

4.0 Mitigation

4.0.1 Introduction

This chapter describes the mitigation measures that address the significant adverse impacts of the Proposed Project. As described in Chapter 3.0, “Affected Environment,” the Proposed Project’s significant adverse impacts are limited to the construction phase. Construction of the floodwall, which is approximately 1.6 miles in length, projected to take 5 years, located within and adjacent to public spaces, as well as adjacent to residential buildings and businesses, would by its breadth, complexity and location cause temporary significant construction impacts. The geography of the Project Area is constrained, and the length of the floodwall would be constructed within a well-used and populated area and there are not opportunities for construction staging elsewhere. Every reasonable measure that can be implemented to minimize and avoid construction impacts has been the subject of extensive study and analysis. However, the significant adverse impacts from construction are temporary and in the service of the Proposed Project which would protect residences, businesses, and the public in the Project Area from significant property damage and potential loss of life from flooding and sea level rise in the future.

The Proposed Project has the potential to result in temporary significant adverse impacts during construction on open space, traffic, noise, and neighborhood character. Potential mitigation measures for each of these technical areas are discussed below.

4.0.2 Construction Open Space

As detailed in Chapter 3.11, “Construction,” there would be more than a 5 percent decrease in total open space ratio for the nonresidential study area over the entire construction period between 2025 and 2030. Therefore, the Proposed Project would have a temporary significant adverse impact on open space during construction due to the closure of portions of the Battery Park City Esplanade and Parks for the duration of construction. However, in the Residential Study Area, impacts would not rise to the level of significance in 2029 and 2030 as project phases are completed and the project Area open spaces begin to reopen to the public and the Rockefeller Park lawn would remain open to the public during construction. Additionally, in order to continue to provide public programs and events that have traditionally taken place at various park spaces throughout the Esplanade, such as the Irish Hunger Memorial Plaza, Pumphouse Park, Belvedere Plaza, and South Cove, among others, BPCA would temporarily relocate all of the programs and events in affected areas to parks and open spaces within Battery Park City for the duration of the Proposed Project’s construction.

The following is a list of potential temporary open space mitigation opportunities within Battery Park City during construction of the Proposed Project:

- Play areas
- Parklets and street seats
- Pop-up parks

- Seating
- Open Streets

The feasibility of these measures and other potential open space mitigation options will continue to be investigated between this DEIS and the FEIS. However, even with these replacement temporary open spaces, the impacts to open space during construction would not be fully mitigated. It is anticipated that the temporary closure of open space resources along the Battery Park City Esplanade, including Belvedere Plaza, Kowsky Plaza, and North and South Coves, during construction would create added demand for programmed activities in other public open spaces resulting in a temporary significant adverse impact on these open spaces.

4.0.3 Construction Transportation

4.0.3.1 Introduction

As described in Chapter 3.11.4, “Construction Transportation,” the analyses examined the potential temporary construction period impacts of project construction on traffic, parking, and pedestrian conditions (operational impacts are presented in Chapter 3.8, “Transportation”). As the first step in this analysis, peak construction activities during the standard construction peak period, hours of 6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM (“Peak Construction Analysis”) were considered. Transportation screening assessments were undertaken using construction worker and truck activity for the highest peak quarter forecasted during the Peak Construction Analysis scenario. Additionally, locations that are projected to have a reduced capacity during construction (such as removing a moving lane or narrowing a travel lane/pedestrian/bicycle pathway) or where pedestrian diversions are proposed due to a full sidewalk closure as part of the construction project’s Maintenance and Protection of Traffic (MPT) during the commuter weekday AM, midday, and PM and Saturday peak hours (“Construction MPT Analysis”) were considered. For the Construction MPT Analysis, transportation screening assessments were undertaken using the latest MPT plan that is anticipated to be in place. Both the Peak Construction Analysis and Construction MPT Analysis scenarios were used to evaluate the potential for significant adverse transportation impacts during construction. Key data used in this analysis (e.g., phasing, construction, and worker trips) were developed based on project build-out data developed by the design build team (e.g., Turner construction). A qualitative analysis of pedestrian and bicycle diversions due to open space closures was also conducted.

The transportation analyses reflected in Chapter 3.11.4, “Construction Transportation,” as well as the recommended mitigation measures in this chapter were based on the initial construction schedule of 66 months. This schedule was further refined and condensed, 60 months with the peak quarter of construction trips occurring in 2027. The previous construction schedule had the same or higher numbers of workers and trucks during the peak quarter, and the peak would have occurred in 2030, at which time there would have been additional traffic and pedestrian growth as compared to 2027.

After evaluating the revised traffic patterns for worker vehicles and trucks, at the intersections that were analyzed assuming the initial construction schedule, vehicle trips generated by construction activity would generally decrease under the revised schedule assumptions. The number of intersections that would

warrant detailed analysis according to the methodology used in this chapter would be reduced by two intersections if the current construction schedule was applied. However, construction vehicles would increase by up to 13 passenger car equivalent trips at the Route 9A/West Street and North Moore Street intersection. However, implementing the recommended mitigation for the Route 9A/West Street and North Moore Street (i.e., a signal timing change) would adequately mitigate for the limited additional vehicles at this location.

Since traffic and pedestrian volumes at other locations previously analyzed for construction peak and MPT conditions would decrease with the current schedule and 2027 peak analysis year, the implementation of the recommended mitigation measures for the 66-month schedule, specifically, signal timing changes for traffic at North End Avenue and Vesey Street, Route 9A/West Street and Laight Street, Route 9A/West Street and Harrison Street, and Route 9A/West Street and Albany Street, and removal of a trash can on the northeast corner of Greenwich Street and North Moore Street and removal of flowerpots along the east sidewalk of Greenwich Street between Franklin Street and North Moore Street for pedestrian impacts due to MPT would negate any need for any further mitigation at those locations.

At unmitigated traffic intersections (Route 9A/West Street and Murray Street and Route 9A/West Street and Liberty Street) and pedestrian elements (West Walkway along Route 9A/West Street between Harrison Street and Chambers Street, Greenwich Street and North Moore Street South Crosswalk, and Greenwich Street and Franklin Street North Crosswalk), the volumes would be lower with the current schedule, although there would continue to be significant impacts at those locations that are unmitigable.

The proposed mitigation measures described below would be subject to approval by the New York City Department of Transportation (NYCDOT) and the New York State Department of Transportation (NYSDOT) prior to implementation.

Peak Construction Analysis: Traffic

Based on the Peak Construction Analysis scenario, the following five intersections would experience temporary significant adverse traffic impacts:

- North End Avenue and Vesey Street (PM peak hour)
- Route 9A/West Street and Murray Street (PM peak hour)
- Route 9A/West Street and Laight Street (AM peak hour)
- Route 9A/West Street and Liberty Street (AM and PM peak hours), and
- Route 9A/West Street and Albany Street (PM peak hour)

Standard traffic mitigation measures (signal timing changes) would fully mitigate the significant adverse impacts at three of the five intersections. The significant adverse traffic impacts at Route 9A/West Street and Murray Street and Route 9A/West Street and Liberty Street would remain unmitigated in the construction weekday PM peak hour.

MPT Construction Analysis: Traffic

Based on the MPT Construction Analysis scenario, the following two intersections would experience temporary significant adverse traffic impacts:

- Route 9A/West Street at Harrison Street (AM peak hour), and
- North Moore Street (midday, PM, construction PM, and Saturday peak hours).

With the implementation of standard traffic mitigation measures (signal timing changes), the significant adverse traffic impacts at both intersections could be mitigated in all five peak hours.

MPT Construction Analysis: Pedestrians

Based on the MPT Construction Analysis scenario, the following five pedestrian elements (two sidewalks/walkways, one corner, and two crosswalks) would experience temporary significant adverse pedestrian impacts:

- West walkway of Route 9A/West Street between Harrison Street and Chambers Street during the weekday AM and PM and Saturday peak hours;
- East sidewalk of Greenwich Street between North Moore Street and Franklin Street during the weekday AM and PM peak hours;
- Northeast corner of Greenwich Street and Franklin Street during the weekday AM, midday, PM and Saturday peak hours;
- South crosswalk of Greenwich Street and North Moore Street during the weekday AM and PM peak hours; and
- North Crosswalk of Greenwich Street and Franklin Street during the weekday AM, midday, and PM peak hours.

The majority of these significant adverse pedestrian impacts could not be mitigated. However, the significant adverse pedestrian impacts on the east sidewalk of Greenwich Street between North Moore Street and Franklin Street could be mitigated in both peak hours by removing the flowerpots from the sidewalk. The LOS on the northeast corner of Greenwich Street and Franklin Street could be improved by removing the trash can from the corner reservoir area (partially mitigated), but would still result in an unmitigated impact. The remaining one walkway and two crosswalks could not be mitigated in any peak hour.

4.0.3.2 Peak Construction Analysis

Traffic

As detailed in Chapter 3.11.4, “Construction Transportation,” traffic conditions were evaluated at 14 intersections for the Peak Construction Analysis scenario for the construction weekday AM and PM peak hours. In the 2030 Proposed Action condition, significant adverse traffic impacts were identified at two intersections during the construction weekday AM peak hour and four intersections during the

construction weekday PM peak hour. **Table 4-1** summarizes the projected significant adverse traffic impacts for the 2030 Proposed Action condition.

Table 4-1
Summary of Peak Construction Analysis Significant Adverse Traffic Impacts

Intersection		Weekday AM Peak Hour	Weekday PM Peak Hour
NB/SB Street	EB/WB Street		
North End Avenue	Vesey Street		SB-LT
Route 9A/West Street	Murray Street		EB-L
			WB-LT
Route 9A/West Street	Laight Street	WB-L	
Route 9A/West Street	Liberty Street		EB-DefL
		NB-L	NB-L
Route 9A/West Street	Albany Street		EB-LTR
Note: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound			

As shown in **Tables 4-2 and 4-3**, the significant adverse traffic impacts at both intersections during the construction AM peak hour and at two of the four intersections during the construction PM peak hour could be mitigated with standard traffic engineering measures (consisting of signal retiming). The proposed mitigation measures would be subject to approval by NYCDOT and NYSDOT prior to implementation. The intersections of Route 9A/West Street and Murray Street and Route 9A/West Street and Liberty Street would remain unmitigated in the construction PM peak hour.

Table 4-2
Recommended Mitigation Measures for Peak Construction Analysis
Construction Weekday AM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and Laight Street	WB: Green = 33 s NB/SB: Green = 99 s LPI: Green = 7 s	Shift 2 seconds of green time from the NB/SB phase to the WB phase	WB: Green = 35 s NB/SB: Green = 97 s LPI: Green = 7 s
Route 9A/West Street and Liberty Street	EB/WB: Green = 41 s NB-T/NB-R/SB-T: Green = 33 s NB-T/NB-R/SB-T/SB-R: Green = 38 s NB-L/SB-L: Green = 16 s	Shift 2 seconds of green time from the EB/WB phase to the NB-L/SB-L phase	EB/WB: Green = 39 s NB-T/NB-R/SB-T: Green = 33 s NB-T/NB-R/SB-T/SB-R: Green = 38 s NB-L/SB-L: Green = 18 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Table 4-3
Recommended Mitigation Measures for Peak Construction Analysis
Construction Weekday PM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
North End Avenue and Vesey Street	WB: Green = 60 s NB/SB: Green = 35 s	Shift 1 second of green time from the WB phase to the NB/SB phase	WB: Green = 59 s NB/SB: Green = 36 s
Route 9A/West Street and Murray Street	EB/WB: Green = 41 s SB-L/SB-T: Green = 12 s NB-T/NB-R/SB-T: Green = 35 s NB-T/NB-R/SB-T/SB-R: Green = 18 s NB: Green = 14 s	Unmitigated	N/A
Route 9A/West Street and Liberty Street	EB/WB: Green = 41 s NB-T/NB-R/SB-T: Green = 41 s NB-T/NB-R/SB-T/SB-R: Green = 32 s NB-L/SB-L: Green = 14 s	Unmitigated	N/A
Route 9A/West Street and Albany Street	EB: Green = 48 s NB/SB: Green = 80 s LPI: Green = 10 s	Shift 2 seconds of green time from the NB/SB phase to the EB phase	EB: Green = 50 s NB/SB: Green = 78 s LPI: Green = 10 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Tables 4-4 and 4-5 compare the LOS and lane group delays at the intersections with significant adverse impacts under the 2030 No Action, Proposed Action, and Mitigation conditions for the construction weekday AM and PM peak hours.

Table 4-4
2030 Construction No Action, Proposed Action, and Mitigation Conditions LOS Analysis
Peak Construction Analysis Construction Weekday AM Peak Hour

Intersection	Construction AM													
	2030 No Action				2030 Proposed Action				2030 Mitigation					
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS		
Route 9A/West Street and Laight Street														
Westbound	L	1.10	139.7	F	L	1.17	163.9	F+	L	1.10	138.7	F		
	R	0.74	72.4	E	R	0.74	72.4	E	R	0.69	66.9	E		
Northbound	T	0.45	12.8	B	T	0.46	12.8	B	T	0.47	13.8	B		
Southbound	T	0.52	13.9	B	T	0.54	14.2	B	T	0.55	15.3	B		
Intersection		27.5		C	Intersection		30.3		C	Intersection		28.6		C
Route 9A/West Street and Liberty Street														
Eastbound	DefL	0.18	43.3	D	DefL	0.19	43.6	D	DefL	0.20	45.4	D		
	TR	0.03	40.1	D	TR	0.03	40.1	D	TR	0.03	41.6	D		
Westbound	LT	0.02	40.0	D	LT	0.02	40.0	D	LT	0.02	41.5	D		
	R	0.06	40.8	D	R	0.06	40.8	D	R	0.06	42.4	D		
Northbound	L	0.63	81.4	F	L	0.80	97.6	F+	L	0.71	83.9	F		
	T	0.54	25.2	C	T	0.54	25.3	C	T	0.54	25.3	C		
Southbound	R	0.02	18.0	B	R	0.02	18.0	B	R	0.02	18.0	B		
	L	0.18	62.7	E	L	0.18	62.7	E	L	0.16	60.5	E		
	T	0.62	27.3	C	T	0.62	27.5	C	T	0.62	27.5	C		
	R	0.41	50.5	D	R	0.48	52.5	D	R	0.48	52.5	D		
Intersection		29.7		C	Intersection		31.1		C	Intersection		30.6		C
Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service + Denotes a significant adverse impact														

Table 4-5

2030 Construction No Action, Proposed Action, and Mitigation Conditions LOS Analysis
Peak Construction Analysis Construction Weekday PM Peak Hour

Intersection	Construction PM											
	2030 No Action				2030 Proposed Action				2030 Mitigation			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
North End Avenue and Vesey Street												
Westbound	LR	0.21	11.8	B	LR	0.22	11.9	B	LR	0.22	12.5	B
Northbound	TR	0.09	24.6	C	TR	0.14	25.1	C	TR	0.14	24.4	C
Southbound	LT	0.98	88.3	F	LT	1.02	98.0	F+	LT	0.98	85.5	F
	Intersection		58.9	E	Intersection		62.3	E	Intersection		55.3	E
Route 9A/West Street and Murray Street												
Eastbound	L	0.58	60.1	E	L	0.69	69.0	E+	Unmitigated			
	TR	0.36	47.7	D	TR	0.38	48.1	D				
Westbound	LT	1.03	122.5	F	LT	1.05	129.9	F+				
	R	0.46	51.0	D	R	0.48	51.8	D				
Northbound	L	0.84	93.8	F	L	0.85	94.8	F				
	TR	0.81	32.2	C	TR	0.83	32.7	C				
Southbound	L	0.18	66.1	E	L	0.18	66.1	E				
	T	1.04	68.0	E	T	1.05	69.1	E				
	R	0.34	67.3	E	R	0.34	67.3	E				
	Intersection		55.5	E	Intersection		56.7	E				
Route 9A/West Street and Liberty Street												
Eastbound	DefL	0.81	81.6	F	DefL	0.92	100.4	F+	Unmitigated			
	TR	0.05	40.4	D	TR	0.05	40.5	D				
Westbound	LT	0.02	39.9	D	LT	0.02	40.0	D				
	R	0.13	42.4	D	R	0.13	42.4	D				
Northbound	L	1.10	167.2	F	L	1.11	173.4	F+				
	T	0.77	30.7	C	T	0.78	31.1	C				
Southbound	R	0.02	17.1	B	R	0.02	17.1	B				
	L	0.11	63.2	E	L	0.11	63.2	E				
	T	1.04	66.5	E	T	1.04	67.4	E				
	R	0.71	68.9	E	R	0.71	68.9	E				
	Intersection		56.2	E	Intersection		57.7	E				
Route 9A/West Street and Albany Street												
Eastbound	LTR	0.76	57.8	E	LTR	0.84	66.0	E+	LTR	0.81	60.6	E
Northbound	TR	0.68	27.0	C	TR	0.69	27.0	C	TR	0.70	28.7	C
Southbound	T	0.79	30.4	C	T	0.79	30.5	C	T	0.81	32.5	C
	R	0.14	18.2	B	R	0.14	18.2	B	R	0.15	19.3	B
	Intersection		30.6	C	Intersection		31.4	C	Intersection		32.7	C
Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service + Denotes a significant adverse impact												

North End Avenue and Vesey Street

By shifting one second of green time from the westbound phase to the northbound/southbound phase during the construction PM peak hour, the significant adverse impact at the southbound approach would be mitigated.

Route 9A/West Street and Laight Street

By shifting two seconds of green time from the northbound/southbound phase to the westbound phase during the construction AM peak hour, the significant adverse impact at the westbound left-turn would be mitigated.

Route 9A/West Street and Murray Street

The significant adverse impacts at the eastbound left-turn and westbound left-turn/through of this intersection during the construction PM peak hour could not be mitigated.

Route 9A/West Street and Liberty Street

By shifting two seconds of green time from the eastbound/westbound phase to the northbound left-turn/southbound left-turn phase during the construction AM peak hour, the significant adverse impact at the northbound left-turn would be mitigated.

The significant adverse impacts at the eastbound defacto left-turn and northbound left-turn of this intersection during the construction PM peak hour could not be mitigated.

Route 9A/West Street and Albany Street

By shifting two seconds of green time from the northbound/southbound phase to the eastbound phase during the construction PM peak hour, the significant adverse impact at the eastbound approach would be mitigated.

As previously described, these impacts were based on the 66-month construction schedule. After evaluating the revised traffic patterns for worker vehicles and trucks at the intersections that were analyzed assuming the initial construction schedule, vehicle trips generated by construction activity would generally decrease under the revised schedule assumptions. The number of intersections that would warrant detailed analysis according to the methodology used in this chapter would be reduced by two intersections if the current construction schedule was applied. However, construction vehicles would increase by up to 13 passenger car equivalent trips at the Route 9A/West Street and North Moore Street intersection, which would incur significant adverse traffic impacts when MPT effects are considered (see 4.0.3.3, “Construction MPT Analysis”) under the 66-month schedule. The implementation of the recommended mitigation for the previous analysis at Route 9A/West Street and North Moore Street (i.e., a signal timing change) under the Construction MPT Analysis scenario would adequately mitigate for the limited additional vehicles at this location. Since traffic and pedestrian volumes at other locations previously analyzed for construction peak and MPT conditions would decrease with the current schedule and 2027 peak analysis year, the implementation of the recommended traffic mitigation measures for the 66-month schedule, specifically, signal timing changes for traffic at North End Avenue and Vesey Street, Route 9A/West Street and Laight Street, Route 9A/West Street and Harrison Street, and Route 9A/West Street and Albany Street would negate any need for any further mitigation at those locations. At unmitigated traffic intersections (Route 9A/West Street and Murray Street and Route 9A/West Street and Liberty Street), the volumes would be lower with the current schedule, but the significant impacts at those locations may persist and may continue to be unmitigable.

4.0.3.3 Construction MPT Analysis

Traffic

As detailed in Chapter 3.11, “Construction,” traffic conditions were evaluated at Route 9A/West Street and Harrison Street and Route 9A/West Street and North Moore Street for the Construction MPT Analysis scenario for the weekday AM, midday, and PM and Saturday peak hours, and the construction weekday AM and PM peak hours. In the 2030 Proposed Action condition, both intersections would experience significant adverse traffic impacts in at least one peak hour. **Table 4-6** summarizes the projected significant adverse traffic impacts for the 2030 Proposed Action condition.

Table 4-6
Summary of Construction MPT Analysis Significant Adverse Traffic Impacts

Intersection		Weekday AM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Construction Weekday AM Peak Hour	Construction Weekday PM Peak Hour
NB/SB Street	EB/WB Street						
Route 9A/West Street	Harrison Street	NB-TR					
Route 9A/West Street	North Moore Street		WB-L		WB-L		
				WB-R			WB-R
Note: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound							

As shown in **Tables 4-7 through 4-11**, the significant adverse traffic impacts at both intersections could be mitigated in all peak hours with standard traffic engineering measures (consisting of signal retiming). The proposed mitigation measures would be approved by NYCDOT and NYSDOT before implementation.

Table 4-7
Recommended Mitigation Measures for Construction MPT Analysis
Weekday AM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and Harrison Street	WB: Green = 40 s NB/SB: Green = 99 s	Shift 1 second of green time from the WB phase to the NB/SB phase	WB: Green = 39 s NB/SB: Green = 100 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Table 4-8
Recommended Mitigation Measures for Construction MPT Analysis
Weekday Midday Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and North Moore Street	WB: Green = 33 s NB/SB: Green = 76 s	Shift 1 second of green time from the NB/SB phase to the WB phase	WB: Green = 34 s NB/SB: Green = 75 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Table 4-9

Recommended Mitigation Measures for Construction MPT Analysis
Weekday PM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and North Moore Street	WB: Green = 45 s NB/SB: Green = 94 s	Shift 3 seconds of green time from the NB/SB phase to the WB phase	WB: Green = 48 s NB/SB: Green = 91 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Table 4-10

Recommended Mitigation Measures for Construction MPT Analysis
Saturday Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and North Moore Street	WB: Green = 35 s NB/SB: Green = 74 s	Shift 2 seconds of green time from the NB/SB phase to the WB phase	WB: Green = 37 s NB/SB: Green = 72 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Table 4-11

Recommended Mitigation Measures for Construction MPT Analysis
Construction Weekday PM Peak Hour

Intersection	No Action Signal Timing	Recommended Mitigation Measures	Recommended Signal Timing
Route 9A/West Street and North Moore Street	WB: Green = 45 s NB/SB: Green = 94 s	Shift 1 second of green time from the NB/SB phase to the WB phase	WB: Green = 46 s NB/SB: Green = 93 s
Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left; T = Through; R = Right; LPI = Lead Pedestrian Interval			

Tables 4-12 through 4-16 compare the LOS and lane group delays at the intersections with significant adverse impacts under the 2030 No Action, Proposed Action, and Mitigation conditions for the weekday AM, midday, PM, Saturday, and construction weekday PM peak hours, respectively.

Table 4-12

2030 MPT No Action, Proposed Action and Mitigation Conditions LOS Analysis
Construction MPT Analysis Weekday AM Peak Hour

Intersection	Weekday AM											
	2030 No Action				2030 Proposed Action				2030 Mitigation			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Route 9A/West Street and Harrison Street												
Westbound	R	0.09	41.7	D	R	0.09	41.7	D	R	0.09	42.5	D
Northbound	TR	0.82	20.9	C	TR	1.05	58.2	E+	TR	1.04	53.9	D
Southbound	T	0.85	23.5	C	T	0.85	23.6	C	T	0.85	22.4	C
	Intersection		22.2	C	Intersection		42.6	D	Intersection		39.8	D
Notes:												
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service												
+ Denotes a significant adverse impact												

Table 4-13
2030 MPT No Action, Proposed Action and Mitigation Conditions LOS Analysis
Construction MPT Analysis Weekday Midday Peak Hour

Intersection	Weekday Midday											
	2030 No Action				2030 Proposed Action				2030 Mitigation			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Route 9A/West Street and North Moore Street												
Westbound	L	0.69	50.7	D	L	0.76	57.1	E+	L	0.73	53.4	D
	R	0.36	38.4	D	R	0.40	39.7	D	R	0.38	38.4	D
Northbound	T	0.57	13.3	B	T	0.77	17.8	B	T	0.78	18.7	B
Southbound	T	0.78	18.3	B	T	0.78	18.3	B	T	0.79	19.2	B
	Intersection		18.1	B	Intersection		20.5	C	Intersection		21.1	C
Notes:												
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service												
+ Denotes a significant adverse impact												

Table 4-14
2030 MPT No Action, Proposed Action and Mitigation Conditions LOS Analysis
Construction MPT Analysis PM Peak Hour

Intersection	Weekday PM											
	2030 No Action				2030 Proposed Action				2030 Mitigation			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Route 9A/West Street and North Moore Street												
Westbound	L	0.54	50.2	D	L	0.59	53.3	D	L	0.55	48.9	D
	R	1.01	104.1	F	R	1.11	135.4	F+	R	1.02	105.2	F
Northbound	T	0.74	20.9	C	T	0.99	42.2	D	T	1.02	52.5	D
Southbound	T	0.87	27.2	C	T	0.87	27.2	C	T	0.90	31.0	C
	Intersection		29.4	C	Intersection		41.6	D	Intersection		46.4	D
Notes:												
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service												
+ Denotes a significant adverse impact												

Table 4-15
2030 MPT No Action, Proposed Action and Mitigation Conditions LOS Analysis
Construction MPT Analysis Saturday Peak Hour

Intersection	Saturday													
	2030 No Action				2030 Proposed Action				2030 Mitigation					
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS		
Route 9A/West Street and North Moore Street														
Westbound	L	0.85	63.6	E	L	0.93	78.6	E+	L	0.87	66.6	E		
	R	0.57	43.8	D	R	0.63	47.2	D	R	0.58	43.0	D		
Northbound	T	0.62	15.2	B	T	0.83	21.3	C	T	0.86	23.6	C		
Southbound	T	0.86	22.7	C	T	0.86	22.7	C	T	0.89	25.3	C		
Intersection			22.2	C	Intersection			25.9	C	Intersection			27.3	C
Notes:														
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service														
+ Denotes a significant adverse impact														

Table 4-16

2030 MPT No Action, Proposed Action and Mitigation Conditions LOS Analysis
Construction MPT Analysis Construction Weekday PM Peak Hour

Intersection	Construction PM											
	2030 No Action				2030 Proposed Action				2030 Mitigation			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Route 9A/West Street and North Moore Street												
Westbound	L	0.62	52.5	D	L	0.68	56.4	E	L	0.66	54.6	D
	R	0.73	59.4	E	R	0.80	66.7	E+	R	0.78	63.8	E
Northbound	T	0.68	19.3	B	T	0.93	32.0	C	T	0.94	33.7	C
Southbound	T	0.91	29.9	C	T	0.91	30.0	C	T	0.92	31.5	C
	Intersection		27.5	C	Intersection		33.8	C	Intersection		35.1	D
Notes:												
L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service												
+ Denotes a significant adverse impact												

Route 9A/West Street and North Moore Street

By shifting one second and two seconds of green time from the northbound/southbound phase to the westbound phase during the weekday midday and Saturday peak hours, respectively, the significant adverse impacts at the westbound left-turn would be mitigated.

By shifting three seconds and one second of green time from the northbound/southbound phase to the westbound phase during the weekday PM and construction PM peak hours, respectively, the significant adverse impacts at the westbound right-turn would be mitigated.

Route 9A/West Street and Harrison Street

By shifting one second of green time from the westbound phase to the northbound/southbound phase during the weekday AM peak hour, the significant adverse impact at the northbound approach would be mitigated.

Evaluating the revised traffic patterns for worker vehicles and trucks at the intersections that were analyzed assuming the initial construction schedule, vehicle trips generated by construction activity would generally decrease under the current schedule. The number of intersections that would warrant detailed analysis according to the methodology used in this chapter would be reduced by two intersections if the current construction schedule was applied. However, construction vehicles would increase by up to 13 passenger car equivalent trips at the Route 9A/West Street and North Moore Street intersection, which would incur significant adverse traffic impacts when MPT effects are considered under the 66-month schedule. The implementation of the recommended mitigation for the previous analysis at Route 9A/West Street and North Moore Street (i.e., a signal timing change) would adequately mitigate for the limited additional vehicles at this location. Since traffic and pedestrian volumes at other locations previously analyzed for construction peak and MPT conditions would decrease with the current schedule and 2027 peak analysis year, the implementation of the recommended traffic mitigation measures for the 66-month schedule, specifically, signal timing changes for traffic at North End Avenue and Vesey Street, Route 9A/West Street and Lighthouse Street, Route 9A/West Street and Harrison Street, and Route 9A/West Street and Albany Street would negate any need for any further mitigation at those locations. At unmitigated traffic intersections (Route 9A/West Street and Murray Street and Route 9A/West Street and Liberty

Street), the volumes would be lower with the current schedule, but the significant impacts at those locations may persist and may continue to be unmitigable.

Pedestrians

As detailed in Chapter 3.11.4, “Construction Impacts,” pedestrian conditions were evaluated at eight sidewalks/walkways, four corners, and two crosswalks for the Construction MPT Analysis scenario for the commuter weekday AM, midday, and PM and Saturday peak hours. In the 2030 Proposed Action condition, significant adverse pedestrian impacts were identified at five elements during the weekday AM peak hour, two elements during the weekday midday peak hour, five elements during the weekday PM peak hour, and two elements during the Saturday peak hour. **Table 4-17** summarizes the projected significant adverse pedestrian impacts for the 2030 Proposed Action condition.

Table 4-17
Summary of Construction MPT Analysis Significant Adverse Pedestrian Impacts

Pedestrian Element	Weekday AM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
West Walkway along Route 9A/West Street between Harrison Street and Chambers Street	Impacted		Impacted	Impacted
East Sidewalk along Greenwich Street between North Moore Street and Franklin Street	Impacted		Impacted	
Greenwich Street and Franklin Street Northeast Corner	Impacted	Impacted	Impacted	Impacted
Greenwich Street and North Moore Street South Crosswalk	Impacted		Impacted	
Greenwich Street and Franklin Street North Crosswalk	Impacted	Impacted	Impacted	

Table 4-18
2030 No Action, Proposed Action, and Mitigation Conditions Construction MPT Analysis Pedestrian LOS Summary

Location	Mitigation Measures	No Action		Proposed Action		Mitigation		Mitigation Effectiveness
		SFP	LOS	SFP	LOS	SFP	LOS	
Weekday AM Peak Hour								
West Walkway along Route 9A/West Street between Harrison Street and Chambers Street	None	63.7	C	25.2	D	25.2	D	Unmitigated
Greenwich Street and Franklin Street Northeast Corner	Remove the trash can	46.6	B	6.7	F	7.8	F	Partially Mitigated
Greenwich Street and North Moore Street South Crosswalk	None	78.9	A	17.9	D	17.9	D	Unmitigated
Greenwich Street and Franklin Street North Crosswalk	None	199.0	A	10.7	E	10.7	E	Unmitigated
Weekday Midday Peak Hour								
Greenwich Street and Franklin Street Northeast Corner	Remove the trash can	33.8	C	5.2	F	6.7	F	Partially Mitigated

Table 4-18

2030 No Action, Proposed Action, and Mitigation Conditions Construction MPT Analysis
Pedestrian LOS Summary

Greenwich Street and Franklin Street North Crosswalk	None	199.5	A	18.5	D	18.5	D	Unmitigated
Weekday PM Peak Hour								
West Walkway along Route 9A/West Street between Harrison Street and Chambers Street	None	43.7	C	16.2	E	16.2	E	Unmitigated
Greenwich Street and Franklin Street Northeast Corner	Remove the trash can	37.2	C	-3.1	F	-1.8	F	Partially Mitigated
Greenwich Street and North Moore Street South Crosswalk	None	69.0	A	18.2	D	18.2	D	Unmitigated
Greenwich Street and Franklin Street North Crosswalk	None	176.6	A	13.3	E	13.3	E	Unmitigated
Saturday Peak Hour								
West Walkway along Route 9A/West Street between Harrison Street and Chambers Street	None	41.8	C	15.3	E	15.3	E	Unmitigated
Greenwich Street and Franklin Street Northeast Corner	Remove the trash can	56.7	B	16.2	D	18.5	D	Partially Mitigated

As shown in **Table 4-18**, the majority of the significant adverse pedestrian impacts could not be mitigated. The significant adverse pedestrian impacts on the east sidewalk of Greenwich Street between North Moore Street and Franklin Street could be mitigated in both peak hours by removing the flowerpots from the sidewalk. The LOS on the northeast corner of Greenwich Street and Franklin Street could be improved by removing the trash can from the corner reservoir area which would partially mitigate the impact. The remaining one walkway and two crosswalks could not be mitigated in any peak hour. The proposed mitigation measures would be subject to approval by NYCDOT and NYSDOT prior to implementation.

As previously described, these impacts were based on the 66-month construction schedule. Traffic and pedestrian volumes at pedestrian elements previously analyzed would decrease with the current schedule and 2027 peak analysis year. Implementing the recommended mitigation measures for the 66-month schedule, specifically, removal of a trash can on the northeast corner of Greenwich Street and North Moore Street and removal of flowerpots along the east sidewalk of Greenwich Street between Franklin Street and North Moore Street for pedestrian impacts due to MPT would negate any need for any further mitigation at those locations. At unmitigated pedestrian elements (West Walkway along Route 9A/West Street between Harrison Street and Chambers Street, Greenwich Street and North Moore Street South

Crosswalk, and Greenwich Street and Franklin Street North Crosswalk), the volumes would be lower with the current schedule, but the significant impacts at those locations may persist and may continue to be unmitigable.

As described further in Chapter 3.11.1, “Construction Overview,” there would be an Early Works Package (EWP) of drainage and utility improvements which is encompassed within the overall 60-month current schedule. The durations of the individual projects would vary but be completed within a total duration of 7 months. As a result, the EWP would involve temporary travel lane, parking lane, and street end closures in the Project Area, but the closures would be of short duration. While this may result in temporary unmitigatable significant adverse traffic and pedestrian impacts throughout the 7-month EWP, MPT plans will be developed in close consultation with and approved by NYCDOT and NYSDOT to minimize these impacts on pedestrians, cyclists, and vehicles.

Cyclists and Pedestrians

As detailed in Chapter 3.11.4, “Construction Transportation,” a qualitative analysis of pedestrian and bicycle diversions due to open space closures was conducted. Based on this analysis, during the peak year of construction (2027) there is the potential for temporary unmitigated significant adverse impacts on pedestrians and bicycles, given the size and geographic extent of the Proposed Project and the multiple open space closures that would necessitate trip diversions. These impacts would be experienced at their maximum during the peak year of construction, but there would be open space closures throughout construction that would result in temporary unmitigated significant adverse effects on pedestrians and bicycles, but at lesser levels than the peak year of construction.

4.0.4 Construction Noise

4.0.4.1 Summary of Impacts

As detailed in Chapter 3.11.7, “Construction Noise,” a detailed analysis of project-generated construction noise identified exceedances of the City’s construction noise impact criteria throughout the seven reaches, with noise levels that would be noticeable and intrusive during the most noise-intensive construction activities at some receptors. While the highest levels of predicted construction noise would not persist throughout construction, and noise levels fluctuate with construction intensity resulting in noise increases that are intermittent, many locations would experience construction noise levels where the magnitude and duration constitute significant adverse impacts under CEQR.

These projected significant adverse construction noise impacts are shown in Figure 3.11.6-2 and are summarized in **Table 4-19**.

Table 4.19
Significant Adverse Construction Noise Impacts

Location	Associated Construction Noise Receptor Site(s)	Land Use(s)
Esplanade	58, 59	Open Space
North Park	60	Open Space
345 and 399 Chambers Street	30, 37	School, Residential
West of North End Avenue, between Chambers Street and River Terrace	10, 17, 38, 39, 40	Residential
102 North End Avenue	5	Hotel
2 River Terrace	8	Residential
320 Albany Street	27, 28, 29	Residential
377 Rector Place	34	Residential
380 Rector Place	35	Residential
200 Rector Place	22	Residential
21 South End Avenue	15	School, Residential
2 South End Avenue	9	Residential
70 Battery Place	45, 46	Residential
50 Battery Place, 36 Battery Place	42, 43	Residential, Museum

While some of the buildings where impacts have been identified feature modern façade construction, including insulated glass windows and an alternative means of ventilation that would allow for the maintenance of a closed-window condition, it is not possible to definitively determine the presence of these features at all receptors that would have the potential to experience construction noise impact.

For impacted open space areas and buildings with outdoor terraces, no practical and feasible mitigation measures have been identified that could be implemented to reduce noise levels below the CEQR threshold. Consequently, construction activities would result in noise levels at these receptors that constitutes an unavoidable significant adverse noise impact. However, as construction outside of Stage 1E in Reach 1 would not regularly occur during evening or weekend hours, the open space and terraces would be free of construction noise during these times.

A more detailed description of the mitigation measures and methods to minimize construction noise impact is provided in the sections below.

4.0.4.2 Mitigation Approach

Recognizing that the proposed project is a large multi-year capital project with an approximately 5-year construction duration, periods of substantially and significantly elevated construction noise are unavoidable. It is therefore the objective of the BPCA working with its selected construction team to minimize construction noise impacts on the community to the extent feasible while facilitating project completion. While noise impacts for a project of this scale in close proximity to residences and open spaces cannot be fully mitigated, measures will be taken to mitigate the impact to the extent feasible.

To that end, the following measures are part of the project's preliminary noise control and mitigation approach.

Construction Operations

NYC Construction Noise Mitigation Rules and Plans

Construction of the Proposed Project is required to comply with the noise mitigation rules of the City of New York and the requirements of the New York City Noise Control Code (also known as Chapter 24 of the Administrative Code of the City of New York, or Local Law 113) for construction noise control measures. Detailed noise control measures would be incorporated in a project-specific noise mitigation plan(s) as required under the New York City Noise Control Code which would include a variety of source and path controls.

For source controls this would include the following:

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be utilized from the start of construction.
- Conversions from diesel- or gas-powered equipment to electrical-powered equipment (e.g., water pumps, bench and table saws) as early as possible.
- . Enclosures for diesel or gas-powered generators and pumps to the extent feasible and practicable.
- Where feasible and practicable, the construction site would be configured to minimize back-up alarm noise.
- Minimizing truck idling to 3 minutes.
- Proper maintenance of all equipment and noise attenuation measures such as mufflers.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures would be implemented:

Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations.

- Noise barriers constructed from plywood or other materials would be utilized to provide shielding (e.g., the construction sites would have a minimum 8-foot-tall barrier around the perimeter).
- Sound-absorptive “blankets” (consistent with the guidance of DEP’s Rules for Citywide Construction Noise Mitigation) are to be mounted on the work side of each site-perimeter noise barrier on the
- Noise path control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents) as necessary to achieve the City’s construction noise mitigation goals and as shown in DEP’s Rules for Citywide Construction Noise Mitigation.
- Minimizing construction activities outside standard work hours. The majority of project construction activities are expected between the standard 7AM to 3:30 PM workday, although some workdays may be extended until 6 PM for certain tasks (e.g., finishing a concrete pour). One exception to this standard would be the construction of the flood barrier system across Route 9A/West Street where overnight work is proposed to minimize impacts on traffic flows and access. Based on experience and consultation with other projects in Manhattan of a similar scale (e.g., East Side Coastal Resiliency

[ESCR] and the SBPCR Project), the BPCA construction team also understands that there is a heightened sensitivity to noise during nighttime work. It will therefore be a project objective of the BPCA construction team to limit landside nighttime work to only those tasks that are necessary to avoid other impacts (e.g., impacting traffic or pedestrian flow in the DOT right-of-way, utility relocation etc.). Work outside of the traditional work hours, such as early evening, morning or nighttime may also be needed for other specific construction activities, such as marine construction that is subject to PANYNJ coordination. All work between the hours of 6PM and 7AM and on weekends would also require approval of the City.

- Minimizing the impacts of the most impactful construction activities. Based on the construction experience and consultation with other projects in Manhattan with a similar scope, the BPCA team understands that most construction noise issues and complaints are associated with the operation of impact equipment such as jackhammers and hoe rams. It is therefore proposed to minimize the use of such equipment and the related activities to the extent practicable and to operate in the least impactful way. For example, a large number of piles are required to support the proposed flood barrier system and a less noise-intensive method of installation is proposed (i.e., drilled shafts for longer piles and micropiles with vibratory sheet pile installation for the remainder, as opposed to impact pile driving). In addition, the use of jackhammers and hoe rams will be minimized by utilizing primarily saw cutting for the platform demolition.
- Equipment noise controls and maintenance. All noise emitting equipment will be compliant with all City, State and Federal regulations with respect to noise emissions and will be inspected regularly to ensure proper maintenance and operation.

Noise Source Mitigation

The following specific noise source attenuation measures will be implemented during project construction.

- Crane operations. Cranes will be equipped with well-maintained, manufacturer-recommended exhaust mufflers to mitigate noise escapes with diesel exhaust.
- Pile Installation. During pile installation, noise originates not only from the crane engine, but also from the methods used to install the pile. Therefore, as stated above the proposed method of pile installation is drilled shafts for longer piles and micropiles with vibratory sheet pile installation for the remainder (no impact pile driving is proposed).
- Enclosures and acoustical fencing. Typical designs for a noise barrier specify an 8-foot-high fence with acoustical blankets hung on the fence on the side of the construction operation. It is also proposed to include recurves (i.e., angled tops) to provide some level of noise protection for high elevations. In areas of construction adjacent to buildings where there is limited or no space for a construction fence, it is proposed to hang sound blankets next to the construction operation supported by manlifts or other means.

- Limiting use of vacuum excavators. Vacuum excavators create high noise levels. It is therefore proposed to minimize use of vacuum excavation to those activities around critical infrastructure, utilities, and/or for sensitive tree root protection.
- Compressors. Low noise compressors would be used (i.e., no greater than 70 dBA at a distance of 50 feet).
- Landscaping Excavators. Excavators used specifically for landscaping tasks would be limited to a noise emission of no greater than 78 dBA at a distance of 50 feet.
- Jack hammers. Manufacturer-recommended mufflers will be used on jackhammers.

Feasibility of Additional Potential Noise Reduction Measures

To ensure that the Proposed Project includes the full range of current and future feasible measures to minimize the impacts of construction, the construction team will be required to continue to investigate additional measures to minimize noise emissions from equipment that will include, but not be limited to, those known at the start of construction in 2025 and those that may evolve or become available during the course of construction (e.g., 2025-2030).

4.0.5 Construction Neighborhood Character

The Proposed Project would result in significant adverse impacts during the construction period for open space, transportation, and noise. While mitigation measures are identified for some of the traffic and pedestrian impacts, there are traffic and pedestrian impacts that would remain unmitigated.

Additionally, mitigation is identified for the temporary construction open space impact through relocation of open space programming during the construction period, increasing temporary open space opportunities such as creating pop-up parks, and additional mitigation will be explored. However, it is anticipated that these mitigations would be partial only and unavoidable adverse impacts on open spaces would occur during construction. Mitigation measures have been identified for the construction noise, however as described above, these measures would not fully reduce the noise levels and there would be unavoidable adverse impacts during the construction period. Continuing efforts to identify additional mitigation measures, as well as continued exploration of noise mitigation measures will in turn work to mitigate the significant adverse impact on neighborhood character during construction, however these measures are not anticipated to fully mitigate the impacts. Therefore, as discussed in Chapter 6.0, “Unavoidable Adverse Impacts,” the temporary significant adverse impact on neighborhood character would be unavoidable.