31st and West 33rd Street was closed because of a construction zone for the Eastern Rail Yard construction. For the future condition, when this sidewalk is again open, FRA and NJ TRANSIT adjusted the crosswalk volumes at these two intersections and the volumes on the east and west sidewalk to reflect the removal of this detour and the reopening of the sidewalk. FRA and NJ TRANSIT used the pedestrian volumes from the 2009 Western Rail Yard FEIS to estimate the future condition pedestrian volumes. In addition, FRA and NJ TRANSIT also incorporated estimated pedestrian volumes that will result from the two new private development projects on the same block as the Twelfth Avenue staging area incorporated into the No Action condition pedestrian volumes.

A summary of the pedestrian analysis results is presented in **Table 5A-30**. Detailed LOS analyses were prepared for each element and are presented in **Appendix 5**.

Table 5A-30
Summary of 2024 No Action Alternative Pedestrian Conditions
New York Study Area

Level of Service	Pedestrian Weekday AM Peak Hour 8-9 AM	Pedestrian Weekday Midday Peak Hour Noon-1 PM	Pedestrian Weekday PM Peak Hour 5:30-6:30 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	5	7
Corners at LOS D	0	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.4.3.2.1 Sidewalks

As shown in **Table 5A-30**, 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 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.

5A.4.3.3 SAFETY ASSESSMENT

As discussed in Section 5A.3.3.3 and indicated in **Table 5A-19**, FRA and NJ TRANSIT identified three intersections in the New York study area as high crash locations: Tenth Avenue and 26th Street, Tenth Avenue and 34th Street, and Twelfth Avenue and 40th Street. Pedestrian and auto volumes will increase in the future in the study area as a result of ongoing development in the area. Some measures to improve the pedestrian environment and increase safety in the study area were identified in the 2009 Western Rail Yard FEIS, and FRA and NJ TRANSIT assume that they will be implemented in the future. These measures may improve traffic flows at Tenth Avenue and 34th Street, but otherwise, pedestrian safety conditions in the No Action condition will not substantially differ from that identified in the existing conditions due to these change in volumes and available pedestrian infrastructure.

5A.5 IMPACTS OF NO ACTION ALTERNATIVE

For purposes of analysis in this FEIS, FRA and NJ TRANSIT have assumed that with the No Action Alternative, the North River Tunnel would remain functional and in operation with ongoing maintenance at least through the FEIS analysis (build) year of 2033. 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 Port Authority Trans-Hudson Corporation (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 20,900 daily weekday Amtrak passenger trips (one-way rides) and up to 189,000 daily weekday NJ TRANSIT passenger trips based on ridership levels prior to COVID-19, on up to approximately 500 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 elect to either shift to alternative mass transit services, which are operating at or near capacity during peak travel hours, or make the trip via automobile on the region's congested roadway system. Either could result in additional congestion on area roadways. Alternatively, some trans-Hudson passengers may elect not to make the trip.

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.



For each study area, the analysis considers a worst-case condition based on peak worker and truck volumes for Project construction, taking into account the activities that would occur on the construction sites. These worst-case conditions would not endure throughout the construction of the Project in each of the study areas, but are used here to present a conservative (worst-case) analysis of the effects that would occur at least some of the time during construction of the Preferred Alternative.

Since publication of the DEIS, the Preferred Alternative has changed as a result of design advancement and in response to public comments. Amtrak has continued to advance the design of the Preferred Alternative, including incorporating design refinements based on further engineering analysis and information. FRA and NJ TRANSIT, in response to comments made during the public comment period and working with the other Project Partners, have identified ways to reduce the impacts of Project construction on local communities near the construction sites in New Jersey and Manhattan. This FEIS includes a revised analysis that reflects the modified Project. As final design and construction advances, the Project Sponsor will identify opportunities to advance the Project more efficiently and with reduced impact through innovation and use of improved technologies, and to leverage private-sector partnerships for procurement methods, project delivery, and long-term maintenance, where practicable.

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

This traffic analysis considers the peak construction activities at the Tonnelle Avenue staging area for both new tunnel construction and North River Tunnel rehabilitation and at the Hoboken staging area during the peak period for new tunnel construction. FRA and NJ TRANSIT used the following assumptions in the analysis.

Based on comments received on the DEIS, design refinement, and coordination with representatives and residents of the Township of Weehawken and nearby communities, FRA and NJ TRANSIT, working with the other Project Partners, evaluated alternative methods for constructing the Preferred Alternative and have incorporated modifications to the construction methods into the Project that will reduce the construction impacts on local residents near the Hoboken staging area. The revised construction methodology involves removing tunnel spoils primarily at Tonnelle Avenue rather than at the Hoboken staging area, which would reduce the construction activities at the Hoboken staging area and would halve the number of hourly construction trucks during peak periods. The DEIS analysis was based on an average of approximately 8 to 16 trucks per hour in each direction (i.e., arriving at and then departing from the Hoboken staging area) during the most intensive construction activity. With the revised staging approach, a maximum of 8 trucks per hour in each direction would travel to and from the Hoboken staging area. Trucks would be carrying construction materials to the site and hauling away construction debris and soil and rock excavated to construct the vertical shaft. FRA and NJ TRANSIT have incorporated these modifications to construction methods, including revisions to estimates of workers and truck volumes, in the revised analyses presented in this FEIS.

Based on preliminary design, this FEIS evaluates peak construction activity for the proposed new Hudson River Tunnel at the Tonnelle Avenue staging area in 2024, when activities related to the construction of the surface alignment (including the new Tonnelle Avenue bridge over the tracks) would overlap with activities related to the new tunnel itself. At that peak time, there would be an estimated maximum of 26 trucks per hour in each direction for all hours of construction, and

between 220 and 328 worker vehicles⁶ arriving at and departing from the site during the AM and PM construction peak hours. This peak activity would occur for approximately 16 months, and during the rest of the construction activity at this location, there would be less traffic.

Rehabilitation of the North River Tunnel would begin after the new tunnel opens for revenue service, with rehabilitation activities beginning in 2029 and completed in 2033. Peak traffic volumes associated with the North River Tunnel rehabilitation at the Tonnelle Avenue staging area would occur in 2032, with an estimated maximum of 17 trucks per hour in each direction for all hours of construction, and between 226 and 452 worker vehicles arriving at and departing from the site during the weekday and Saturday AM and PM construction peak hours. This peak activity would occur for approximately 12 months, and during the rest of the construction activity at this location, fewer trucks and workers would travel to and from the site. Construction activities for the rehabilitation of the North River Tunnel would normally occur six days a week (i.e., weekdays and Saturday).

At the Hoboken staging area, peak traffic volumes associated with the construction of the new tunnel would occur in 2025 during construction of the new ventilation shaft. At that point, there would be a maximum of 8 trucks per hour for all hours of construction, and between 30 and 60 worker vehicles⁷ arriving at and departing from the site during the AM and PM construction peak hours. This peak activity would occur for approximately 24 months, and during the rest of the construction activity at this location, fewer trucks and workers would travel to and from the site. Construction activities for the new tunnel would occur five days a week, Monday through Friday. (In addition, for this FEIS, FRA and NJ TRANSIT also conducted an alternative analysis to evaluate the effects of construction workers parking at off-site garages, as discussed below.)

FRA and NJ TRANSIT conducted the traffic analysis for the study area's commuter peak hours and the construction peak hours. More specifically, this included the following:

- Tonnelle Avenue staging area: weekday AM and PM peak hours in 2024 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 2032, to evaluate the effects of rehabilitation of the North River Tunnel.
- Hoboken staging area: weekday AM and PM peak hours in 2025 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. FRA and NJ TRANSIT used revised daily workforce and truck projections for the construction of the Preferred Alternative 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. They used the following worst-case construction-related traffic volumes in each of the peak hours analyzed:

⁶ An auto occupancy rate, taken from U.S. Census Reverse-Journey-to-Work data for construction workers in the census tracts around the Tonnelle Avenue staging area, of 1.08 persons per vehicle was applied to the worker estimates for the Tonnelle Avenue staging site to determine the resulting number of worker vehicles.

⁷ An auto occupancy rate, taken from US Census Reverse-Journey-to-Work data for construction workers in the census tracts around the Hoboken staging area, of 1.36 persons per vehicle was applied to the worker estimates for the Hoboken staging site to determine the resulting number of worker vehicles.



- Tonnelle Avenue staging area in 2024:
 - AM peak hour total of 272 combined worker and truck trips (52 truck trips [i.e., 26 trucks in each direction] and 220 worker trips).
 - PM peak hour total of 380 combined worker and truck trips (52 truck trips [i.e., 26 trucks in each direction] and 328 worker trips).
- Tonnelle Avenue staging area in 2032:
 - AM peak hour total of 260 combined worker and truck trips (34 truck trips [i.e., 17 trucks in each direction] and 226 worker trips).
 - PM peak hour total of 486 combined worker and truck trips (34 truck trips [i.e., 17 trucks in each direction] and 452 worker trips).
- Hoboken staging area in 2025:
 - AM peak hour total of 46 combined worker and truck trips (16 truck trips [i.e., 8 trucks in each direction] and 30 worker trips).
 - PM peak hour total of 76 combined worker and truck trips (16 truck trips [i.e., 8 trucks in each direction] and 60 worker trips).

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

FRA and NJ TRANSIT evaluated the potential traffic impacts associated with the construction truck routes presented in Chapter 3 and shown in **Figure 5A-1, Figure 5A-2, Figure 5A-3, and Figure 5A-4.**

Because of the working hours and locations of the New Jersey construction staging sites, FRA and NJ TRANSIT assumed for this analysis that all construction workers would drive directly to the construction staging sites in automobiles, and would not use mass transit. FRA and NJ TRANSIT also assumed that some workers would carpool, based on census data for other construction projects in this area. Using census information related to auto occupancy for workers specific to each of the staging areas resulted in an auto occupancy of 1.08 for the Tonnelle Avenue staging area and an auto occupancy of 1.36 for the Hoboken staging area. 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.

For this analysis, FRA and NJ TRANSIT assumed that all construction workers for both the Tonnelle Avenue and Hoboken staging areas would park at each of these respective construction staging areas in New Jersey. In addition, FRA and NJ TRANSIT also undertook an additional analysis for the Hoboken staging area to examine the effects of having off-site worker parking, with workers being shuttled to and from remote parking locations. For each worker shift change, this off-site parking analysis considers the effects of all of the workers on each shift driving directly to or from nearby parking garages instead of to the staging area, and two shuttle van trips in each direction between the Hoboken staging area and the parking garages. For purposes of this analysis, FRA and NJ TRANSIT assumed that workers would park at three parking garages south of the construction staging area in Hoboken, near 14th and 15th Streets. The potential locations for the off-site worker parking are shown in **Figure 5A-5.** This analysis considers the construction peak hours (when shift changes occur), since workers would not drive on roadways in the study area during the regular commuter peak hours. FRA and NJ TRANSIT analyzed the impacts of these workers traveling to the potential off-site parking areas, including the impacts at the secondary study area intersections in Hoboken as well as impacts in the primary study area from the changes in traffic patterns (since workers would no longer be traveling to the Hoboken staging

area). The analysis evaluates traffic impacts of those workers in combination with truck traffic for the Project using each of the potential truck route options.

In addition, after completion of the DEIS, the Project Partners developed a third possible truck route to the Hoboken staging area (see Chapter 3, “Construction Methods and Activities,” Section 3.3.3.4). This alternate route would not use the service roads for Park or Willow Avenues but instead would use a new construction access road running along the north and west sides of the HBLR right-of-way between 19th Street and the staging area. Access to and from this site would be via 19th Street east of Park Avenue/JFK Boulevard. Trucks traveling to the Hoboken staging area using this route would turn left (east) from JFK Boulevard onto 19th Street and then right onto the new access road immediately before the HBLR crossing after passing the Dykes Lumber property. Trucks leaving the site would do the opposite. This new access road, like the two other haul routes, would make use of NJ TRANSIT’s easement through the dog run of the 1700 Park Avenue apartment building but otherwise would shift trucks away from residences on Willow and Park Avenue service roads. This FEIS includes an analysis of the potential effects of this alternative truck route on traffic in the Hoboken/Weehawken study area. The implementation of this truck route would require the installation of a traffic signal on 19th Street at the new access road, which would need to be coordinated with the signals at the intersections of 19th Street with Lincoln Harbor Road and Waterfront Terrace, which are also coordinated with HBLR train operations.

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**.

For each intersection where the analysis indicates that adverse traffic impacts would occur, this section of the EIS also includes an analysis of potential mitigation measures, to determine whether the impacts could be mitigated. For adverse traffic impacts in New Jersey, measures that would reduce the delay increment resulting from the Preferred Alternative, in comparison to the delay with the No Action Alternative, are considered to fully mitigate the impact. Measures that would improve delays resulting from the Preferred Alternative, but by less than 10 seconds relative to the No Action Alternative, are considered to partially mitigate the impact.

5A.6.2.1 *TONNELLE AVENUE STAGING AREA*

5A.6.2.1.1 *2024 Weekday Commuter Peak Hours (New Tunnel Construction)*

In 2024, the peak year for construction of the new Hudson River Tunnel at the Tonnelle Avenue staging area, two lane groups would experience adverse traffic impacts during all commuter peak hours:



- Westbound right-turn movement at Tonnelle Avenue (U.S. Route 1/9) northbound and 10th Street (stop-controlled) would operate at LOS F during the AM and PM commuter peak hours; and
- Westbound right-turn movement at the stop-controlled intersection of Tonnelle Avenue (U.S. Route 1/9) northbound 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 2024 commuter peak hours is presented in **Table 5A-31**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-31
Summary of 2024 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey:
New Tunnel Construction
Commuter Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM
Lane Groups at 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
Lane Groups at 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	2	1	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 2024 Weekday Construction Peak Hours (New Tunnel Construction)

In 2024, the peak year for construction of the new Hudson River Tunnel, a total of four lane groups in the Tonnelle Avenue staging area 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 and PM construction peak hours;
- Southbound 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 Tonnelle Avenue staging area study area for the 2024 construction peak hours is presented in **Table 5A-32**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-32
Summary of 2024 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey:
New Tunnel Construction
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
<i>Lane Groups at Signalized Intersections</i>		
Lane Groups at LOS A/B/C	9	11
Lane Groups at D, below mid-LOS D ¹	2	2
Lane Groups at D, above mid-LOS D ²	3	1
Lane Groups at LOS E	1	1
Lane Groups at LOS F	0	0
Total	15	15
Number of intersections with adverse impacts	2	1
<i>Lane Groups at Unsignalized Intersections</i>		
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.6.2.1.3 Summary of Impacts During New Tunnel Construction

Table 5A-33 summarizes the adverse traffic impacts that would occur in the Tonnelle Avenue staging area study area for both the commuter and construction peak hours in 2024 as a result of activities associated with construction of the new Hudson River Tunnel for the Preferred Alternative.



Table 5A-33
Summary of 2024 Adverse Traffic Impacts
Tonnelle Avenue Staging Area, New Jersey: New Tunnel Construction

Map ID #	Intersection	Commuter Peak Hours			Construction Peak Hours	
		AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 1-2 PM	PM Commuter Peak Hour 5-6 PM	AM Construction Peak Hour 6:30-7:30 AM	PM Construction Peak Hour 2:30-3:30 PM
2	Wendy's and White Cap Const. Supply (1500 Tonnelle Avenue)				NB-T SBT	NBT
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB-R		WB-R	WB-R	
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB-R	WB-R	WB-R	WB-R	WB-R
Total Impacted Intersections/Lane Groups		2/2	1/1	2/2	3/4	2/2
Notes: T = Through, R = Right Turn, WB = Westbound, NB = Northbound.						

5A.6.2.1.4 2032 Weekday and Saturday Commuter Peak Hours (North River Tunnel Rehabilitation)

In 2032, the peak year for construction activities related to rehabilitation of the North River Tunnel, two lane groups in the Tonnelle Avenue staging area study area would experience adverse traffic impacts during one or more commuter peak hours:

- Westbound right-turn movement at Tonnelle 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 Tonnelle 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 in the Tonnelle Avenue staging area study area for the 2032 commuter peak hours is presented in **Table 5A-34**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

Table 5A-34
Summary of 2032 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey:
North River Tunnel Rehabilitation
Commuter Peak Hours

Level of Service	Analysis Peak Hours			
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM	Saturday Midday Commuter Peak Hour 2-3 PM
Lane Groups at 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
Lane Groups at 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.6.2.1.5 2032 Weekday and Saturday Construction Peak Hours (North River Tunnel Rehabilitation)

In 2032, the peak year for construction activities associated with rehabilitation of the North River Tunnel, six lane groups in the Tonnelle Avenue staging area study area 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 F 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 all 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 2032 construction peak hours in the Tonnelle Avenue staging area study area is presented in **Table 5A-35**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

Table 5A-35
Summary of 2032 Preferred Alternative Traffic Analysis Results
Tonnelle Avenue Staging Area, New Jersey:
North River Tunnel Rehabilitation
Construction Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 4:45-5:45 PM	Saturday PM Construction Peak Hour 4:45-5:45 PM
Lane Groups at 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	3	0	1
Lane Groups at LOS F	2	3	1
Total	15	15	15
Number of intersections with adverse impacts	2	2	2
Lane Groups at 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.6.2.1.6 Summary of Impacts During Tunnel Rehabilitation

Table 5A-36 summarizes the adverse traffic impacts that would occur in the Tonnelle Avenue staging area study area in 2032 for both the commuter peak hours and the construction peak hours as a result of construction activities for the rehabilitation of the North River Tunnel.

**Table 5A-36
Summary of 2032 Adverse Traffic Impacts
Tonnelles Avenue Staging Area, New Jersey:
North River Tunnel Rehabilitation**

Map ID #	Intersection	Commuter Peak Hours				Construction Peak Hours		
		Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM	Saturday Midday Commuter Peak Hour 2-3 PM	Weekday AM Constrn Peak Hour 6:30-7:30 AM	Weekday PM Constrn Peak Hour 4:45-5:45 PM	Saturday PM Constrn Peak Hour 4:45-5:45 PM
1	Taco Bell (2020 Tonnelles Avenue / milepost 57)					NB-T SB-T	NB-T SB-T	NB-T
2	Wendy's and White Cap Const. Supply (1500 Tonnelles Avenue)					NB-T	NB-T SB-T	NB-T
3	Tonnelles Avenue (U.S. Route 1/9) northbound at 10th Street			WB-R	WB-R	WB-R	WB-R	WB-R
4	Tonnelles Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB-R	WB-R	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.								

5A.6.2.1.7 Safety Assessment

At the Tonnelles Avenue staging area study area, construction of the Preferred Alternative would add approximately 26 truck trips per hour weekdays between 7 AM and 11 PM, and 226 and 334 worker trips during the AM and PM construction peak hours (for shift changes), respectively, during the 2024 analysis year for the construction of the new tunnel along the route detailed in **Figure 5A-1**. The Preferred Alternative would add approximately 17 truck trips per hour weekdays and Saturdays between 7 AM and 3 AM, and 226 and 452 worker trips during the AM and PM construction peak hours (for shift changes), respectively, during the 2032 analysis year along the route detailed in **Figure 5A-1**. Pedestrian traffic along Tonnelles Avenue is minimal and none of the study area intersections were identified as high crash locations. As described in Chapter 3, "Construction Methods and Activities," in Sections 3.3.2.6 and 3.3.2.7, respectively, workers would park at and trucks would carry materials and remove debris/spoils from the Tonnelles Avenue staging site for new tunnel construction and for the rehabilitation of the North River Tunnel. The additional vehicle trips associated with construction would not be likely to adversely affect safety conditions.

5A.6.2.1.8 Identification and Evaluation of Mitigation

Following completion of the DEIS, FRA and NJ TRANSIT identified a new mitigation measure for the Tonnelles Avenue staging area study area that would address many of the adverse traffic impacts identified there. The new measure is installation of a new traffic signal at the entrance to the Tonnelles Avenue staging area, so that trucks would no longer have to travel south past the staging area to make a U-turn. Installation of this traffic signal, which would create a new intersection at the driveway, would require approval from NJDOT, which has jurisdiction for Tonnelles Avenue (U.S. Routes 1 and 9). The discussion that follows describes the mitigation measures that could be used if no new signal is installed as well as measures needed if a new signal is installed.

5A.6.2.1.8.1 Mitigation Measures Not Including New Intersection

FRA and NJ TRANSIT identified full mitigation measures at one of the four study area intersections in the Tonnelle Avenue staging area study area where adverse impacts would occur as a result of the Preferred Alternative in one or more peak hours. FRA and NJ TRANSIT also identified partial mitigation measures at one study area intersection. These measures are summarized in **Table 5A-37** and described below.

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 2032 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 2032 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 24 seconds fully mitigates the adverse impacts to the southbound through movement and partially mitigates the adverse impact to the northbound through movement during the 2024 AM construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact for the northbound through movement.
- Changing the maximum green time of the eastbound phase from 40 seconds to 25 seconds fully mitigates the adverse impact to the northbound through movement during the 2024 PM and 2032 AM construction peak hours.
- Changing the maximum green time of the eastbound phase from 40 seconds to 26 seconds partially mitigates the adverse impact to the northbound and southbound through movements during the 2032 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 19 seconds partially mitigates the adverse impact to the northbound through movement during the 2032 Saturday construction peak hour. While delay per vehicle would decrease, this would remain an adverse impact.

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: 2024 AM, 2024 PM, 2032 PM and Saturday commuter peak hours, 2024 AM, 2032 AM, 2032 PM and 2032 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.

Table 5A-37
Identified Mitigation Measures
During Construction of the Preferred Alternative,
Tonnelle Avenue Staging Area, New Jersey
Not Including New Intersection at Site Driveway

Map ID #	Intersection	Movement	Mitigation Measure
2024 (Construction of New Tunnel)			
AM Commuter Peak Hour			
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB right-turn	Impact cannot be fully mitigated
AM Construction Peak Hour			
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Partial Mitigation: Change EB max green time from 40 sec to 24 sec
		SB Through	Change EB max green time from 40 sec to 24 sec
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
Midday Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB right-turn	Impact cannot be fully mitigated
PM Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB right-turn	Impact cannot be fully mitigated
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
PM Construction Peak Hour			
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Change EB max green time from 40 sec to 25 sec
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB right-turn	Impact cannot be fully mitigated
2032 (Rehabilitation of North River Tunnel)			
AM Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
AM Construction Peak Hour			
1	Tonnelle Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelle Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
		SB Through	Impact cannot be fully mitigated
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Change EB max green time from 40 sec to 25 sec
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
Midday Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
PM Commuter Peak Hour			
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated



**Table 5A-37 (Cont'd)
Identified Mitigation Measures
During Construction of the Preferred Alternative,
Tonnelles Avenue Staging Area, New Jersey
Not Including New Intersection at Site Driveway**

Map ID #	Intersection	Movement	Mitigation Measure
2032 (Rehabilitation of North River Tunnel) - Cont'd			
PM Construction Peak Hour			
1	Tonnelles Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelles Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
		SB Through	Impact cannot be fully mitigated
2	Tonnelles Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelles Avenue)	NB Through	Partial Mitigation: Change EB max green time from 40 sec to 26 sec
		SB Through	Partial Mitigation: Change EB max green time from 40 sec to 26 sec
3	Tonnelles Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelles Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
Saturday Midday Commuter Peak Hour			
3	Tonnelles Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelles Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated
Saturday Midday Construction Peak Hour			
1	Tonnelles Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelles Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
2	Tonnelles Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelles Avenue)	NB Through	Partial Mitigation: Change EB max green time from 40 sec to 19 sec
3	Tonnelles Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact cannot be fully mitigated
4	Tonnelles Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact cannot be fully mitigated

5A.6.2.1.8.2 Mitigation Measures Including New Intersection

For the FEIS, FRA and NJ TRANSIT evaluated a new mitigation measure that was not included in the DEIS—introduction of a new traffic signal at the site driveway for the Tonnelles Avenue staging area. With this new measure, the driveway accessing the construction site at 1801 Tonnelles Avenue would be redesigned as a signalized (actuated) intersection. This would require the removal of the island and jersey barrier that currently prevent traffic exiting from the site driveway from turning left onto northbound Tonnelles Avenue; it would also require the installation of a traffic signal. This would allow truck and worker traffic to turn left from the driveway and head northbound, as opposed to heading south to make a U-turn to continue northward.

With the introduction of the new intersection, workers would no longer need to turn around at the jughandle and truck traffic would no longer need to turn around at Secaucus Road. This would greatly reduce the construction-related traffic at intersections on Tonnelles Avenue south of the construction staging area, so that some of the predicted traffic impacts would no longer occur. FRA and NJ TRANSIT evaluated this mitigation measure in this FEIS. The final truck route(s) to be used, including this proposed change to the street system on Tonnelles Avenue, will be determined by the Project Sponsor and in coordination and with the approval of NJDOT and any required local municipality (Township of North Bergen) during final design of the Project. The detailed results of the mitigation condition LOS analyses for each peak time period analyzed and location are provided in **Appendix 5**.

For the scenario with a new intersection because of the introduction of the signal, FRA and NJ TRANSIT identified full mitigation measures at two of the four study area intersections where adverse impacts would occur in one or more peak hours as a result of construction activities for the Preferred Alternative. These measures are summarized in **Table 5A-38** and described below.

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 2032 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 2032 AM and PM construction peak hours.

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

- Signalizing the intersection of the 1801 Tonnelle Avenue driveway and Tonnelle Avenue would decrease volumes at this intersection sufficiently to mitigate the adverse impact to the northbound through movement during the 2024 AM and PM construction peak hours.
- Signalizing the intersection of the 1801 Tonnelle Avenue driveway and Tonnelle Avenue would decrease volumes at this intersection sufficiently to mitigate the adverse impact to the southbound through movement during the 2024 AM and 2032 PM construction peak hours.
- Changing the maximum green time of the eastbound phase from 40 seconds to 25 seconds fully mitigates the adverse impact to the northbound through movement during the 2032 AM construction peak hour.
- Changing the maximum green time of the eastbound phase from 40 seconds to 23 seconds fully mitigates the adverse impact to the northbound through movement during the 2032 PM construction peak hour.
- Changing the maximum green time of the eastbound phase from 40 seconds to 16 seconds fully mitigates the adverse impact to the northbound through movement during the 2032 Saturday construction peak hour.

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

- Signalizing the intersection of the 1801 Tonnelle Avenue driveway and Tonnelle Avenue would decrease volumes at this intersection sufficiently to mitigate the adverse impact to the westbound right-turn movement during the 2024 AM, 2024 PM, 2032 PM and Saturday commuter peak hours.
- Feasible mitigation measures could not be identified to address the adverse impacts to the westbound right-turn movement during 2024 AM, 2032 AM, 2032 PM and 2032 Saturday construction peak hours.

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

- Signalizing the intersection of the 1801 Tonnelle Avenue driveway and Tonnelle Avenue would decrease volumes at this intersection sufficiently to mitigate the adverse impact to the westbound right-turn movement during each of the commuter peak hours.
- Feasible mitigation measures could not be identified to address the adverse impacts to the westbound right-turn movement during all construction peak hours.



**Table 5A-38
Identified Mitigation Measures
During Construction of the Preferred Alternative
with Signalized 1801 Tonnelle Avenue,
Tonnelle Avenue Staging Area, New Jersey**

Map ID #	Intersection	Movement	Mitigation Measure
2024 (Construction of New Tunnel)			
AM Commuter Peak Hour			
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
AM Construction Peak Hour			
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
		SB Through	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
Midday Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
PM Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
PM Construction Peak Hour			
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
2032 (Rehabilitation of North River Tunnel)			
AM Commuter Peak Hour			
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
AM Construction Peak Hour			
1	Tonnelle Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelle Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
		SB Through	Impact cannot be fully mitigated
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Impact fully mitigated: Change EB max green time from 40 sec to 25 sec
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
Midday Commuter Peak Hour			
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)

Table 5A-38 (Cont'd)
Identified Mitigation Measures
During Construction of the Preferred Alternative
with Signalized 1801 Tonnelle Avenue,
Tonnelle Avenue Staging Areas, New Jersey

Map ID #	Intersection	Movement	Mitigation Measure
2032 (Rehabilitation of North River Tunnel) – Cont'd			
PM Construction Peak Hour			
1	Tonnelle Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelle Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
		SB Through	Impact cannot be fully mitigated
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Impact fully mitigated: Change EB max green time from 40 sec to 23 sec
		SB Through	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
Saturday Midday Commuter Peak Hour			
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact fully mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
Saturday Midday Construction Peak Hour			
1	Tonnelle Avenue (U.S. Route 1/9) intersection at Taco Bell (2020 Tonnelle Avenue/milepost 57)	NB Through	Impact cannot be fully mitigated
2	Tonnelle Avenue (U.S. Route 1/9) intersection at Wendy's & White Cap Construction Supply (1500 Tonnelle Avenue)	NB Through	Impact fully mitigated: Change EB max green time from 40 sec to 16 sec
3	Tonnelle Avenue (U.S. Route 1/9) northbound at 10th Street	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)
4	Tonnelle Avenue (U.S. Route 1/9) northbound at entrance ramp from Secaucus Road	WB Right-turn	Impact partially mitigated: Signalize 1801 Tonnelle Ave (decrease in volume at this intersection)

5A.6.2.2 HOBOKEN STAGING AREA

FRA and NJ TRANSIT evaluated traffic impacts associated with three different potential truck routes for accessing the Hoboken staging area: haul route Option 1, entering via the Park Avenue service road, exiting via the Willow Avenue service road (**Figure 5A-2**); haul route Option 2, with its entrance and exit via the Willow Avenue service roads (**Figure 5A-3**); haul route Option 3, which would extend along the north and west side of the HBLR tracks from Park Avenue, continuing behind the Dykes Lumber property, and joining 19th Street at a reconfigured intersection beside the HBLR at-grade crossing (**Figure 5A-4**).

5A.6.2.2.1 Haul Route Option 1

5A.6.2.2.1.1 2025 Weekday Commuter Peak Hours

In 2025, the peak construction year evaluated for the Hoboken staging area, construction traffic associated with the Preferred Alternative using haul route Option 1 would not result in adverse traffic impacts at any of the analysis locations during the commuter peak hour.

A summary of the traffic analysis results for the 2025 commuter peak hours with haul route Option 1 is presented in **Table 5A-39**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.



Table 5A-39
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 1: Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM
Lane Groups at 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	1	1	1
Lane Groups at LOS F	2	1	2
Total	39	39	39
Number of intersections with adverse impacts	0	0	0
Lane Groups at Unsignalized Intersections			
Lane Groups at LOS A/B/C	3	5	4
Lane Groups at D, below mid-LOS D ¹	2	0	1
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.6.2.2.1.2 2025 Weekday Construction Peak Hours: Construction Workers Parking at the Staging Area

In 2025, construction traffic associated with the Preferred Alternative using haul route Option 1 with all construction workers parking at the staging area 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 E during the weekday PM construction peak hour; 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 2025 construction peak hours with haul route Option 1 and all workers parking on-site is presented in **Table 5A-40**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-40
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 1: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking at the Staging Area)**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	32	32
Lane Groups at D, below mid-LOS D ¹	4	4
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
Number of intersections with adverse impacts	1	2
Lane Groups at 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.6.2.2.1.3 2025 Construction Peak Hours: Construction Workers Parking Off-Site

In 2025, construction traffic associated with haul route Option 1 and off-site worker parking would result in adverse traffic impacts on four lane groups at intersections in the Hoboken staging area study area during the PM construction peak hour:

- Northbound left-turn/through/right-turn movement at the 19th Street and Willow Avenue intersection would operate at LOS E during the weekday PM construction peak hour;
- Westbound left-turn movement at the 19th Street and Park Avenue intersection would operate at LOS F during the weekday PM construction peak hour;
- Southbound through movement at the 16th Street and Park Avenue intersection would operate at LOS E during the weekday PM construction peak hour; and
- Eastbound left-turn/right-turn movement at the 15th Street and Willow Avenue intersection would operate at LOS F during the weekday PM construction peak hour.

A summary of the traffic analysis results for the 2025 construction peak hours for the haul route Option 1 and off-site worker parking is presented in **Table 5A-41**.



Table 5A-41
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 1: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking Off-Site)

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	47	46
Lane Groups at D, below mid-LOS D ¹	7	5
Lane Groups at D, above mid-LOS D ²	0	1
Lane Groups at LOS E	1	2
Lane Groups at LOS F	2	3
Total	57	57
Number of intersections with adverse impacts	0	4
Lane Groups at 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.6.2.2.1.4 Haul Route Option 1 Summary of Impacts

Table 5A-42 summarizes the traffic impacts that would result from construction activities at the Hoboken staging area in commuter and construction peak hours with the use of haul route Option 1, with all construction workers parking at the staging area and with workers parking off-site.

**Table 5A-42
Summary of 2025 Adverse Traffic Impacts
Hoboken Staging Area, New Jersey
Haul Route Option 1**

Map ID #	Intersection	Commuter Peak Hours			Construction Peak Hours	
		Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Construction Workers Parking at the Staging Area						
7	19th Street and Willow Avenue					NB-LTR
8	19th Street and Park Avenue				WB-L	WB-L
Total Impacted Intersections/ Lane Groups		0/0	0/0	0/0	1/2	2/2
Construction Workers Parking Off-Site						
7	19th Street and Willow Avenue					NB-LTR
8	19th Street and Park Avenue					WB-L
18	16th Street and Park Avenue					SBT
19	15th Street and Willow Avenue					EBLR
Total Impacted Intersections/ Lane Groups		0/0	0/0	0/0	0/0	4/4
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound.						

5A.6.2.2.2 Haul Route Option 2

5A.6.2.2.2.1 2025 Weekday Commuter Peak Hours

In 2025, construction traffic associated with the Preferred Alternative using haul route Option 2 would result in adverse traffic impacts on one lane group during two 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.

A summary of the traffic analysis results for the 2025 commuter peak hours with haul route Option 2 is presented in **Table 5A-43**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

5A.6.2.2.2.2 2025 Weekday Construction Peak Hours: Construction Workers Parking at the Staging Area

In 2025, construction traffic associated with the Preferred Alternative using haul route Option 2, with all construction workers parking at the staging area, 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 E during the weekday PM construction peak hour; 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.



Table 5A-43
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 2: Hoboken Staging Area, New Jersey
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM
<i>Lane Groups at Signalized Intersections</i>			
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	4
Lane Groups at LOS E	1	1	1
Lane Groups at LOS F	2	1	2
Total	39	39	39
Number of intersections with adverse impacts	1	0	1
<i>Lane Groups at Unsignalized Intersections</i>			
Lane Groups at LOS A/B/C	3	5	4
Lane Groups at D, below mid-LOS D ¹	2	0	1
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.			

A summary of the traffic analysis results for the 2025 construction peak hours with haul route Option 2 and all workers parking on-site is presented in **Table 5A-44**. The detailed results of the LOS analyses for each time period are provided in **Appendix 5**.

**Table 5A-44
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 2: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking at the Staging Area)**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at 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
Number of intersections with adverse impacts	1	2
Lane Groups at 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.6.2.2.2.3 2025 Construction Peak Hours: Construction Workers Parking Off-Site

In 2025, construction traffic associated with the haul route Option 2 and off-site worker parking would result in adverse traffic impacts on four lane groups at intersections in the Hoboken staging area study area during one or more of the construction peak hours:

- Westbound left-turn movement at the 19th Street and Willow Avenue intersection would operate at LOS F during the AM and PM peak hours;
- Northbound left-turn/through/right-turn movement at the 19th Street and Willow Avenue intersection would operate at LOS E during the PM peak hour;
- Southbound through movement at the 16th Street and Park Avenue intersection would operate at LOS E during the PM peak hour; and
- Eastbound left-turn/right-turn movement at the 15th Street and Willow Avenue intersection would operate at LOS F during the PM peak hour.

A summary of the traffic analysis results for the 2025 construction peak hours for haul route Option 2 and off-site worker parking is presented in **Table 5A-45**.

5A.6.2.2.2.4 Haul Route Option 2 Summary of Impacts

Table 5A-46 summarizes the traffic impacts that would result from construction activities at the Hoboken staging area in commuter and construction peak hours with the use of haul route Option 2, with all construction workers parking at the staging area and with workers parking off-site.



**Table 5A-45
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 2: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking Off-Site)**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	47	46
Lane Groups at D, below mid-LOS D ¹	7	6
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	1	2
Lane Groups at LOS F	2	3
Total	57	57
Number of intersections with adverse impacts	1	3
Lane Groups at 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.		

**Table 5A-46
Summary of 2025 Adverse Traffic Impacts
Hoboken Staging Area, New Jersey
Haul Route Option 2**

Map ID #	Intersection	Commuter Peak Hours			Construction Peak Hours	
		Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Construction Workers Parking at the Staging Area						
7	19th Street and Willow Avenue	WB-L		WB-L	WB-L	WB-L NB-LTR
Total Impacted Intersections/ Lane Groups		1/1	0/0	1/1	1/1	1/2
Construction Workers Parking Off-Site						
7	19th Street and Willow Avenue	WB-L		WB-L	WB-L	WB-L NB-LTR
18	16th Street and Park Avenue					SBT
19	15th Street and Willow Avenue					EBLR
Total Impacted Intersections/ Lane Groups		1/1	0/0	1/1	1/1	3/4
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound.						

5A.6.2.2.3 Haul Route Option 3

5A.6.2.2.3.1 2025 Weekday Commuter Peak Hours

In 2025, construction traffic associated with haul route Option 3 would result in no adverse traffic impacts during the commuter peak hours. A summary of the traffic analysis results for the 2025 commuter peak hours with haul route Option 3 is presented in **Table 5A-47**.

**Table 5A-47
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 3: Hoboken Staging Area, New Jersey
Commuter Peak Hours**

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM
Lane Groups at Signalized Intersections			
Lane Groups at LOS A/B/C	34	35	31
Lane Groups at D, below mid-LOS D ¹	4	2	3
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	41	41	41
Number of intersections with adverse impacts	0	0	0
Lane Groups at Unsignalized Intersections			
Lane Groups at LOS A/B/C	3	5	4
Lane Groups at D, below mid-LOS D ¹	2	0	1
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.6.2.2.3.2 2025 Weekday Construction Peak Hours: Construction Workers Parking at the Staging Area

In 2025, construction traffic associated with the Preferred Alternative using haul route Option 3, with all workers parking at the staging area, would result in no adverse traffic impacts during the construction peak hours.

A summary of the traffic analysis results for haul route Option 3 for the 2025 construction peak hours is presented in **Table 5A-48**.



Table 5A-48
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 3: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking at the Staging Area)

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	34	34
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	3
Total	41	41
Number of intersections with adverse impacts	0	0
Lane Groups at 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.6.2.2.3.3 2025 Construction Peak Hours: Construction Workers Parking Off-Site

In 2025, construction traffic associated with haul route Option 3 and off-site worker parking would result in adverse traffic impacts on two lane groups at intersections in the Hoboken staging area study area during the PM construction peak hour:

- Southbound through movement at the 16th Street and Park Avenue intersection would operate at LOS E during the PM peak hour; and
- Eastbound left-turn/right-turn at the 15th Street and Willow Avenue intersection would operate at LOS F during the PM peak hour.

A summary of the traffic analysis results for the 2025 construction peak hours for haul route Option 3 and off-site worker parking is presented in **Table 5A-49**.

Table 5A-49
Summary of 2025 Preferred Alternative Traffic Analysis Results
Haul Route Option 3: Hoboken Staging Area, New Jersey
Construction Peak Hours (Workers Parking Off-Site)

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	48	48
Lane Groups at D, below mid-LOS D ¹	8	6
Lane Groups at D, above mid-LOS D ²	0	0
Lane Groups at LOS E	1	2
Lane Groups at LOS F	2	3
Total	59	59
Number of intersections with adverse impacts	0	2
Lane Groups at 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.6.2.2.3.4 Haul Route Option 3 Summary of Impacts

Table 5A-50 summarizes the traffic impacts that would result from construction activities at the Hoboken staging area in commuter and construction peak hours with the use of haul route Option 3, with all construction workers parking at the staging area and with workers parking off-site.



**Table 5A-50
Summary of 2025 Adverse Traffic Impacts
Hoboken Staging Area, New Jersey
Haul Route Option 3**

Map ID #	Intersection	Commuter Peak Hours			Construction Peak Hours	
		Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 1-2 PM	Weekday PM Commuter Peak Hour 5-6 PM	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Construction Workers Parking at the Staging Area						
No impacts		—	—	—	—	—
Total Impacted Intersections/Lane Groups		0/0	0/0	0/0	0/0	0/0
Construction Workers Parking Off-Site						
18	16th Street and Park Avenue					SBT
19	15th Street and Willow Avenue					EBLR
Total Impacted Intersections/Lane Groups		0/0	0/0	0/0	0/0	2/2
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound.						

5A.6.2.2.4 Safety Assessment

At the Hoboken staging area study area, construction of the Preferred Alternative would add a maximum of 8 truck trips per hour weekdays between 7 AM and 11 PM, and 30 and 60 worker trips during the AM and PM construction peak hours (for shift changes), respectively, along the truck routes for the construction of the new tunnel along the routes detailed in **Figure 5A-2**, **Figure 5A-3**, and **Figure 5A-4**. Turning construction vehicles would result in conflicting movements with pedestrians at the intersections of 19th Street with Park Avenue, 19th Street with Willow Avenue, and, for haul route Option 3, at the intersection of 19th Street and the new haul route access point. None of the study area intersections were identified as high crash locations. The intersection of 19th Street and Willow Avenue has high-visibility crosswalks. The west crosswalk at the intersection of 19th Street and Park Avenue is a high-visibility crosswalk, while the remaining crosswalks are striped as basic transverse crosswalks. The hourly weekday increase in truck or construction worker shift change trips in this area would not be large enough to adversely affect safety conditions. However, to increase pedestrian visibility at intersections on 19th Street, the Project Sponsor will coordinate with the Township of Weehawken to restripe the remaining crosswalks at 19th Street and Park Avenue to high-visibility crosswalks if haul route Options 2 and/or 3 are selected. The Project Sponsor will also coordinate with the Township of Weehawken to provide high-visibility crosswalks at the new intersection of the haul route and 19th Street in haul route Option 3 if that route is selected.

If all workers park off-site rather than at the Hoboken staging area (as discussed in the introduction to Section 5A.6.2), there would be fewer workers moving through the area, which would reduce the potential safety issues.

5A.6.2.2.5 Identification and Evaluation of Mitigation

FRA and NJ TRANSIT identified full mitigation measures at each of the two study area intersections where adverse impacts would occur in one or more peak hours in the scenario where construction workers would park at the Hoboken staging area—the intersections of 19th Street at Park Avenue and 19th Street at Willow Avenue. These measures are summarized in **Table 5A-51** and described below.

**Table 5A-51
Identified Mitigation Measures
During Construction of the Preferred Alternative,
Hoboken Staging Area, New Jersey**

Map ID #	Intersection	Movement	Mitigation Measure
Haul Route Option 1			
AM Construction Peak Hour			
8	19th Street and Park Avenue	WB Left-turn	Provide leading protected WB left turn (22 sec) to match EB protected left turn
PM Construction Peak Hour			
7	19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 1 sec green time from SB phase to NB phase
8	19th Street and Park Avenue	WB Left-turn	Provide leading protected WB left turn (22 sec) to match EB protected left turn
Haul Route Option 2			
AM Commuter Peak Hour			
7	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
PM Commuter Peak Hour			
7	19th Street and Willow Avenue	WB Left-turn	Shift 1 sec green time from SB phase to EB/WB phase
AM Construction Peak Hour			
7	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 2 sec green time from SB phase to EB/WB
PM Construction Peak Hour			
7	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 1 sec green time from SB phase to EB/WB
Haul Route Option 3			
AM & PM Construction Peak Hours			
No adverse impacts identified			
AM, Midday, & PM Commuter Peak Hours			
No adverse impacts identified			
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.			

19th Street and Willow 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 2025 PM construction peak hour (haul route Option 1).
- 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 2025 AM commuter peak hour (haul route Option 2).
- 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 2025 PM commuter peak hour (haul route Option 2).
- Shifting two 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 2025 AM construction peak hour (haul route Option 2).
- Shifting one second 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 2025 PM construction peak hour (haul route Option 2).



- 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 2025 PM construction peak hour (haul route Option 2).

19th Street and Park Avenue (signalized)

- 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 2025 AM and PM construction peak hours (haul route Option 1).

5A.6.2.2.6 Hoboken Staging Area (Off-Site Worker Parking Scenario)

Table 5A-52 summarizes the impacted intersections for the traffic study area in the scenario where workers park off-site at garages in Hoboken, for the three truck route options and the corresponding measures taken to mitigate adverse impacts. Those mitigation measures are summarized below:

Table 5A-52
Identified Mitigation Measures
During Construction of the Preferred Alternative with Off-Site Worker Parking,
Hoboken Staging Area, New Jersey

Map ID #	Intersection	Movement	Mitigation Measure
Haul Route Option 1			
AM Construction Peak Hour			
No adverse impacts identified			
PM Construction Peak Hour			
7	19th Street and Willow Avenue	NB Left-turn / Through / Right-turn	Shift 1 sec green time from SB phase to NB phase
8	19th Street and Park Avenue	WB Left-turn	Shift 1 sec green time from NB/SB phase to EB/WB phase
18	16th Street and Park Avenue	SB Left-turn	Shift 2 sec green time from EBR phase to SB phase
19	15th Street and Willow Avenue	EB Left-turn/ Through / Right-turn	Shift 1 sec green time from the NB/SB phase to the EB/WB phase
Haul Route Option 2			
AM Commuter Peak Hour			
7	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
PM Commuter Peak Hour			
7	19th Street and Willow Avenue	WB Left-turn	Shift 1 sec green time from SB phase to EB/WB phase
AM Construction Peak Hour			
7	19th Street and Willow Avenue	WB Left-turn	Switch 1 sec of green time from SB phase to EB/WB phase
PM Construction Peak Hour			
7	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 1 sec green time from SB phase to EB/WB phase
18	16th Street and Park Avenue	SB Through	Shift 2 sec from EBR phase to SB phase
19	15th Street and Willow Avenue	EB Left-turn/ Through / Right-turn	Shift 1 sec from EB/WB to NB/SB phase
Haul Route Option 3			
AM Construction Peak Hour			
No adverse impacts identified			
PM Construction Peak Hour			
18	16th Street and Park Avenue	SB Through	Shift 2 sec from EBR to SB phase
19	15th Street and Willow Avenue	EB Left-turn/ Through / Right-turn	Shift 1 sec from NB/SB phase to EB/WB phase
Notes:			
L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.			

19th Street and Willow Avenue

- 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 2025 PM construction peak hour (haul route Option 1).
- 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 2025 AM commuter peak hour (haul route Option 2).
- 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 2025 PM commuter peak hour (haul route Option 2).
- 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 2025 AM and PM construction peak hour (haul route Option 2).
- 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 2025 PM construction peak hour (haul route Option 2).

19th Street and Park Avenue

- Shifting one second of green time from the northbound/southbound phase to the eastbound/westbound phase would mitigate the adverse impact to the westbound left-turn movement during the 2025 PM construction peak hour (haul route Option 1).

16th Street and Park Avenue

- Shifting two seconds from the eastbound right-turn phase to the southbound phase would mitigate the adverse impact to the southbound left-turn movement during the 2025 PM construction peak hour (haul route Option 1).
- Shifting two seconds from the eastbound right-turn phase to the southbound phase would mitigate the adverse impact to the southbound through movement during the 2025 PM construction peak hour (haul route Option 2).
- Shifting two seconds from the eastbound right-turn phase to the southbound phase would mitigate the adverse impact to the southbound through movement during the 2025 PM construction peak hour (haul route Option 3).

15th Street and Willow Avenue

- Shifting one second from the northbound/southbound phase to the eastbound/westbound phase would mitigate the adverse impact to the eastbound left-turn/through/right-turn movement during the 2025 PM construction peak hour (haul route Option 1).
- Shifting one second from the northbound/southbound phase to the eastbound/westbound phase would mitigate the adverse impact on the eastbound left-turn/through/right-turn movement during the 2025 PM construction peak hour (haul route Option 2).
- Shifting one second from the northbound/southbound phase to the eastbound/westbound phase would mitigate the adverse impact on the eastbound left-turn/through/right-turn movement during the 2025 PM construction peak hour (haul route Option 3).

5A.6.2.3 PEDESTRIANS

FRA and NJ TRANSIT did not evaluate pedestrian conditions (i.e., crowding on sidewalks, corners, and crosswalks) 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

Based on preliminary design, the updated construction schedule for the Preferred Alternative shows construction activities for the Preferred Alternative in New York beginning in 2022 and ending in late 2029. Construction would occur on a regular weekday (i.e., five days per week) schedule. With this schedule, peak traffic volumes associated with construction activity at the Twelfth Avenue shaft site and Tenth Avenue cut-and-cover site would occur during 2024, with an estimated peak of 14 trucks per hour for all hours of construction, and between 32 and 64 worker vehicles⁸ arriving and departing the site during the weekday AM and PM construction peak hours. The truck volumes are assumed to be constant throughout the day for all working hours. This peak activity would occur for approximately 16 months, with the remainder of the construction activity at this location being of lesser intensity. Therefore, evaluation of construction impacts of the Preferred Alternative in New York was conducted for the 2024 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 60 combined worker and truck trips (28 truck and 32 worker trips).
- PM peak hour total of 92 combined worker and truck trips (28 truck and 64 worker trips).

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. FRA and NJ TRANSIT used daily workforce and truck projections to determine the number of daily truck trips and worker commute trips that would access each construction site. They assumed that hourly truck trips would be constant throughout the workday. They evaluated the truck trips assuming that trucks would follow the construction truck routes presented in Chapter 3, “Construction Methods and Activities,” and shown in **Figure 5A-6**.

Because of the availability of mass transit choices in this area of Manhattan, and the general shortage of available on-street parking and/or affordable off-street parking in the study area, many construction workers at sites in Manhattan typically use mass transit for their commute to work. FRA and NJ TRANSIT used census information related to construction worker travel modes for the Project area to estimate the proportion of workers that would use mass transit (54 percent), as well as the number that would drive to the construction staging sites in automobiles (46 percent). In addition, they used census information related to auto occupancy to estimate the level of carpooling that would occur.

Since the publication of the DEIS, the construction methods have been further refined, as described in Chapter 3, “Construction Methods and Activities.” As a result, the Preferred

⁸ An auto occupancy rate, taken from U.S. Census Reverse-Journey-to-Work data for construction workers working in the census tracts around the Tenth and Twelfth Avenue staging areas, of 1.16 persons per vehicle was applied to the worker estimates for the Tenth and Twelfth Avenue staging sites in Manhattan to determine the resulting number of worker vehicles.

Alternative no longer requires full closure of West 30th Street between Eleventh and Twelfth Avenues between 2023 and 2026. At least one through lane of traffic could be maintained on West 30th Street between Eleventh and Twelfth Avenues during the construction period, although parking on either side of this street segment would still be eliminated during construction. Therefore, traffic would not need to be rerouted around West 30th Street.

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.

For each intersection where the analysis indicates that adverse traffic impacts would occur, this section of the EIS also includes an analysis of potential mitigation measures, to determine whether the impacts could be mitigated. For adverse traffic impacts in New Jersey, measures that would reduce the delay increment resulting from the Preferred Alternative, in comparison to the delay with the No Action Alternative, are considered to fully mitigate the impact. Measures that would improve delays resulting from the Preferred Alternative, but by less than 10 seconds relative to the No Action Alternative, 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 with the 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 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 with mitigation 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 with mitigation 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 with mitigation is fewer than 3 seconds greater than the No Action condition. Mitigation measures are considered to be partial mitigation when they would improve delays but would not sufficiently reduce delay increments to lower than the thresholds defined for each of the No Action condition LOS levels described above.

If construction activities in this area include the use of Sequential Excavation Method (SEM) mining together with ground freezing in Hudson River Park, there would be additional truck trips and construction equipment in this area. For a period of approximately 18 months, 1 to 2 trucks per hour would enter and then leave the construction staging area in Hudson River Park (with up to 4 trucks per hour for 2 of those months). Chapter 3, "Construction Methods and Activities," Section 3.3.6.1.2, describes the potential construction activity in Hudson River Park. Based on the conceptual construction schedule, this construction activity would not occur at the same time as the peak construction activity at the Twelfth Avenue shaft site, and therefore the traffic analysis that FRA and NJ TRANSIT conducted for this FEIS evaluates the worst-case (i.e., conservative) traffic volumes resulting from the construction activities for the Preferred Alternative.

As described in Chapter 3, "Construction Methods and Activities," Section 3.3.7.7, if construction activities for the Preferred Alternative on the Twelfth Avenue shaft site use a portion of Lot 12 on the same block, this may delay construction of the potential Emergency Medical Services (EMS) station or one-story garage that is planned on that same site. If built, the EMS station (or garage) would occupy the western 126 feet of Lot 12, adjacent to the new private development under construction at the eastern end of the block. If the Preferred Alternative uses this site for construction staging, construction of the future EMS station or one-story garage could not occur until construction for the Preferred Alternative on the Twelfth Avenue staging site is complete in

2029. FRA and NJ TRANSIT have evaluated the potential traffic-related effects of construction of the potential EMS facility or one-story garage, which would occur from 2029 to 2032.

Construction of the potential EMS facility or one-story garage on the western portion of Lot 12 would take approximately 18 months. As presented in Chapter 3, “Construction Methods and Activities,” Section 3.3.7.7, there would be an average of 62 construction workers per day in the peak month of construction for the EMS facility or garage (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 (2024). 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 associated with the EMS facility or garage in later years.

5A.6.4.1.1 2024 Commuter Peak Hours

In the New York study area, in 2024, construction traffic associated with the Preferred Alternative would result in adverse traffic impacts per CEQR criteria on a total of four 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;
- Eastbound left-turn/through movement at Tenth Avenue and West 30th Street would operate at LOS F during the weekday AM commuter peak hour;
- Westbound right-turn movement at Tenth Avenue and West 34th Street would operate at LOS F 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 for the 2024 commuter peak hours in the New York study area is presented in **Table 5A-53**. The detailed results of the LOS analyses for each commuter peak time period analyzed are provided in **Appendix 5**.

Table 5A-53
Summary of 2024 Preferred Alternative Traffic Analysis Results
New York Study Area
Commuter Peak Hours

Level of Service	Analysis Peak Hours		
	Weekday AM Commuter Peak Hour 7:45-8:45 AM	Weekday Midday Commuter Peak Hour 12:45-1:45 PM	Weekday PM Commuter Peak Hour 3:45-4:45 PM
Lane Groups at Signalized Intersections			
Lane Groups at LOS A/B/C	52	53	52
Lane Groups at D, below mid-LOS D ¹	9	11	5
Lane Groups at D, above mid-LOS D ²	3	7	6
Lane Groups at LOS E	9	5	8
Lane Groups at LOS F	7	4	9
Total	80	80	80
Number of intersections with adverse impacts	3	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.			
As noted in Table 5A-27, the future analysis assumes implementation of Western Rail Yard mitigation, resulting in a total of three additional lane groups in comparison to existing conditions.			

5A.6.4.1.2 2024 Construction Peak Hours

In 2024 in the New York study area, construction traffic associated with the Preferred Alternative would result in adverse traffic impacts per CEQR criteria on a total of five 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;
- 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;
- Westbound right-turn movement at Tenth Avenue and West 34th Street would operate at LOS E 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 for the construction peak hours in the New York study area is presented in **Table 5A-54**. The detailed results of the LOS analyses for each construction peak time period analyzed are provided in **Appendix 5**.



**Table 5A-54
Summary of 2024 Preferred Alternative Traffic Analysis Results
New York Study Area
Construction Peak Hours**

Level of Service	Analysis Peak Hours	
	Weekday AM Construction Peak Hour 6:30-7:30 AM	Weekday PM Construction Peak Hour 2:30-3:30 PM
Lane Groups at Signalized Intersections		
Lane Groups at LOS A/B/C	57	58
Lane Groups at D, below mid-LOS D ¹	9	3
Lane Groups at D, above mid-LOS D ²	2	5
Lane Groups at LOS E	8	7
Lane Groups at LOS F	4	7
Total	80	80
Number of intersections with adverse impacts	3	4
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.		
As noted in Table 5A-27, the future analysis assumes implementation of mitigation identified in the 2009 Western Rail Yard FEIS, resulting in a total of three additional lane groups in comparison to existing conditions.		

5A.6.4.1.3 Summary of Impacts

Table 5A-55 summarizes the adverse traffic impacts that would occur in the New York Study area in the commuter and construction peak hours in 2024 as a result of construction activities for the Preferred Alternative.

**Table 5A-55
Summary of 2024 Adverse Traffic Impacts
New York Study Area**

Map ID #	Intersection	Commuter Peak Hours			Construction Peak Hours	
		AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 12:45-1:45 PM	Weekday PM Commuter Peak Hour 3:45 – 4:45 PM	AM Construction Peak Hour 6:30-7:30 AM	PM Construction Peak Hour 2:30-3:30 PM
22	Twelfth Avenue and West 29th Street	WB-R	WB-R	WB-R	WB-R	WB-R
35	Eleventh Avenue and West 40th Street					EB-TR
37	Tenth Avenue and West 30th Street	EB-LT			EB-LT	EB-LT
39	Tenth Avenue and West 34th Street			WB-R		WB-R
40	Dyer Avenue and West 34th Street	SB-R	SB-R		SB-R	
Total Impacted Intersections/Lane Groups		3/3	2/2	2/2	3/3	4/4
Notes: L = Left Turn, T = Through, R = Right Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.						

5A.6.4.1.4 Identification and Evaluation of Mitigation

FRA and NJ TRANSIT identified mitigation measures that could fully mitigate the adverse impacts of the Preferred Alternative at all but one of the study area intersections in the New York study area where adverse impacts would occur as a result of construction activities for the Preferred Alternative in one or more peak hours. Feasible mitigation measures could not be identified to address the impact at Tenth Avenue and West 34th Street during the 2024 commuter peak hour and this would remain an unmitigated adverse impact. These measures are summarized in **Table 5A-56** and described below:

Twelfth Avenue and West 29th Street (signalized)

- 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 2024 AM commuter peak hour.
- Shifting two 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 2024 midday and PM commuter peak hour.
- 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 2024 AM and PM construction peak hours.

Eleventh Avenue and West 40th Street (signalized)

- Shifting one second 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 2024 PM construction peak hour.



Table 5A-56
Identified Mitigation Measures
During Construction of the Preferred Alternative,
New York Study Area

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

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 2024 AM commuter peak hour.
- 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 2024 AM and PM construction peak hours.

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 without creating new impacts during the 2024 PM commuter peak hour.
- Shifting one second of green time from the northbound phase to the eastbound/westbound phase would mitigate the adverse impacts to the westbound right-turn movement during the 2024 PM construction peak hour.

Dyer Avenue and West 34th Street (signalized)

- 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 2024 AM and midday commuter peak hours.
- 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 2024 AM construction peak hours.

5A.6.4.2 PEDESTRIANS

Construction of the Preferred Alternative would not appreciably increase pedestrian volumes in the New York study area. For this EIS, FRA and NJ TRANSIT considered the potential effects associated with construction activities that would affect the width of sidewalks, which could result in changes to pedestrian patterns on sidewalks and nearby corners and crosswalks.

5A.6.4.2.1 Tenth Avenue Between West 31st and West 33rd Streets

The DEIS described that construction activities for the Preferred Alternative would involve closing the sidewalks along both sides of Tenth Avenue between West 31st and West 33rd Streets, resulting in adverse impacts to pedestrian flow there. After publication of the DEIS, FRA and NJ TRANSIT, working with the other Project Partners, refined the approach to construction near Tenth Avenue in New York. Rather than closing the sidewalk on one side of Tenth Avenue, the Project Sponsor will reduce the work areas in each construction stage to provide a 10-foot-wide sidewalk on both sides of Tenth Avenue, per NYCDOT Office of Construction Mitigation and Coordination (OCMC) requirements.

As noted earlier, when FRA and NJ TRANSIT prepared the DEIS, all northbound and southbound pedestrian traffic between West 33rd and West 31st Streets on Tenth Avenue used the east sidewalk due to a construction detour. FRA and NJ TRANSIT assumed that existing pedestrian volumes on the east sidewalk at that time likely represented the total 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). To consider future conditions when the west sidewalk was open again, FRA and NJ TRANSIT adjusted the existing volumes to account for the reopening of the west sidewalk.

With a 10-foot-wide sidewalk maintained on each side of Tenth Avenue between West 31st and West 33rd Streets, the adverse impacts to pedestrian conditions in that area (i.e., sidewalks, corners, and crosswalks) that were identified in the DEIS would no longer occur.

5A.6.4.2.2 Sidewalks Adjacent to Twelfth Avenue Staging Area

At the Twelfth Avenue staging area, adjacent sidewalks on the east side of Twelfth Avenue between West 29th and West 30th Street and on both sides of West 30th Street between Eleventh and Twelfth Avenue would be closed, with a pedestrian walkway provided in the parking lane, as is typical for construction projects in New York City.



To reflect the closure of sidewalks on West 30th Street adjacent to the Twelfth Avenue staging site, FRA and NJ TRANSIT assigned pedestrian volumes from those sidewalks 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.

The partial closure of West 30th Street adjacent to the Twelfth Avenue staging site 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 might require narrowing the Hudson River Park bikeway on the west side of Twelfth Avenue for approximately 200 linear feet.

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 temporary construction detours to walkways in the parking lane would not result in adverse impacts to pedestrian flows.

5A.6.4.2.3 Summary of Results

Construction activities for the Preferred Alternative in New York would not result in any adverse effects to pedestrian conditions at the locations FRA and NJ TRANSIT evaluated in this EIS. A summary of the pedestrian analysis results for the New York study area is presented in **Table 5A-57**. Detailed LOS analyses for each element are presented in **Appendix 5**.

**Table 5A-57
Summary of 2024 Preferred Alternative
Pedestrian Analysis Results
New York Study Area**

Level of Service	Analysis Peak Hours		
	Pedestrian Weekday AM Peak Hour 8-9 AM	Pedestrian Weekday Midday Peak Hour Noon-1 PM	Pedestrian Weekday PM Peak Hour 5:30-6:30 PM
Sidewalks			
Sidewalks at LOS A/B/C	3	2	3
Sidewalks at LOS D	0	1	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	0	0	0
Corner Reservoirs			
Corners at LOS A/B/C	7	5	7
Corners at LOS D	0	1	0
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	0	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	0	0	0
Note: LOS = Level-of-Service.			

5A.6.4.3 SAFETY ASSESSMENT

Construction activities for the Preferred Alternative in the New York study area would add approximately 14 truck trips per hour weekdays between 7 AM and 11 PM, and 32 and 64 worker trips during the AM and PM construction peak hours (for shift changes), respectively (during the period of peak construction), to the study area road network and along the truck routes shown in **Figure 5A-6**. Of the three identified high crash locations, two locations are located along the truck route: Tenth Avenue at 34th Street and Twelfth Avenue at 40th Street. Both of these intersections have high-visibility crosswalks. The additional traffic volumes resulting from construction activities for the Preferred Alternative would not be large enough to adversely affect safety at these locations.

If construction activities for the Preferred Alternative in the Manhattan waterfront area involve SEM mining in Hudson River Park, the Project Sponsor will provide full-time flaggers to protect pedestrians on the Hudson River Park walkway and bicyclists on the adjacent Route 9A bikeway from construction truck traffic crossing into and out of the construction staging area in the West 30th Street Heliport.

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 alignment, 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 SUMMARY OF IMPACTS INCLUDING IDENTIFIED MITIGATION

FRA and NJ TRANSIT evaluated the potential impacts to traffic and pedestrian conditions as well as safety that would result from traffic associated with the construction of the Preferred Alternative. For this evaluation, they considered the effects of the peak construction-related traffic (i.e., the period during construction that would result in the largest number of construction truck trips and largest number of worker trips) traveling to and from each of the major construction sites for the Preferred Alternative—the Tonnelle Avenue staging area and Hoboken staging area in New Jersey, and the Twelfth Avenue staging area in New York. For this analysis, they considered the effects during five peak hours each weekday: the morning, midday, and evening hours when roadway traffic is greatest (i.e., commuter peak hours) and the morning and evening hours when construction-related traffic would be greatest (i.e., construction peak hours). They also evaluated a Saturday midday and evening peak hour for the North River Tunnel rehabilitation, which would include construction work on Saturdays.

The results of this analysis are summarized in this section of the chapter.

5A.8.1 NEW JERSEY

5A.8.1.1 TONNELLE AVENUE STAGING AREA

In the Tonnelle Avenue staging area study area, construction-related traffic associated with construction of the new Hudson River Tunnel for the Preferred Alternative would result in adverse traffic impacts at three intersections along Tonnelle Avenue during some or all of the peak hours evaluated:

- Tonnelle Avenue at Wendy’s and White Cap Construction Supply (1500 Tonnelle Avenue, signalized)
- Tonnelle Avenue northbound at 10th Street (unsignalized)
- Tonnelle Avenue northbound at the entrance ramp from Secaucus Road (unsignalized)

Construction-related traffic associated with rehabilitation of the North River tunnel would result in adverse traffic impacts at the same three intersections along Tonnelle Avenue during some or all

of the peak hours evaluated, including both Saturday peak hours, as well as one additional intersection:

- Tonnelle Avenue at Taco Bell (2020 Tonnelle Avenue, signalized)
- Tonnelle Avenue at Wendy's and White Cap Construction Supply (1500 Tonnelle Avenue, signalized)
- Tonnelle Avenue northbound at 10th Street (unsignalized)
- Tonnelle Avenue northbound at the entrance ramp from Secaucus Road (unsignalized)

FRA and NJ TRANSIT evaluated the potential effectiveness of installing a new traffic signal at the access point for the Tonnelle Avenue staging area and concluded that creating this new signalized intersection, in combination with signal timing changes at the Wendy's White Cap intersection, would mitigate many of the adverse impacts identified. (In addition, the improvements to traffic flow would also mitigate a traffic-related noise impact that would otherwise occur for some residences along Tonnelle Avenue, as described in Chapter 12A, "Noise," Section 12A.9.3). However, traffic impacts at the Taco Bell intersection, the intersection of Tonnelle Avenue northbound at 10th Street, and the intersection of Tonnelle Avenue northbound at the entrance ramp from Secaucus Road would not be fully mitigated.

If no new traffic signal is installed at the access point for the Tonnelle Avenue staging area, adverse impacts would remain at all affected intersections; FRA and NJ TRANSIT were unable to identify effective mitigation measures for any of the intersections.

Tables 5A-58 through 5A-61 present a summary of traffic impacts including mitigation for the Tonnelle Avenue staging area in 2024 (during new tunnel construction) and in 2032 (during North River Tunnel rehabilitation), including no creation of a new site driveway and with creation of a new site driveway.



**Table 5A-58
Tonnelles Avenue Staging Area
New Tunnel Construction (2024)
Traffic Mitigation Overview –
Mitigation Not Including New Signal**

Map ID #	Location	AM Construction Peak Hour 6:30-7:30 AM	AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 1-2 PM	PM Construction Peak Hour 2:30-3:30 PM	PM Commuter Peak Hour 5-6 PM
1	Tonnelles Ave at Taco Bell (2020 Tonnelles Avenue / Milepost 57)	○	○	○	○	○
2	Tonnelles Ave/Wendy's/White Cap	⊗	○	○	⊖	○
3	Tonnelles Ave northbound at 10th St	●	●	○	○	●
4	Tonnelles Ave at northbound entrance ramp from Secaucus Rd	●	●	●	●	●
5	Secaucus Rd at Tonnelles Ave southbound ramp	○	○	○	○	○
6	Secaucus Rd at Tonnelles Ave northbound ramp	○	○	○	○	○

Legend:

No adverse impact:	○	Partially mitigated adverse impact:	⊗
Mitigated adverse impact:	⊖	Unmitigated adverse impact:	●

**Table 5A-59
Tonnelles Avenue Staging Area
New Tunnel Construction (2024)
Traffic Mitigation Overview –
Mitigation Including New Traffic Signal at Site Driveway**

Map ID #	Location	AM Construction Peak Hour 6:30-7:30 AM	AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 1-2 PM	PM Construction Peak Hour 2:30-3:30 PM	PM Commuter Peak Hour 5-6 PM
1	Tonnelles Ave at Taco Bell (2020 Tonnelles Avenue / Milepost 57)	○	○	○	○	○
2	Tonnelles Ave/Wendy's/White Cap	⊖	○	○	⊖	○
3	Tonnelles Ave northbound at 10th St	⊗	⊖	○	○	⊖
4	Tonnelles Ave northbound at entrance ramp from Secaucus Rd	⊗	⊖	⊖	⊗	⊖
5	Secaucus Rd at Tonnelles Ave southbound ramp	○	○	○	○	○
6	Secaucus Rd at Tonnelles Ave northbound ramp	○	○	○	○	○

Legend:

No adverse impact: ○ Partially mitigated adverse impact: ⊗

Mitigated adverse impact: ⊖ Unmitigated adverse impact: ●



Table 5A-60
Tonnelle Avenue Staging Area
Rehabilitation of the North River Tunnel (2032)
Traffic Mitigation Overview
Mitigation Not Including New Signal

Map ID #	Location	AM Construction Peak Hour 6:30-7:30 AM	AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 1-2 PM	PM Construction Peak Hour 4:45-5:45 PM	PM Commuter Peak Hour 5-6 PM	Saturday Commuter Peak 2-3 PM	Saturday Construction Peak 4:45-5:45PM
1	Tonnelle Ave at Taco Bell (2020 Tonnelle Avenue / Milepost 57)	●	○	○	●	○	○	●
2	Tonnelle Ave/Wendy's/ White Cap	○	○	○	◐	○	○	◐
3	Tonnelle Ave northbound at 10th St	●	○	○	●	●	●	●
4	Tonnelle Ave northbound at entrance ramp from Secaucus Rd	●	●	●	●	●	●	●
5	Secaucus Rd at Tonnelle Ave southbound ramp	○	○	○	○	○	○	○
6	Secaucus Rd at Tonnelle Ave northbound ramp	○	○	○	○	○	○	○

Legend:

No adverse impact: ○	Partially mitigated adverse impact: ◐
Mitigated adverse impact: ○	Unmitigated adverse impact: ●

**Table 5A-61
Tonnelle Avenue Staging Area
Rehabilitation of the North River Tunnel (2032)
Traffic Mitigation Overview
Mitigation Including New Signal at Site Driveway**

Map ID #	Location	AM Construction Peak Hour 6:30-7:30 AM	AM Commuter Peak Hour 7:45-8:45 AM	Midday Commuter Peak Hour 1-2 PM	PM Construction Peak Hour 4:45-5:45 PM	PM Commuter Peak Hour 5-6 PM	Saturday Commuter Peak 2-3 PM	Saturday Construction Peak 4:45-5:45PM
1	Tonnelle Ave at Taco Bell (2020 Tonnelle Avenue / Milepost 57)	●	○	○	●	○	○	●
2	Tonnelle Ave/ Wendy's/ White Cap	○	○	○	○	○	○	○
3	Tonnelle Ave northbound at 10th St	⊘	○	○	⊘	○	○	⊘
4	Tonnelle Ave northbound at entrance ramp from Secaucus Rd	⊘	○	○	⊘	○	○	⊘
5	Secaucus Rd at Tonnelle Ave southbound ramp	○	○	○	○	○	○	○
6	Secaucus Rd at Tonnelle Ave northbound ramp	○	○	○	○	○	○	○

Legend:

No adverse impact:	○	Partially mitigated adverse impact:	⊘
Mitigated adverse impact:	○	Unmitigated adverse impact:	●

5A.8.1.2 HOBOKEN STAGING AREA

In the Hoboken staging area study area, FRA and NJ TRANSIT evaluated the potential traffic impacts associated with the three different potential truck routes for accessing the Hoboken staging area, in a scenario where all construction workers park within the boundaries of the Hoboken staging area. They also evaluated the potential traffic impacts associated with the three truck routes in a scenario in which all construction workers park off-site at a remote parking location south of the staging area in Hoboken and travel to and from the construction site via shuttle van.

Construction activities for the Preferred Alternative at the Hoboken staging area would result in adverse traffic impacts at intersections along Willow Avenue and Park Avenue in Weehawken and Hoboken, as follows:

Haul Route Option 1

- Willow Avenue at 19th Street, Weehawken (signalized), whether workers park on-site or off-site
- Signalized intersection at Park Avenue at 19th Street, Weehawken (signalized), whether workers park on-site or off-site
- Willow Avenue at 15th Street, Hoboken (signalized), if workers park off-site
- Park Avenue at 16th Street, Hoboken (signalized), if workers park off-site

Haul Route Option 2

- Willow Avenue at 19th Street, Weehawken (signalized), whether workers park on-site or off-site
- Willow Avenue at 15th Street, Hoboken (signalized), if workers park off-site
- Park Avenue at 16th Street, Hoboken (signalized), if workers park off-site

Haul Route Option 3

- Willow Avenue at 15th Street, Hoboken (signalized), if workers park off-site
- Park Avenue at 16th Street, Hoboken (signalized), if workers park off-site

FRA and NJ TRANSIT evaluated potential mitigation measures for the traffic impacts associated with construction of the Preferred Alternative and concluded that a combination of signal timing and phasing changes would fully mitigate all identified impacts.

In addition, while the analysis did not identify safety concerns at any of the study area intersections near the Hoboken staging area, to increase pedestrian visibility at intersections on 19th Street, the Project Sponsor will coordinate with the Township of Weehawken to restripe the remaining crosswalks at 19th Street and Park Avenue to high-visibility crosswalks if haul route Options 2 and/or 3 are selected. The Project Sponsor will also coordinate with the Township of Weehawken to provide high-visibility crosswalks at the new intersection of the haul route and 19th Street in haul route Option 3 if that route is selected.

Tables 5A-62, 5A-63, and 5A-64 present a summary of traffic impacts including mitigation for the Hoboken staging area in 2025 for the three potential truck routes, and **Tables 5A-65, 5A-66, and 5A-67** present the results for the analysis in which construction workers park off-site.

**Table 5A-62
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction): Haul Route Option 1**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 1				
		AM Construction Peak 6:30-7:30AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	○	○	○	⊖	○
8	19th St/Park Ave	⊖	○	○	⊖	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○

Legend:

No adverse impact: ○ Partially mitigated adverse impact: ⊖

Mitigated adverse impact: ⊖ Unmitigated adverse impact: ●



**Table 5A-63
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction): Haul Route Option 2**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 2				
		AM Construction Peak 6:30-7:30 AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30 PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	○	○	○	○	○
8	19th St/Park Ave	○	○	○	○	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○

Legend:

No adverse impact:	○	Partially mitigated adverse impact:	◐
Mitigated adverse impact:	◑	Unmitigated adverse impact:	●

**Table 5A-64
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction): Haul Route Option 3**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 2				
		AM Construction Peak 6:30-7:30 AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30 PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	○	○	○	○	○
8	19th St/Park Ave	○	○	○	○	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○

Legend:

No adverse impact:	○	Partially mitigated adverse impact:	◐
Mitigated adverse impact:	◑	Unmitigated adverse impact:	●



**Table 5A-65
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction):
Haul Route Option 1 and Off-Site Worker Parking**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 1				
		AM Construction Peak 6:30-7:30 AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30 PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	○	○	○	⊖	○
8	19th St/Park Ave	○	○	○	⊖	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○
16	19th St/Dykes Lumber Site	○	○	○	○	○
17	16th St/Willow Ave	○	○	○	○	○
18	16th St/Park Ave	○	○	○	⊖	○
19	15th St/Willow Ave	○	○	○	⊖	○
20	15th St/Park Ave	○	○	○	○	○

Legend:

No adverse impact:	○	Partially mitigated adverse impact:	⊖
Mitigated adverse impact:	⊖	Unmitigated adverse impact:	●

**Table 5A-66
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction):
Haul Route Option 2 and Off-Site Worker Parking**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 2				
		AM Construction Peak 6:30-7:30 AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30 PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	⊖	⊖	○	⊖	⊖
8	19th St/Park Ave	○	○	○	○	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○
16	19th St/Dykes Lumber Site	○	○	○	○	○
17	16th St/Willow Ave	○	○	○	○	○
18	16th St/Park Ave	○	○	○	⊖	○
19	15th St/Willow Ave	○	○	○	⊖	○
20	15th St/Park Ave	○	○	○	○	○
Legend:						
No adverse impact:		○	Partially mitigated adverse impact:		⊗	
Mitigated adverse impact:		⊖	Unmitigated adverse impact:		●	



**Table 5A-67
Hoboken Staging Area
Traffic Mitigation Overview
Analysis Year 2025 (New Tunnel Construction):
Haul Route Option 3 and Off-Site Worker Parking**

Map ID #	Location	Park Ave / Willow Ave with Haul Route Option 3				
		AM Construction Peak 6:30-7:30 AM	AM Commuter Peak 7:45-8:45 AM	Midday Commuter Peak 1-2 PM	PM Construction Peak 2:30-3:30 PM	PM Commuter Peak 5-6 PM
7	19th St/Willow Ave	○	○	○	○	○
8	19th St/Park Ave	○	○	○	○	○
9	19th St/Lincoln Harbor Rd	○	○	○	○	○
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	○	○	○	○	○
16	19th St/Dykes Lumber Site	○	○	○	○	○
17	16th St/Willow Ave	○	○	○	○	○
18	16th St/Park Ave	○	○	○	⊖	○
19	15th St/Willow Ave	○	○	○	⊖	○
20	15th St/Park Ave	○	○	○	○	○

Legend:

No adverse impact: ○ Partially mitigated adverse impact: ⊗

Mitigated adverse impact: ⊖ Unmitigated adverse impact: ●

5A.8.2 NEW YORK

Construction activities for the Preferred Alternative in New York would result in adverse impacts at five intersections in the New York study area as follows:

- Twelfth Avenue at West 29th Street (signalized)
- Eleventh Avenue at West 40th Street (signalized)
- Tenth Avenue at West 30th Street (signalized)
- Tenth Avenue at West 34th Street (signalized)
- Dyer Avenue at West 34th Street (signalized)

FRA and NJ TRANSIT identified mitigation measures, using a signal timing changes, that could fully mitigate the adverse impacts of the Preferred Alternative at four of the five affected intersections in the New York study area. Feasible mitigation measures could not be identified to address the impact at Tenth Avenue and West 34th Street.

Table 5A-68 summarizes conditions at each intersection, including mitigation. The detailed results of the mitigation condition LOS analyses are provided in **Appendix 5**.

FRA and NJ TRANSIT also evaluated the effects of construction activity on pedestrian conditions in New York, including nearby sidewalks, crosswalks, and corners. With a modified construction approach since the DEIS to maintain sidewalks at least 10 feet wide on both sides of Tenth Avenue between West 31st and West 33rd Streets, construction activities would not result in any adverse effects to pedestrian conditions in New York.

























Table 5A-69 presents the results of the pedestrian analysis. The detailed results of the LOS analyses are provided in **Appendix 5**.



**Table 5A-68
New York Study Area
Traffic Mitigation Overview
Analysis Year 2024**

Map ID #	Location	AM Construction Peak 6:30-7:30AM	AM Commuter Peak 7:45-8:45AM	Midday Commuter Peak 12:45-1:45PM	PM Construction Peak 2:30-3:30PM	PM Commuter Peak 3:45-4:45PM
21	Twelfth Ave/W 26th St	○	○	○	○	○
22	Twelfth Ave/W 29th St	⊖	⊖	⊖	⊖	⊖
23	Twelfth Ave/W 30th St	○	○	○	○	○
24	Twelfth Ave/W 34th St	○	○	○	○	○
25	Twelfth Ave/tow pound exit	○	○	○	○	○
26	Twelfth Ave/Pier 79 ferry	○	○	○	○	○
27	Twelfth Ave/W 40th St	○	○	○	○	○
28	Eleventh Ave/W 26th St	○	○	○	○	○
29	Eleventh Ave/W 27th St	○	○	○	○	○
30	Eleventh Ave/W 28th St	○	○	○	○	○
31	Eleventh Ave/W 29th St	○	○	○	○	○
32	Eleventh Ave/W 30th St	○	○	○	○	○
33	Eleventh Ave/W 33rd St	○	○	○	○	○
34	Eleventh Ave/W 34th St	○	○	○	○	○
35	Eleventh Ave/W 40th St	○	○	○	⊖	○
36	Tenth Ave/W 26th St	○	○	○	○	○
37	Tenth Ave/W 30th St	⊖	⊖	○	⊖	○
38	Tenth Ave/W 33rd St	○	○	○	○	○
39	Tenth Ave/W 34th St	○	○	○	⊖	●

**Table 5A-68 (Cont'd)
New York Study Area
Traffic Mitigation Overview
Analysis Year 2024**

Map ID #	Location	AM Construction Peak 6:30-7:30AM	AM Commuter Peak 7:45-8:45AM	Midday Commuter Peak 12:45-1:45PM	PM Construction Peak 2:30-3:30PM	PM Commuter Peak 3:45-4:45PM
40	Dyer Ave/W 34th St					
41	Dyer Ave/W 35th St					
42	Dyer Ave SB/W 36th St					
43	Dyer Ave NB/W 36th St					
Legend:						
No adverse impact:			Partially mitigated adverse impact:			
Mitigated adverse impact:			Unmitigated adverse impact:			



**Table 5A-69
New York Study Area
Pedestrian Mitigation Overview**

Map ID #	Location	Pedestrian Weekday AM Peak Hour 8-9 AM	Pedestrian Weekday Midday Peak Hour Noon-1 PM	Pedestrian Weekday PM Peak Hour 5:30-6:30 PM
1P	East sidewalk Twelfth Ave/W 29th St	○	○	○
2P	South sidewalk W 30th St/Eleventh-Twelfth Aves	○	○	○
3P	East sidewalk Tenth Ave/W 31st-W 33rd Sts	○	○	○
4P	North crosswalk Tenth Ave/W 31st St	○	○	○
5P	South crosswalk Tenth Ave/W 33rd St	○	○	○
6P	Northeast corner Twelfth Ave/W 29th St	○	○	○
7P	Northeast corner Twelfth Ave/W 30th St	○	○	○
8P	Southeast corner Eleventh Ave/W 30th St	○	○	○
9P	Southwest corner Eleventh Ave/W 30th St	○	○	○
10P	Northwest corner Eleventh Ave/W 30th St	○	○	○
11P	Northeast corner Tenth Ave/W 31st St	○	○	○
12P	Southeast corner Tenth Ave/W 33rd St	○	○	○

Legend:

No adverse impact:	○	Partially adverse mitigated impact:	⊗
Mitigated adverse impact:	⊖	Unmitigated adverse impact:	●

5A.9 MEASURES TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

The Project Sponsor will implement measures to avoid or minimize adverse impacts on traffic conditions in all Project study areas during construction of the Preferred Alternative, as described below. The lead Federal agency will be responsible for ensuring that the Project Sponsor implements these measures, which will be identified in the ROD. The Project Sponsor will implement the following measures.

5A.9.1 GENERAL TRAFFIC MITIGATION MEASURES

- For all construction locations, the Project Sponsor will develop and implement Maintenance and Protection of Traffic (MPT) plans during final design in consultation with the appropriate local transportation agencies. The MPT plans will maintain travel lanes, and detour through traffic away from construction activities and equipment to the extent practicable. For all

construction locations, MPT plans will include strict enforcement of Project truck routes by specifying the routes in contract documents.

- For all locations where adverse traffic impacts were identified, the Project Sponsor will coordinate with the appropriate local transportation authorities to implement mitigation measures similar to those identified in Sections 5A.6.2 and 5A.6.4 of this chapter, as appropriate. Traffic mitigation measures may include changes to signal timing or phasing (e.g., shifting green time from underutilized phases to over-capacity approaches), changes to pavement markings (e.g., restriping lanes), changes to lane designations, and modifications to parking regulations. The identified mitigation measures are subject to approval and implementation by the appropriate local government agency in New Jersey and NYCDOT in New York, and may be revised after agency review. The costs for these mitigation measures would be Project costs that will be borne by the Project Sponsor rather than the local community.
- The Project Sponsor will be responsible for maintenance, repair, and cleaning of designated truck routes on local streets and will reconstruct any streets damaged by trucking activity associated with construction of the Preferred Alternative. This may include advance or preventive rehabilitation of the proposed truck routes before the onset of construction, as necessary.
- The Project Sponsor will require strict enforcement of identified Project truck routes; trucks will wait inside construction staging areas rather than in the public right-of-way, to the extent practicable.

5A.9.2 TONNELLE AVENUE STAGING AREA STUDY AREA

- For intersections in the Tonnelle Avenue staging area study area, the Project Sponsor will coordinate with the Township of North Bergen and NJDOT, as appropriate, regarding mitigation.
- The Project Sponsor will further evaluate during final design, in cooperation with the Project Partners and in coordination with NJDOT, the potential for introduction of a new traffic signal at the proposed location of the access driveway to the Tonnelle Avenue staging area, to avoid unnecessary vehicle movements on Tonnelle Avenue from construction vehicles that would otherwise use the nearest U-turn.

5A.9.3 HOBOKEN STAGING AREA STUDY AREA

- For intersections in the Hoboken staging area study area, the Project Sponsor will coordinate with Hudson County, NJ TRANSIT, City of Hoboken, or Township of Weehawken, as appropriate, regarding mitigation.
- Construction traffic will be routed via designated truck routes, making use of a new off-street access point to the Hoboken staging area along the north side of the HBLR right-of-way.
- The Project Sponsor, in coordination with the Project contractor, will select the final truck route during final design and will coordinate with the local municipality regarding this selection.
- The Project Sponsor will remove excavated materials from construction of the river tunnel segment primarily via the Tonnelle Avenue staging area, in order to minimize trucking to and from the Hoboken staging area.
- While construction activities are under way at the Hoboken staging area, the Project Sponsor will require that there be a maximum (cap) of no more than 8 trucks per hour in each direction traveling to and from the Hoboken staging area.
- The Project Sponsor will require that no construction-related trucks will use local roads in Weehawken or Hoboken between 10 PM and 7 AM.



- Construction workers working at the Hoboken staging area will either park within the boundaries of the staging area or will park at a designated off-site parking facility, with transportation provided to shuttle the workers between the staging area and the off-site parking facility. Construction workers will not park on local streets in Weehawken.
- To increase pedestrian visibility at intersections on 19th Street, the Project Sponsor will coordinate with the Township of Weehawken to restripe the basic transverse striped crosswalks at 19th Street and Park Avenue to high-visibility crosswalks if haul route Options 2 and/or 3 are selected. The Project Sponsor will also coordinate with the Township of Weehawken to provide high-visibility crosswalks at the new intersection of the haul route and 19th Street in haul route Option 3 if that route is selected.

5A.9.4 NEW YORK

- For roads in New York, the Project Sponsor will coordinate with NYCDOT and/or New York City Police Department, and for intersections on Route 9A (i.e., Twelfth Avenue), NYCDOT and NYSDOT.
- The Project Sponsor will maintain at least one traffic lane on West 30th Street between Eleventh and Twelfth Avenues at all times, except for potential short-term closures as necessary for utility relocations.
- If construction activities for the Preferred Alternative in the Manhattan waterfront area involve SEM mining in Hudson River Park, the Project Sponsor will provide full-time flaggers to protect pedestrians on the Hudson River Park walkway and bicyclists on the adjacent Route 9A bikeway from construction truck traffic crossing into and out of the construction staging area in the West 30th Street Heliport.
- The Project Sponsor will maintain the sidewalk on both sides of Tenth Avenue between West 31st and West 33rd Streets with a minimum width of 10 feet. *