

3.8 Transportation

3.8.1 Introduction

This chapter has been prepared following the guidance of *City Environmental Quality Review (CEQR) Technical Manual* and the methodologies that define transportation impact assessments. The chapter examines the potential effects of the Proposed Project on a number of transportation elements as well as plazas and paths, which are not specifically addressed by the *CEQR Technical Manual*. The future with the Proposed Project (“Proposed Action”) is compared to the future without the Proposed Project (“No Action”). As described in greater detail in Chapter 1.0, “Project Description,” the Project Area is comprised of seven design reaches. Reach 1 includes the project segments along Greenwich Street, North Moore Street, the westernmost segment of Harrison Street, and State Route 9A/West Street; the balance of the Project Area is in Battery Park City and includes North Esplanade (Reach 2), North Neighborhood/Rockefeller Park (Reach 3), Ferry Terminal (Reach 4), Brookfield Place (Reach 5), South Esplanade (Reach 6), and South Neighborhood (Reach 7). Reach 2 and Reach 3 are located entirely off-street and contain no travel lanes, parking lanes, sidewalks, or crosswalks, but do contain shared bike and pedestrian paths. The widths of those paths would be the same as existing conditions or wider and no further evaluation is necessary because the Proposed Action would not have the potential for significant adverse impacts on paths in Reaches 2 and 3.

The transportation analyses reflected in this chapter in the Draft Environmental Impact Statement (DEIS) were based on the 60 percent design drawings provided by the design build team. This Final EIS (FEIS) evaluates transportation conditions using the 90 percent design drawings and includes updated results if pedestrian or bicycle paths would be narrowed or traffic capacity would be reduced in comparison to the 60 percent design drawings presented in the DEIS. Per the 90 percent design drawings, in May 2024. The refined sidewalk plans were evaluated in this chapter and were determined to either provide the same or improved pedestrian conditions. Along along the west sidewalk of Greenwich Street between Franklin Street and North Moore Street, the flood barrier structure would end approximately 50 feet south of the corner of North Moore Street instead of midblock between Franklin Street and North Moore Street. This reduced length of the flood barrier structure would not affect the sidewalk pedestrian analysis which relies on the narrowest point along the sidewalk that would still be presented by the flood barrier structure just south of the corner.

As part of the design advancement since the DEIS, the Battery Park City Authority (BPCA) coordinated with Independence Plaza and the Borough of Manhattan Community College (BMCC) to address concerns related to the interface of the proposed flood barrier system with the property frontages along North Moore Street, Harrison Street and State Route 9A/West Street. This FEIS includes an updated design approach for North Moore Street that widens the sidewalk by approximately 9 feet to allow additional operational space for pedestrians and Independence Plaza functions. This is achieved by converting the parking lane in North Moore Street to a widened sidewalk between State Route 9A/West Street on the west and Greenwich Street on the east. To implement the sidewalk widening, the two 16-foot-wide travel lanes along westbound North Moore Street at State Route 9A/West Street would be reduced in width to

provide two 11-foot-wide travel lanes. The curbside parking lane along the south curb of North Moore Street would be maintained, but the number of on-street parking spaces would be reduced from approximately 14 to 8 spaces to install curb extensions. Therefore, between the DEIS and FEIS, a quantified traffic analysis was prepared to determine if the lane width reductions would result in any significant adverse traffic impacts at the intersection of State Route 9A/West Street and North Moore Street. As described below, the travel lane width reductions would result in the potential for significant adverse traffic impacts at the intersection with State Route 9A/West Street with the sidewalk widening.

Included in the 90 percent design are changes in the widths of sidewalks, corner reservoir areas, and crosswalk crossing distances upon implementation of the flood barrier system in Reach 1 and the widths of paths used by pedestrians and bicycles in Reaches 2 through 7. The widths of these pedestrian elements and pedestrian/bicycle paths under the 90 percent design conditions were compared to the widths presented in this chapter in the DEIS. In Reaches 2 and 3, the widths of paths under the 90 percent design conditions would be the same or wider than under the 60 percent design conditions and no further evaluation in those reaches is required. Further descriptions are provided in section 3.8.7 “Detailed Pedestrian Operation Analysis,” for Reach 1 and section 3.8.8 “Qualitative Consideration: Potential Effects to Reaches 4 to 7,” which conclude that there would be no change in the finding of no significant adverse pedestrian impacts under 90 percent design conditions. With the exception of the westbound approach of North Moore Street at State Route 9A/West Street, there would be no significant adverse impacts to traffic and the bikeway parallel to State Route 9A/West Street would not be affected by the 90 percent design drawings.

Design updates related to the State Route 9A/West Street and Harrison Street gate crossings were provided by the design build team between the DEIS and FEIS after extensive consultation with NYCDOT. The gates crossing State Route 9A/West Street would be swing gates stored in the median north of Chambers Street: one for the southbound side and one for the northbound side. To achieve acceptable swing gate and geometric street design dimensions, the median would need to be widened from approximately 20 to 30 feet. This would narrow the two southbound left-turn lanes adjacent to the median and would not narrow any southbound through lanes, the southbound right-turn lane, or any northbound through lanes. It would eliminate two parking spaces along northbound State Route 9A/West Street, which are currently 4-hour metered parking spaces along the east curb. The two southbound left-turn lanes approaching Chambers Street would be reduced in length from an average storage length of 286 feet to 201 feet. The reduced traffic capacity on the southbound approach of State Route 9A/West Street has been evaluated and would not have the potential for significant adverse traffic impacts (see Section 3.8.5, “Detailed Traffic Operation Analyses”). This design update would also reduce the east sidewalk of State Route 9A/West Street between Chambers Street and Harrison Street. However, the final width of the sidewalk would be wider than under the 60 percent design conditions presented in the DEIS and FEIS, and no further evaluation of pedestrian operations is required for this design update.

The gates crossing Harrison Street would be flip-up gates stored in the street bed just east of State Route 9A/West Street. The curb-to-curb width of Harrison Street would not be reduced by the flip-up gates, and this design update would not have the potential for significant adverse traffic impacts. The flip-up gates would narrow the sidewalks on the south and north sides of Harrison Street. However, the final widths of

the sidewalks would be wider than under the 60 percent design conditions, and no further evaluation of pedestrian operations is required for this design update.

New York City's Central Business District (CBD) Tolling Program, also known as "Congestion Pricing," is an electronic toll system that charges drivers to enter Manhattan's CBD. The program aims to reduce traffic and air pollution, enhance street safety, raise revenues to improve the transit system, and encourage the use of public transportation. The program went into effect on January 5, 2025. Initial data collected by the Metropolitan Transportation Authority (MTA)/New York City Transit (NYCT) and the New York City Department of Transportation (NYCDOT) indicate a decrease in the number of vehicles entering the CBD, suggesting that the program is already reducing citywide traffic volumes. Early signs also show that some drivers are shifting their travel times to off-peak hours to avoid the toll, which could lead to a reduction in peak-hour traffic as commuters either switch to transit or adjust their schedules. While some bus and subway lines indicate an increase in ridership in response to the implementation of Congestion Pricing, the program's early effects on the pedestrian and transit networks are less clear. Other factors, such as shifts to in-office work and lingering pandemic-related trends, may also be influencing these patterns. The transportation data presented in this document were collected prior to implementation of the Congestion Pricing program. The data were not adjusted to account for the implementation of the program, nor have any improvements to the transit system been considered, because the long-term effects of the program are unknown at this time. Over time, as commuters adapt and public transportation options improve, transportation patterns are expected to evolve and eventually settle into a new equilibrium. However, the timeline for this transition remains uncertain. Adding to this uncertainty is the position of the current federal administration which has recently expressed a desire to halt Congestion Pricing. This introduces an additional layer of unpredictability as to the program's long-term impact on New York City's transportation landscape.

Between the DEIS and FEIS, there were further refinements to construction phasing and the year of completion for the Proposed Project was modified to 2031. Changes in additional background traffic and pedestrian growth for the increase in the year of completion from 2030 to 2031 were applied to detailed analyses presented in this chapter. The change in the peak year of construction and activity by reach are described in Chapter 3.11.4, "Construction Transportation."

3.8.2 Principal Conclusions

Using *CEQR Technical Manual* guidance, it was determined that the Proposed Project would not generate any new trips; therefore, no analysis of the effects of operational trips on transportation systems was necessary and the operational phase analysis focused on the introduction of the proposed flood barrier structure into existing pedestrian elements and shared pedestrian and bicycle facilities in the Project Area. The proposed flood barrier structure would not displace any on-street parking except for 8 parking spaces or reduce the width of the two-way bikeway along State Route 9A/West Street but would reduce traffic capacity along the westbound approach of North Moore Street at State Route 9A/West Street and the southbound approach of State Route 9A/West Street at Chambers Street. As part of this assessment, user data was collected, and analyses of potential impacts were performed where the Proposed Project would reduce traffic capacity or narrow pedestrian and bicycle pathways. Analyses were conducted for the

intersections of State Route 9A/West Street and Chambers Street, Harrison Street, and North Moore Street and pedestrian elements at nine locations in Reach 1 including North Moore and Harrison Streets and along State Route 9A/West Street. These assessments were also conducted for shared pedestrian and bicycle facilities in Reaches 4 through 7 including in the vicinity of the Lily Pond, Pumphouse Park, Gateway Plaza, and the street ends at West Thames and Albany Streets as well as in the vicinity of South Cove. The Proposed Project would not adversely impact pedestrian and bicycle shared facilities in Reaches 2 and 3. Based on these detailed analyses, it was concluded that the Proposed Project would result in the potential for significant adverse traffic impacts at State Route 9A/West Street and North Moore Street during the weekday midday, weekday PM, and Saturday peak hours. Mitigation measures for these potential impacts are presented in Chapter 4.0, "Mitigation." Specific signal timing changes recommended as mitigation will be evaluated post-construction, based on in-field operations, and reviewed by NYCDOT for approval. If the recommended mitigation is deemed infeasible and no alternative mitigation measure can be identified, then the identified significant adverse traffic impact would be unmitigated. Although according to CEQR Technical Manual methodologies there would be no significant adverse traffic impact from the reduction in the lengths of left-turn lane storage lanes approaching Chambers Street necessitated by the median widening to store the State Route 9A/West Street swing gates, there would be an increase in delay during peak hours on the southbound through movement. This is from the effect of the southbound left-turn storage lanes currently being at capacity and the additional vehicles spilling into the southbound through lanes at times but not blocking them because there are three southbound through lanes for drivers to get around the queue spillback from the southbound left-turn. This condition occurs today and would worsen upon implementation of the Proposed Project. To address the increase in delay and safety concerns, a signal timing modification to shift additional time to improve traffic and safety conditions on southbound State Route 9A/West Street may be contemplated by NYCDOT. As described above for specific signal timing changes recommended as mitigation, specific signal timing changes on southbound State Route 9A/West Street will be evaluated post-construction, based on in-field operations, and reviewed by NYCDOT for approval.

Installing the proposed flood barrier system with additional landscaping and the sidewalk widening on the south side of North Moore Street would not result in any adverse impacts on pedestrian movement or circulation along North Moore Street. Rather, the widened sidewalk would improve pedestrian conditions as presented in this FEIS over those presented in the DEIS.

This FEIS also expands on the description and assessment of the flood barrier system testing and maintenance and deployment in design storm conditions. System testing and maintenance is expected to be annual to ensure the readiness of all project elements for deployment in a storm event. Gate-testing would require temporary closure of sections of roadways and sidewalks including State Route 9A/West Street (both the roadway and parallel bikeway between Chambers Street and North Moore Street), Harrison Street, and North Moore Street in Reach 1 and various locations within Battery Park City in Reaches 2 to 7. This testing would be implemented in accordance with an approved flood barrier system maintenance and operations plan that would be subject to review and approval by multiple City and State agencies and including New York City Emergency Management (NYCEM) and the Federal Emergency Management Agency (FEMA). To minimize impacts on vehicular travel, cyclists, and pedestrians, gate

maintenance and testing operations would be performed for each gate during off-peak times and overnight. The closures are expected to take up to eight hours and the frequency of the closures depends on the type of gate (i.e., flip-ups twice annually and swing-gates annually). Given that a plan will be in place to minimize impacts and that this testing will be a limited and coordinated event, the annual or twice-annual testing and maintenance would not result in any significant adverse impacts on transportation systems.

Design storm conditions will involve the deployment of all gates to enclose the Protected Area. In a storm event, NYCEM would determine the timing of the deployment of the system. These deployment procedures are to be addressed in an Emergency Response Plan that will be designed to address the needs of the community and emergency vehicles both in the Protected Area and the adjacent neighborhoods. This plan will be prepared in coordination with FEMA, NYCEM, BPCA, and multiple City and State agencies. Given that these design storm conditions are episodic and temporary with a plan in-place to address transportation needs of the community, including allowing for adequate evacuation time before deployment, it is not expected that the storm-event activation of the flood protection gates would result in any significant adverse impacts on transportation systems. Finally, protecting this segment of streets from flooding impacts would eliminate the need for post-storm debris removal from the Protected Area and repairs, thereby providing the benefits of faster resumption of traffic and transit access in the Protected Area. ~~not result in any significant adverse impacts on pedestrian elements or shared pedestrian and bicycle facilities.~~

3.8.3 Screening Assessment

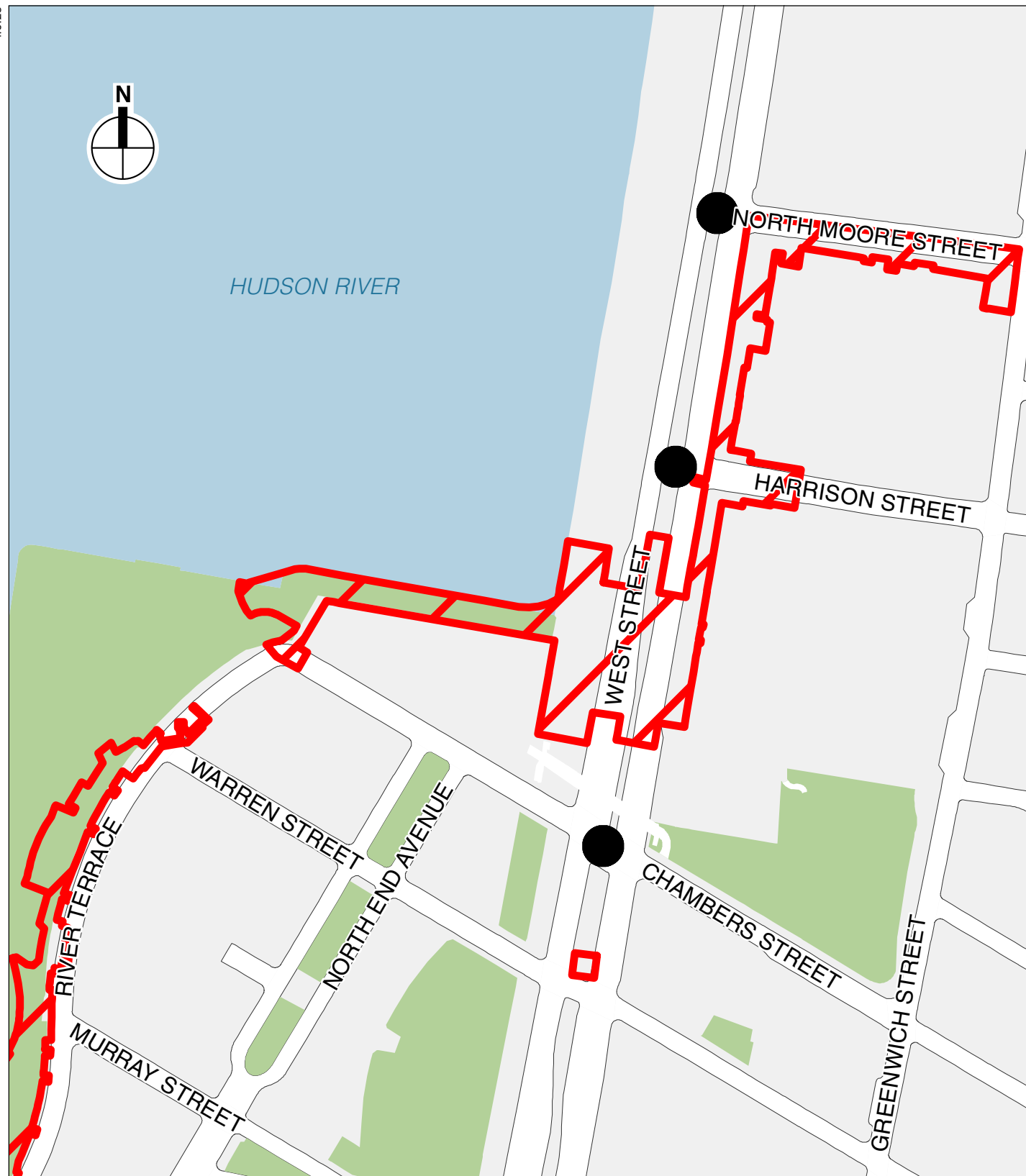
3.8.3.1 CEQR Technical Manual Guidelines

As defined in the *CEQR Technical Manual*, a two-tiered screening analysis is undertaken to determine whether a quantified traffic, transit, ferry, pedestrian, or parking analysis is warranted. The methodology begins with the preparation of a trip generation analysis to determine the volume of person and vehicle trips associated with the Proposed Project.

Since the Proposed Project would not generate new person trips or divert person or vehicle trips, no impact assessment of incremental trip increases is necessary for this operational phase analysis. (For an assessment of these impacts during construction see Chapter 3.11, "Construction"). However, as detailed below, the completion of the Proposed Project would narrow the lane widths at one intersection and operating widths at nine pedestrian elements. Therefore, they have been selected for detailed analysis of potential impacts that is presented below.

3.8.3.2 Detailed Assessment

Upon completion, the Proposed Project would result in reduced lane widths at one intersection, reduced left-turn queue storage lane lengths at one intersection, and somewhat reduced operating widths at nine pedestrian elements (~~six-five sidewalks and three-two corner reservoir areas, and two crosswalks~~) that are the focus of this quantified analysis, ~~and t~~. The selected analysis locations are shown in **Figures 3.8-1a and 3.8-1b**. Corner reservoir areas are queue storage areas for pedestrians on street corners controlled by pedestrian signals. The selected traffic intersection and pedestrian elements are all in Reach 1 and include:



 Project Area

 Traffic Analysis Location

0 500 FEET

Traffic Analysis Locations



Pedestrian Analysis Locations

Figure 3.8-1b

- State Route 9A/West Street and North Moore Street;
- State Route 9A/West Street and Harrison Street;
- State Route 9A/West Street and Chambers Street;
- Harrison Street north sidewalk between State Route 9A/West Street and Greenwich Street;
- State Route 9A/West Street east sidewalk between Harrison Street and Chambers Street;
- Harrison Street south sidewalk between State Route 9A/West Street and Greenwich Street;
- State Route 9A/West Street east sidewalk between North Moore Street and Harrison Street;
- North Moore Street south sidewalk between State Route 9A/West Street and Greenwich Street;
- ~~Greenwich Street west sidewalk between North Moore Street and Franklin Street;~~
- ~~Greenwich Street and North Moore Street southwest corner reservoir area;~~
- Harrison Street and State Route 9A/West Street northeast corner reservoir area; ~~and~~
- Harrison Street and State Route 9A/West Street southeast corner reservoir area;
- North Moore Street and State Route 9A/West Street east crosswalk; and
- North Moore Street and Greenwich Street west crosswalk.

The Proposed Project would not narrow any shared pedestrian and bicycle facilities on or within paths, plazas, or park areas in Reaches 2 and 3. In Reaches 4 through 7, the Proposed Project would narrow pathways for pedestrians and bicycles not defined in the *CEQR Technical Manual* as warranting detailed analysis; however, for those pathways, a narrative discussion of the potential effects of the Proposed Project on existing pedestrian and bicycle activity is provided below.

3.8.4 Transportation Analysis Methodologies

As stated above, the Proposed Project warrants detailed transportation analysis only for effects of new structures on three traffic intersections and pedestrian operations at nine pedestrian elements. The traffic and pedestrian analysis methodologies are described below.

3.8.4.1 Traffic Operations

The operations of the signalized intersections in the study area were assessed using methodologies presented in the 2000 HCM using the Highway Capacity Software (Synchro 11). The HCM procedure evaluates the levels of service (LOS) for signalized intersections using average stop control delay, in seconds per vehicle, as described below.

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 LOS are defined in Table 3.8-1.

Table 3.8-1
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. <i>Highway Capacity Manual</i> , 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 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, LOS D or better (average control delay less than or equal to 55.0 seconds of delay) is considered to reflect acceptable operations.

Significant Impact Criteria

According to the criteria presented in the *CEQR Technical Manual*, impacts are considered significant and require examination of mitigation if they result in an increase in the Proposed Action condition of 5 or more seconds of delay in a lane group over No Action levels within LOS E. For No Action LOS F, a 4-second increase in delay is considered significant. In addition, impacts are considered significant if levels of service deteriorate from acceptable A, B, C, or D in the No Action condition to unacceptable LOS E or F in the Proposed Action condition.

3.8.4.2 Pedestrian Operations

The adequacy of the Study Area's sidewalk and corner reservoir capacities is evaluated based on the methodologies presented in the *2010 Highway Capacity Manual (HCM)* and the procedures detailed in the *CEQR Technical Manual*.

The primary performance measure for sidewalks and walkways is pedestrian space, expressed as square feet per pedestrian (SFP), which is an indicator of the quality of pedestrian movement and comfort. The calculation of the sidewalk SFP is based on the pedestrian volumes by direction, the effective sidewalk or walkway width, and average walking speed. The SFP forms the basis for sidewalk levels of service (LOS) analysis.

Street corners are not easily measured in terms of free pedestrian flow, as they are influenced by the effects of traffic signals. To that end, corners should provide sufficient space for a mix of standing pedestrians (i.e., queued to cross a street) and circulating pedestrians (i.e., crossing the street or moving around the corner). The *HCM* methodologies apply a measure of time and space availability based on the area of the corner, the timing of the intersection signal, and the estimated space used by circulating pedestrians.

The total “time-space” available for these activities, expressed in square feet-seconds, is calculated by multiplying the net area of the corner (in square feet) by the signal’s cycle length. The analysis then determines the total circulation time for all pedestrian movements at the corner per signal cycle (expressed as pedestrians per second). The ratio of net time-space divided by the total pedestrian circulation volume per signal cycle provides the LOS measurement of SFP.

The LOS standards for sidewalks and corner reservoirs are summarized in **Table 3.8-2**. The *CEQR Technical Manual*-specified acceptable LOS in CBD areas is mid-LOS D or better (minimum of 31.5 SFP for sidewalks; minimum of 19.5 SFP for corners and crosswalks), which includes the Proposed Project’s Study Area.

Table 3.8-2
Level of Service Criteria for Pedestrian Elements

LOS	Sidewalks	Corner Reservoirs
A	≥ 530.1 SFP	≥ 60.1 SFP
B	90.1 – 530.0 SFP	40.1 – 60.0 SFP
C	40.1 – 90.0 SFP	24.1 – 40.0 SFP
D	23.1 – 40.0 SFP	15.1 – 24.0 SFP
E	11.1 – 23.0 SFP	8.1 – 15.0 SFP
F	≤ 11.0 SFP	≤ 8.0 SFP

Note: SFP = square feet per pedestrian
Source: New York City Mayor’s Office of Environmental Coordination, *CEQR Technical Manual*, 2021.

Significant Impact Criteria

Determining significant pedestrian impacts considers the level of predicted decrease in pedestrian space between the No Action and Proposed Action conditions. For different pedestrian elements, flow conditions, and area types, the *CEQR Technical Manual* procedure for assessing these impacts corresponds with various sliding-scale formulas, as further detailed below.

Sidewalks

The sliding-scale formula for determining sidewalk impacts is $Y \geq X/(9.5 - 0.321)$, where Y is the decrease in pedestrian space in SFP and X is the No Action pedestrian space in SFP. Since a decrease in pedestrian

space within acceptable levels would not constitute a significant impact, these formulas would apply only if the ~~With-Proposed~~ Action pedestrian space falls short of mid-LOS D in CBD areas or LOS C in non-CBD areas. **Table 3.8-3** summarizes the sliding scale guidance provided by the *CEQR Technical Manual* for determining potential significant sidewalk impacts.

Table 3.8-3
Significant Impact Guidance for Sidewalks

Sliding Scale Formula: $Y \geq X/9.5 - 0.321$			
Non-CBD Areas		CBD Areas	
No Action Pedestrian Space (X, SFP)	Proposed Action Pedestrian Space Reduction (Y, SFP)	No Action Pedestrian Space (X, SFP)	Proposed Action Pedestrian Space Reduction (Y, SFP)
≥ 44.3	Proposed Action Condition ≤ 40.0		
43.5 to 44.2	≥ 4.3	—	—
42.5 to 43.4	≥ 4.2	—	—
41.6 to 42.4	≥ 4.1	—	—
40.6 to 41.5	≥ 4.0	—	—
39.7 to 40.5	≥ 3.9	—	—
38.7 to 39.6	≥ 3.8	—	—
37.8 to 38.6	≥ 3.7	—	—
36.8 to 37.7	≥ 3.6	—	—
35.9 to 36.7	≥ 3.5	—	—
34.9 to 35.8	≥ 3.4	≥ 34.7	Proposed Action Condition ≤ 31.4
34.0 to 34.8	≥ 3.3	34.0 to 34.6	≥ 3.3
33.0 to 33.9	≥ 3.2	33.0 to 33.9	≥ 3.2
32.1 to 32.9	≥ 3.1	32.1 to 32.9	≥ 3.1
31.1 to 32.0	≥ 3.0	31.1 to 32.0	≥ 3.0
30.2 to 31.0	≥ 2.9	30.2 to 31.0	≥ 2.9
29.2 to 30.1	≥ 2.8	29.2 to 30.1	≥ 2.8
28.3 to 29.1	≥ 2.7	28.3 to 29.1	≥ 2.7
27.3 to 28.2	≥ 2.6	27.3 to 28.2	≥ 2.6
26.4 to 27.2	≥ 2.5	26.4 to 27.2	≥ 2.5
25.4 to 26.3	≥ 2.4	25.4 to 26.3	≥ 2.4
24.5 to 25.3	≥ 2.3	24.5 to 25.3	≥ 2.3
23.5 to 24.4	≥ 2.2	23.5 to 24.4	≥ 2.2
22.6 to 23.4	≥ 2.1	22.6 to 23.4	≥ 2.1
21.6 to 22.5	≥ 2.0	21.6 to 22.5	≥ 2.0
20.7 to 21.5	≥ 1.9	20.7 to 21.5	≥ 1.9
19.7 to 20.6	≥ 1.8	19.7 to 20.6	≥ 1.8
18.8 to 19.6	≥ 1.7	18.8 to 19.6	≥ 1.7
17.8 to 18.7	≥ 1.6	17.8 to 18.7	≥ 1.6
16.9 to 17.7	≥ 1.5	16.9 to 17.7	≥ 1.5
15.9 to 16.8	≥ 1.4	15.9 to 16.8	≥ 1.4
15.0 to 15.8	≥ 1.3	15.0 to 15.8	≥ 1.3
14.0 to 14.9	≥ 1.2	14.0 to 14.9	≥ 1.2
13.1 to 13.9	≥ 1.1	13.1 to 13.9	≥ 1.1
12.1 to 13.0	≥ 1.0	12.1 to 13.0	≥ 1.0
11.2 to 12.0	≥ 0.9	11.2 to 12.0	≥ 0.9
10.2 to 11.1	≥ 0.8	10.2 to 11.1	≥ 0.8
9.3 to 10.1	≥ 0.7	9.3 to 10.1	≥ 0.7
8.3 to 9.2	≥ 0.6	8.3 to 9.2	≥ 0.6
7.4 to 8.2	≥ 0.5	7.4 to 8.2	≥ 0.5
6.4 to 7.3	≥ 0.4	6.4 to 7.3	≥ 0.4
< 6.3	≥ 0.3	< 6.3	≥ 0.3

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

Corner Reservoirs

The determination of significant corner impacts is also based on a sliding scale using the following formula: $Y \geq X/9.0 - 0.31$, where Y is the decrease in pedestrian space in SFP and X is the No Action pedestrian

space in SFP. Since a decrease in pedestrian space within acceptable levels would not constitute a significant impact, this formula would apply only if the Proposed Action pedestrian space falls short of mid-LOS D in CBD areas or LOS C in non-CBD areas. **Table 3.8-4** summarizes the sliding scale guidance provided by the *CEQR Technical Manual* for determining potential significant corner reservoir impacts.

Table 3.8-4
Significant Impact Guidance for Corners

Sliding Scale Formula: $Y^3 X / 9.0 - 0.31$			
Non-CBD Areas		CBD Areas	
No Action Pedestrian Space (X, SFP)	Proposed Action Pedestrian Space Reduction (Y, SFP)	No Action Pedestrian Space (X, SFP)	Proposed Action Pedestrian Space Reduction (Y, SFP)
≥ 26.6	Proposed Action Condition ≤ 24.0		
25.8 to 26.5	≥ 2.6	—	—
24.9 to 25.7	≥ 2.5	—	—
24.0 to 24.8	≥ 2.4	—	—
23.1 to 23.9	≥ 2.3	—	—
22.2 to 23.0	≥ 2.2	≥ 21.5	Proposed Action Condition ≤ 19.4
21.3 to 22.1	≥ 2.1	21.3 to 21.4	≥ 2.1
20.4 to 21.2	≥ 2.0	20.4 to 21.2	≥ 2.0
19.5 to 20.3	≥ 1.9	19.5 to 20.3	≥ 1.9
18.6 to 19.4	≥ 1.8	18.6 to 19.4	≥ 1.8
17.7 to 18.5	≥ 1.7	17.7 to 18.5	≥ 1.7
16.8 to 17.6	≥ 1.6	16.8 to 17.6	≥ 1.6
15.9 to 16.7	≥ 1.5	15.9 to 16.7	≥ 1.5
15.0 to 15.8	≥ 1.4	15.0 to 15.8	≥ 1.4
14.1 to 14.9	≥ 1.3	14.1 to 14.9	≥ 1.3
13.2 to 14.0	≥ 1.2	13.2 to 14.0	≥ 1.2
12.3 to 13.1	≥ 1.1	12.3 to 13.1	≥ 1.1
11.4 to 12.2	≥ 1.0	11.4 to 12.2	≥ 1.0
10.5 to 11.3	≥ 0.9	10.5 to 11.3	≥ 0.9
9.6 to 10.4	≥ 0.8	9.6 to 10.4	≥ 0.8
8.7 to 9.5	≥ 0.7	8.7 to 9.5	≥ 0.7
7.8 to 8.6	≥ 0.6	7.8 to 8.6	≥ 0.6
6.9 to 7.7	≥ 0.5	6.9 to 7.7	≥ 0.5
6.0 to 6.8	≥ 0.4	6.0 to 6.8	≥ 0.4
5.1 to 5.9	≥ 0.3	5.1 to 5.9	≥ 0.3
≤ 5.0	≥ 0.2	≤ 5.0	≥ 0.2

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

3.8.5 Detailed Traffic Operation Analyses

3.8.5.1 Project Area

As described in greater detail in Chapter 1.0, "Project Description," the Project Area is comprised of seven design reaches. Reach 1 includes the project segments along Greenwich Street, North Moore Street, the westernmost segment of Harrison Street, and State Route 9A/West Street; the balance of the Project Area is in Battery Park City and includes North Esplanade (Reach 2), North Neighborhood/ Rockefeller Park (Reach 3), Ferry Terminal (Reach 4), Brookfield Place (Reach 5), South Esplanade (Reach 6), and South Neighborhood (Reach 7).

3.8.5.2 Traffic Operations

As part of this analysis, traffic data were collected in June 2023 in accordance with procedures outlined in the *CEQR Technical Manual* during the weekday hours from 7:00 AM to 10:00 AM, 11:00 AM to 2:00 PM, and 4:00 PM to 7:00 PM and Saturday hours from 12:00 PM to 5:00 PM via a combination of video

intersection counts and 24-hour Automatic Traffic Recorder (ATR) counts. Existing peak hour traffic volumes were developed based on these counts.

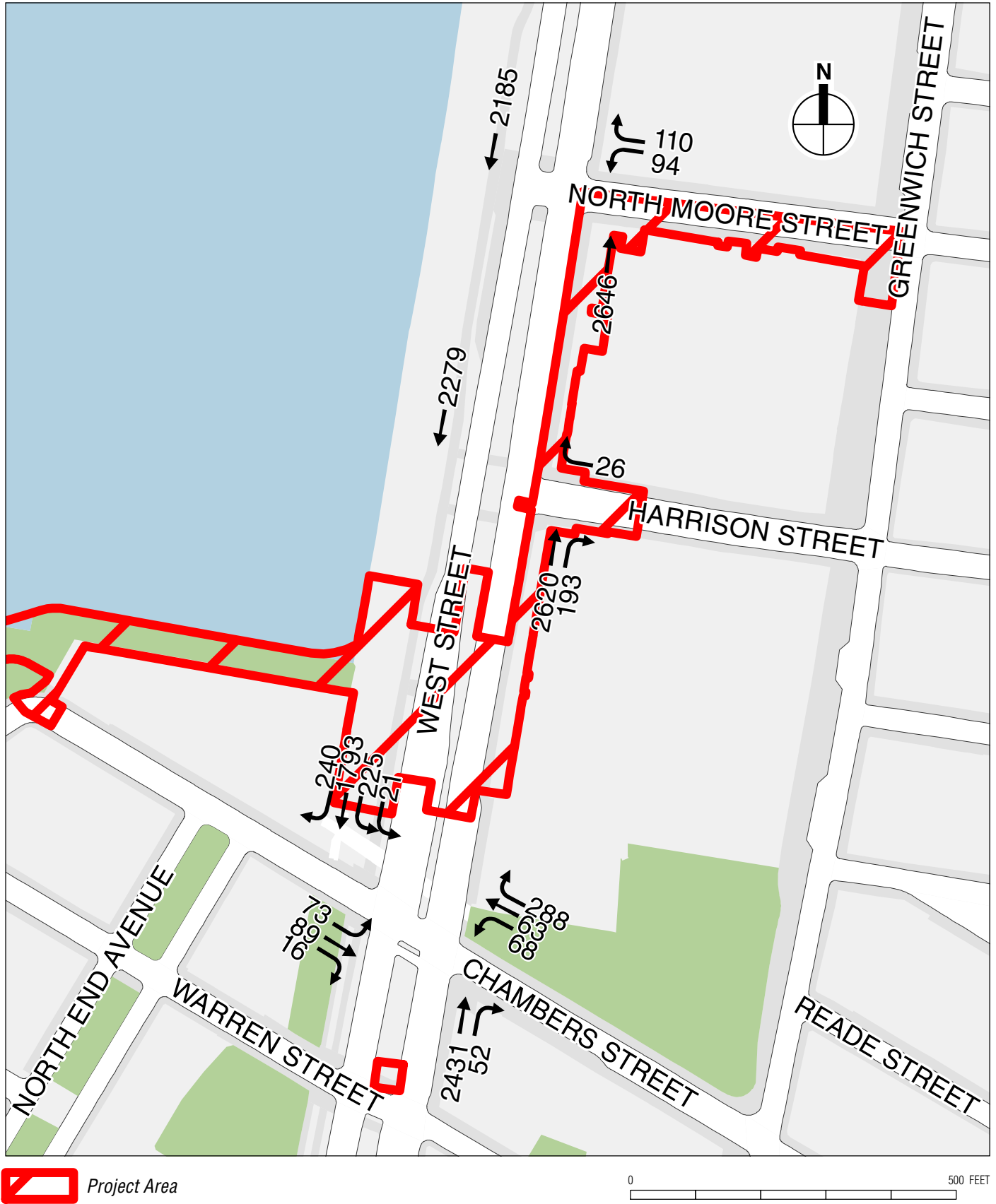
Inventories of roadway geometry, traffic controls, bus stops, and parking regulations/activities were recorded to provide appropriate inputs for the analysis. Official signal timings were also obtained from NYCDOT for use in the analysis.

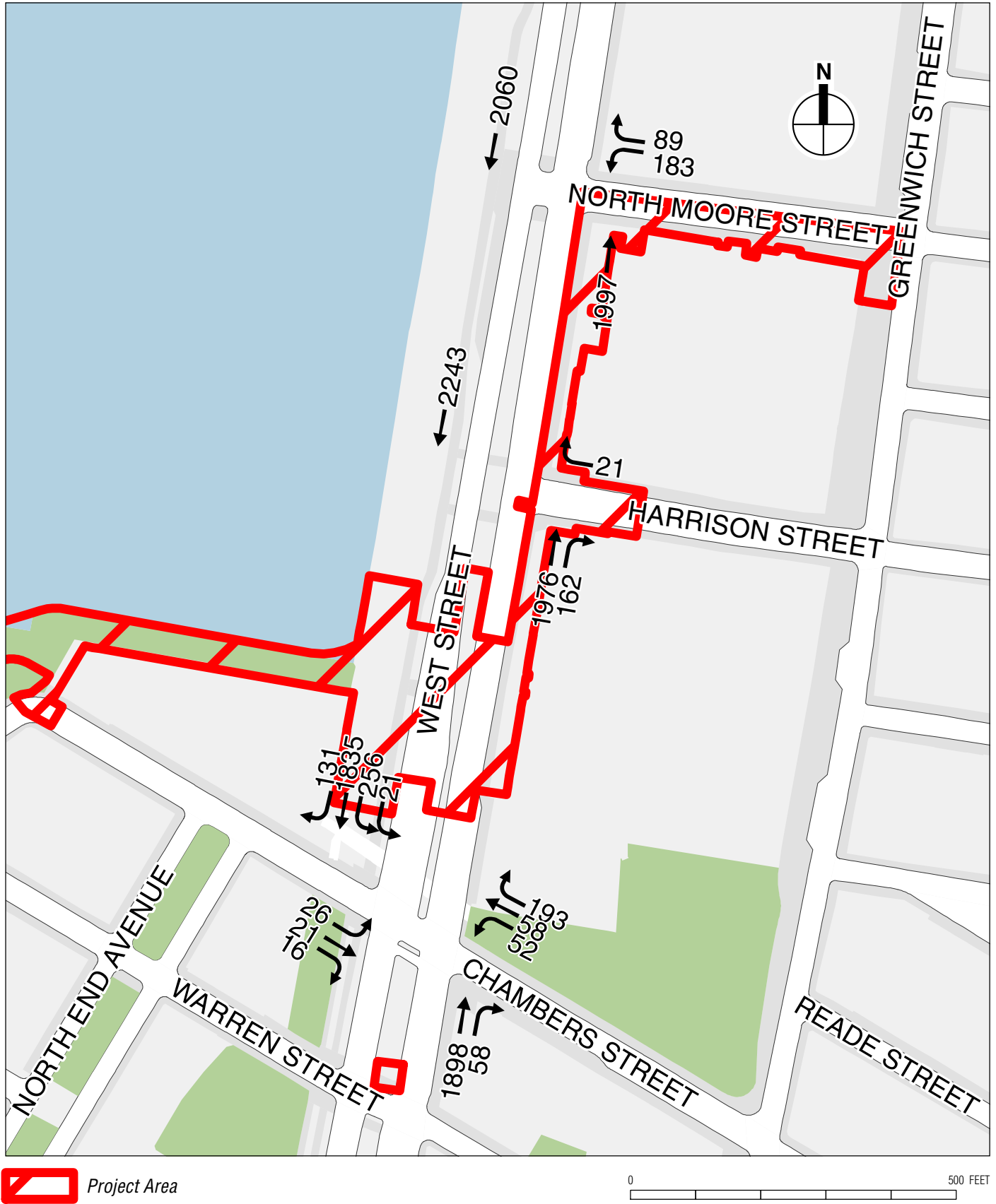
No Action condition traffic volumes were estimated by increasing existing traffic levels to reflect expected growth in overall travel through and within the study area. As per CEQR guidelines, an annual background growth rate of 0.25 percent was assumed for the first five years (2024 to 2028) and 0.125 percent was assumed for the following three years (2029 to 2031). Consistent with the methodology approved by NYCDOT for the quantified construction analysis, an additional growth rate of 3.0 percent was also assumed to account for volume increases resulting from No Build projects within ¼ mile of the Project Area. These growth rates together represent a cumulative increase of 4.63 percent over existing conditions. As discussed above, the Proposed Project would not generate additional demand and the volumes would be the same in the 2031 No Action and Proposed Action conditions (as shown in **Figures 3.8-2 through 3.8-5**).

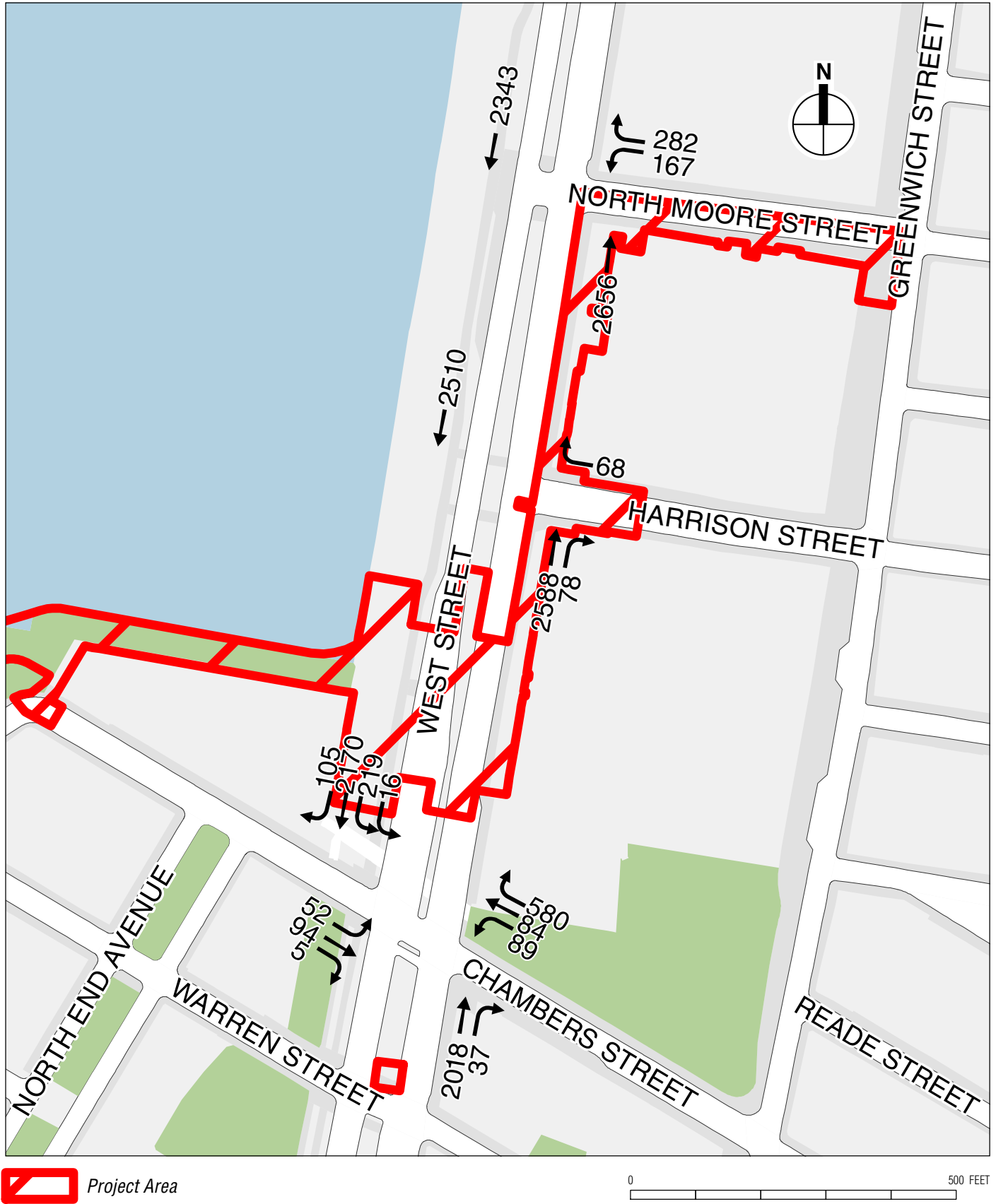
As noted above, the westbound lane widths of North Moore Street at the State Route 9A/West Street and North Moore Street intersection would be reduced from 16 feet to 11 feet in the Proposed Action condition with the North Moore Street sidewalk extension. This has been analyzed in conjunction with the reduced average queue storage lane length of the State Route 9A/West Street southbound left-turn lanes approaching Chambers Street. Details on LOS, v/c ratios, and average delays for the No Action and Proposed Action conditions are presented in **Table 3.8-5**. As shown, the following potential significant adverse traffic impacts could result at the State Route 9A/West Street and North Moore Street intersection during the weekday midday, weekday PM, and Saturday peak hours:

- The westbound left-turn at the State Route 9A/West Street and North Moore Street intersection would deteriorate from LOS D (v/c ratio of 0.70 and 50.9 seconds per vehicle [spv] of delay) to LOS E (v/c ratio of 0.81 and 62.0 spv of delay), from LOS D (v/c ratio of 0.54 and 50.3 spv of delay) to LOS E (v/c ratio of 0.62 and 55.3 spv of delay), and from LOS D (v/c ratio of 0.74 and 52.8 spv of delay) to LOS E (v/c ratio of 0.85 and 67.3 spv of delay), increases in delay of more than five seconds during the weekday midday, weekday PM, and Saturday peak hours.
- The westbound right-turn at the State Route 9A/West Street and North Moore Street intersection would deteriorate within LOS F (v/c ratio of 1.01 and 104.1 spv of delay) to a v/c ratio of 1.18 and 164.9 spv of delay), an increase in delay of more than four seconds, during the weekday PM peak hour.

To address these impacts, potential mitigation measures are presented in Chapter 4.0, "Mitigation." Specific signal timing changes recommended as mitigation will be evaluated post-construction, based on in-field operations, and reviewed by NYCDOT for approval. If the recommended mitigation is deemed infeasible and no alternative mitigation measure can be identified, then the identified significant adverse traffic impact would be unmitigated. Although according to *CEQR Technical Manual* methodologies there would be no significant adverse traffic impact from the reduction in the lengths of left-turn lane storage



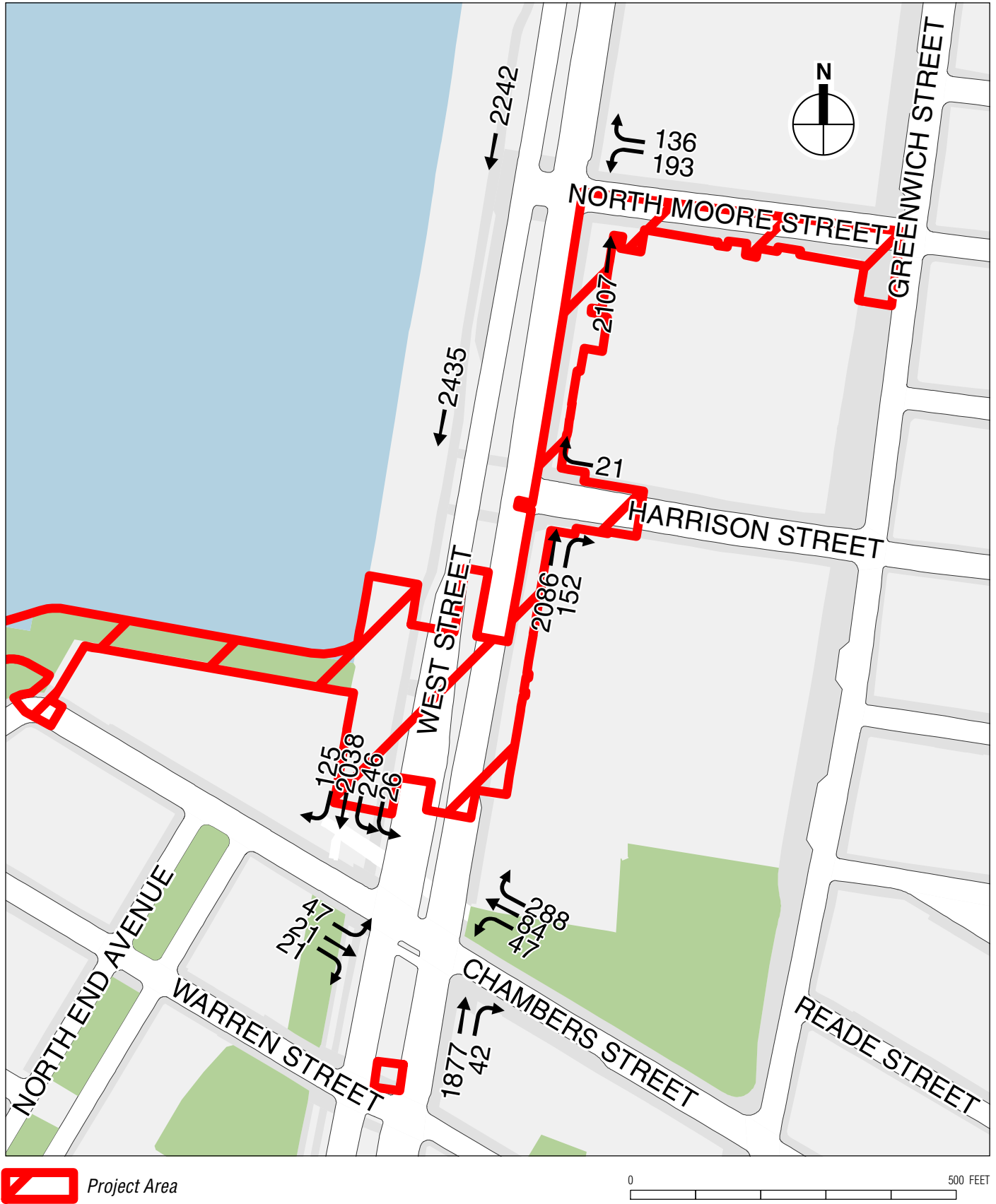




 Project Area

0 500 FEET

2031 No Action/With Action Traffic Volumes
Weekday PM Peak Hour



lanes approaching Chambers Street necessitated by the median widening to store the State Route 9A/West Street swing gates, there would be an increase in delay during peak hours on the southbound through movement, as shown in **Table 3.8-5**. This is from the effect of the southbound left-turn storage lanes currently being at capacity and the additional vehicles spilling into the southbound through lanes at times but not blocking them because there are three southbound through lanes for drivers to get around the queue spillback from the southbound left-turn. This condition occurs today and would worsen upon implementation of the Proposed Project. To address the increase in delay and safety concerns, a signal timing modification to shift additional time to improve traffic and safety conditions on southbound State Route 9A/West Street may be contemplated by NYCDOT. As described above for specific signal timing changes recommended as mitigation, specific signal timing changes on southbound State Route 9A/West Street will be evaluated post-construction, based on in-field operations, and reviewed by NYCDOT for approval.

Table 3.8-5

2030 No Action and Proposed Action Conditions Level of Service Analysis

Intersection	Weekday-AM								Weekday-Midday								Weekday-PM								Saturday							
	2030-No Action				2030-Proposed Action				2030-No Action				2030-Proposed Action				2030-No Action				2030-Proposed Action				2030-No Action				2030-Proposed Action			
	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	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
Signalized Intersections																																
State Route 9A/West Street and North Moore Street																																
Westbound	L	0.36	47.9	D	L	0.43	50.3	D	L	0.69	50.7	D	L	0.82	63.7	E+	L	0.54	50.2	D	L	0.63	56.0	E+	L	0.95	63.6	E	L	0.99	95.6	F+
	R	0.41	49.3	D	R	0.48	52.5	D	R	0.36	38.4	D	R	0.42	40.7	D	R	1.01	104.1	F	R	1.18	164.9	F+	R	0.57	43.8	D	R	0.67	50.5	D
Northbound	T	0.74	18.3	B	T	0.74	18.3	B	T	0.57	13.3	B	T	0.57	13.3	B	T	0.74	20.9	C	T	0.74	20.9	C	T	0.62	15.2	B	T	0.62	15.2	B
Southbound	T	0.82	21.7	C	T	0.82	21.7	C	T	0.78	18.3	B	T	0.78	18.3	B	T	0.87	27.2	C	T	0.87	27.2	C	T	0.86	22.7	C	T	0.86	22.7	C
	Intersection	21.2	C		Intersection	21.3	C		Intersection	18.1	B		Intersection	18.8	B		Intersection	29.4	C		Intersection	33.2	C		Intersection	22.2	C		Intersection	24.1	C	
Notes:																																
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service																																
+ Denotes a significant adverse impact																																

Table 3.8-5

2031 No Action and Proposed Action Conditions Level of Service Analysis

Intersection	Weekday AM								Weekday Midday								Weekday PM								Saturday							
	2031 No Action				2031 Proposed Action				2031 No Action				2031 Proposed Action				2031 No Action				2031 Proposed Action				2031 No Action				2031 Proposed Action			
	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	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
Signalized Intersections																																
State Route 9A/West Street and North Moore Street																																
Westbound	L	0.36	47.9	D	L	0.42	50.1	D	L	0.70	50.9	D	L	0.81	62.0	E+	L	0.54	50.3	D	L	0.62	55.3	E+	L	0.74	52.8	D	L	0.85	67.3	E+
	R	0.41	49.4	D	R	0.48	52.6	D	R	0.36	38.4	D	R	0.43	40.8	D	R	1.01	104.1	E	R	1.18	164.9	E+	R	0.56	43.2	D	R	0.65	49.5	D
Northbound	T	0.78	6.6	A	T	0.78	6.6	A	T	0.61	18.4	B	T	0.61	18.4	B	T	0.78	7.2	A	T	0.78	7.2	A	T	0.63	7.6	A	T	0.63	7.6	A
	I	0.82	21.6	C	I	0.82	21.6	C	I	0.78	18.2	B	I	0.78	18.2	B	I	0.87	27.1	C	I	0.87	27.1	C	I	0.85	21.9	C	I	0.85	21.9	C
Southbound																																
	Intersection	15.1	B		Intersection	15.2	B		Intersection	20.4	C		Intersection	21.0	C		Intersection	22.8	C		Intersection	26.6	C		Intersection	17.9	B		Intersection	18.8	B	
State Route 9A/West Street and Harrison Street																																
Westbound	R	0.09	41.8	D	R	0.09	41.8	D	R	0.07	34.0	C	R	0.07	34.0	C	R	0.20	40.1	D	R	0.20	40.1	D	R	0.07	31.0	C	R	0.07	31.0	C
	TR	0.86	11.1	B	TR	0.86	11.1	B	TR	0.67	19.0	B	TR	0.67	19.0	B	TR	0.84	10.5	B	TR	0.84	10.5	B	TR	0.71	8.1	A	TR	0.71	8.1	A
Northbound	T	0.85	6.8	A	T	0.85	6.8	A	T	0.82	7.8	A	T	0.82	7.7	A	T	0.95	12.4	B	T	0.95	12.3	B	T	0.92	10.3	B	T	0.92	10.1	B
	Intersection	9.4	A		Intersection	9.4	A		Intersection	13.4	B		Intersection	13.3	B		Intersection	11.9	B		Intersection	11.8	B		Intersection	9.4	A		Intersection	9.3	A	
State Route 9A/West Street and Chambers Street																																
Eastbound	LTR	0.74	65.0	E	LTR	0.74	65.0	E	LTR	0.21	33.5	C	LTR	0.21	33.5	C	LTR	0.50	45.6	D	LTR	0.50	45.6	D	LTR	0.39	37.9	D	LTR	0.39	37.9	D
	LT	0.67	64.0	E	LT	0.67	64.0	E	LT	0.44	39.3	D	LT	0.44	39.3	D	LT	0.69	56.1	E	LT	0.69	56.1	E	LT	0.47	39.4	D	LT	0.47	39.4	D
Westbound	R	0.63	43.7	D	R	0.63	43.7	D	R	0.38	26.3	C	R	0.38	26.3	C	R	1.10	112.7	F	R	1.10	112.7	F	R	0.58	31.5	C	R	0.58	31.5	C
	TR	0.98	50.4	D	TR	0.98	50.4	D	TR	0.93	41.2	D	TR	0.93	41.2	D	TR	0.87	40.9	D	TR	0.87	40.9	D	TR	0.87	36.4	D	TR	0.87	36.4	D
Northbound	L	0.87	105.3	E	L	0.87	105.3	E	L	0.82	77.2	E	L	0.82	77.2	E	L	1.10	160.1	F	L	1.10	160.1	F	L	0.87	81.4	E	L	0.87	81.4	E
	T	0.69	9.0	A	T	0.72	9.2	A	T	0.72	2.8	A	T	0.72	2.9	A	T	0.87	12.7	B	T	0.92	14.6	B	T	0.80	12.1	B	T	0.82	12.3	B
Southbound	R	1.09	112.4	E	R	1.09	112.4	E	R	0.54	29.8	C	R	0.54	29.8	C	R	0.68	51.8	D	R	0.68	51.8	D	R	0.56	35.8	D	R	0.56	35.8	D
	Intersection	42.5	D		Intersection	42.5	D		Intersection	27.2	C		Intersection	27.2	C		Intersection	44.0	D		Intersection	44.8	D		Intersection	29.0	C		Intersection	29.1	C	
Notes:																																
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service																																
+ Denotes a significant adverse impact																																

3.8.6 Detailed Pedestrian Operation Analyses

3.8.6.1 Existing Conditions

Pedestrian Operations

As part of this analysis, pedestrian volume data were collected in June 2023 in accordance with procedures outlined in the *CEQR Technical Manual* during the weekday hours from 7:00 AM to 10:00 AM, 11:00 AM to 2:00 PM, and 4:00 PM to 7:00 PM and Saturday hours from 12:00 PM to 5:00 PM. Based on the data collected during the respective peak periods the highest peak hour pedestrian volumes observed were from 8:00 AM to 9:00 AM, 12:00 PM to 1:00 PM, and 5:00 PM to 6:00 PM for weekday and 12:00 PM to 1:00 PM for Saturday. These peak hour volumes were used for the analysis.

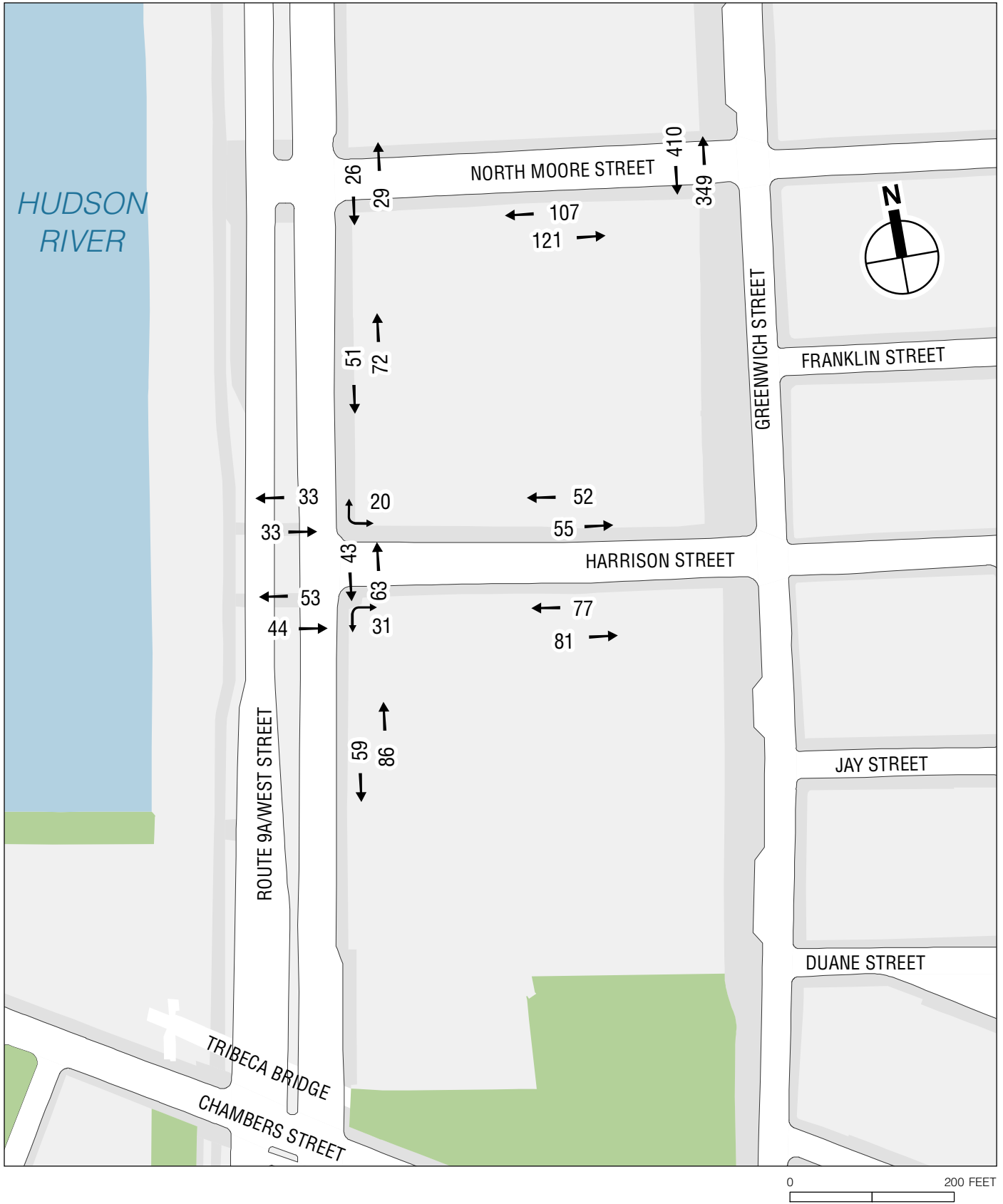
The existing peak hour pedestrian volumes are shown in **Figures 3.8-6 through 3.8-9**. As shown in **Tables 3.8-6 and through 3.8-8**, the analysis locations currently operate at favorable LOS A and BC or better.

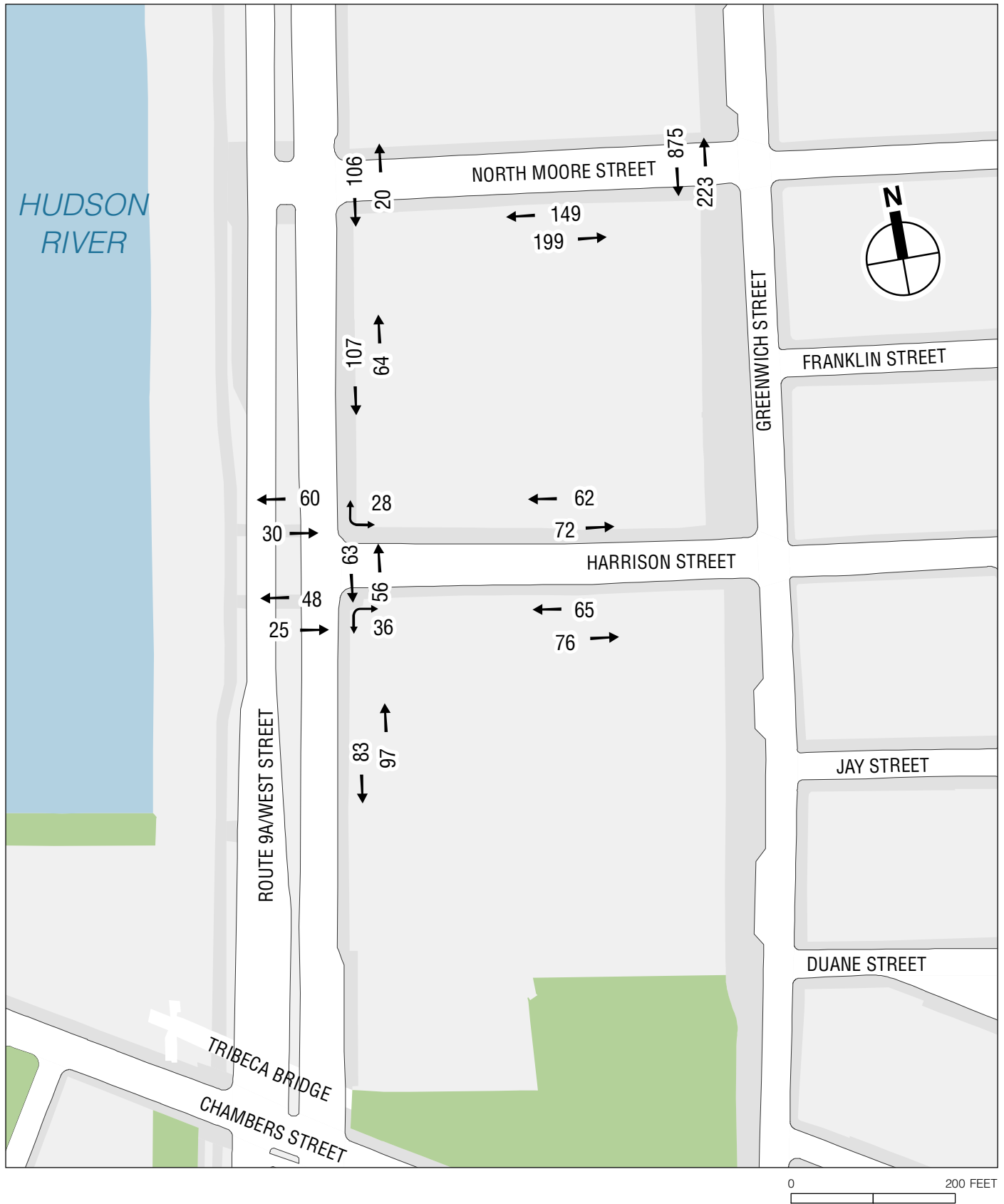
Table 3.8-6
Existing Conditions: Sidewalk Analysis

Location	Sidewalk	Effective Width (ft)	Two-way Peak Hour Volume	PHF	SFP	Platoon LOS
Weekday AM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	100	0.83	1320.0	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	96	0.77	1800.0	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	85	0.79	533.2	A
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	119	0.66	679.9	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	167	0.64	415.3	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~1352~~	~~0.78~~	~~160.3~~	~~B~~
Weekday Midday Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	107	0.74	1100.0	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	145	0.68	1052.8	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	158	0.63	228.4	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	123	0.72	711.6	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	228	0.69	325.2	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~976~~	~~0.84~~	~~240.4~~	~~B~~
Weekday PM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	134	0.80	942.8	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	180	0.74	914.7	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	141	0.73	299.9	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	171	0.84	599.9	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	348	0.84	259.4	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~1256~~	~~0.88~~	~~197.0~~	~~B~~
Saturday Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	184	0.65	557.7	A

Existing Pedestrian Volumes
Weekday AM Peak Hour

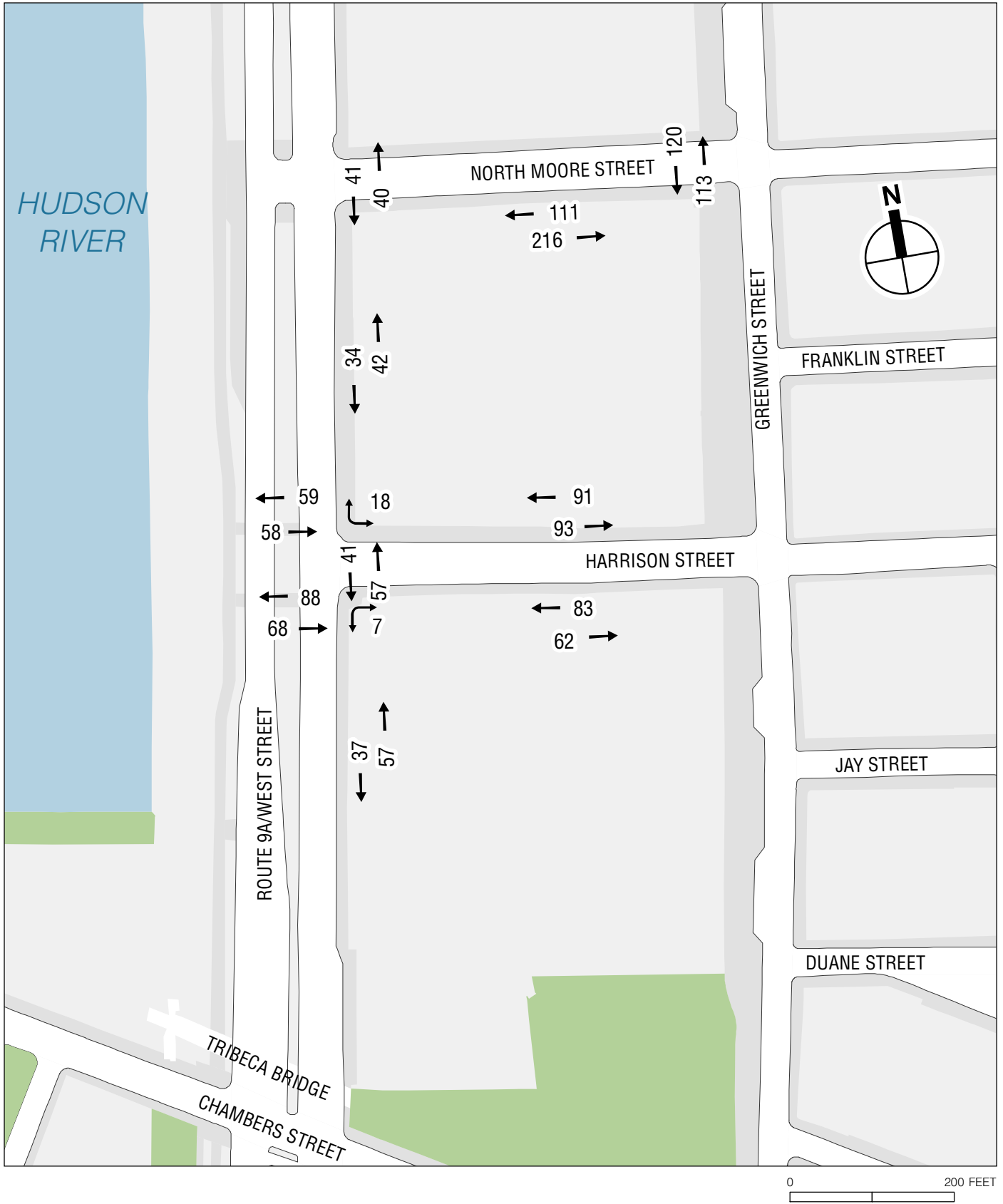
Figure 3.8-6





Existing Pedestrian Volumes
Weekday PM Peak Hour

Figure 3.8-8



Existing Pedestrian Volumes
Saturday Peak Hour

Figure 3.8-9

Table 3.8-6
Existing Conditions: Sidewalk Analysis

Location	Sidewalk	Effective Width (ft)	Two-way Peak Hour Volume	PHF	SFP	Platoon LOS
State Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	94	0.76	1800.0	A
Harrison Street between State Route 9A/West Street and Greenwich Street	South	4.0	145	0.70	276.8	B
State Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	76	0.54	874.2	A
North Moore Street between State Route 9A/West Street and Greenwich Street	South	7.5	327	0.72	238.8	B
Greenwich Street between North Moore Street and Franklin Street	West	19.5	481	0.75	437.5	B
Note: SFP = square feet per pedestrian.						

Table 3.8-7
Existing Conditions: Corner Analysis

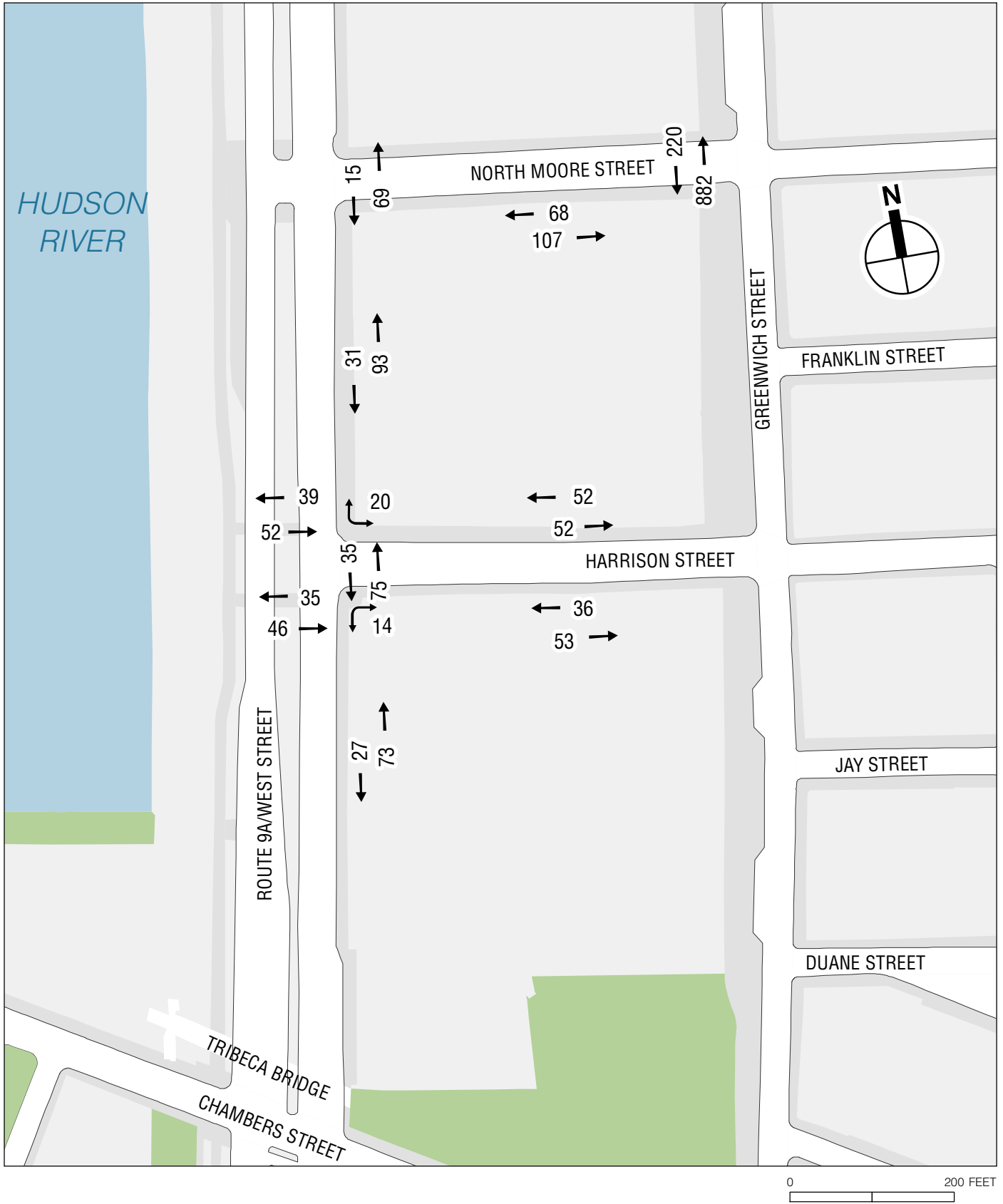
Location	Corner	Weekday AM Peak Hour		Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
State Route 9A/West Street and Harrison Street	Northeast	2386.4	A	2838.0	A	2381.4	A	2030.2	A
	Southeast	2409.9	A	2271.2	A	2375.3	A	1950.7	A
Greenwich Street and North Moore Street	Southwest	307.7	A	436.5	A	307.2	A	866.7	A
Note: SFP = square foot per pedestrian									

Table 3.8-8
Existing Conditions: Crosswalks Analysis

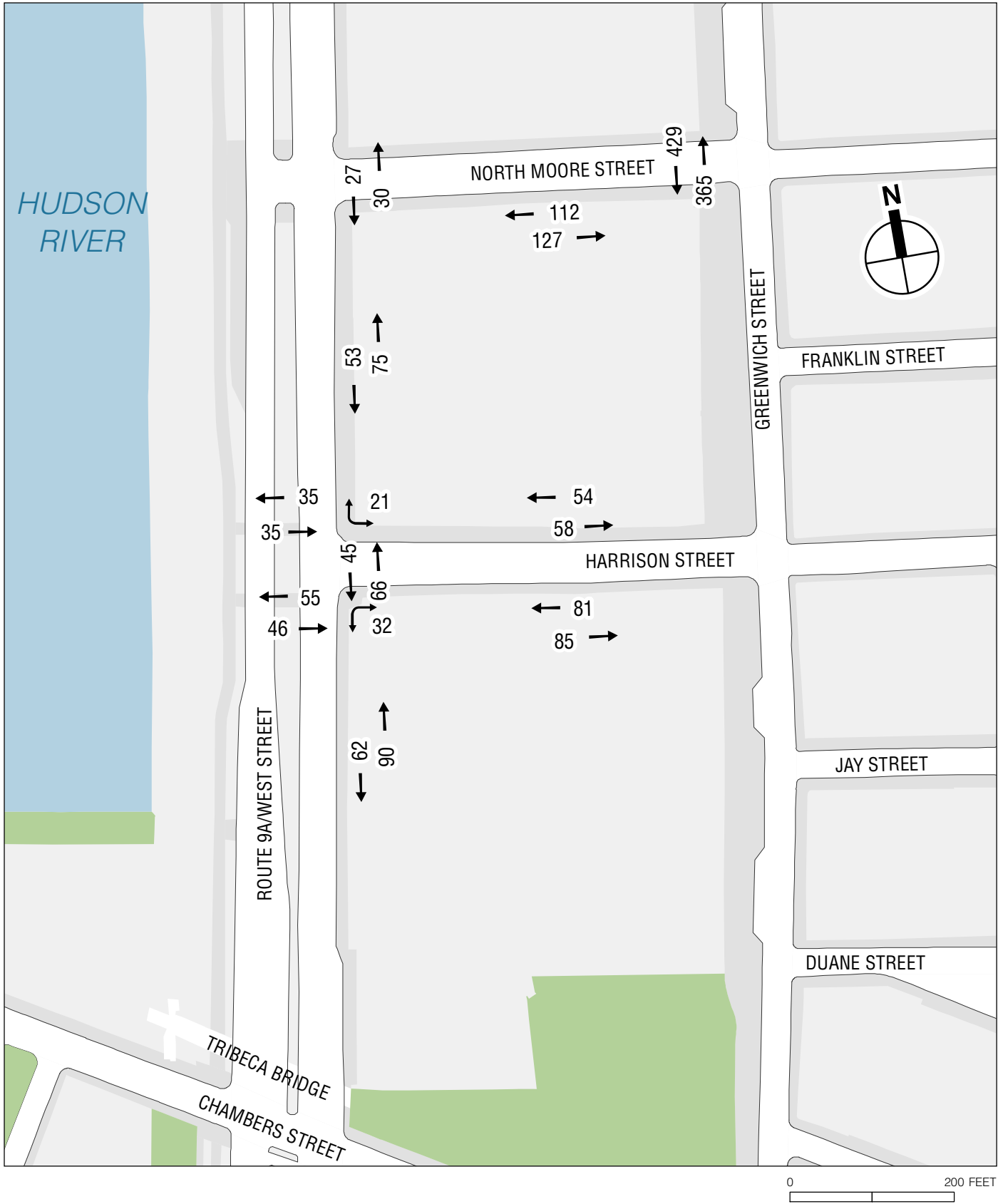
Location	Crosswalk	Crosswalk Length (ft)	Crosswalk Width (ft)	Two-way Peak Hour Volume	SFP	LOS
Weekday AM Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	80	678.2	A
North Moore Street and Greenwich Street	West	50.0	15.5	1053	34.0	C
Weekday Midday Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	55	1205.2	A
North Moore Street and Greenwich Street	West	50.0	15.5	759	54.6	B
Weekday PM Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	126	503.6	A
North Moore Street and Greenwich Street	West	50.0	15.5	1098	33.3	C
Saturday Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	81	677.0	A
North Moore Street and Greenwich Street	West	50.0	15.5	233	169.3	A
Note: SFP = square foot per pedestrian						

3.8.6.2 No Action Conditions

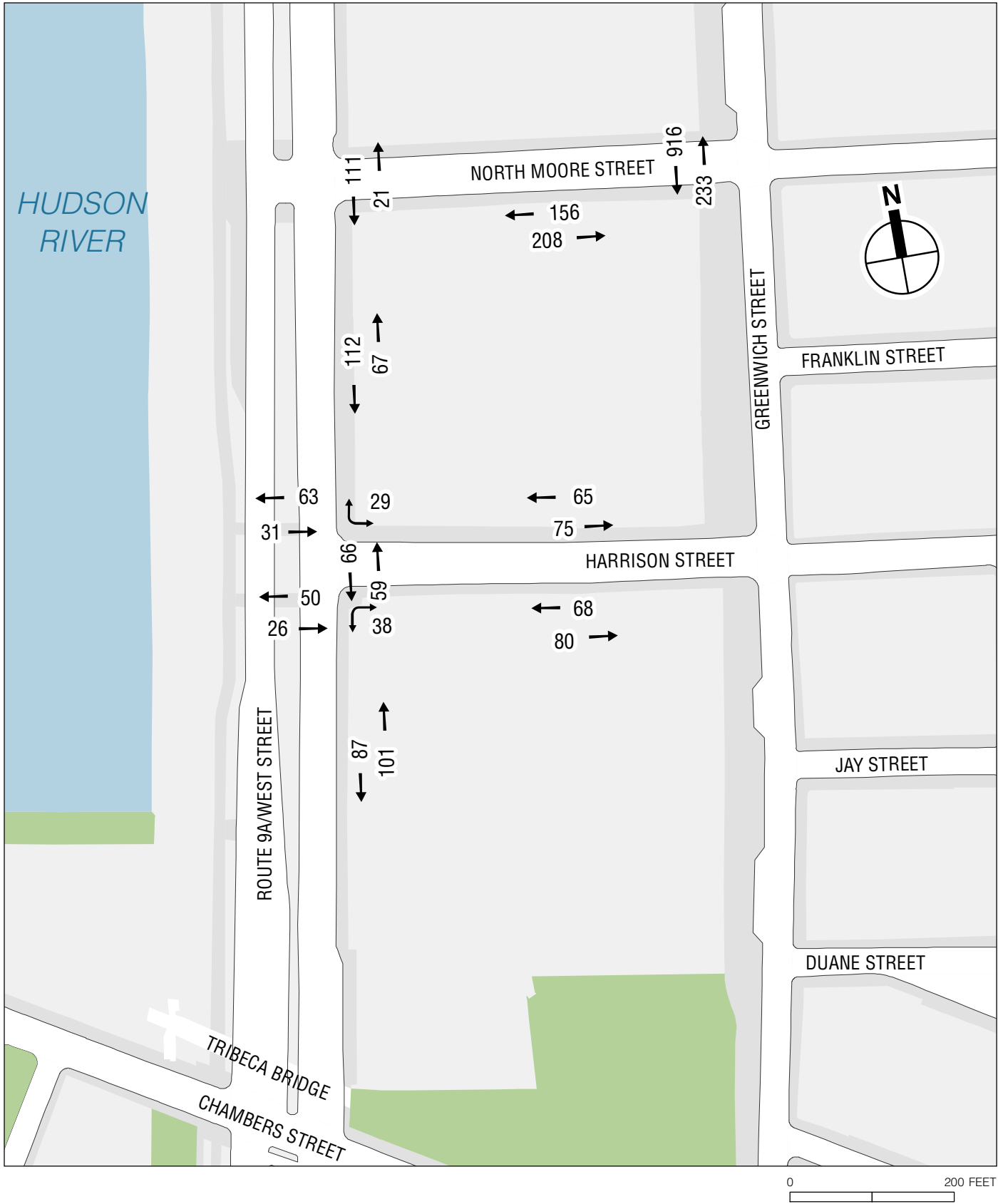
No Action condition pedestrian volumes were estimated by increasing existing pedestrian levels to reflect expected growth in overall travel through and within the study area in the same manner as described above for traffic. The 2030-2031 No Action/Proposed Action volumes are shown in **Figures 3.8-10 through 3.8-13**. As also shown in **Tables 3.8-9 and through 3.8-11**, in the No Action condition, all analysis locations will continue to operate at favorable LOS C or better ~~A and B~~.



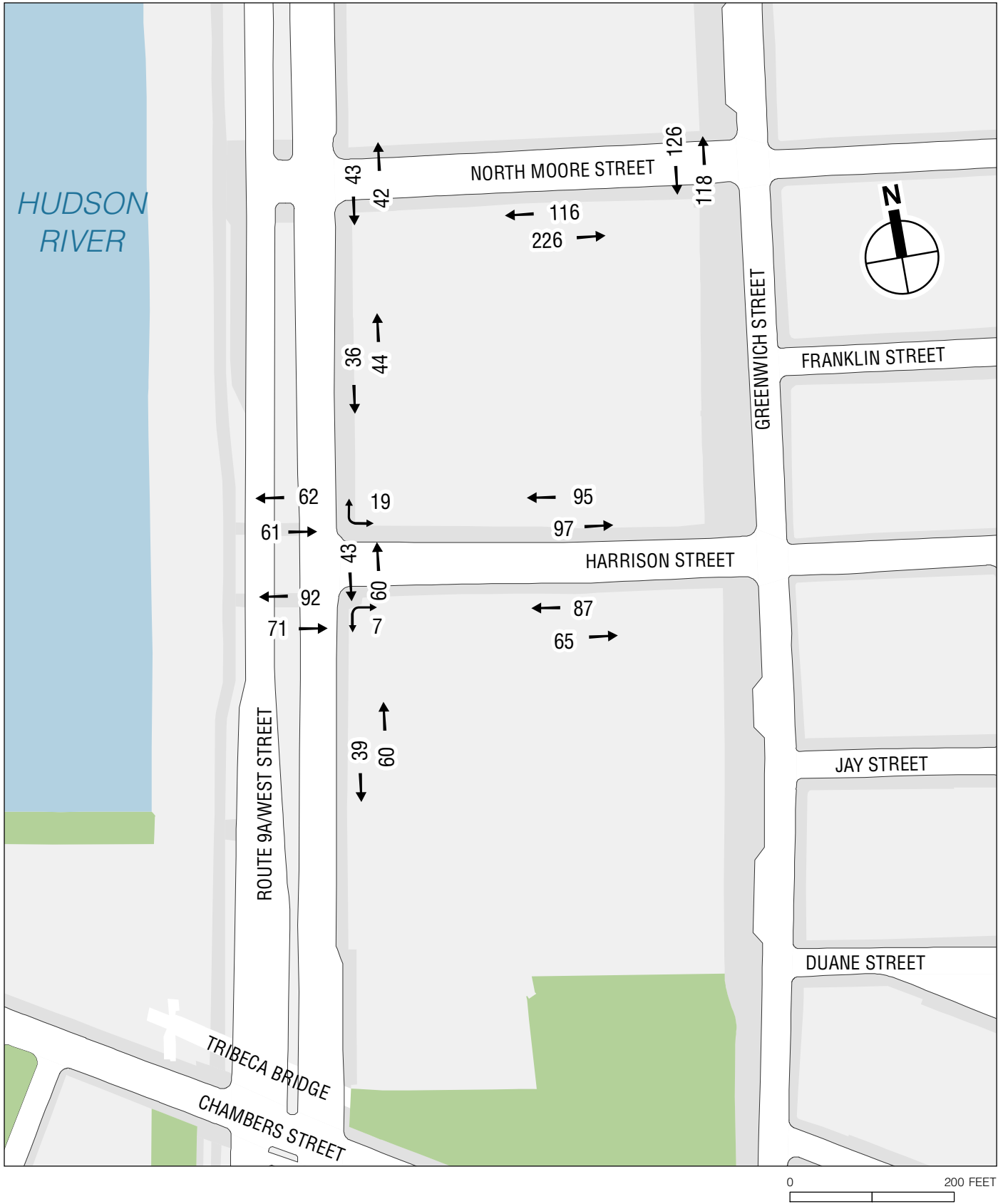
2031 No Action/With Action Pedestrian Volumes
Weekday AM Peak Hour



2031 No Action/With Action Pedestrian Volumes
Weekday Midday Peak Hour



2031 No Action/With Action Pedestrian Volumes
Weekday PM Peak Hour



2031 No Action/With Action Pedestrian Volumes
Saturday Peak Hour

Table 3.8-9
2030-2031 No Action Conditions: Sidewalk Analysis

Location	Sidewalk	Effective Width (ft)	Two-way Peak Hour Volume	PHF	SFP	Platoon LOS
Weekday AM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	104	0.83	1269.2	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	100	0.77	1728.0	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	89	0.79	509.3	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	124	0.66	652.5	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	175	0.64	396.3	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~1413~~	~~0.78~~	~~153.4~~	~~B~~
Weekday Midday Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	~~111~~ 112	0.74	~~1060.3~~ 1050.9	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	152	0.68	1004.3	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	~~166~~ 165	0.63	~~218.7~~ 217.3	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	128	0.72	683.8	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	~~238~~ 239	0.69	~~311.5~~ 310.2	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~1020~~	~~0.84~~	~~230.0~~	~~B~~
Weekday PM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	140	0.80	902.4	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	188	0.74	875.8	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	~~147~~ 148	0.73	~~287.6~~ 285.7	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	179	0.84	573.1	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	364	0.84	248.0	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~1313~~	~~0.88~~	~~188.4~~	~~B~~
Saturday Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	11.0	192	0.65	534.4	A
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	15.5	99	0.76	1709.1	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	4.0	152	0.70	264.0	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	8.5	80	0.54	830.5	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	7.5	342	0.72	228.3	B
~~Greenwich Street between North Moore Street and Franklin Street~~	~~West~~	~~19.5~~	~~502~~	~~0.75~~	~~419.2~~	~~B~~
Note: SFP = square feet per pedestrian.						

Table 3.8-10**2030-2031 No Action Conditions: Corner Analysis**

Location	Corner	Weekday AM Peak Hour		Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
State Route 9A/West Street and Harrison Street	Northeast	2288.5	2275.9	A	2722.8	2696.7	A	2275.2	A
	Southeast	2312.4	2287.9	A	2177.3	A	2265.4	A	1865.6
Greenwich Street and North Moore Street	Southwest	294.1	A	417.0	A	293.8	A	829.0	A

Note: SFP = square foot per pedestrian

Table 3.8-11**2031 No Action Conditions: Crosswalks Level of Service Analysis**

Location	Crosswalk	Crosswalk Length (ft)	Crosswalk Width (ft)	Two-way Peak Hour Volume	SFP	LOS
Weekday AM Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	84	644.6	A
North Moore Street and Greenwich Street	West	50.0	15.5	1102	32.3	C
Weekday Midday Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	57	1162.6	A
North Moore Street and Greenwich Street	West	50.0	15.5	794	52.0	B
Weekday PM Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	132	480.3	A
North Moore Street and Greenwich Street	West	50.0	15.5	1149	32.3	C
Saturday Peak Hour						
North Moore Street and State Route 9A/West Street	East	49.5	17.0	85	644.9	A
North Moore Street and Greenwich Street	West	50.0	15.5	244	158.2	A

Note: SFP = square foot per pedestrian

3.8.6.3 Proposed Action Conditions

The geometric changes with the Proposed Project at the nine analysis locations include:

- Reducing the narrowest width of the north sidewalk on Harrison Street between State Route 9A/West Street and Greenwich Street from 14 feet to approximately 6.06-4 feet;
- Reducing the narrowest width of the east sidewalk on State Route 9A/West Street between Harrison Street and Chambers Street from 19 feet to approximately 12-11.9 feet;
- Reducing the narrowest width of the south sidewalk on Harrison Street between State Route 9A/West Street and Greenwich Street from 7 feet to approximately 6-6.02 feet;
- Reducing the narrowest width of the east sidewalk on State Route 9A/West Street between North Moore Street and Harrison Street from 11 feet to approximately 7.6 feet;
- Reducing the narrowest width of the south sidewalk on North Moore Street between State Route 9A/West Street and Greenwich Street from 10 feet to approximately 5-18.0 feet;
- Reducing the corner reservoir areas at the northeast corner of Harrison Street and State Route 9A/West Street from 23 feet (width of the corner on Harrison Street) by 33.5 feet (width of the corner on State Route 9A/West Street), to approximately 20.5-17.4 feet on Harrison Street by 17.5-20.0 feet on Route 9A/West Street);

- Reducing the corner reservoir area at the southeast corner of Harrison Street and State Route 9A/West Street from 23 feet (width of the corner on Harrison Street) by 34 feet (width of the corner on State Route 9A/West Street), to approximately ~~20~~21.3 feet on Harrison Street by ~~21~~20.0 feet on State Route 9A/West Street; and
- Reducing the corner reservoir area at the southwest corner of Greenwich Street and North Moore Street from 16 feet (width of the corner on North Moore Street) by 45 feet (width of the corner on Greenwich Street), to approximately 13.9 feet on North Moore Street by 29.6 feet on Greenwich Street, crossing distance at the east crosswalk of North Moore Street and State Route 9A/West Street from 49.5 feet to approximately 40.5 feet; and
- Reducing the crossing distance at the west crosswalk of North Moore Street and Greenwich Street from 50.0 feet to approximately 32.0 feet.

As shown in **Tables 3.8-12 through 3.8-14**, based on an assessment prepared in accordance with the above-described methodologies, in the Proposed Action condition all analyzed locations would continue to operate at a favorable LOS A and BC or better. Therefore, it is concluded that the ~~proposed~~ Proposed project elements along North Moore Street, Greenwich Street, State Route 9A/West Street, and Harrison Street would not result in any significant adverse pedestrian impacts. ~~with these design optionswidening.~~

Table 3.8-12
2030-2031 Proposed Action Conditions: Sidewalk Analysis

Location	Sidewalk	Effective Width (ft)	Two-way Peak Hour Volume	PHF	SFP	Platoon LOS
Weekday AM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	~~3.53~~ <u>3.9</u>	104	0.83	~~403.7444~~ <u>41</u>	B
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	~~10.941~~ <u>10</u>	100	0.77	~~1215.11226~~ <u>3</u>	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	~~2.52~~ <u>2.7</u>	89	0.79	~~318.2343~~ <u>7</u>	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	~~5.16~~ <u>6</u>	124	0.66	~~391.4506~~ <u>6</u>	B
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	~~5.02~~ <u>6</u>	175	0.64	~~264.1137~~ <u>6</u>	B
Greenwich Street between North Moore Street and Franklin Street	West	~~15.6~~	~~1413~~	~~0.78~~	~~122.5~~	~~B~~
Weekday Midday Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	~~3.53~~ <u>3.9</u>	~~111~~ <u>112</u>	0.74	~~287.0371~~ <u>0</u>	B
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	~~10.941~~ <u>10</u>	152	0.68	~~615.8712~~ <u>7</u>	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	~~2.52~~ <u>2.7</u>	~~165~~ <u>166</u>	0.63	~~178.4147~~ <u>4</u>	B
<u>State</u> Route 9A/West Street between North Moore Street and Harrison Street	East	~~5.16~~ <u>6</u>	128	0.72	~~343.8530~~ <u>9</u>	A
North Moore Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	~~5.02~~ <u>6</u>	~~238~~ <u>239</u>	0.69	~~165.2408~~ <u>0</u>	B
Greenwich Street between North Moore Street and Franklin Street	West	~~15.6~~	~~1020~~	~~0.84~~	~~183.8~~	~~B~~
Weekday PM Peak Hour						
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	North	~~3.53~~ <u>3.9</u>	140	0.80	~~287.0315~~ <u>7</u>	B
<u>State</u> Route 9A/West Street between Harrison Street and Chambers Street	East	~~10.941~~ <u>10</u>	188	0.74	~~615.8621~~ <u>5</u>	A
Harrison Street between <u>State</u> Route 9A/West Street and Greenwich Street	South	~~2.52~~ <u>2.7</u>	147	0.73	~~178.4194~~ <u>0</u>	B

Table 3.8-12
2030-2031 Proposed Action Conditions: Sidewalk Analysis

Location	Sidewalk	Effective Width (ft)	Two-way Peak Hour Volume	PHF	SFP	Platoon LOS
State Route 9A/West Street between North Moore Street and Harrison Street	East	<u>5.16.6</u>	179	0.84	<u>343.8445.0</u>	B
North Moore Street between State Route 9A/West Street and Greenwich Street	South	<u>5.02.6</u>	364	0.84	<u>165.285.9</u>	C
Greenwich Street between North Moore Street and Franklin Street	West	<u>15.6</u>	<u>1313</u>	<u>0.88</u>	<u>150.5</u>	<u>B</u>
Saturday Peak Hour						
Harrison Street between State Route 9A/West Street and Greenwich Street	North	<u>3.53.9</u>	192	0.65	<u>169.8186.8</u>	B
State Route 9A/West Street between Harrison Street and Chambers Street	East	<u>10.911.0</u>	99	0.76	<u>1201.81212.9</u>	A
Harrison Street between State Route 9A/West Street and Greenwich Street	South	<u>2.52.7</u>	152	0.70	<u>164.8178.1</u>	B
State Route 9A/West Street between North Moore Street and Harrison Street	East	<u>5.16.6</u>	80	0.54	<u>498.3644.8</u>	A
North Moore Street between State Route 9A/West Street and Greenwich Street	South	<u>5.02.6</u>	342	0.72	<u>152.078.9</u>	C
Greenwich Street between North Moore Street and Franklin Street	West	<u>15.6</u>	<u>502</u>	<u>0.75</u>	<u>335.1</u>	<u>B</u>
Note: SFP = square feet per pedestrian.						

Table 3.8-13
2030-2031 Proposed Action Conditions: Corner Analysis

Location	Corner	Weekday AM Peak Hour		Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
State Route 9A/West Street and Harrison Street	Northeast	1000.5	A	1190.0	A	991.9	A	842.3	A
	Southeast	1179.4	A	1107.2	A	1155.3	A	948.8	A
Greenwich Street and North Moore Street	Southwest	154.7	A	224.0	A	157.3	A	449.3	A
Note: SFP = square foot per pedestrian									

Table 3.8-14
2031 Proposed Action Conditions: Crosswalks Level of Service Analysis

Location	Crosswalk	Crosswalk Length (ft)	Crosswalk Width (ft)	Two-way Peak Hour Volume	SFP	LOS
Weekday AM Peak Hour						
North Moore Street and State Route 9A/West Street	East	<u>40.5</u>	<u>17.0</u>	<u>84</u>	<u>620.8</u>	<u>A</u>
North Moore Street and Greenwich Street	West	<u>32.0</u>	<u>15.5</u>	<u>1102</u>	<u>28.0</u>	<u>C</u>
Weekday Midday Peak Hour						
North Moore Street and State Route 9A/West Street	East	<u>40.5</u>	<u>17.0</u>	<u>57</u>	<u>1121.3</u>	<u>A</u>
North Moore Street and Greenwich Street	West	<u>32.0</u>	<u>15.5</u>	<u>794</u>	<u>46.0</u>	<u>B</u>
Weekday PM Peak Hour						
North Moore Street and State Route 9A/West Street	East	<u>40.5</u>	<u>17.0</u>	<u>132</u>	<u>462.0</u>	<u>A</u>
North Moore Street and Greenwich Street	West	<u>32.0</u>	<u>15.5</u>	<u>1149</u>	<u>27.9</u>	<u>C</u>
Saturday Peak Hour						
North Moore Street and State Route 9A/West Street	East	<u>40.5</u>	<u>17.0</u>	<u>85</u>	<u>621.5</u>	<u>A</u>
North Moore Street and Greenwich Street	West	<u>32.0</u>	<u>15.5</u>	<u>244</u>	<u>140.5</u>	<u>A</u>
Note: SFP = square foot per pedestrian						

Reach 1 Gate Design Updates

As described in 3.8.1, "Introduction," design updates related to the State Route 9A/West Street and Harrison Street gate crossings would result in geometric constraints on pedestrians for three sidewalks. The State Route 9A/West Street gate crossing design refinements would not affect the conclusions of the DEIS, which assumed a reduced width for the east sidewalk of State Route 9A/West Street between Harrison Street and Chambers Street. The Harrison Street gate crossing design refinements would not affect the conclusions of the DEIS, which assumed reduced sidewalk widths for the north and south sidewalks of Harrison Street between State Route 9A/West Street and Greenwich Street. For the three sidewalks, the final widths would be wider than under the design conditions evaluated in the DEIS, and no further evaluation of pedestrian operations is required for these design updates. As was previously concluded in the DEIS with respect to the prior design, there would not be any effect on bike conditions on the parallel two-way bikeway along State Route 9A/West Street under the Reach 1 gate design refinements presented in this FEIS.

3.8.7 Qualitative Consideration: Potential Effects to Reaches 4 to 7

For Reaches 4 to 7, a narrative discussion of the potential effects of the Proposed Project on pedestrian and bicycle activity is provided below. Pedestrian and bicycle count data were collected during the same time periods as those presented for Reach 1. The discussions below cite the highest peak hour pedestrian and bicycle volumes of the weekday AM, midday, PM, or Saturday peak hour time periods for data collected in June 2023. The conclusions are based on facilities operating at acceptable mid-LOS D or better conditions according to the 2010 HCM methodologies for walkways. This results when paths maintain a clear width of at least 9 feet and have volumes as high as approximately 1,420 pedestrians per hour. According to these conditions, LOS D or better would be maintained at all locations below where the Proposed Project would narrow shared pedestrian and bicycle facilities.

3.8.7.1 Reach 4

The pedestrian path to the east of Lily Pond handles approximately 240 pedestrians per hour. While the design proposes narrowing this path segment, a clear width of at least 9.4 feet is provided. The west entrance of Irish Hunger Memorial Plaza handles approximately 610 pedestrians per hour. While the design proposes narrowing this entrance, a clear width of at least 49 feet is provided. Therefore, it is concluded that the Proposed Project would not result in any adverse impacts on pedestrian operations or safety in this reach.

3.8.7.2 Reach 5

The Pumphouse Park path handles approximately 1050 pedestrians and 50 bikes per hour. While the design proposes narrowing this path segment, a clear width of at least 14.75~~22~~ feet is provided. The Battery Park Esplanade west of Belvedere Plaza handles approximately 510 pedestrians per hour. While the design proposes narrowing this path segment, a clear width of at least 22.25~~24.6~~ feet is provided. Therefore, it is concluded that the Proposed Project would not result in any adverse impacts on pedestrian and bicycle operations or safety in this reach.

3.8.7.3 Reach 6

The Gateway Plaza paths handle approximately 680 pedestrians and 40 bikes per hour. While the design proposes narrowing this path segment, a clear width of at least ~~8~~¹⁰ feet is provided. The path near the Rector Place entrance carries approximately 630 pedestrians and 40 bikes per hour. While the design also proposes narrowing this path segment, a clear width of at least 10 feet is provided. The path near the Regatta Condominium carries approximately 580 pedestrians and 40 bikes per hour. While the design proposes narrowing this path segment, a clear width of at least 10 feet is provided.

The plaza near the Rector Place entrance carries approximately 100 pedestrians per hour. While the design also proposes narrowing this plaza area, a clear width of at least 20 feet is provided. The plaza near the West Thames Street entrance carries approximately 80 pedestrians per hour. While the design also proposes narrowing this plaza area, a clear width of at least 30.8 feet is provided. Therefore, it is concluded that the Proposed Project would not result in any adverse impacts on pedestrian and bicycle operations or safety in this reach.

3.8.7.4 Reach 7

The North Edge paths carry approximately 440 pedestrians and 30 bikes per hour. While the design proposes narrowing this path segment, a clear width of at least ~~19.5~~¹⁵ feet is provided. The Battery Park Esplanade south of the Regatta Condominium carries approximately 530 pedestrians per hour. While the design proposes narrowing this path segment, a clear width of at least ~~7.5~~^{12.4} feet is provided. The plaza near the 2nd Place entrance carries approximately 590 pedestrians per hour. While the design also proposes narrowing this plaza area, a clear width of at least 24 feet is provided. The plaza near the 3rd Place entrance carries approximately 300 pedestrians per hour. While the design also proposes narrowing this plaza area, a clear width of at least 20 feet is provided. Therefore, it is concluded that the Proposed Project would not result in any adverse impacts on pedestrian and bicycle operations or safety in this reach.

3.8.8 Assessment of Operational Deployment Conditions

3.8.8.1 Introduction

The proposed flood protection system is comprised of an in-place flood barrier wall with deployable gates at street and sidewalk crossings including crossings at State Route 9A/West Street, the parallel Greenway and along City streets, including Harrison and North Moore Streets. The transportation effects of the Proposed Project have been evaluated above assuming the deployable gates would be open and not deployed, to represent typical conditions. Gates are to be deployed under two circumstances — routine maintenance and testing and storm event deployment. The effects on transportation systems under these two scenarios are described below.

3.8.8.2 System Testing and Maintenance

Testing and maintenance of the deployable gates during non-storm conditions is expected to be undertaken annually to ensure they are ready to operate in a storm condition. This gate-testing would require temporary closure of the sections of the roadways and sidewalks within the Project Area, including State Route 9A/West Street (both the roadway and parallel bikeway between Chambers Street and North

Moore Street), Harrison Street, and North Moore Street, and various locations within Battery Park City. This testing would be implemented in accordance with an approved flood barrier system maintenance and operations plan that would be subject to review and approval by the New York State Department of Transportation (NYSDOT) and NYCDOT, NYCEM, the New York City Police Department (NYPD), New York City Fire Department (FDNY), New York City Department of Environmental Protection (NYCDEP), other City agencies, and FEMA, while minimizing impacts on transportation systems including temporary closures and diversions of vehicles, cyclists, and pedestrians with the objective to ensure safe access is coordinated and maintained with alternate access routes, as needed. To that end, it is expected that gate maintenance and testing operations would be performed for each gate during overnight hours. The closures would last up to eight hours, and the frequency of the closures would depend on the type of gate installed. A flip-up gate design would require closures twice per year per gate, and in the case of a swing-gate the closure would be limited to once per year per gate. Given that a plan will be in-place to minimize impacts and that this testing is a limited and coordinated event, the annual testing and maintenance events would not result in any significant adverse impacts on transportation systems.

3.8.8.3 Design Storm Conditions

Design storm conditions will involve the deployment of all gates to complete the flood barrier, enclose the Protected Area and provide the necessary flood protection. In a storm event, NYCEM would determine the timing of the deployment of the gates along State Route 9A/West Street. This will be addressed in the Emergency Response Plan that will be designed to address the needs of the community and emergency vehicles both in the Protected Area and the adjacent neighborhoods. This Plan will be prepared in coordination with FEMA, NYCEM, BPCA, NYSDOT, NYCDOT, NYCDEP NYPD, FDNY, NYC Parks, and other City and State agencies, including MTA for issues related to transit systems management. Given that these design storm conditions are episodic and temporary, and the Emergency Response Plan would need to be in place to address transportation needs of the community, including allowing for adequate evacuation time before deployment, it is not expected that the deployment of flood protection gates during storm event conditions would result in any significant adverse impacts on transportation systems. Finally, protecting this segment of the highway from the impacts of flooding would eliminate the need for post-storm debris removal from the Protected Area and repairs, thereby providing for a faster resumption of traffic and transit access within the Protected Area.