A. INTRODUCTION

This chapter examines the potential effects on the transportation systems that could occur during the construction of the proposed project. Specifically, it compares conditions for the proposed project against the No Action Alternative in order to determine the potential for significant adverse effects to transportation systems during construction. The analyses were conducted pursuant to the methodologies outlined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*. Construction of the proposed project is projected to start in spring 2020 with Alternatives 2, 3, and 5 projected to be completed in 2025 and the Preferred Alternative expected to be completed in 2023 (the flood protection system, raised East River Park, and foundations for the shared-use flyover bridge for Alternative 4 would be completed in 2023, with the prefabricated bridge span be installed and completed in 2025). This shorter construction duration for the Preferred Alternative is primarily due to less disruption to the Franklin Delano Roosevelt East River Drive (FDR Drive) since flood protection in East River Park would be primarily along the East River rather than along the FDR Drive and these alternatives also allow full closure of East River Park so it can be reconstructed in a single stage.

The proposed project has two project sub-areas for analysis: Project Area One extends from Montgomery Street on the south to the north end of East River Park (or about East 13th Street). This project area includes all of East River Park, and the four existing pedestrian bridges to the park over the FDR Drive (the Corlears Hook, Delancey Street, East 6th Street, and East 10th Street Bridges) as well as the Houston Street overpass. Project Area Two includes the FDR Drive gate crossing and northward (the equivalent of East 13th Street) to East 25th Street. Construction in this area is along and within the FDR Drive right-of-way, the Con Edison East River Complex, Murphy Brothers Playground, Stuyvesant Cove Park, street segments along and under the FDR Drive, and through Asser Levy Playground to connect with the VA Hospital system on the north.

B. PRINCIPAL CONCLUSIONS

The potential for significant adverse effects to transportation systems during construction were assessed for the proposed project. Based on the magnitude of construction automobile and truck trips during the peak construction period, construction of the proposed project would have the potential to result in significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction analysis peak traffic hour. These effects could be fully mitigated with the implementation of standard traffic mitigation measures (e.g., signal timing changes). In addition, the proposed project may require a rerouting of the bikeway/walkway along the proposed project area to inland routes and would therefore have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Moreover, Alternative 5 would result in additional significant adverse traffic effects due to the temporary lane closures that are required

along the FDR Drive to accommodate construction activities under this alternative. Construction of the proposed project would not result in any significant adverse transit, and parking effects. A summary of the anticipated significant adverse effects under each of the alternatives is provided below.

NO ACTION ALTERNATIVE (ALTERNATIVE 1)

Under the No Action Alternative, no new comprehensive coastal protection system is installed in the proposed project area, and no new trips are generated by the proposed project. As described in Chapter 5.9, "Transportation," there are a number of projects planned or under construction within a ½-mile of the project area that are expected to be complete by 2025. These projects will generate traffic, transit, pedestrian trips, and parking demands that are background growth not associated with the proposed project.

PREFERRED ALTERNATIVE (ALTERNATIVE 4): FLOOD PROTECTION SYSTEM WITH A RAISED EAST RIVER PARK

TRAFFIC

Construction of the Preferred Alternative would generate 251 passenger car equivalents (PCEs) during the 6:00 to 7:00 AM peak hour and 131 PCEs during the 3:00 to 4:00 PM peak hour, exceeding the *CEQR Technical Manual* analysis threshold of 50 vehicle trips. Based on this trip generation, traffic assignments were prepared and six intersections for the AM peak hour and one intersection for the PM peak hour were selected for detailed traffic analysis. The analysis disclosed temporary significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the AM peak hour. However, these effects could be fully mitigated as described below. As discussed below, the same significant adverse traffic effects and mitigation measures are expected for Alternative 3, however, the effects would be for a shorter duration under the preferred Alternative. In addition, with the full reconstruction of East River Park under this alternative, barging of fill materials to East River Park could be employed, thereby reducing the volume of truck trips from what would otherwise be needed to reconstruct and raise the park.

PARKING

An inventory of on- and off-street parking within a ¼-mile radius of the project area showed approximately 70 on-street parking spaces available near Project Area One and 30 on-street parking spaces available near Project Area Two. The off-street survey showed approximately 60 spaces available near Project Area One and 800 spaces available near Project Area Two.

Construction under the Preferred Alternative is anticipated to generate a maximum parking demand of 92 spaces for Project Area One and 52 spaces for Project Area Two. In addition to the construction parking demand, up to 50 parking spaces could be displaced during construction adjacent to the East River Housing Corporation, which has also been accounted for in the parking analysis. The Project Area Two parking demand would be fully accommodated by the large inventory of available on- and off-street parking spaces near the project area. The Project Area One demand would not be fully accommodated within ¼-mile and could result in a parking shortfall of up to approximately 35 spaces. It is expected that excess parking demand within Project Area One would need to be accommodated by on-street parking or off-street parking beyond a ¼-mile walk from the project area. Alternatively, motorists could choose other modes of

transportation. As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, construction of the preferred Alternative would not result in any significant adverse parking effects.

TRANSIT

Construction of the Preferred Alternative would generate 144 transit trips (total of Project Area One and Project Area Two) during the peak hour of the peak construction period, below the *CEQR Technical Manual* analysis threshold of 200 transit trips. Therefore, construction of this alternative would not result in any significant adverse transit effects.

PEDESTRIANS

Construction under the Preferred Alternative would generate 200 pedestrian trips for Project Area One and 112 pedestrian trips for Project Area Two. Given the number of available pedestrian routes to/from area parking facilities and transit services and the various access/egress points to the East River Park, no sidewalks or crosswalks are expected to experience 200 or more pedestrian trips during an hour. However, because this alternative would require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, the Preferred Alternative would require the development and implementation of a rerouting plan.

OTHER ALTERNATIVE (ALTERNATIVE 2): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – BASELINE

Since Alternative 2 is expected to yield comparable worker and truck estimates during peak construction as the Preferred Alternative, Alternative 2 would have the potential to result in significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction peak hour. However, these significant adverse effects could be fully mitigated with the implementation of signal timing changes. This alternative would not have any significant adverse transit, pedestrian, or parking effects.

OTHER ALTERNATIVE (ALTERNATIVE 3): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – ENHANCED PARK AND ACCESS

TRAFFIC

Peak construction activities under Alternative 3 would generate 153 PCEs during the 6:00 to 7:00 AM peak hour and 85 PCEs during the 3:00 to 4:00 PM peak hour, exceeding the *CEQR Technical Manual* analysis threshold of 50 vehicle trips during the peak hour. Based on this trip generation, traffic assignments were prepared and six intersections for the AM peak hour and one intersection for the PM peak hour were selected for detailed traffic analysis. Similar to the Preferred Alternative, significant adverse traffic effects were identified at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the AM peak hour. However, these effects could be fully mitigated as described below.

PARKING

Construction under Alternative 3 is estimated to generate a maximum parking demand of 55 spaces for Project Area One and 31 spaces for Project Area Two. Similar to the Preferred Alternative, the Project Area Two demand would be fully accommodated by the large inventory of available on- and off-street parking spaces near the project area and the Project Area One demand could result in a parking shortfall within ¼-mile. As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, construction of Alternative 3 would not result in any significant adverse parking effects.

TRANSIT

Construction of Alternative 3 would generate 86 peak hour transit trips (total for Project Areas One and Two) during the peak construction period, which is well below the *CEQR Technical Manual* analysis threshold of 200 transit trips. Therefore, construction under Alternative 3 would not result in any significant adverse transit effects.

PEDESTRIANS

Construction of Alternative 3 would generate 188 peak hour pedestrian trips during the peak construction period, below the *CEQR Technical Manual* analysis threshold of 200 pedestrian trips. Therefore, construction under Alternative 3 would not result in any significant adverse pedestrian effects. However, because this alternative may require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, Alterative 3 would require the development and implementation of a rerouting plan for the full 5-year construction duration through 2025.

OTHER ALTERNATIVE (ALTERNATIVE 5): FLOOD PROTECTION SYSTEM EAST OF FDR DRIVE

Alternative 5 aligns the flood protection system on the east side of the FDR Drive between East 13th Street and Captain Patrick J. Brown Walk to the north and raises the northbound lanes of the FDR Drive by approximately six feet between East 13th Street and Avenue C, thereby placing the line of protection generally on the east side of the FDR Drive in this segment. Construction of Alternative 5 would require either a temporary full 24-hour closure of the FDR Drive in the northbound direction and one-lane closure in the southbound direction for two consecutive months or partial closure in both directions. Both of these scenarios have the potential to result in significant adverse traffic effects beyond those identified above for the Preferred Alternative. The use of Traffic Enforcement Agents (TEAs) would help mitigate any additional significant adverse traffic effects that could occur due to the closure of the FDR Drive; however, as a result of the closure, some effects could remain unmitigatable.

MITIGATION

As described above, the proposed project would require mitigation for temporary construction traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C, temporary closures of bikeway/walkway along the proposed project area to inland routes and closure of the FDR Drive under Alternative 5.

For the proposed project, the temporary significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Second Avenue could be fully mitigated by implementing standard traffic mitigation measures (e.g., signal timing changes).

Because the proposed project may require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, the proposed project would require the development and implementation of a rerouting plan. The following measures would be implemented to accommodate pedestrians and bicyclists at this area during construction:

- During construction, the East River Greenway would be closed from 23rd Street to Montgomery Street. NYCDOT would re-route bicyclists to the on-street bike network, primarily the protected bicycle lanes along First and Second Avenues, as well as those on Allen Street/Pike Street and Clinton Street (see Figure 6.9-20). These protected bicycle lanes would provide a reasonable alternative for many of those bicyclists who use the Greenway as a transportation route, as they are proximate to numerous destinations in the neighborhoods that run alongside the Greenway, and may actually provide a more direct route for many trips. NYCDOT is currently upgrading a number of intersections along these corridors with offset crossings to provide a more comfortable riding experience on these routes. In addition, signs would also be installed one block west of the East River Greenway to inform pedestrians of the closure.
- NYCDOT is committed to expanding the City's bicycle network, including adding more protected bicycle lanes. In July 2019, Mayor de Blasio unveiled the Green Wave Bicycle Plan, which, amongst other improvements, increases the number of planned protected bicycle lane miles to be installed each year to thirty miles city-wide. As part of these ongoing efforts to expand the bicycle lane network, NYCDOT is currently evaluating the feasibility of installing new north–south protected bicycling lanes in the East Village that would provide additional options for bicyclists during the Greenway closure and beyond.
- Access to the ferry landings at Stuyvesant Cove Park from First and Second Avenues would be maintained via the two-way protected bicycle lane along 20th Street.

For Alternative 5, the effects due to the closure of the FDR Drive would be mitigated through the development of a detailed NYCDOT-approved Traffic Management Plan and deployment of New York City Police Department (NYPD) TEAs that would manage traffic and pedestrian circulation at the intersections that are temporarily and significantly affected near the project area. Additional mitigation measures are expected to include transportation management on an area-wide level with public outreach and the use of variable message signs and other measures to alert motorists. If a construction plan can be developed that does not require full closure of the FDR Drive, the potential significant adverse transportation effects could be reduced. Since Alternatives 2 through 4 would not require a 24-hour closure of the FDR Drive, a Traffic Management Plan is not needed for those alternatives.

C. REGULATORY CONTEXT

The transportation modes in the study area are regulated and/or monitored by Federal, state, and local agencies, including U.S. Coast Guard (USCG), New York State Department of Transportation (NYSDOT), New York City Department of Transportation (NYCDOT), New

York's Metropolitan Transportation Authority (MTA), and the New York City Economic Development Corporation (EDC).

D. METHODOLOGY

The construction transportation analysis assesses the potential for construction activities to result in significant adverse effects to traffic, transit (i.e., subway and bus), pedestrian elements (i.e., sidewalks, corners, and crosswalks), and parking conditions. The analysis is based on the peak worker and truck trips during construction of the proposed project, taking into account several factors including worker modal splits (how the workers access the sites per mode of transportation: automobile, transit, or walking); vehicle occupancy and trip distribution; truck PCEs; and arrival/departure patterns. The effects of the construction activities for the proposed project were compared with the No Action Alternative to assess the potential transportation effects during construction. As discussed above, the flood protection system and raised East River Park proposed under the Preferred Alternative would be constructed in 3.5 years and completed in 2023 compared to the 5-year construction duration anticipated under Alternatives 2, 3, and 5. Construction activities in Project Area One are anticipated to be divided into three primary segments (see Figure 6.0-1): Segment 1 encompasses construction from Montgomery Street to the Williamsburg Bridge; Segment 2 encompasses construction from the Williamsburg Bridge to the northern end of the Track and Field Complex; and Segment 3 encompasses construction from the northern end of the Track and Field Complex to the northern end of East River Park. Construction activities in Project Area Two under Alternative 3 are also anticipated to proceed in three segments: Segment 4 encompasses construction from south of the East River Complex at approximately East 14th Street to Murphy Brothers Playground and includes the closure structure across the FDR Drive; Segment 5 encompasses construction within and immediately adjacent to Stuyvesant Cove Park; and Segment 6 encompasses construction at and near Asser Levy Playground, including the wall spanning Asser Levy Place that connects to the VA Medical Center resiliency project.

TRANSPORTATION PLANNING ASSUMPTIONS

CONSTRUCTION WORKER MODAL SPLITS AND VEHICLE OCCUPANCY

Trip generation factors for the proposed project were developed based on information from U.S. Census data. The trip generation is based on an estimated quarterly construction work schedule and average daily construction worker and truck projections. Based on the latest available U.S. Census data (2000 Census data) for workers in the construction and excavation industry, it is expected that 48 percent of construction workers commute to the project site by private autos at an average occupancy of approximately 1.30 persons per vehicle.

VEHICULAR ACCESS AND CIRCULATION

As discussed in detail in Chapter 6.0, "Construction Overview," there is one existing vehicular access/egress location to East River Park at Montgomery Street and South Street. However, a potential new construction truck access/egress point via the northbound FDR Drive off-ramp/on-ramp near East Houston Street may also be established during construction. This access/egress point would only be accessible during night time, when traffic on the FDR Drive is lowest, and would alleviate traffic through the Montgomery Street access/egress point. However, in order to

present a conservative analysis, only the existing access/egress at Montgomery Street was assumed for the transportation analysis.

There is one existing vehicular access/egress location to Stuyvesant Cove Park at East 23rd Street but a potential new vehicular access/egress point at East 20th Street may be temporarily available during construction of the proposed project if the barrier within the existing EDC parking lot under the FDR Drive is removed. However, in order to present a conservative analysis, only the existing access/egress at East 23rd Street was assumed for the transportation analysis.

The area under the Williamsburg Bridge is currently cordoned off to restrict access to the six 30-foot by 30-foot bridge footings, but additional safety measures such as additional fencing and flaggers would be implemented, where necessary, during construction to protect the footings from the construction traffic streams passing through this area.

PEDESTRIAN/CYCLIST ACCESS AND CIRCULATION

As discussed in Chapter 5.9, "Transportation," pedestrians and bicyclists can access East River Park at Montgomery Street and South Street, at four pedestrian bridges, including Corlears Hook Park, Delancey Street, East 6th Street, and East 10th Street pedestrian bridges as well as the overpass at Houston Street. However, Alternatives 3 through 5 would include the reconstruction of the Delancey Street and East 10th Street Bridges, and for Alternatives 4 and 5, also the reconstruction of the Corlears Hook Bridge. Based on the preliminary construction schedule, these bridges would each be closed for approximately one and a half years during construction for Alternatives 2 and 3, and for the full duration of the construction period for Alternatives 4 and 5. Pedestrian and bicyclist circulation through Stuyvesant Cove Park may also be closed for a portion of the construction period for the proposed project and the analysis conservatively assumes that circulation through this area would be closed during construction. The proposed project would also include the temporary closure of Captain Patrick J. Brown Walk during a portion of the construction period to accommodate activities associated with the flyover pedestrian bridge.

TRANSPORTATION ASSESSMENT

SCREENING ASSESSMENT

The *CEQR Technical Manual* identifies procedures for evaluating the proposed project's potential effects on traffic, transit, pedestrian, and parking conditions. This methodology begins with the preparation of a trip generation analysis to determine the volume of person and vehicle trips associated with the construction of the proposed project. The results are then compared with the *CEQR Technical Manual*-specified thresholds (Level 1 screening analysis) to determine whether additional screening and/or quantified analyses are warranted. If the proposed project would result in 50 or more peak hour vehicle trips or 200 or more peak hour transit or pedestrian trips, a Level 2 screening analysis is performed.

For the Level 2 screening analysis, project-generated trips are assigned to specific intersections, transit routes, and pedestrian elements. If the results of this analysis show that the proposed project would generate 50 or more peak hour vehicle trips through an intersection, 50 or more peak hour bus riders on a bus route in a single direction, 200 or more peak hour subway passengers at any given station, or 200 or more peak hour pedestrian trips per pedestrian

element, further quantified analyses may be warranted to evaluate the potential for significant adverse effects on traffic, transit, and pedestrian safety.

DETAILED TRAFFIC ANALYSIS

Traffic Operations

If a detailed analysis is warranted, the operation of all signalized intersections in the study area would be assessed using methodologies presented in the *2000 Highway Capacity Manual (HCM)* using the *Highway Capacity Software (HCS+ 5.5)*. The *HCM* procedure evaluates the levels of service (LOS) for signalized intersections using average stop control delay, in seconds per vehicle, as described below.

Signalized Intersections

The average control delay per vehicle is the basis for LOS determination for individual lane groups (grouping of movements in one or more travel lanes), the approaches, and the overall intersection. The levels of service are defined in **Table 6.9-1**.

Table 6.9-1
Level of Service Criteria for Signalized Intersections

LOS	Average Control Delay
A	≤ 10.0 seconds
B	>10.0 and ≤ 20.0 seconds
C	>20.0 and ≤ 35.0 seconds
D	>35.0 and ≤ 55.0 seconds
E	>55.0 and ≤ 80.0 seconds
F	>80.0 seconds

Source: Transportation Research Board. *Highway Capacity Manual*, 2000.

Although the HCM methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the *HCM*. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay actually represents the most efficient condition in terms of traffic engineering standards, where an approach or the whole intersection processes traffic close to its theoretical maximum capacity with minimal delay. However, very high v/c ratios—especially those approaching or greater than 1.0—are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. Conditions at LOS E and F reflect poor service levels, and cycle breakdowns are frequent. The *HCM* methodology also provides for a summary of the total intersection operating conditions. The analysis chooses the two critical movements (the worst case from each roadway) and calculates a summary critical v/c ratio. The overall intersection delay, which determines the intersection's LOS, is based on a weighted average of control delays of the individual lane groups. Within New York City, the midpoint of LOS D (45 seconds of delay) is generally considered as the threshold between acceptable and unacceptable operations.

Significant Effect Criteria

According to the criteria presented in the *CEQR Technical Manual*, effects are considered significant and require examination of mitigation if they result in an increase for the proposed project of 5 or more seconds of delay in a lane group over No Action levels beyond mid-LOS D. For No Action LOS E, a 4-second increase in delay is considered significant. For No Action LOS F, a 3-second increase in delay is considered significant. In addition, effects are considered significant if levels of service deteriorate from acceptable A, B, or C in the No Action condition to marginally unacceptable LOS D (a delay in excess of 45 seconds, the midpoint of LOS D), or unacceptable LOS E or F for the proposed project.

E. AFFECTED ENVIRONMENT/EXISTING CONDITIONS

EXISTING CONDITIONS

ROADWAY NETWORK AND TRAFFIC STUDY AREA

The key roadways in the traffic study area (a geographical area that encompasses the potential analysis intersections or elements near the project area) include the FDR Drive, South Street, Avenue C, First Avenue, Second Avenue, Montgomery Street, Grand Street, Delancey Street, East Houston Street, East 20th Street, and East 23rd Street. The physical and operational characteristics of the study area roadways are as follows:

- **FDR Drive** is a major two-way northbound-southbound parkway open to passenger cars only and is closed to commercial traffic. The FDR Drive starts north of the Battery Park Underpass at South and Broad Streets and runs along the entire length of the East River to the 125th Street/Robert F. Kennedy Bridge exit, where it becomes the Harlem River Drive. The FDR Drive has three lanes in each direction for the majority of its span. It is elevated south of Montgomery Street, between East 18th Street and East 25th Street, between East 29th Street and East 38th Street, and between East 93rd Street and East 99th Street and is not elevated for the remaining stretch of roadway. The elevated sections of the FDR Drive are within NYSDOT jurisdiction while the local roadways/non-elevated roadways are within NYCDOT jurisdiction. FDR Drive entrance/exit ramps provide access/egress to multiple corridors within the study area, including, South Street, East Houston Street, East 18th Street, and East 23rd Street.
- **South Street** is a local two-way northbound-southbound roadway to the south of Montgomery Street and a one-way southbound roadway between Montgomery Street and Jackson Street. South Street is located immediately adjacent to the East River and operates from Whitehall Street to Jackson Street near the Williamsburg Bridge. South Street is approximately 34 feet wide curb-to-curb and is a NYCDOT-designated truck route south of Pike Street. There is a designated two-way bicycle lane along South Street that connects to/from the shared-use pathway within East River Park and Stuyvesant Cove Park. South Street provides vehicular, pedestrian, and bicycle access/egress to the East River Park at Montgomery Street.
- **Avenue C** is a major two-way northbound-southbound roadway that operates north of East Houston Street with a curb-to-curb width of approximately 45 feet. South of East Houston Street, Avenue C is known as Pitt Street and operates one-way northbound from north of Grand Street to East Houston Street with a curb-to-curb width ranging from 25 feet to 70 feet. South of Grand Street, Pitt Street becomes Montgomery Street and runs two-way

northbound-southbound with a curb-to-curb width of approximately 70 feet. The M9 bus route operates along Avenue C in both directions north of East Houston Street. Curbside parking is provided along both sides of the street for the majority of the roadway. There is a designated two-way bicycle lane along Avenue C to the north of East Houston Street. Avenue C provides pedestrian and bicycle access/egress to the waterfront at East 18th and East 20th Streets and vehicular, pedestrian, and bicycle access/egress at East 23rd Street.

- **First Avenue** is a major one-way northbound roadway that operates north of East Houston Street with a curb-to-curb width of approximately 70 feet. South of East Houston Street, First Avenue is known as Allen Street and operates two-way northbound-southbound with a curb-to-curb width of approximately 115 feet. First Avenue/Allen Street is a NYCDOT-designated truck route and the M15 local and Select Bus Service (SBS) bus routes operate along Allen Street in both directions and operates northbound along First Avenue and southbound along Second Avenue. Curbside parking is provided along both sides of the street. There is a designated two-way bicycle lane along Allen Street and a one-way northbound bicycle lane along First Avenue.
- **Second Avenue** is a major one-way southbound roadway that operates north of East Houston Street with a curb-to-curb width of approximately 60 feet. South of East Houston Street, Second Avenue is known as Chrystie Street and operates two-way northbound-southbound with a curb-to-curb width of approximately 70 feet. Second Avenue/Chrystie Street is a NYCDOT-designated truck route and the M15 local and SBS bus routes operate southbound along Second Avenue north of East Houston Street. Curbside parking is provided along both sides of the street. There is a designated two-way bicycle lane along Chrystie Street and a one-way southbound bicycle lane along Second Avenue.
- **Grand Street** is a local street that operates one-way eastbound west of Chrystie Street and two-way eastbound-westbound east of Chrystie Street and provides curbside parking on both sides of the street. West of Chrystie Street the curb-to-curb width is approximately 40 feet and east of Chrystie Street the curb-to-curb width is approximately 65 feet. Grand Street is a NYCDOT-designated truck route between Church Street and Allen Street and the M14A bus route operates along Grand Street in both directions to the east of Essex Street. There is a designated two-way bicycle lane along Grand Street east of Chrystie Street and a one-way eastbound bicycle lane west of Chrystie Street.
- **Delancey Street** is a major two-way eastbound-westbound roadway with pedestrian refuge islands within the roadway's median to separate the two-directional traffic and provide storage for pedestrians. Delancey Street generally consists of four travel lanes in each direction with curbside parking on both sides of the street with a curb-to-curb width of approximately 110 feet. East of Clinton Street, the Delancey Street mainline leads onto the Williamsburg Bridge and its service roads extend to/from the FDR Drive. Delancey Street is a NYCDOT-designated truck route and the M14D bus route operates along Delancey Street in the westbound direction only between Columbia Street and the FDR Drive. There is a designated two-way bicycle lane along Delancey Street to the east of Chrystie Street that connects to/from the Williamsburg Bridge. Delancey Street provides access/egress for pedestrians and bicyclists to the East River Park via the existing pedestrian bridge.
- **Houston Street** is a major two-way east–west roadway with three moving lanes in each direction and provides curbside parking on both sides of the street. East Houston Street is approximately 100 feet wide curb-to-curb and is a NYCDOT-designated truck route west of Allen Street/First Avenue. The M14D bus route operates along Houston Street in the eastbound direction only between Avenue D and the FDR Drive. The M21 bus route

operates along Houston Street in both directions. There is a designated two-way bicycle lane along Houston Street. East Houston Street provides access/egress for pedestrians and bicyclists to the East River Park via the existing pedestrian overpass.

- **East 10th Street** is a local roadway that operates one-way eastbound west of Avenue A and two-way eastbound-westbound east of Avenue A and provides curbside parking on both sides of the street. West of Avenue A the curb-to-curb width is approximately 30 feet and east of Avenue A the curb-to-curb width is approximately 45 feet. The M8 bus route operates along East 10th Street in both directions between Avenue A and the traffic circle to the east of Avenue D. There is a designated two-way bicycle lane along East 10th Street east of Avenue A and a one-way eastbound bicycle lane west of Avenue A. East 10th Street provides access/egress for pedestrians and bicyclists to the East River Park via the existing pedestrian bridge.
- **East 20th Street** operates one-way eastbound west of First Avenue and two-way eastbound-westbound east of First Avenue and provides curbside parking on both sides of the street. West of First Avenue the curb-to-curb width is approximately 35 feet and east of First Avenue the curb-to-curb width is approximately 55 feet. The M23 SBS bus route operates westbound along East 20th Street between Avenue C and First Avenue. There is a designated two-way bicycle lane along East 20th Street east of First Avenue and a one-way eastbound bicycle lane west of First Avenue. East 20th Street provides pedestrian and bicycle access/egress to the waterfront at Avenue C.
- **East 23rd Street** is a local two-way east–west roadway with two moving lanes in each direction and provides curbside parking on both sides of the street. East 23rd Street is approximately 65 feet wide curb-to-curb and is a NYCDOT-designated truck route west of First Avenue. The M23 SBS bus route operates along East 23rd Street in both directions. East 23rd Street provides vehicular, pedestrian, and bicycle access/egress to the waterfront at Avenue C.

TRAFFIC CONDITIONS

Traffic data were collected in May 2015 and November 2015 for the weekday AM, midday, PM, and Saturday peak periods via a combination of manual intersection counts and 24-hour automatic traffic recorder (ATR) counts. The existing peak period traffic volumes were developed based on these counts. Since the data was collected in 2015, volume comparisons (between 2015 and 2017) at selected study area locations were also prepared to validate the 2015 data. The comparisons showed that the 2017 weekday traffic volumes are lower than the 2015 traffic volumes by approximately 10 percent. Therefore, the baseline conditions presented below provide a conservative assessment.

Inventories of roadway geometry, traffic controls, bus stops, and parking regulations/activities were recorded to provide appropriate inputs for the operational analyses presented in Chapter 5.9, "Transportation." Official signal timings were also obtained from NYCDOT for use in the analysis of the study area signalized intersections. **Figures 6.9-1 and 6.9-2** show the existing traffic volumes for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours, respectively.

LEVELS OF SERVICE

A summary of the existing conditions traffic analysis results is presented in **Table 6.9-2**. Details on LOS v/c ratios, and average delays are presented in **Table 6.9-3**. Overall, the capacity

analysis indicates that most of the intersection approaches/lane groups near the project area operate acceptably—at mid-LOS D or better (delays of 45 seconds or less per vehicle) for the peak hours. Approaches/lane groups operating beyond mid-LOS D and those with v/c ratios of 0.90 or greater are listed below.

Table 6.9-2
Summary of Existing Traffic Analysis Conditions

	Analysis Peak Hours	
Level of Service	**Weekday AM (6:00 AM to 7:00 AM)**	**Weekday PM (3:00 PM to 4:00 PM)**
Lane Groups at LOS A/B/C	20	4
Lane Groups at LOS D	7	0
Lane Groups at LOS E	3	0
Lane Groups at LOS F	0	0
Total	30	4
Lane Groups with v/c ≥ 0.90	1	0
Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio.		

- Eastbound left-turn at the East 23rd Street and First Avenue intersection (LOS D with a v/c ratio of 0.56 and a delay of 51.0 seconds per vehicle [spv] during the weekday AM peak hour);
- Westbound right-turn at the East 23rd Street and First Avenue intersection (LOS E with a v/c ratio of 0.78 and a delay of 64.9 spv during the weekday AM peak hour);
- Northbound left-turn at the East 23rd Street and First Avenue intersection (LOS E with a v/c ratio of 0.77 and a delay of 67.4 spv during the weekday AM peak hour);
- Southbound approach at the East 23rd Street and Avenue C intersection (LOS E with a v/c ratio of 0.97 and a delay of 66.5 spv during the weekday AM peak hour); and
- Northbound left-turn at the East Broadway and Allen Street/Pike Street intersection (LOS D with a v/c ratio of 0.39 and a delay of 45.5 spv during the weekday AM peak hour).

Table 6.9-3
Existing Conditions Level of Service Analysis

Intersection	AM Peak Hour (6:00 AM to 7:00 AM) Lane Group	v/c Ratio	Delay (sec)	LOS	PM Peak Hour (3:00 PM to 4:00 PM) Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and Second Avenue								
EB	TR	0.63	31.4	C	Analysis not warranted during PM peak hour.			
WB	LT	0.67	34.2	C				
SB	L	0.69	43.8	D				
	TR	0.56	12.1	B				
	Intersection		21.0	C				
East 23rd Street and First Avenue								
EB	L	0.56	51.0	D	Analysis not warranted during PM peak hour.			
	T	0.34	16.0	B				
WB	T	0.32	26.2	C				
	R	0.78	64.9	E				
NB	L	0.77	67.4	E				
	TR	0.66	27.2	C				
	Intersection		30.4	C				
East 23rd Street and Avenue C								
EB (Mainline)	LTR	0.84	43.6	D	Analysis not warranted during PM peak hour.			
WB	LTR	0.08	14.0	B				
NB	LTR	0.40	18.5	B				
SB	LTR	0.97	66.5	E				
EB (Service Road)	R	0.23	38.0	D				
	Intersection		42.9	D				
East Broadway and Allen Street/Pike Street								
EB	LTR	0.70	37.6	D	Analysis not warranted during PM peak hour.			
WB	LTR	0.48	28.0	C				
NB	L	0.39	45.5	D				
	TR	0.25	18.0	B				
SB	L	0.17	41.4	D				
	T	0.28	19.6	B				
	Intersection		26.9	C				
South Street and Allen Street/Pike Street								
EB	L	0.30	10.8	B	Analysis not warranted during PM peak hour.			
	T	0.35	21.0	C				
WB	TR	0.54	25.0	C				
SB	L	0.31	32.5	C				
	R	0.31	32.6	C				
	Intersection		23.1	C				
South Street and Montgomery Street								
EB	LTR	0.18	10.7	B	LTR	0.25	11.4	B
WB	LTR	0.33	12.2	B	LTR	0.83	24.4	C
NB	LTR	0.06	19.9	B	LTR	0.04	19.7	B
SB	LTR	0.29	22.8	C	LTR	0.28	22.7	C
	Intersection		14.4	B	Intersection		21.4	C

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

F. ENVIRONMENTAL EFFECTS

A detailed description of the alternatives analyzed in this chapter is presented in Chapter 2.0, "Project Alternatives."

NO ACTION ALTERNATIVE (ALTERNATIVE 1)[1]

Under the No Action Alternative, no new comprehensive coastal protection system is installed in the proposed project area, and no new trips are generated by the proposed project. As described in Chapter 5.9, "Transportation," there are a number of projects planned or under construction within a ½-mile of the project area that are expected to be complete by 2025. These projects will generate traffic, transit, pedestrian trips, and parking demands that are background growth not associated with the proposed project.

As discussed in greater detail below, the peak quarter of construction for Alternative 3 would occur in the first quarter of 2023 and the peak quarter of construction for the Preferred Alternative would occur in the first quarter of 2022, resulting in an analysis year of 2023 for Alternative 3 and 2022 for the Preferred Alternative. For comparison to the proposed project's construction peak quarter traffic conditions in 2022 and 2023, the No Action Alternative was developed by increasing existing traffic levels by the expected growth in overall travel through and within the study area. As per *CEQR Technical Manual* guidelines, an annual background growth rate of 0.25 percent was assumed for the first five years (year 2016 to year 2020) and then 0.125 percent for the remaining years (year 2021 to the construction peak quarter in the year 2022 for the Preferred Alternative and 2023 for Alternative 3) in Manhattan, resulting in an overall growth rate of approximately 1.50 percent by 2022 and 1.65 percent by 2023. As shown in detail in **Appendix A1**, a total of 168 development projects expected to occur in the No Action Alternative (No Action projects) were identified as being planned for the ½-mile study area by the end of 2025. However, many of these planned projects are modest in size and would be very modest traffic generators. Additionally, the construction analysis peak hours of 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM are atypical and would generate a marginal amount of trips as compared to the typical commuter peak hours of 8:00 AM to 9:00 AM and 5:00 PM to 6:00 PM. Three of the planned developments would generate more substantial traffic increases during the analysis peak hours, the *Brookdale Campus EIS* (including the four-story New York City Department of Sanitation garage complex to store equipment and provide personnel support services and operational space as well as approximately 1.5 million square feet of mixed-use commercial, retail, and community facility space), the *Alexandria Phase 3 EIS* (including approximately 1.30 million square feet of mixed-use commercial, academic, and community facility space), and the *Two Bridges Large Scale Residential Development EIS* (including approximately 2,775 new dwelling units and 27,996 square feet of mixed-use retail and community facility space). Mitigation measures from the *Two Bridges Large Scale Residential Development EIS* at the East Broadway and Allen Street/Pike Street intersection (consisting of lane restriping) that would be implemented prior to the peak construction quarter were also assumed in the No Action Alternative presented below. In 2017, the intersection of South Street and Montgomery Street was restriped, resulting in updated lane widths at this intersection. These modifications were similarly assumed in the No Action Alternative.

[1] The Two Bridges LSRD Project, comprised of Sites 4 (4A/4B), 5, and 6A, as analyzed in the 2018 FEIS, was assumed to start construction in 2019 and be completed and occupied in 2021. A court has issued a decision preventing the project from moving forward at this time, however, in order to provide for a conservative construction traffic analyses in this chapter, the transportation demands presented in that FEIS during occupancy of the Two Bridges LSRD Project have been included in the construction traffic analysis of the Preferred Alternative.

The trips associated with the three proposed projects were developed and included in the No Action Alternative traffic volumes. In order to prepare a conservative analysis, an additional background growth rate of 3.0 percent was assumed to account for traffic increases resulting from the remaining No Action projects.

TRAFFIC OPERATIONS

The 2022 No Action Alternative traffic volumes are shown in **Figures 6.9-3 and 6.9-4** and the 2023 No Action Alternative traffic volumes are shown in **Figures 6.9-5 and 6.9-6** for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours, respectively. The No Action traffic volumes for both Alternatives were projected by layering on top of the existing traffic volumes the following: *CEQR* background growth, background growth to account for No Action projects in the area, and incremental trips generated by the three No Action projects described above. A summary of the 2022 and 2023 No Action Alternative traffic analysis results is presented in **Table 6.9-4**. Details on level-of-service, v/c ratios, and average delays are presented in **Tables 6.9-5 and 6.9-6**.

Table 6.9-4
Summary of 2022 and 2023 No Action Traffic Analysis Results

Level of Service	Analysis Peak Hours	
	Weekday AM (6:00 AM to 7:00 AM)	Weekday PM (3:00 PM to 4:00 PM)
2022 No Action (Preferred Alternative) & 2023 No Action (Alternative 3)		
Lane Groups at LOS A/B/C	21	4
Lane Groups at LOS D	6	0
Lane Groups at LOS E	3	0
Lane Groups at LOS F	1	0
Total	31	4
Lane Groups with v/c ≥ 0.90	2	0

Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio

Based on the analysis results presented in **Tables 6.9-5 and 6.9-6**, the majority of the approaches/lane-groups will operate at the same LOS as in the existing conditions. The following approaches/lane-groups are expected to operate at deteriorated LOS when compared to the existing conditions:

- Southbound left-turn at the East 23rd Street and Second Avenue intersection will deteriorate within LOS D with a v/c ratio of 0.75/0.75 and a delay of 47.5/47.7 spv during the weekday AM peak hour in 2022/2023;
- Eastbound left-turn at the East 23rd Street and First Avenue intersection will deteriorate to LOS E with a v/c ratio of 0.64 and a delay of 55.8 spv during the weekday AM peak hour in 2022 and 2023;
- Westbound right-turn at the East 23rd Street and First Avenue intersection will deteriorate to LOS F with a v/c ratio of 0.93 and a delay of 90.8 spv during the weekday AM peak hour in 2022 and 2023; and
- Eastbound (mainline) approach at the East 23rd Street and Avenue C intersection will deteriorate within LOS D with a v/c ratio of 0.88/0.88 and a delay of 47.1/47.3 spv during the weekday AM peak hour in 2022/2023.

Table 6.9-5
2022 No Action Alternative Level of Service Analysis – Preferred Alternative

Intersection	AM Peak Hour (6:00 AM to 7:00 AM)				PM Peak Hour (3:00 PM to 4:00 PM)			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and Second Avenue								
EB	TR	0.66	32.3	C	Analysis not warranted during PM peak hour.			
WB	LT	0.72	36.3	D				
SB	L	0.75	47.5	D				
	TR	0.60	12.6	B				
	Intersection		22.0	C				
East 23rd Street and First Avenue								
EB	L	0.64	55.8	E	Analysis not warranted during PM peak hour.			
	T	0.36	16.2	B				
WB	T	0.34	26.4	C				
	R	0.93	90.8	F				
NB	L	0.80	71.4	E				
	TR	0.70	28.0	C				
	Intersection		33.3	C				
East 23rd Street and Avenue C								
EB (Mainline)	LTR	0.88	47.1	D	Analysis not warranted during PM peak hour.			
WB	LTR	0.08	14.1	B				
NB	LTR	0.43	18.9	B				
SB	LTR	1.02	77.5	E				
EB (Service Road)	R	0.23	38.0	D				
	Intersection		47.8	D				
East Broadway and Allen Street/Pike Street								
EB	LT	0.54	29.7	C	Analysis not warranted during PM peak hour.			
	R	0.11	21.5	C				
WB	LTR	0.50	28.7	C				
NB	L	0.42	46.3	D				
	TR	0.26	18.2	B				
SB	L	0.19	41.9	D				
	T	0.29	19.7	B				
	Intersection		25.0	C				
South Street and Allen Street/Pike Street								
EB	L	0.32	11.1	B	Analysis not warranted during PM peak hour.			
	T	0.37	21.3	C				
WB	TR	0.57	25.8	C				
SB	L	0.33	32.9	C				
	R	0.33	33.0	C				
	Intersection		23.6	C				
South Street and Montgomery Street								
EB	LTR	0.20	10.9	B	LTR	0.27	11.6	B
WB	LTR	0.35	12.4	B	LTR	0.89	28.9	C
NB	LTR	0.06	20.0	B	LTR	0.04	19.8	B
SB	LTR	0.32	23.4	C	LTR	0.37	24.5	C
	Intersection		14.8	B	Intersection		24.6	C

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

Table 6.9-6
2023 No Action Alternative Level of Service Analysis – Alternative 3

Intersection	AM Peak Hour (6:00 AM to 7:00 AM)				PM Peak Hour (3:00 PM to 4:00 PM)			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and Second Avenue								
EB	TR	0.66	32.3	C	Analysis not warranted during PM peak hour.			
WB	LT	0.72	36.3	D				
SB	L	0.75	47.7	D				
	TR	0.60	12.6	B				
	Intersection		22.1	C				
East 23rd Street and First Avenue								
EB	L	0.64	55.8	E	Analysis not warranted during PM peak hour.			
	T	0.36	16.2	B				
WB	T	0.34	26.4	C				
	R	0.93	90.8	F				
NB	L	0.80	71.4	E				
	TR	0.70	28.0	C				
	Intersection		33.3	C				
East 23rd Street and Avenue C								
EB (Mainline)	LTR	0.88	47.3	D	Analysis not warranted during PM peak hour.			
WB	LTR	0.08	14.1	B				
NB	LTR	0.43	18.9	B				
SB	LTR	1.02	77.5	E				
EB (Service Road)	R	0.23	38.0	D				
	Intersection		47.9	D				
East Broadway and Allen Street/Pike Street								
EB	LT	0.55	29.7	C	Analysis not warranted during PM peak hour.			
	R	0.11	21.5	C				
WB	LTR	0.50	28.7	C				
NB	L	0.42	46.3	D				
	TR	0.26	18.2	B				
SB	L	0.19	41.9	D				
	T	0.29	19.7	B				
	Intersection		25.0	C				
South Street and Allen Street/Pike Street								
EB	L	0.32	11.1	B	Analysis not warranted during PM peak hour.			
	T	0.37	21.3	C				
WB	TR	0.57	25.8	C				
SB	L	0.33	32.9	C				
	R	0.33	33.0	C				
	Intersection		23.6	C				
South Street and Montgomery Street								
EB	LTR	0.20	10.9	B	LTR	0.27	11.6	B
WB	LTR	0.35	12.4	B	LTR	0.89	29.0	C
NB	LTR	0.06	20.0	B	LTR	0.04	19.8	B
SB	LTR	0.32	23.4	C	LTR	0.39	24.5	C
	Intersection		14.8	B	Intersection		24.7	C

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

PREFERRED ALTERNATIVE (ALTERNATIVE 4): FLOOD PROTECTION SYSTEM WITH A RAISED EAST RIVER PARK

Preferred Alternative would raise the majority of East River Park. This plan would reduce the length of wall between the community and the waterfront to provide for enhanced neighborhood connectivity and integration. In addition to the Delancey Street and 10th Street Bridges, the Corlears Hook Bridge would be reconstructed to be universally accessible and ADA-compliant and would improve safety and access/egress to East River Park for pedestrians and bicyclists.

The Preferred Alternative would also include modifications of the existing sewer system, including installation of gates underground near the northern and southern extents of the project area within the existing large capacity sewer pipe (interceptor), and flood-proofing manholes and regulators located on the unprotected side of the proposed project alignment, to control flow into the project area from the larger combined sewer drainage area. One interceptor gate would be installed along the service road in Corlears Hook Park just west of the FDR Drive between Jackson and Cherry Streets, and another along the eastbound approach of East 20th Street just west of Avenue C (referred to as the "south gate" and "north gate," respectively, in the subsequent description). Each interceptor gate would consist of a below-ground interceptor chamber and above-ground interceptor house. The south gate chamber and house would not occupy any part of the service road, sidewalks, or nearby streets. As part of the south gate installation, there would be a lane shift within the service road for approximately 150 feet so that the existing shared-use path could be realigned to a minimum width of 10 feet. This lane shift would not affect vehicular or pedestrian circulation or safety and would not result in any significant adverse effects on transportation systems. As part of the north gate construction, potential No Standing Anytime parking regulations would be sought for a length that would displace no more than three passenger car parking spaces in what is currently a commercial loading zone by day and alternate side parking by night. The north gate house would be located within the raised concrete divider between the eastbound service road and mainline of East 20th Street just west of Avenue C. This divider is currently paved with cobblestones and trees, and is not used for pedestrian circulation. To site the gate house next to the gate chamber and safely accommodate workers within the raised curb area of the divider who may need to access the gate house, the divider will be widened into the parking lanes north and south of it. During construction, a total of up to 11 parking spaces that could be lost on East 20th Street. Vehicles currently using these parking spaces would park on-street or at off-street parking facilities within ¼-mile of the project area where capacity was observed. Therefore similar to the south gate, the north gate installation would not result in any significant adverse effects on transportation systems. The lane shift is a temporary measure during construction only and would not affect operational conditions once construction is completed. The parking removal on East 20th Street would continue after construction is completed and would affect both construction and operational conditions.

One parallel conveyance, M-27, would be constructed on private property owned by the East River Housing Corporation. During construction there would be a temporary loss of up to 50 spaces, which was accounted for in the parking analysis presented below. During this time, a small portion of vehicles currently parking on-site may need to be relocated to on-street curbsides and off-street parking facilities within ½-mile. These relocated vehicles would need to circulate the surrounding street networks, which could result in modest vehicle trip increases at various intersections. However, based on the limited and temporary loss in parking spaces expected, it is not anticipated that traffic circulating to find available parking would result in any significant adverse traffic effects. While there would be temporary displacement of parking during construction, this displacement is not expected to materially impact operational parking at the East River Houses property once construction is completed.

Installation of additional sewer pipes and, in one location, enlargement of existing sewer pipe, is also proposed within and adjacent to the project area to reduce the risk of street and property flooding within the protected area during a storm event. Under this alternative, a shared-use flyover bridge would be built cantilevered over the northbound FDR Drive to address the narrowed pathway (pinch point) near the East River Dock between East 13th Street and East

15th Street, thus providing a more accessible connection between East River Park and Captain Patrick J. Brown Walk. During construction of the flyover bridge, the pinch point near the East River Dock would be closed.

The flood protection system and raised East River Park proposed under this alternative would be constructed in 3.5 years and completed in 2023 compared to the 5-year construction duration anticipated under Alternatives 2, 3, and 5. The foundations for the shared-use flyover bridge would also be completed in 2023, with the prefabricated bridge span be installed and completed in 2025. Construction associated with the flyover bridge would require temporary FDR Drive lane closures, which would conform to the lane closure schedule currently permitted by NYCDOT's OCMC during off-peak hours. Therefore, no significant adverse effects on transportation systems are anticipated.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Table 6.9-7 shows the estimated average daily numbers of workers and deliveries to Project Area One by calendar quarter for the duration of the construction period for the proposed project under the Preferred Alternative. The average number of workers throughout the entire period would be approximately 216 per day and the peak number of workers would reach 250 per day from the third quarter of 2020 to the second quarter of 2022. The average number of trucks throughout the entire construction period would be 60 per day, and the peak would occur from the fourth quarter of 2021 to the first quarter of 2022, with 147 trucks per day.

Table 6.9-7
Average Number of Daily Workers and Trucks by Year and Quarter
Project Area One – The Preferred Alternative[1]

Year	2020				2021				2022					
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers/Worker Autos	27/10	173/64	**250/92**	**250/92**	**250/92**	**250/92**	**250/92**	**250/92**	**250/92**	**250/92**	230/85	230/85		
Trucks	6	34	45	111	111	39	39	**147**	**147**	39	39	39		
Year	2023				2024				2025					
Quarter	1st	2nd	3rd	4th[1]	1st[1]	2nd[1]	3rd[1]	4th[1]	1st[1]	2nd	3rd	4th	Average	Peak
Workers/Worker Autos	230/85	183/68	160/59	12/5	12/5	12/5	12/5	12/5	12/5	-	-	-	216/80	250/92
Trucks	39	31	27	4	4	4	4	4	4	-	-	-	60	147

Note:
[1] The build year for the proposed project is 2025. Under the Preferred Alternative, the flood protection, reconstruction of three existing pedestrian bridges, foundations for a new shared-use flyover bridge, and park access features are expected to be completed in 2023, with the superstructure of the shared-use flyover bridge would then be completed in 2025.
Source: AKRF/KSE Joint Venture (JV), November 2018.

Table 6.9-8 shows the estimated average daily numbers of workers and deliveries to Project Area Two by calendar quarter for the duration of the construction period for the proposed project under the Preferred Alternative. The average number of workers throughout the entire period would be approximately 94 per day and the peak number of workers would reach 140 per day in the second quarter of 2022. The average number of trucks throughout the entire construction period would be 29 per day, and the peak would occur from the third quarter of 2021 to the second quarter of 2022, with 44 trucks per day.

Table 6.9-8
Average Number of Daily Workers and Trucks by Year and Quarter
Project Area Two – Preferred Alternative[1]

Year	2020				2021				2022					
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers/Worker Autos	20/7	60/22	90/33	97/36	110/41	110/41	**140/52**	**140/52**	**140/52**	133/49	120/44	110/41		
Trucks	4	11	36	37	40	40	**44**	**44**	**44**	43	40	32		
Year	2023				2024				2025					
Quarter	1st	2nd	3rd	4th[1]	1st[1]	2nd[1]	3rd[1]	4th[1]	1st[1]	2nd	3rd	4th	Average	Peak
Workers/Worker Autos	60/22	50/18	30/11	12/5	12/5	12/5	12/5	12/5	12/5	-	-	-	94/35	140/52
Trucks	8	7	4	4	4	4	4	**4**	**4**	-	-	-	29	44

Note:
[1] The build year for the proposed project is 2025. Under the Preferred Alternative, the flood protection, reconstruction of three existing pedestrian bridges, foundations for a new shared-use flyover bridge, and park access features are expected to be completed in 2023, with the superstructure of the shared-use flyover bridge would then be completed in 2025.
Source: AKRF/KSE Joint Venture (JV), November 2018.

PEAK-HOUR CONSTRUCTION-WORKER VEHICLE AND TRUCK TRIPS

As discussed in Chapter 6.0, "Construction Overview," the preliminary construction schedule for the proposed project assumes five workdays per week with one 8-hour shift day shift and one 6-hour night shift. For the daytime work shift, similar to other construction projects in New York City, most of the construction activities are expected to take place from 7:00 AM to 3:30 PM. While construction truck trips would occur throughout the day (with more trips during the early morning), most trucks would remain in the area for short durations, and construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips (one "in" and one "out"), whereas each worker vehicle was assumed to arrive near the work shift start hour and depart near the work shift end hour. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would generally occur during the hour before and after each work shift. Construction truck deliveries typically peak during the hour before each shift (25 percent), overlapping with construction worker arrival traffic. Further, in accordance with the *CEQR Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2.

Due to the proximity of the expected floodwall alignment to the FDR Drive, excavation, and pile driving activities for the floodwall will likely require night work due to the need for FDR Drive single lane closures, which are only permitted at night. Appropriate work permits from NYCDOT would be obtained for any necessary night time work. **Table 6.9-9** shows the schedule for FDR Drive lane closures currently permitted by NYCDOT's Office of Construction Mitigation and Coordination (OCMC).

In addition, as discussed in Section D, "Affected Environment/Existing Conditions," during the installation of closure structures (including gates and associated foundations) across the FDR Drive near East 13th Street, the FDR Drive may require temporary lane closures for Alternatives 2 through 4. Installation of these closures structures is discussed in further detail below under "Swing Gates Construction across the FDR Drive." Construction of the raised FDR Drive platform and flyover bridge under Alternative 5 would require more extensive work within the FDR Drive. The preliminary assumptions for construction phasing and required lane closures are discussed in further details below under "Alternative 5: Flood Protection System Alignment East of FDR Drive."

Table 6.9-9
Schedule for Permitted FDR Drive Lane Closures
Brooklyn Bridge to East 125th Street

Day of Week	One Lane	Two Lanes[1]
Weekdays	11:00 PM to 5:30 AM	1:00 AM to 5:00 AM
Saturday	12:00 AM to 6:00 AM	1:00 AM to 5:00 AM
Sunday	1:00 AM to 11:00 AM	1:00 AM to 5:00 AM

Note:
[1] OCMC generally allows for closure of up to two lanes of traffic for 4 hours beginning at 1:00 AM, with clearance, and full re-opening by 5:00 AM; full closure (3 lanes) is generally limited to 15 minutes.
Source: NYCDOT comment letter, April 22, 2015.

Extended Work Hours

As described in Chapter 6.0, "Construction Overview," in order to factor in potential weather delays and/or other possible construction delays and to meet the project construction schedule as determined by the City, additional evening and overnight construction and Saturday construction may also be necessary. The daily traffic variations were evaluated through a review of the ATR volume data, which included weekends, to determine if weekend background volumes in the area are generally lower than those on weekdays during the construction analysis peak hours (6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM). Based on the collected ATR data, the weekday AM volumes are approximately thirty percent higher than the Saturday (the higher traffic volume day of the two weekend days) AM volumes and the weekday PM volumes are approximately the same as the Saturday PM volumes. Therefore, any potential significant adverse traffic, parking, transit, and pedestrian effects identified during weekend conditions would be within the envelope of significant adverse traffic, parking, transit, and pedestrian effects identified during weekday conditions.

TRANSPORTATION SCREENING ASSESSMENT

As discussed above in "Methodology," based on the latest available U.S. Census data (2000 Census data) for workers in the construction and excavation industry, it is expected that 48 percent of construction workers commute to the project site by private autos at an average occupancy of approximately 1.30 persons per vehicle.

Level 1 Screening Analysis

Table 6.9-10presents the hourly-trip projections for the peak construction quarter (first quarter of 2022) for Project Area One when activities are anticipated to occur throughout the project area. As shown, the maximum construction-related traffic increments would be approximately 166 PCEs between 6:00 AM and 7:00 AM and 82 PCEs between 3:00 PM and 4:00 PM. **Table 6.9-11** presents the hourly-trip projections for the peak construction quarter (second quarter of 2022) for Project Area Two when activities are anticipated to occur throughout the project area. As shown, the maximum construction-related traffic increments would be approximately 85 PCEs between 6:00 AM and 7:00 AM and 49 PCEs between 3:00 PM and 4:00 PM.

Table 6.9-10
Peak Construction Vehicle Trip Projections
Project Area One – Preferred Alternative

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	**74**	**0**	**74**	**23**	**23**	**46**	**97**	**23**	**120**	**120**	**46**	**166**
7 AM–8 AM	18	0	18	18	18	36	36	18	54	54	36	90
8 AM–9 AM	0	0	0	18	18	36	18	18	36	36	36	72
9 AM–10 AM	0	0	0	18	18	36	18	18	36	36	36	72
10 AM–11 AM	0	0	0	17	17	34	17	17	34	34	34	68
11 AM–12 PM	0	0	0	17	17	34	17	17	34	34	34	68
12 PM–1 PM	0	0	0	17	17	34	17	17	34	34	34	68
1 PM–2 PM	0	0	0	15	15	30	15	15	30	30	30	60
2 PM–3 PM	0	5	5	2	2	4	2	7	9	4	9	13
3 PM–4 PM	0	74	74	2	2	4	2	76	78	4	78	82
4 PM–5 PM	0	13	13	0	0	0	0	13	13	0	13	13
Daily Total	92	92	184	147	147	294	239	239	478	386	386	772

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).
* This table has been revised for the FEIS.

Table 6.9-11
Peak Construction Vehicle Trip Projections
Project Area Two – Preferred Alternative

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	41	0	41	11	11	22	52	11	63	63	22	85
7 AM–8 AM	11	0	11	5	5	10	16	5	21	21	10	31
8 AM–9 AM	0	0	0	5	5	10	5	5	10	10	10	20
9 AM–10 AM	0	0	0	5	5	10	5	5	10	10	10	20
10 AM–11 AM	0	0	0	4	4	8	4	4	8	8	8	16
11 AM–12 PM	0	0	0	4	4	8	4	4	8	8	8	16
12 PM–1 PM	0	0	0	4	4	8	4	4	8	8	8	16
1 PM–2 PM	0	0	0	2	2	4	2	2	4	4	4	8
2 PM–3 PM	0	3	3	2	2	4	2	5	7	4	7	11
3 PM–4 PM	0	41	41	2	2	4	2	43	45	4	45	49
4 PM–5 PM	0	8	8	0	0	0	0	8	8	0	8	8
Daily Total	52	52	104	44	44	88	96	96	192	140	140	280

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

The cumulative construction trips in PCEs for Project Areas One and Two are presented in **Table 6.9-12**. The peak quarter construction-related traffic increments would be approximately 251 PCEs between 6:00 AM and 7:00 AM and 131 PCEs between 3:00 PM and 4:00 PM. As was done for Alternative 3, a Level 2 assessment was conducted, as discussed below.

Table 6.9-12
Total Peak Construction Vehicle Trip Projections – Preferred Alternative

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	**115**	**0**	**115**	**34**	**34**	**68**	**149**	**34**	**183**	**183**	**68**	**251**
7 AM–8 AM	29	0	29	23	23	46	52	23	75	75	46	121
8 AM–9 AM	0	0	0	23	23	46	23	23	46	46	46	92
9 AM–10 AM	0	0	0	23	23	46	23	23	46	46	46	92
10 AM–11 AM	0	0	0	21	21	42	21	21	42	42	42	84
11 AM–12 PM	0	0	0	21	21	42	21	21	42	42	42	84
12 PM–1 PM	0	0	0	21	21	42	21	21	42	42	42	84
1 PM–2 PM	0	0	0	17	17	34	17	17	34	34	34	68
2 PM–3 PM	0	8	8	4	4	8	4	12	16	8	16	24
3 PM–4 PM	0	115	115	4	4	8	4	119	123	8	123	131
4 PM–5 PM	0	21	21	0	0	0	0	21	21	0	21	21
Daily Total	144	144	288	191	191	382	335	335	670	526	526	1,052

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

LEVEL 2 SCREENING ANALYSIS

The assignments of the 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hour incremental construction trips in PCEs described above are shown in **Figures 6.9-7a and 6.9-7b, Figures 6.9-8a and 6.9-8b**, and **Table 6.9-13**. As presented in **Table 6.9-21**, the same six intersections selected for quantified analysis for Alternative 3 (see below) were also analyzed for the Preferred Alternative.

Table 6.9-13
Traffic Level 2 Screening Analysis Results
Selected Analysis Locations – Preferred Alternative

Intersection	Weekday		Selected Analysis Locations
	6:00 AM–7:00 AM	3:00 AM–4:00 PM	
23rd Street and Third Avenue	46	12	
23rd Street and Second Avenue	**87**	14	✓
23rd Street and First Avenue	**74**	27	✓
23rd Street and Avenue C	**58**	36	✓
20th Street and Second Avenue	**53**	2	
20th Street and First Avenue	44	17	
20th Street and Avenue C	25	25	
18th Street and Avenue C	10	7	
14th Street and Second Avenue	46	2	
14th Street and First Avenue	44	4	
Houston Street and Chrystie Street/Second Avenue	32	10	
Houston Street and Allen Street/First Avenue	34	12	
Houston Street and Essex Street/ Avenue A	2	8	
Houston Street and Columbia Street/ Avenue D	8	7	
Houston Street and FDR Drive	**60**	7	
Delancey Street and Chrystie Street/Second Avenue	30	10	
Delancey Street and Allen Street/First Avenue	38	8	
Delancey Street and Clinton Street/Avenue B	26	6	
Grand Street and Chrystie Street/Second Avenue	26	4	
Grand Street and Allen Street/First Avenue	52	4	
Grand Street and Clinton Street/Avenue B	24	4	
Grand Street and Pitt Street/Montgomery Street	24	8	
Canal Street and Allen Street/First Avenue	50	4	
East Broadway and Allen Street/Pike Street	66	10	✓
East Broadway and Montgomery Street	48	8	
Madison Street and Montgomery Street	48	14	
South Street and Allen Street/Pike Street	56	15	✓
South Street and Montgomery Street	98	66	✓

Notes: ✓ denotes intersections selected for the detailed traffic analysis. South Street and Montgomery Street were selected for analysis for both peak hours and the remaining locations were selected only for the 6:00–7:00 AM peak hour.

Traffic Assignment Assumptions

The construction vehicle trips were assigned to area intersections based on the most likely travel routes to and from the project area, prevailing travel patterns, commuter origin-destination (O–D) summaries from the census data, the configuration of the roadway network, and the expected locations of site access and egress. Construction workers are generally prohibited from parking their vehicles on-site during the construction period and would be accommodated by available on-street and off-street parking facilities within a ½-mile radius of the project area.

Construction Worker Autos

The assignments for construction workers were based on the 2006–2010 U.S. Census Bureau American Community Survey (ACS) RJTW origin-destination estimates (for Manhattan census tracts 2.01, 2.02, 10.01, 10.02, 12, 14.01, 20, 22.01, 22.02, 24, 26.01, 26.02, 28, 34, 44.01, 60, and 62). Many of the trips would originate from north of the project area, from Manhattan north of the project area (7 percent), from Queens (23 percent), from the Bronx (10 percent), from counties in upstate New York (10 percent), from Connecticut (1 percent), and from Long Island (11 percent). The remaining trips would originate from New Jersey (15 percent), Brooklyn (15 percent), Staten Island (5 percent), and within Manhattan west of the project area (3 percent). All

of the auto trips for Project Area One were assigned to the nearby available on-street parking spaces and all of the auto trips for Project Area Two were assigned to the available on-street parking spaces and off-street parking facilities available within a ½-mile radius of the East River. The majority of trips from north of the project area were expected to reach the sites via Harlem River crossings, the Queensboro Bridge, Queens-Midtown Tunnel, and subsequently along the FDR Drive or West Side Highway. Trips from Brooklyn and Staten Island are expected to use the Manhattan Bridge, Brooklyn Bridge, and Williamsburg Bridge and access the sites via the FDR Drive or the most direct local routes available. Trips originating in New Jersey were assigned through the Holland Tunnel or Lincoln Tunnel to the West Side Highway or the FDR Drive.

Deliveries

Truck delivery trips were assigned to NYCDOT-designated truck routes (see **Figure 6.9-9**). Trucks were assigned to the vehicular access/egress locations at Montgomery Street and East 23rd Street via the Holland Tunnel, Lincoln Tunnel, Williamsburg Bridge, Manhattan Bridge, Ninth Avenue, Tenth Avenue, Lexington Avenue, Third Avenue, Second Avenue, First Avenue, 23rd Street, 14th Street, the West Side Highway, Delancey Street, Allen Street, and South Street. They would remain on the designated truck routes as long as possible, until reaching the project area.

DETAILED TRAFFIC ANALYSIS

Overall, the proposed project would result in approximately 183 and 123 construction-related traffic increments between 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM, respectively. The incremental construction worker auto trips were assigned to the nearby available on-street parking spaces and off-street parking facilities available within a ½-mile radius of the East River. All delivery trips were assigned to the project area via NYCDOT designated truck routes. The incremental construction-related vehicle trips are shown in **Figures 6.9-10 and 6.9-11** for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours.

The Preferred Alternative's traffic volumes are shown in **Figures 6.9-12 and 6.9-13** for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours. The Preferred Alternative's traffic volumes were constructed by layering on top of the No Action Alternative traffic volumes the incremental vehicle trips shown in **Figures 6.9-10 and 6.9-11**. A summary of the Preferred Alternative's traffic analysis results is presented in **Table 6.9-14**.

Table 6.9-14
Summary of Preferred Alternative's Traffic Analysis Results

	Analysis Peak Hours	
Level of Service	**Weekday AM (6:00 AM to 7:00 AM)**	**Weekday PM (3:00 PM to 4:00 PM)**
Lane Groups at LOS A/B/C	21	3
Lane Groups at LOS D	6	1
Lane Groups at LOS E	2	0
Lane Groups at LOS F	2	0
Total	31	4
Lane Groups with v/c ≥ 0.90	2	1
Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio		

Significant Adverse Effects

Details on LOS, v/c ratios, and average delays are presented in **Table 6.9-15**. Significant adverse traffic effects were identified at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the weekday 6:00 AM to 7:00 AM peak hour for the Preferred Alternative. Potential measures that can be implemented to mitigate these significant adverse traffic effects are discussed in Section F below. In addition, with the full reconstruction of East River Park, this alternative is likely to involve barging of fill materials to East River Park, thereby reducing the volume of truck trips from what would otherwise be needed to reconstruct and raise the park.

- Westbound right-turn at the East 23rd Street and First Avenue intersection would deteriorate within LOS F (from a v/c ratio of 0.93 and 90.8 spv of delay to a v/c ratio of 0.95 and 97.2 spv of delay), an increase of more than three seconds, during the weekday AM peak hour. This projected increase in delay constitutes a significant adverse effect.
- Southbound approach at the East 23rd Street and Avenue C intersection would deteriorate from LOS E (v/c ratio of 1.02 and 77.5 spv of delay) to LOS F (v/c ratio of 1.05 and 86.0 spv of delay), an increase of more than four seconds, during the weekday AM peak hour. This projected increase in delay constitutes a significant adverse effect.

Table 6.9-15
No Action and the Preferred Alternative's Level of Service Analysis

Intersection	AM Peak Hour (6:00 AM to 7:00 AM)								PM Peak Hour (3:00 PM to 4:00 PM)							
	No Action				Preferred Alternative				No Action				Preferred Alternative			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and Second Avenue																
EB	TR	0.66	32.3	C	TR	0.68	33.2	C	Analysis not warranted during PM peak hour.							
WB	LT	0.72	36.3	D	LT	0.83	44.2	D								
SB	L	0.75	47.5	D	L	0.75	47.9	D								
	TR	0.60	12.6	B	TR	0.60	12.7	B								
	Intersection		22.0	C	Intersection		23.6	C								
East 23rd Street and First Avenue																
EB	L	0.64	55.8	E	L	0.64	55.8	E	Analysis not warranted during PM peak hour.							
	T	0.36	16.2	B	T	0.36	16.2	B								
WB	T	0.34	26.4	C	T	0.37	26.9	C								
	R	0.93	90.8	F	R	0.95	97.2	F+								
NB	L	0.80	71.4	E	L	0.82	74.9	E								
	TR	0.70	28.0	C	TR	0.70	28.2	C								
	Intersection		33.3	C	Intersection		33.8	C								
East 23rd Street and Avenue C																
EB (Mainline)	LTR	0.88	47.1	D	LTR	0.89	49.1	D	Analysis not warranted during PM peak hour.							
WB	LTR	0.08	14.1	B	LTR	0.10	14.2	B								
NB	LTR	0.43	18.9	B	LTR	0.43	18.9	B								
SB	LTR	1.02	77.5	E	LTR	1.05	86.0	F+								
EB (Service Road)	R	0.23	38.0	D	R	0.23	38.0	D								
	Intersection		47.8	D	Intersection		51.3	D								
East Broadway and Allen Street/Pike Street																
EB	LT	0.54	29.7	C	LT	0.55	29.9	C	Analysis not warranted during PM peak hour.							
	R	0.11	21.5	C	R	0.11	21.5	C								
WB	LTR	0.50	28.7	C	LTR	0.53	29.7	C								
NB	L	0.42	46.3	D	L	0.42	46.3	D								
	TR	0.26	18.2	B	TR	0.27	18.3	B								
SB	L	0.19	41.9	D	L	0.19	41.9	D								
	T	0.29	19.7	B	T	0.30	19.9	B								
	Intersection		25.0	C	Intersection		25.2	C								
South Street and Allen Street/Pike Street																
EB	L	0.32	11.1	B	L	0.32	11.2	B	Analysis not warranted during PM peak hour.							
	T	0.37	21.3	C	T	0.38	21.4	C								
WB	TR	0.57	25.8	C	TR	0.59	26.4	C								
SB	L	0.33	32.9	C	L	0.38	34.0	C								
	R	0.33	33.0	C	R	0.33	33.0	C								
	Intersection		23.6	C	Intersection		24.2	C								
South Street and Montgomery Street																
EB	LTR	0.19	10.9	B	LTR	0.22	11.1	B	LTR	0.27	11.6	B	LTR	0.28	11.6	B
WB	LTR	0.35	12.4	B	LTR	0.35	12.4	B	LTR	0.89	28.9	C	LTR	0.94	35.4	D
NB	LTR	0.06	20.0	B	LTR	0.10	20.6	C	LTR	0.04	19.8	B	LTR	0.05	19.8	B
SB	LTR	0.31	23.4	C	LTR	0.35	23.9	C	LTR	0.37	24.5	C	LTR	0.40	25.2	C
	Intersection		14.8	B	Intersection		15.5	B	Intersection		24.6	C	Intersection		29.3	C

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, Int. = Intersection
+ Denotes a significant adverse traffic effect.

PARKING

An inventory of on- and off-street parking within a ¼-mile radius of the project area was conducted in June 2015. The on-street survey involved recording curbside regulations and performing general observations of daytime utilization. The off-street survey provided an inventory of the area's public parking facilities and their legal capacities and daytime utilization.

In terms of on-street parking, there are approximately 70 available on-street parking spaces available near Project Area One and 30 on-street parking spaces available near Project Area Two.

There are a total of 9 public parking facilities within ¼-mile of the project area (1 in Project Area One and 8 in Project Area Two). The combined capacity of these facilities is 400 parking spaces in Project Area One and 3,652 parking spaces in Project Area Two for a total of 4,052 parking spaces. Overall, the facilities were approximately 85 percent utilized and 75 percent utilized, with 60 and 915 off-street parking spaces available within Project Area One and Project Area Two, respectively.

As shown in **Tables 6.9-16 and 6.9-17**, the peak number of workers during the construction of the proposed project would be approximately 250 per day for Project Area One and 140 per day for Project Area Two. Based on 2000 U.S. Census data on workers in the construction and excavation industry, it is expected that 48 percent of construction workers commute to the project area by private autos at an average occupancy of approximately 1.30 persons per vehicle.

The expected construction activities are therefore projected to generate a maximum parking demand of 92 spaces for Project Area One and 52 spaces for Project Area Two. In addition to the construction parking demand, up to 50 off-street parking spaces could be temporarily displaced during construction at the East River Housing Corporation lot as a result of the construction of the Delancey Bridge ramp and parallel conveyance in the East River Housing parking lot. The temporary closure of these two portions of the parking lot during construction would still require that adequate circulation is provided in the East River Housing Corporation parking facility with respect to access to the essential utilities and services as well as access to the other spaces in the lot.

The parking demand for Project Area Two could be fully accommodated by the available on-street parking spaces and off-street parking facilities within a ¼-mile. The Project Area One demand would not be fully accommodated within ¼-mile and could result in a parking shortfall of up to approximately 35 spaces. It is expected that excess parking demand within Project Area One would need to be accommodated by on-street parking or off-street parking beyond a ¼-mile walk from the project area. Alternatively, motorists could choose other modes of transportation. As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, construction of the Preferred Alternative would not result in any significant adverse parking effects.

TRANSIT

Based on 2000 U.S. Census data on workers in the construction and excavation industry, it is expected that approximately 46 percent of construction workers would commute to the project area via transit. The study area is well served by mass transit, including 6 subway lines (No. 6, and F, J, M, Z, and L) and numerous local and express bus routes. During the peak-construction worker shift (a maximum of 250 average daily construction workers for Project Area One and a maximum of 140 average daily construction workers in Project Area Two, as shown in **Tables 6.9-7 and 6.9-8**), this would correspond to approximately 115 and 64 workers traveling by transit for Project Area One and Project Area Two, respectively. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of peak-hour transit trips would be 92 and 52 for Project Area One and Project Area Two, respectively. Since these incremental construction transit trips are well below the *CEQR Technical Manual* 200-transit-trip analysis threshold, no further quantified analysis is warranted. Therefore, construction of the proposed project under the Preferred Alternative would not result in any significant adverse transit effects.

PEDESTRIANS

As summarized above, up to 250 average daily construction workers for Project Area One and 140 average daily construction workers for Project Area Two are projected during peak construction for the proposed project. With 80 percent of these workers arriving or departing during the construction peak hours (6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM), the corresponding numbers of peak-hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be approximately 200 and 112 for Project Area One and Project Area Two, respectively. Given the number of available pedestrian routes to/from area parking facilities and transit services and the various access/egress points to the project area, no pedestrian element is expected to experience 200 or more pedestrian trips during an hour, the *CEQR Technical Manual* analysis threshold. Therefore, construction of the proposed project under the Preferred Alternative would not result in any significant adverse pedestrian effects.

However, because pedestrian and bicyclist circulation through East River Park and Stuyvesant Cove Park would be temporarily closed throughout the construction period, it is concluded that construction under the Preferred Alternative would result in temporary significant adverse effects for users of the East River bikeway/walkway. A preliminary rerouting plan would be developed by NYCDOT for implementation during construction of the Preferred Alternative (see Section I: Mitigation-Pedestrians, for measures that would be implemented to accommodate pedestrians and bicyclists during construction).

SHARED-USE FLYOVER BRIDGE

As currently contemplated, the proposed flyover bridge would be a steel thru-truss superstructure supported on footings placed adjacent to the eastern edge of the northbound FDR Drive lanes, within the limits of the existing East River Bikeway. The proposed flyover bridge would be cantilevered over the northbound FDR Drive. The thru truss bridge would be approximately 1,000 feet long and 15 feet wide and approximately 19 feet tall from the surface of the bridge deck to the top of the truss. The bridge would have a 16-foot minimum clearance above the elevated roadway between East 13th and East 15th Streets adjacent to the East River Dock. The total height of the flyover bridge would be approximately 40 feet above grade. The flyover bridge would slope down to connect to East River Park on the south and to Captain Patrick J. Brown Walk around East 16th Street on the north. As discussed in Chapter 6.0, "Construction Overview," construction of the flyover bridge would require drilled shafts and the placement of concrete to provide foundation for the structure, installation of piers, and the installation of the prefabricated bridge span. This work would require cranes, excavators, and loaders. Construction associated with the shared-use flyover bridge would require work near the FDR Drive that would necessitate temporary FDR Drive closures, which could only occur at nighttime as currently permitted by NYCDOT. Since all FDR Drive lane closures during construction of the flyover bridge would be temporary in nature and conform to the lane closure schedule currently permitted by NYCDOT's OCMC during off-peak hours, no significant adverse effects on transportation systems are anticipated.

OTHER ALTERNATIVE (ALTERNATIVE 2): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – BASELINE

The Flood Protection System on the West Side of East River Park Baseline Alternative (Alternative 2) would provide flood protection in Project Areas One and Two using a

combination of floodwalls, levees, and closure structures (i.e., deployable gates) from Montgomery Street to East 25th Street.

The flood protection alignment proposed in Alternative 2 would require that the majority of flood protection construction in Project Area One be performed during night-time single-lane closures of the FDR Drive, thus the flood protection system and associated components under this alternative are assumed to be constructed in five years and completed in 2025.

Alternative 2, which is expected to yield comparable construction activities as the Preferred Alternative, would have the potential to result in significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction peak hour. However, these significant adverse effects could be fully mitigated with the implementation of signal timing changes. This alternative would not have any significant adverse transit, pedestrian, or parking effects.

OTHER ALTERNATIVE (ALTERNATIVE 3): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – ENHANCED PARK AND ACCESS

Alternative 3 provides flood protection using a combination of floodwalls, levees, and closures structures in Project Areas One and Two. In addition, the existing pedestrian bridges and bridge landings at Delancey and East 10th Streets would be completely reconstructed to provide American Disability Act (ADA)-compliant access, and a new raised and landscaped park-side plaza landing would be created at the entrance to the park from the East Houston Street overpass. In Project Area Two, the flood protection alignment would be similar to that proposed in the Preferred Alternative 2.

As proposed in the Preferred Alternative, this alternative would include the shared-use flyover bridge to address the Con Edison pinch point. Similarly, the north and south interceptor gates would also be included in this alternative.

Construction of the flood protection system alignment along the FDR Drive is anticipated to be the critical path component and assumes a 5-year construction duration to be completed in 2025.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Table 6.9-16 shows the estimated average daily numbers of workers and deliveries to Project Area One by calendar quarter for the duration of the construction period for the proposed project under Alternative 3. The average number of workers throughout the entire period would be approximately 114 per day and the peak number of workers would reach 150 per day during the peak construction period from the third quarter of 2020 to the first quarter of 2023 and from the fourth quarter of 2022 to the first quarter of 2023. The average number of trucks throughout the entire construction period would be 53 per day, and the peak would occur from the fourth quarter of 2022 to the first quarter of 2023, with 73 trucks per day.

Table 6.9-16
Average Number of Daily Workers and Trucks by Year and Quarter
Project Area One – Alternative 3

Year	2020				2021				2022				2023			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers/Worker Autos	-	100/37	**150/55**	**150/55**	**150/55**	**150/55**	**150/55**	**150/55**	**150/55**	125/46	125/46	**150/55**	**150/55**	125/46	75/28	75/28
Trucks	-	43	65	65	65	65	65	65	65	55	61	**73**	**73**	61	37	37

Year	2024				2025				Average	Peak
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers/Worker Autos	75/28	75/28	75/28	75/28	75/28	50/18	-	-	114/42	150/55
Trucks	37	37	37	37	37	25	-	-	53	73

Source: AKRF/KSE Joint Venture (JV), February 2018

Table 6.9-17 shows the estimated average daily numbers of workers and deliveries to Project Area Two by calendar quarter for the duration of the construction period for the proposed project under Alternative 3. The average number of workers throughout the entire period would be approximately 55 per day and the peak number of workers would reach 85 per day in the second quarter of 2023. The average number of trucks throughout the entire construction period would be 4 per day, and the peak would occur from the third quarter of 2021 to the second quarter of 2023, with 7 trucks per day.

Table 6.9-17
Average Number of Daily Workers and Trucks by Year and Quarter
Project Area Two – Alternative 3

Year	2020				2021				2022				2023			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers/Worker Autos	-	20/7	30/11	30/11	30/11	30/11	75/28	75/28	75/28	75/28	75/28	75/28	75/28	**85/31**	75/28	75/28
Trucks	-	1	2	2	2	2	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	6	6

Year	2024				2025				Average	Peak
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers/Worker Autos	75/28	60/22	30/11	30/11	30/11	20/7	-	-	55/20	85/31
Trucks	6	4	4	4	4	4	-	-	4	7

Source: AKRF/KSE Joint Venture (JV), February 2018

TRANSPORTATION SCREENING ASSESSMENT

Level 1 Screening Analysis

Table 6.9-18 presents the hourly-trip projections for the peak construction quarter (first quarter of 2023) for Project Area One when activities are anticipated to occur at Segments 1 and 2. As shown, the maximum construction-related traffic increments would be approximately 120 PCEs between 6:00 AM and 7:00 AM and 60 PCEs between 3:00 PM and 4:00 PM. **Table 6.9-19** presents the hourly-trip projections for the peak construction quarter (second quarter of 2023) for Project Area Two when activities are anticipated to occur at Segments 4 and 5. As shown, the maximum construction-related traffic increments would be approximately 33 PCEs between 6:00 AM and 7:00 AM and 25 PCEs between 3:00 PM and 4:00 PM.

Table 6.9-18
Peak Construction Vehicle Trip Projections
Project Area One – Alternative 3

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	**44**	**0**	**44**	**19**	**19**	**38**	**63**	**19**	**82**	**82**	**38**	**120**
7 AM–8 AM	11	0	11	7	7	14	18	7	25	25	14	39
8 AM–9 AM	0	0	0	7	7	14	7	7	14	14	14	28
9 AM–10 AM	0	0	0	7	7	14	7	7	14	14	14	28
10 AM–11 AM	0	0	0	7	7	14	7	7	14	14	14	28
11 AM–12 PM	0	0	0	7	7	14	7	7	14	14	14	28
12 PM–1 PM	0	0	0	7	7	14	7	7	14	14	14	28
1 PM–2 PM	0	0	0	4	4	8	4	4	8	8	8	16
2 PM–3 PM	0	4	4	4	4	8	4	8	12	8	12	20
3 PM–4 PM	0	44	44	4	4	8	4	48	52	8	52	60
4 PM–5 PM	0	7	7	0	0	0	0	7	7	0	7	7
10 PM–11 PM	18	0	18	3	3	6	21	3	24	24	6	30
11 PM–12 AM	4	0	4	1	1	2	5	1	6	6	2	8
12 AM–1 AM	0	0	0	1	1	2	1	1	2	2	2	4
1 AM–2 AM	0	0	0	1	1	2	1	1	2	2	2	4
2 AM–3 AM	0	0	0	1	1	2	1	1	2	2	2	4
3 AM–4 AM	0	1	1	1	1	2	1	2	3	2	3	5
4 AM–5 AM	0	18	18	1	1	2	1	19	20	2	20	22
5 AM–6 AM	0	3	3	0	0	0	0	3	3	0	3	3
Daily Total	77	77	154	82	82	164	159	159	318	241	241	482

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Table 6.9-19
Peak Construction Vehicle Trip Projections
Project Area Two – Alternative 3

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	25	0	25	2	2	4	27	2	29	29	4	33
7 AM–8 AM	6	0	6	1	1	2	7	1	8	8	2	10
8 AM–9 AM	0	0	0	1	1	2	1	1	2	2	2	4
9 AM–10 AM	0	0	0	1	1	2	1	1	2	2	2	4
10 AM–11 AM	0	0	0	1	1	2	1	1	2	2	2	4
11 AM–12 PM	0	0	0	1	1	2	1	1	2	2	2	4
12 PM–1 PM	0	0	0	0	0	0	0	0	0	0	0	0
1 PM–2 PM	0	0	0	0	0	0	0	0	0	0	0	0
2 PM–3 PM	0	2	2	0	0	0	0	2	2	0	2	2
3 PM–4 PM	0	25	25	0	0	0	0	25	25	0	25	25
4 PM–5 PM	0	4	4	0	0	0	0	4	4	0	4	4
10 PM–11 PM	10	0	10	1	1	2	11	1	12	12	2	14
11 PM–12 AM	3	0	3	1	1	2	4	1	5	5	2	7
12 AM–1 AM	0	0	0	0	0	0	0	0	0	0	0	0
1 AM–2 AM	0	0	0	0	0	0	0	0	0	0	0	0
2 AM–3 AM	0	0	0	0	0	0	0	0	0	0	0	0
3 AM–4 AM	0	1	1	0	0	0	0	1	1	0	1	1
4 AM–5 AM	0	10	10	0	0	0	0	10	10	0	10	10
5 AM–6 AM	0	2	2	0	0	0	0	2	2	0	2	2
Daily Total	44	44	88	9	9	18	53	53	106	62	62	124

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

The cumulative construction trips in PCEs for Project Areas One and Two are presented in **Table 6.9-20**. The peak quarter construction-related traffic increments would be approximately 153 PCEs between 6:00 AM and 7:00 AM and 85 PCEs between 3:00 PM and 4:00 PM. Since the incremental construction PCEs exceed the *CEQR Technical Manual* 50 vehicle-trip analysis threshold during these peak hours, a Level 2 screening assessment was conducted to determine the need for additional quantified traffic analyses, as discussed below.

Table 6.9-20
Total Peak Construction Vehicle Trip Projections—Alternative 3

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM–7 AM	**69**	**0**	**69**	**21**	**21**	**42**	**90**	**21**	**111**	**111**	**42**	**153**
7 AM–8 AM	17	0	17	8	8	16	25	8	33	33	16	49
8 AM–9 AM	0	0	0	8	8	16	8	8	16	16	16	32
9 AM–10 AM	0	0	0	8	8	16	8	8	16	16	16	32
10 AM–11 AM	0	0	0	8	8	16	8	8	16	16	16	32
11 AM–12 PM	0	0	0	8	8	16	8	8	16	16	16	32
12 PM–1 PM	0	0	0	7	7	14	7	7	14	14	14	28
1 PM–2 PM	0	0	0	4	4	8	4	4	8	8	8	16
2 PM–3 PM	0	6	6	4	4	8	4	10	14	8	14	22
3 PM–4 PM	0	69	69	4	4	8	4	73	77	8	77	85
4 PM–5 PM	0	11	11	0	0	0	0	11	11	0	11	11
10 PM–11 PM	28	0	28	4	4	8	32	4	36	36	8	44
11 PM–12 AM	7	0	7	2	2	4	9	2	11	11	4	15
12 AM–1 AM	0	0	0	1	1	2	1	1	2	2	2	4
1 AM–2 AM	0	0	0	1	1	2	1	1	2	2	2	4
2 AM–3 AM	0	0	0	1	1	2	1	1	2	2	2	4
3 AM–4 AM	0	2	2	1	1	2	1	3	4	2	4	6
4 AM–5 AM	0	28	28	1	1	2	1	29	30	2	30	32
5 AM–6 AM	0	5	5	0	0	0	0	5	5	0	5	5
Daily Total	121	121	242	91	91	182	212	212	424	303	303	606

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

LEVEL 2 SCREENING ANALYSIS

As shown in **Table 6.9-20**, incremental construction trips in PCEs would exceed the *CEQR* Level-1 screening threshold during the 6:00 AM to 7:00 AM peak hour. Therefore, a Level 2 screening analysis for traffic was prepared and is presented below.

Summary

According to the *CEQR Technical Manual*, intersections expected to incur 50 or more incremental construction trips in PCEs may have to be assessed in a quantified traffic analysis to identify the potential for significant adverse traffic effects. The assignments of the 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hour incremental construction trips in PCEs described above are shown in **Figures 6.9-14a and 6.9-14b, Figures 6.9-15a and 6.9-15b**, and **Table 6.9-21**. As presented in **Table 6.9-21**, only two intersections for the 6:00 AM to 7:00 AM peak hour (East Broadway and Allen Street/Pike Street and South Street and Montgomery Street) and one intersection for the 3:00 PM to 4:00 PM peak hour (South Street and Montgomery Street) would exceed the analysis threshold of 50 PCEs. However, in order to present analysis encompassing roadways within both Project Areas, six intersections for the 6:00 AM to 7:00 AM peak hour and one intersection for the 3:00 PM to 4:00 PM peak hour, were selected for analysis.

Table 6.9-21
Traffic Level 2 Screening Analysis Results—Selected Analysis Locations (Alternative 3)

Intersection	Weekday		Selected Analysis Locations
	6:00 AM–7:00 AM	3:00 AM–4:00 PM	
23rd Street and Third Avenue	24	6	
23rd Street and Second Avenue	47	8	✓
23rd Street and First Avenue	31	12	✓
23rd Street and Avenue C	17	18	✓
20th Street and Second Avenue	35	4	
20th Street and First Avenue	29	10	
20th Street and Avenue C	16	16	
18th Street and Avenue C	6	4	
14th Street and Second Avenue	30	6	
14th Street and First Avenue	28	4	
Houston Street and Chrystie Street/Second Avenue	22	8	
Houston Street and Allen Street/First Avenue	24	10	
Houston Street and Essex Street/ Avenue A	2	6	
Houston Street and Columbia Street/ Avenue D	6	5	
Houston Street and FDR Drive	37	5	
Delancey Street and Chrystie Street/Second Avenue	20	8	
Delancey Street and Allen Street/First Avenue	26	10	
Delancey Street and Clinton Street/Avenue B	16	8	
Grand Street and Chrystie Street/Second Avenue	20	4	
Grand Street and Allen Street/First Avenue	44	10	
Grand Street and Clinton Street/Avenue B	22	8	
Grand Street and Pitt Street/Montgomery Street	22	10	
Canal Street and Allen Street/First Avenue	40	8	
East Broadway and Allen Street/Pike Street	**52**	12	✓
East Broadway and Montgomery Street	39	10	
Madison Street and Montgomery Street	39	14	
South Street and Allen Street/Pike Street	44	14	✓
South Street and Montgomery Street	**80**	**50**	✓

Notes: ✓ denotes intersections selected for the detailed traffic analysis. South Street and Montgomery Street were selected for analysis for both peak hours and the remaining locations were selected only for the 6:00–7:00 AM peak hour.

As described above and shown in **Table 6.9-21**, six traffic analysis locations have been selected for detailed analysis for the 6:00 AM to 7:00 AM peak hour and one traffic analysis location has been selected for detailed analysis for the 3:00 PM to 4:00 PM peak hour under Alternative 3. All of the selected analysis intersections are signalized.

Detailed Traffic Analysis

Overall, the proposed project would result in approximately 111 and 77 construction-related traffic increments between 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM, respectively. The incremental construction worker auto trips were assigned to the nearby available on-street parking spaces and off-street parking facilities available within a ½-mile radius of the East River. All delivery trips were assigned to the project area via NYCDOT designated truck routes. The incremental construction-related vehicle trips are shown in **Figures 6.9-16 and 6.9-17** for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours.

Traffic Operations

Alternative 3's traffic volumes are shown in **Figures 6.9-18 and 6.9-19** for the weekday 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM peak hours. Alternative 3's traffic volumes were constructed by layering on top of the No Action Alternative traffic volumes the incremental

vehicle trips shown in **Figures 6.9-16 and 6.9-17**. A summary of the Alternative 3's traffic analysis results is presented in **Table 6.9-22**.

Table 6.9-22
Summary of Alternative 3's Traffic Analysis Results

Level of Service	Analysis Peak Hours	
	Weekday AM (6:00 AM to 7:00 AM)	Weekday PM (3:00 PM to 4:00 PM)
Lane Groups at LOS A/B/C	21	4
Lane Groups at LOS D	6	0
Lane Groups at LOS E	2	0
Lane Groups at LOS F	2	0
Total	31	4
Lane Groups with v/c ≥ 0.90	2	1

Notes: LOS = Level-of-Service; v/c = volume-to-capacity ratio

Significant Adverse Effects

Details on LOS, v/c ratios, and average delays are presented in **Table 6.9-23**. As discussed below, significant adverse traffic effects were identified at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the weekday 6:00 AM to 7:00 AM peak hour for Alternative 3.

Potential measures that can be implemented to mitigate these significant adverse traffic effects are discussed in Section F below.

- Westbound right-turn at the East 23rd Street and First Avenue intersection would deteriorate within LOS F (from a v/c ratio of 0.93 and 90.8 spv of delay to a v/c ratio of 0.94 and 94.1 spv of delay), an increase of more than three seconds, during the weekday AM peak hour. This projected increase in delay constitutes a significant adverse effect.
- Southbound approach at the East 23rd Street and Avenue C intersection would deteriorate from LOS E (v/c ratio of 1.02 and 77.5 spv of delay) to LOS F (v/c ratio of 1.03 and 82.3 spv of delay), an increase of more than four seconds, during the weekday AM peak hour. This projected increase in delay constitutes a significant adverse effect.

Table 6.9-23
No Action and Alternative 3's Level of Service Analysis

Intersection	AM Peak Hour (6:00 AM to 7:00 AM)								PM Peak Hour (3:00 PM to 4:00 PM)							
	No Action				Alternative 3				No Action				Alternative 3			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and Second Avenue																
EB	TR	0.66	32.3	C	TR	0.67	33.0	C	Analysis not warranted during PM peak hour.							
WB	LT	0.72	36.3	D	LT	0.78	40.3	D								
SB	L	0.75	47.7	D	L	0.75	47.7	D								
	TR	0.60	12.6	B	TR	0.60	12.7	B								
	Intersection		22.1	C	Intersection		22.8	C								
East 23rd Street and First Avenue																
EB	L	0.64	55.8	E	L	0.64	55.8	E	Analysis not warranted during PM peak hour.							
	T	0.36	16.2	B	T	0.36	16.2	B								
WB	T	0.34	26.4	C	T	0.35	26.6	C								
	R	0.93	90.8	F	R	0.94	94.1	F+								
NB	L	0.80	71.4	E	L	0.82	74.9	E								
	TR	0.70	28.0	C	TR	0.70	28.1	C								
	Intersection		33.3	C	Intersection		33.8	C								
East 23rd Street and Avenue C																
EB (Mainline)	LTR	0.88	47.3	D	LTR	0.88	47.6	D	Analysis not warranted during PM peak hour.							
WB	LTR	0.08	14.1	B	LTR	0.09	14.1	B								
NB	LTR	0.43	18.9	B	LTR	0.43	18.9	B								
SB	LTR	1.02	77.5	E	LTR	1.03	82.3	F+								
EB (Service Road)	R	0.23	38.0	D	R	0.23	38.0	D								
	Intersection		47.9	D	Intersection		49.7	D								
East Broadway and Allen Street/Pike Street																
EB	LT	0.54	29.7	C	LT	0.55	29.8	C	Analysis not warranted during PM peak hour.							
	R	0.11	21.5	C	R	0.11	21.5	C								
WB	LTR	0.50	28.7	C	LTR	0.53	29.5	C								
NB	L	0.42	46.3	D	L	0.42	46.3	D								
	TR	0.26	18.2	B	TR	0.27	18.3	B								
SB	L	0.19	41.9	D	L	0.19	41.9	D								
	T	0.29	19.7	B	T	0.30	19.9	B								
	Intersection		25.0	C	Intersection		25.2	C								
South Street and Allen Street/Pike Street																
EB	L	0.32	11.1	B	L	0.32	11.2	B	Analysis not warranted during PM peak hour.							
	T	0.37	21.3	C	T	0.38	21.4	C								
WB	TR	0.57	25.8	C	TR	0.59	26.3	C								
SB	L	0.33	32.9	C	L	0.37	33.8	C								
	R	0.33	33.0	C	R	0.33	33.0	C								
	Intersection		23.6	C	Intersection		24.1	C								
South Street and Montgomery Street																
EB	LTR	0.20	10.9	B	LTR	0.21	11.1	B	LTR	0.27	11.6	B	LTR	0.28	11.6	B
WB	LTR	0.35	12.4	B	LTR	0.35	12.4	B	LTR	0.89	29.0	C	LTR	0.92	32.4	C
NB	LTR	0.06	20.0	B	LTR	0.10	20.5	C	LTR	0.04	19.8	B	LTR	0.05	19.9	B
SB	LTR	0.32	23.4	C	LTR	0.35	23.8	C	LTR	0.37	24.5	C	LTR	0.40	25.1	C
	Intersection		14.8	B	Intersection		15.3	B	Intersection		24.7	C	Intersection		27.2	C

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, Int. = Intersection
+ Denotes a significant adverse traffic effect.

PARKING

As shown in **Tables 6.9-16 and 6.9-17**, the peak number of workers during the construction of the proposed project would be approximately 150 per day for Project Area One and 85 per day for Project Area Two. Based on 2000 U.S. Census data on workers in the construction and excavation industry, the expected construction activities are therefore projected to generate a maximum parking demand of 55 spaces for Project Area One and 31 spaces for Project Area Two. Similar to the Preferred Alternative, the Project Area Two demand would be fully accommodated by the large inventory of available on- and off-street parking spaces near the project area and the Project Area One demand could result in a parking shortfall within ¼-mile.

As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, construction of Alternative 3 would not result in any significant adverse parking effects.

TRANSIT

Based on 2000 U.S. Census data on workers in the construction and excavation industry, it is expected that approximately 46 percent of construction workers would commute to the project area via transit. During the peak-construction worker shift (a maximum of 150 average daily construction workers for Project Area One and a maximum of 85 average daily construction workers in Project Area Two, as shown in **Tables 6.9-16 and 6.9-17**), this would correspond to approximately 69 and 39 workers traveling by transit for Project Area One and Project Area Two, respectively. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of peak-hour transit trips would be 55 and 31 for Project Area One and Project Area Two, respectively. Since these incremental construction transit trips are well below the *CEQR Technical Manual* 200-transit-trip analysis threshold, no further quantified analysis is warranted. Therefore, construction of the proposed project under Alternative 3would not result in any significant adverse transit effects.

PEDESTRIANS

As summarized above, up to 150 average daily construction workers for Project Area One and 85 average daily construction workers for Project Area Two are projected during peak construction for the proposed project. With 80 percent of these workers arriving or departing during the construction peak hours (6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM), the corresponding numbers of peak-hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be approximately 120 and 68 for Project Area One and Project Area Two, respectively. Since these incremental construction pedestrian trips are below the *CEQR Technical Manual* 200-pedestrian-trip analysis threshold, no further quantified analysis is warranted.

Under Alternative 3, pedestrian and bicyclist circulation through East River Park and Stuyvesant Cove Park may be temporarily closed for a portion of the construction period. Therefore, similar to the Preferred Alternative, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway and would require the development and implementation of a rerouting plan.

OTHER ALTERNATIVE (ALTERNATIVE 5): FLOOD PROTECTION SYSTEM EAST OF FDR DRIVE

The Flood Protection System East of FDR Drive (Alternative 5) proposes a flood protection alignment similar to the Preferred Alternative, except for the approach in Project Area Two between East 13th Street and Avenue C. This alternative would raise the northbound lanes of the FDR Drive in this area by approximately six feet to meet the design flood elevation then connect to closure structures at the south end of Stuyvesant Cove Park. Maintaining the flood protection alignment along the east side of the FDR Drive would eliminate the need to cross the FDR Drive near East 13th Street as well as the need to install floodwalls adjacent to NYCHA Jacob Riis Houses, the East River Complex, and Murphy Brothers Playground.

This alternative would include drainage components to reduce the risk of interior flooding, carbon fiber wrapping of Con Edison transmission lines, and construction of the shared-use flyover bridge to address the Con Edison pinch point. Similarly, the north and south interceptor gates would also be included in this Alternative.

Anticipated project completion under this alternative is driven by construction of the raised northbound lanes of the FDR Drive and the adjacent shared-use flyover bridge in this same footprint, therefore Alternative 5 is anticipated to be constructed in five years and completed in 2025.

Construction activities in Project Area One are the same between the Preferred Alternative and Alternative 5. In addition, although the activities are different in nature, the peak number of daily workers and trucks during the construction of the raised FDR Drive platform and the pedestrian flyover bridge under Alternative 5 are estimated to be similar to those projected for the flood protection system installation activities on the west side of the FDR Drive under the Preferred Alternative that the platform and flyover bridge would replace. Therefore, the magnitude of daily workers and trucks during the peak quarter of construction under Alternative 5 would be comparable to those presented under the Preferred Alternative. For Project Area One, similar to the Preferred Alternative, the maximum construction-related traffic increments for Alternative 5 would be approximately 166 PCEs between 6:00 AM and 7:00 AM and 82 PCEs between 3:00 PM and 4:00 PM during the first quarter of 2022; for Project Area Two, the maximum construction-related traffic increments would be approximately 85 PCEs between 6:00 AM and 7:00 AM and 49 PCEs between 3:00 PM and 4:00 PM during the second quarter of 2022.

There is a possibility, however, that the FDR Drive would temporarily require a full closure (24 hours a day) in the northbound direction and one lane closure in the southbound direction for two months during construction activities under Alternative 5 (Scenario 1). If these full closures are required, they would most likely occur during the summer months when traffic volumes along the FDR Drive are lower than the rest of the year. Under Scenario 2, there is also a possibility that a full closure in the northbound direction would not be required and that two lanes in the northbound and southbound directions could remain open along the FDR Drive between East 13th Street and East 18th Street during construction. Depending on the type of closure and the duration, vehicular traffic from the FDR Drive would need to be diverted to the local roadways in the study area, which would most likely result in additional significant adverse traffic effects at intersections other than those identified under Alternative 3. The 2010 Best Practices Model (BPM) was utilized to identify the potential traffic diversions (for both closure scenarios described above) resulting from the construction of Alternative 5. Based on a review of the BPM results, the daily and peak period percent change in traffic along parallel corridors and East River crossings were calculated. The BPM results showed that Scenario 1 would result in much greater traffic diversions on parallel routes within the study area as compared to Scenario 2. The BPM results showed that under Scenario 1, daily traffic would increase by 10 percent or more along major corridors including Route 9A, Avenue C, East Houston Street, 14th Street, First Avenue, Second Avenue, Third Avenue, Lexington Avenue, Park Avenue, Sixth Avenue, Eighth Avenue, and Tenth Avenue.

The potential FDR Drive closure would require the use of TEAs to regulate traffic and pedestrian circulation within the study area. The use of TEAs would help mitigate any additional significant adverse traffic effects that could occur due to the closure of the FDR Drive. Given the large volumes of diverted traffic, the implementation of Alternative 5 would require detailed

traffic management plans and detour plans that would include identifying mitigation measures where the management of traffic may be beyond that of TEAs. Additionally, intercepting vehicles on a regional level via variable message signs and public outreach could be additional mitigation to assist TEAs in managing the locally diverted traffic. If full closures along the FDR Drive are not required under this Alternative, any potential significant adverse traffic, parking, transit, and pedestrian effects identified under Alternative 5 would be within the envelope of significant adverse traffic, parking, transit, and pedestrian effects identified under Alternatives 3 and 4.

G. SWING GATE CONSTRUCTION ACROSS THE FDR DRIVE

During the installation of closure structures (including gates and associated foundations) across the FDR Drive near East 13th Street, lane closures on the FDR Drive would be required for the Preferred Alternative and Alternatives 2 and 3 during construction. To minimize disruptions to traffic flow on the FDR Drive, any FDR Drive lane closures will be required to follow the lane closure schedule currently permitted by NYCDOT's OCMC (see **Table 6.9-9**). Construction of the raised FDR Drive platform and flyover bridge under Alternative 5 would require more extensive work within the FDR Drive.

The proposed swing gates across the FDR Drive where Project Area Two begins near the Con Edison facility are comprised of the following key elements:

- Median Center Structure – A floodwall with a foundation, and gate columns that are proposed to be constructed in the center median of the FDR Drive;
- Cut-off Walls and Gate Tracks – Cut-off walls, foundation slabs, and approach slabs for the proposed gates that would be installed within the north and southbound lanes of the highway;
- Anchor Structure (West) – A gate column structure west of the FDR Drive southbound lanes of the highway right-of-way that would be installed in the area between the existing highway barrier and the sidewalk;
- Anchor Structure (East) – A gate column structure east of the FDR Drive northbound lanes of the highway right-of-way that would be installed in East River Park;
- Gate Installation;
- Final finishes; and
- Testing.

The construction activities and the duration of these elements would be as follows:

- Median center structure: (1) establish safe and secure work zone in highway; (2) remove segment of median and establish work zone; (3) drill and install a foundation pile; (4) create the pile cap foundation (5) install the gate stanchion and mechanical equipment. This stage would involve the use of backhoes, cranes, drilling equipment, concrete and flatbed trucks to form and pour concrete foundations and deliver and install the steel gate elements.
- Cut-off walls and gate tracks: (1) score the roadbed; (2) excavate and install steel sheet piles for the cut-off wall install foundation slab and approach slabs; (3) jet grouting repair and finalize road surface. This stage would involve the use of backhoes, cranes, cutting equipment, jackhammers, jet grouting trucks, concrete and flatbed trucks to cut the roadbed, excavate a track alignment, form and pour a concrete foundation, repair and finalize the road surface.

- Gate columns (east and west of highway): (1) clear and secure work area; (2) drill and install a foundation pile; (3) install the gate foundation and gate stanchion and mechanical equipment. This stage would involve the use of cranes, drilling equipment, flatbed and concrete trucks to form and pour concrete and deliver and install the steel gate elements.
- Gate installation: (1) establish work areas; (2) delivery of gate sections; and (3) installation too hang and secure gates. This stage would involve the use of cranes and flatbed trucks to deliver and install the steel gate elements.
- Final finishes: (1) complete installation of mechanical fixtures; and (2) finishing elements such as landscaping, lighting, or signage (as necessary). This stage would involve primarily hand-held and light duty equipment.
- Test deployment. This stage would involve primarily hand-held equipment.

The estimated duration of each stage of this construction is provided in **Table 6.9-24.**

Table 6.9-24
Estimated Construction Duration for Gate Closure Structure

Construction Element	Estimated Total Duration (workdays)	Estimated Workdays in FDR Drive
Median Center Structure	20 to 30	20 to 30
Cut-off Wall and Gate track (southbound lanes)	20 to 40	20 to 40
Cut-Off Wall and Gate track (northbound lanes)	20 to 40	20 to 40
East/West Anchor Structures	20	0
Gate installation	10 to 20	5 to 10
Final finishes	10 to 20	5 to 10
Testing	5 to 10	5 to 10

While some of the work could be staged and performed immediately adjacent to the FDR Drive, certain activities such as gate foundations and cut-off walls crossing the FDR Drive, and work in the median (not applicable for Alternative 5) would require excavation and pile installation in the roadway which would require FDR Drive lane closures.

It will be an objective of the proposed project to limit construction activities in the highway and the disruptions to traffic. To that end, weekend and off-peak work hours (as well as July/August work periods) could be used to minimize effects on traffic flow along the highway. Additionally, at the end of each work shift full use of the highway would be restored. However, it is anticipated that at least one travel lane in either a northbound or southbound direction would need to be closed during certain phases of gate closure construction (e.g., installation of the median structure) as detailed above in **Table 6.9-24**.

To minimize disruptions to traffic flow on the FDR Drive, any FDR Drive lane closures will be required to follow the lane closure schedule currently permitted by NYCDOT's OCMC (see **Table 6.9-9**). In addition, Maintenance and Protection of Traffic Plans would be developed for any temporary lane closures and approval of these plans and implementation of the closures would be coordinated with OCMC. Since all FDR Drive lane closures during the swing gate construction would be temporary in nature and conform to the lane closure schedule currently permitted by NYCDOT's OCMC during off-peak hours, no significant adverse effects on transportation systems are anticipated.

H. POTENTIAL BARGING OPERATIONS

As discussed in detail in Chapter 6.0, "Construction Overview," the Preferred Alternative and Alternative 5 are expected to use both barges and truck deliveries for material transport while Alternatives 2 and 3 may also employ barges for material deliveries. Although truck activity between potential barge loading/unloading locations and construction staging/work areas within East River Park would increase, a combination of truck and barge deliveries compared to truck deliveries only would decrease daily truck activity that would traverse the external roadways near the project area during construction.

Approximately 775,000 cubic yards of fill is estimated to be required for the construction under the Preferred Alternative, and an average of 3 barge trips per day are anticipated throughout the 3.5-year construction period. East River is a busy maritime port with tour boats, tugs, barges, and recreational vessels traversing the waters 24 hours a day. USCG operates a Vessel Traffic Service that provides the mariner with information related to the safe navigation of a waterway. The maritime trips generated by construction of the proposed project are expected to be limited to tug-assisted barges for equipment and materials. All of these vessels are operated by captains licensed by USCG. The number of daily trips to project area for construction is expected to be minimal compared with the existing trips and would not add significantly to the waterborne traffic in the East River

I. MITIGATION

TRAFFIC

As discussed above, traffic conditions were evaluated at six intersections for the weekday 6:00 AM to 7:00 AM peak hour and one intersection for the 3:00 PM to 4:00 PM peak hour under the Preferred Alternative and Alternative 3, for which the analyses identified the potential for significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the weekday 6:00 AM to 7:00 AM peak hour. As discussed below, implementation of proposed mitigation measures could fully mitigate the potential for significant adverse traffic effects at these intersections for both alternatives.

As discussed above, traffic LOS at signalized and unsignalized intersections are evaluated using average stop control delay, in seconds per vehicle, for individual lane groups (grouping of movements in one or more travel lanes), the approaches, and the overall intersection. According to the criteria presented in the *CEQR Technical Manual*, effects are considered significant and require examination of mitigation if they result in an increase under conditions with the proposed project of five or more seconds of delay in a lane group over conditions with the No Action Alternative levels beyond mid-LOS D. For LOS E in conditions with the No Action Alternative, a four-second increase in delay is considered significant. For LOS F in conditions with the No Action Alternative, a three-second increase in delay is considered significant. In addition, effects are considered significant if levels of service deteriorate from acceptable A, B, or C under conditions with the No Action Alternative to marginally unacceptable LOS D (a delay in excess of 45 seconds, the midpoint of LOS D), or unacceptable LOS E or F in the condition with the proposed project. A traffic effect is considered fully mitigated when the resulting degradation in the average control delay per vehicle under the proposed project with Mitigation condition compared with the condition with the No Action Alternative is no longer deemed significant following the criteria described above.

MITIGATION MEASURES

Table 6.9-25 itemizes the recommended mitigation measures that address the identified effects under the construction of the proposed project. With the implementation of these standard traffic mitigation measures (signal timing changes), which are subject to review and approval by the NYCDOT, the significant adverse traffic effects identified above could be fully mitigated.

Table 6.9-25
Recommended Mitigation Measures: Proposed Project
Weekday AM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
East 23rd Street and First Avenue	EB-T/WB-T: Green = 7 s EB-T/WB-T/WB-R: Green = 19 s EB-L/EB-T: Green = 11 s NB-T/NB-R: Green = 15 s NB-L/NB-T/NB-R: Green = 11 s	Shift 1 second of green time from the NB TR phase to the EB T/WB TR phase	EB-T/WB-T: Green = 7 s EB-T/WB-T/WB-R: Green = 20 s EB-L/EB-T: Green = 11 s NB-T/NB-R: Green = 14 s NB-L/NB-T/NB-R: Green = 11 s
East 23rd Street and Avenue C	EB-R (SR)/WB: Green = 13 s EB-LTR (ML)/WB: Green = 23 s NB/SB: Green = 19 s NB: Green = 6 s NB /WB: Green = 9 s	Shift 1 second of green time from the EB-R (SR)/WB phase to the NB/SB phase	EB-R (SR)/WB: Green = 12 s EB-LTR (ML)/WB: Green = 23 s NB/SB: Green = 20 s NB: Green = 6 s NB /WB: Green = 9 s

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

A discussion of the recommended mitigation measures is provided below. **Tables 6.9-26a and 6.9-26b** compare the LOS and lane group delays for the affected intersections under the 2022 No Action Alternative, the proposed project, and mitigation conditions for the 6:00 AM to 7:00 AM peak hour for Alternative 3 and the Preferred Alternative, respectively.

Table 6.9-26a
Level of Service Analysis
Weekday AM Peak Hour – Alternative 3

	Weekday 6:00 AM to 7:00 AM											
	No Action Alternative				Alternative 3				Mitigation			
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and First Avenue												
EB	L	0.64	55.8	E	L	0.64	55.8	E	L	0.64	55.8	E
	T	0.36	16.2	B	T	0.36	16.2	B	T	0.35	15.5	B
WB	T	0.34	26.4	C	T	0.35	26.6	C	T	0.34	25.7	C
	R	0.93	90.8	F	R	0.94	94.1	F+	R	0.88	79.1	E
NB	L	0.80	71.4	E	L	0.82	74.9	E	L	0.82	74.9	E
	TR	0.70	28.0	C	TR	0.70	28.1	C	TR	0.73	29.4	C
	Intersection		33.3	C	Intersection		33.8	C	Intersection		33.3	C
East 23rd Street and Avenue C												
EB (Mainline)	LTR	0.88	47.3	D	LTR	0.88	47.6	D	LTR	0.88	47.6	D
WB	LTR	0.08	14.1	B	LTR	0.09	14.1	B	LTR	0.09	14.7	B
NB	LTR	0.43	18.9	B	LTR	0.43	18.9	B	LTR	0.42	18.2	B
SB	LTR	1.02	77.5	E	LTR	1.03	82.3	F+	LTR	0.98	67.2	E
EB (Service Road)	R	0.23	38.0	D	R	0.23	38.0	D	R	0.25	39.7	D
	Intersection		47.9	D	Intersection		49.7	D	Intersection		44.5	D

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, Int. = Intersection.
+ Denotes a significant adverse traffic effect.

Table 6.9-26b
Level of Service Analysis
Weekday AM Peak Hour – Preferred Alternative

	Weekday 6:00 AM to 7:00 AM											
	No Action Alternative				Preferred Alternative				Mitigation			
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
East 23rd Street and First Avenue												
EB	L	0.64	55.8	E	L	0.64	55.8	E	L	0.64	55.8	E
	T	0.36	16.2	B	T	0.36	16.2	B	T	0.35	15.5	B
WB	T	0.34	26.4	C	T	0.37	26.9	C	T	0.36	26.0	C
	R	0.93	90.8	F	R	0.95	97.2	F+	R	0.89	81.5	F
NB	L	0.80	71.4	E	L	0.82	74.9	E	L	0.82	74.9	E
	TR	0.70	28.0	C	TR	0.70	28.2	C	TR	0.73	29.5	C
	Intersection		33.3	C	Intersection		33.8	C	Intersection		33.5	C
East 23rd Street and Avenue C												
EB (Mainline)	LTR	0.88	47.1	D	LTR	0.89	49.1	D	LTR	0.89	49.1	D
WB	LTR	0.08	14.1	B	LTR	0.10	14.2	B	LTR	0.10	14.8	B
NB	LTR	0.43	18.9	B	LTR	0.43	18.9	B	LTR	0.42	18.2	B
SB	LTR	1.02	77.5	E	LTR	1.05	86.0	F+	LTR	0.99	70.0	E
EB (Service Road)	R	0.23	38.0	D	R	0.23	38.0	D	R	0.25	39.7	D
	Intersection		47.8	D	Intersection		51.3	D	Intersection		45.9	D

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, Int. = Intersection.
+ Denotes a significant adverse traffic effect.

East 23rd Street and First Avenue

The significant adverse effect at the westbound right-turn of this intersection during the weekday AM peak hour could be fully mitigated by shifting 1 second of green time from the northbound through/right-turn phase to the eastbound through/westbound through/westbound right-turn phase.

East 23rd Street and Avenue C

The significant adverse effect at the southbound approach of this intersection during the weekday AM peak hour could be fully mitigated by shifting 1 second of green time from the eastbound right-turn (service road)/westbound phase to the northbound/southbound phase.

CONCLUSIONS

Traffic conditions were evaluated at six intersections for the weekday 6:00 AM to 7:00 AM peak hour and one intersection for the 3:00 PM to 4:00 PM peak hour under the Preferred Alternative and Alternative 3. In 2022 with the proposed project, there would be the potential for significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the weekday 6:00 AM to 7:00 AM peak hour for both Alternatives.

At the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C where significant adverse traffic effects are predicted to occur could be fully mitigated with the implementation of standard traffic mitigation measures (e.g., signal timing), which are described above.

The magnitude of construction activities during the peak construction period of Alternative 2 would be comparable to the Preferred Alternative and any transportation effects identified under Alternative 2 would be similar to those identified under the Preferred Alternative.

PEDESTRIANS

Because the proposed project may require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, the proposed project would require the development and implementation of a rerouting plan.

The following measures would be implemented to accommodate pedestrians and bicyclists at this area during construction:

- During construction, the East River Greenway would be closed from 23rd Street to Montgomery Street. NYCDOT would re-route bicyclists to the on-street bike network, primarily the protected bicycle lanes along First and Second Avenues, as well as those on Allen Street/Pike Street and Clinton Street (see **Figure 6.9-20**). These protected bicycle lanes would provide a reasonable alternative for many of those bicyclists who use the Greenway as a transportation route, as they are proximate to numerous destinations in the neighborhoods that run alongside the Greenway, and may actually provide a more direct route for many trips. NYCDOT is currently upgrading a number of intersections along these corridors with offset crossings to provide a more comfortable riding experience on these routes. In addition, signs would also be installed one block west of the East River Greenway to inform pedestrians of the closure.
- NYCDOT is committed to expanding the City's bicycle network, including adding more protected bicycle lanes. In July 2019, Mayor de Blasio unveiled the Green Wave Bicycle Plan, which, amongst other improvements, increases the number of planned protected bicycle lane miles to be installed each year to thirty miles city-wide. As part of these ongoing efforts to expand the bicycle lane network, NYCDOT is currently evaluating the feasibility of installing new north–south protected bicycling lanes in the East Village that would provide additional options for bicyclists during the Greenway closure and beyond.
- Access to the ferry landings at Stuyvesant Cove Park from First and Second Avenues would be maintained via the two-way protected bicycle lane along 20th Street.

RAISED FDR DRIVE

Under Alternative 5, there is a possibility that the FDR Drive would temporarily require a full closure in the northbound direction and one-lane closure in the southbound direction for two months to accommodate construction activities for the raised FDR Drive. If a full closure in any direction is required, it would most likely occur during the summer months when the magnitudes of traffic volumes along the FDR Drive are lower than the rest of the year. Depending on the type of closure and the duration, vehicular traffic from the FDR Drive would need to be diverted to the local roadways in the study area, likely resulting in significant adverse traffic effects beyond those identified for the Preferred Alternative. The potential FDR Drive closure would require the use of TEAs to regulate traffic and pedestrian circulation within the study area. The use of TEAs would help mitigate any additional significant adverse traffic effects that could occur due to the closure of the FDR Drive; however, as a result of the closure, some effects could remain unmitigatable. ✷