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Mitigation

In accordance with the *2020 City Environmental Quality Review (CEQR) Technical Manual*, where significant adverse impacts are identified, mitigation measures to reduce or eliminate the impacts to the fullest extent practicable are to be developed and evaluated.

Introduction

As detailed in the preceding chapters, upon completion, the Proposed Project has the potential to result in significant adverse traffic, transit, and pedestrian impacts at certain locations. Mitigation measures have been identified to address those impacts where feasible and/or practical. As discussed below in more detail, partial mitigation is proposed for some of the significant adverse impacts of the Proposed Project. If no mitigation has been identified, an unavoidable significant adverse impact may result.

Principal Conclusions

Transportation

Traffic

Of the 15 intersections analyzed, the Proposed Project would result in significant adverse traffic impacts at ~~14 intersections during the AM and midday peak hours, and at all 15 intersections during the AM and PM peak hours and at 14 intersections during the midday peak~~ hour. The major overall finding of the traffic mitigation analysis is that impacts to

several intersections could be fully mitigated via signal timing changes, while for the majority of the significantly impacted intersections there are no traffic engineering improvements that could provide full or partial mitigation and the impacts would therefore remain unmitigated.

Signal timing changes detailed later in this chapter would provide full mitigation for ~~four~~five of the ~~14~~15 significantly impacted intersections in the AM peak hour, one of the 14 significantly impacted intersections in the midday peak hour, and two of the 15 significantly impacted intersections in the PM peak hour. The remaining significantly impacted intersections would remain unmitigated. One or more traffic movements at the following intersections could not be mitigated in at least one peak hour:

- › Second Avenue and East 40th Street (midday and PM peak hours);
- › Second Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Third Avenue and East 40th Street (AM, midday, and PM peak hours);
- › Third Avenue and East 42nd Street (AM, midday and PM peak hours);
- › Lexington Avenue and East 40th Street (AM peak hour);
- › Lexington Avenue and East 42nd Street (AM, midday and PM peak hours);
- › Lexington Avenue and East 43rd Street (AM, midday and PM peak hours);
- › Lexington Avenue and East 44th Street (midday and PM peak hours);
- › Lexington Avenue and East 45th Street (midday and PM peak hours)
- › Lexington Avenue and East 46th Street (AM, midday, and PM peak hours);
- › Park Avenue and East 40th Street (AM, midday, and PM peak hours);
- › Madison Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Fifth Avenue and 42nd Street (AM, midday, and PM peak hours); and
- › Sixth Avenue and West 42nd Street (AM, midday, and PM peak hours).

Mitigation measures such as signal timing modifications are standard traffic capacity improvements that are typically implemented by the New York City Department of Transportation (NYCDOT).

Transit

The Proposed Project would provide several transit and public realm improvements that would enhance passenger circulation conditions at the Grand Central – 42nd Street subway station, which would also benefit the Grand Central Terminal (GCT) transportation hub overall. These include increased circulation capacity at the R238, R238A, and R240 fare control areas, improved subway mezzanine level circulation through the introduction of a new surface to mezzanine stairway (from the R238 fare control area) to the midpoint of the mezzanine and the removal of numerous girders at the mezzanine level that impede pedestrian flow. The Proposed Project would also include the construction of a "Short Loop connection" to provide direct access through GCT for Metro-North Railroad (MNR) and Long Island Rail Road (LIRR) riders to the subway.

While these improvements would provide significant enhancements, the analysis of subway station elements (stairways, escalators, fare control areas, and passageways) identified significant adverse transit impacts at five stairways along the northbound and southbound

Lexington line platforms during the AM peak hour, and one stairway along the northbound Lexington line platform during the PM peak hour. Measures to mitigate these stairway impacts will be evaluated in consultation with NYCT between the Draft EIS and Final EIS. were evaluated in consultation with NYCT between the Draft EIS and Final EIS. The possibility of constructing a new platform stair between two impacted stairs, P16 and P18, was evaluated. Although it was determined that this new stair could draw enough passengers away from the P16 and P18 stairs to mitigate the impacts at those two stairs, NYCT has advised that it also would adversely affect conditions at the platform level. The new diagonal mezzanine (M1) stair and relocation of the R238 fare control area proposed as part of the Proposed Project have been designed to distribute passengers to the center and northern ends of the platform and alleviate crowding on the southern end. The introduction of this new stair would negate this transit benefit by directing riders to the southern end of the platform and would result in loss of platform area at that location. Therefore, NYCT has advised that the addition of this new stair would not be practicable. No feasible mitigation measures were identified that would address impacts at other impacted stairway locations (P13, P19, and P21). Accordingly, the stairway impacts would remain unmitigated.

Two escalators (ES208 and ES210) located at the west end of the Flushing platform would also have significant adverse impacts during both the AM and PM peak hours, and could potentially be mitigated by increasing the escalator operating speed; the practicability of implementing this measure would also be explored between the Draft EIS and Final EIS. Should measures to mitigate these impacts be determined to be impracticable, these significant impacts would be considered unmitigated in the Final EIS. Replacement of the two escalators as part of MTA's Capital Program is expected to be completed by 2025 and would allow for the increase of the escalator operating speed to 100 feet per minute. However, if in the future it is determined that there is crowding in the immediate switchback landing as passengers transfer between escalators, then NYCT would have to potentially lower the escalator operating speed back to 90 feet per minute, in which case, the impact would remain unmitigated.

Pedestrians

The Proposed Project would result in significant adverse pedestrian impacts at one pedestrian element during the AM and PM peak hours and at five pedestrian elements during the midday peak hour, out of the 15 pedestrian elements analyzed. Mitigation consisting of crosswalk widenings was identified for one impacted element in the AM and PM peak hours, and for three out of the five impacted elements in the midday peak hour.

For the midday peak hour, two corner areas could not be mitigated. At one of these two locations—the southwest corner of the intersection of Lexington Avenue and East 42nd Street—the relocation of a garbage bin would partially mitigate the impact. Implementation of the pedestrian mitigation measures is within the jurisdiction of NYCDOT, except for the relocation of garbage bins; the Applicant will coordinate with the Grand Central Partnership to implement the relocation of the garbage bin and ensure its compliance.

Construction

Traffic

As discussed in Chapter 15, Construction, five key intersections were analyzed for potential significant traffic impacts during the construction traffic peak hours. Significant impacts were identified at all five analysis intersections during the AM and PM construction peak hours. Where impacts during construction may occur, measures similar to those recommended in the operational traffic analysis could be implemented early to aid in alleviating congested traffic conditions. Significant impacts to the intersections of East 42nd Street with Third Avenue and with Lexington Avenue, and the intersection of East 43rd Street with Lexington Avenue during the AM and PM peak hours, and the intersection of Lexington Avenue with East 45th Street during the PM peak hour, could not be mitigated under construction conditions, similar to the findings of the operational With-Action conditions.

Pedestrians

Due to the proposed sidewalk closures associated with construction activities along the Lexington Avenue and East 42nd Street site frontages, an assessment of the proposed walkway level of service during construction was performed and compared to the No-Action condition when the sidewalks would be available, as requested by NYCDOT. For the purposes of a conservative analysis, the No-Action condition analyzed a condition where the existing building would remain. Pedestrian impacts would be expected at both sidewalks during the AM and PM operational peak hours during construction.

Transportation

As discussed in **Chapter 9, Transportation**, the Proposed Project would result in significant adverse impacts at a number of locations in the study area. This section describes the mitigation measures that could reduce or eliminate significant impacts and indicates where impacts would remain unmitigated.

Traffic

Although traffic increases at individual intersections as a result of the Proposed Project are expected to be modest (typically not more than one additional vehicle per minute), significant traffic impacts are expected for each of the 15 intersections during one or more peak hours due to roadway improvement projects identified in the study area which would reduce roadway capacity for vehicles to prioritize transit, pedestrian, and bicyclist mobility and safety, and prevailing traffic congestion in the network. Of the 15 intersections analyzed, the Proposed Project would result in significant adverse traffic impacts at ~~44~~all 15 intersections during the AM peak hour (at ~~2224~~ movements) and ~~midday~~PM peak hour (at ~~2326~~ movements), and ~~all 15~~at 14 intersections (at ~~2721~~ movements) during the ~~PM~~midday peak hour. **Table 16-1** summarizes the number of significant traffic impacts and whether they could be fully mitigated (i.e. "mitigated") or partially mitigated, and **Table 16-2** summarizes the significantly impacted traffic movements. Details of the intersection capacity analyses and all traffic mitigation measures are summarized in **Table 16-3** through **Table 16-5**.

Table 16-1 Traffic Impact Mitigation Summary

Intersections	AM Peak Hour	Midday Peak Hour	PM Peak Hour
No significant impact	<u>0</u>	1	0
Fully mitigated impact	<u>5</u>	1	2
Partially mitigated impact	0	0	0
Unmitigated impact	10	13	13

Table 16-2 Summary of Significantly Impacted Traffic Movements

Intersection	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Second Avenue and East 40th Street	SBLT	SBLT	EBT
Second Avenue and East 42nd Street	WBL SBR	E BR WBL S BT SBR	EBT EBR WBL SBR
Third Avenue and East 40th Street	<u>EBLT</u> NBT	NBT	NBT
Third Avenue and East 42nd Street	WBT WBR NBL NBR	WBT NBL NBR	WBT NBL NBR
Lexington Avenue and East 40th Street		EBT	EBR
Lexington Avenue and East 42nd Street	WBLT SBT SBR	WBLT SBR	WBLT SBR
Lexington Avenue and East 43rd Street	<u>SBT</u>	SBT	SBT
Lexington Avenue and East 44th Street	SBLT	SBLT	SBLT
Lexington Avenue and East 45th Street	SBT SBR	SBT	SBT SBR
Lexington Avenue and East 46th Street	SBLT	SBLT	SBLT
Park Avenue and East 40th Street	EBTR (West side) EBLT (East side)	EBTR (West side) EBLT (East side)	EBTR (West side) EBLT (Tunnel) NBTR (East side)
Madison Avenue and East 42nd Street	WBT	WBT	EBT WBT
Fifth Avenue and 42nd Street	WBT	WBT	WBT

Table 16-2 Summary of Significantly Impacted Traffic Movements

Intersection	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Sixth Avenue and West 42nd Street			
	WBT	WBT WBR	WBT WBR
Broadway and West 42nd Street			
	WBT	WBL WBT	WBL WBT
Number of impacted traffic movements	<u>2224</u>	<u>2321</u>	<u>2726</u>
Number of unmitigated traffic movements	<u>1718</u>	<u>2119</u>	<u>2423</u>

Notes:

EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left turn; T = Through; R = Right turn; DefL = De facto left turn movement

An overall finding of the traffic mitigation analysis shows that although most of the 15 intersections analyzed are significantly impacted, some could be fully mitigated with readily implementable traffic improvement measures that are typically implemented by NYCDOT. Geometric improvements, such as lane restriping or prohibiting parking in order to provide an additional travel lane, would not be feasible and would conflict with the planned roadway improvements projects identified in **Chapter 9, Transportation**. These projects would reduce the amount of space available for vehicle traffic while prioritizing providing more pedestrian and bicycle spaces and increased safety for these travel modes.

As shown in **Table 16-1**, ten of the 15 intersections would remain unmitigated during the AM peak hour, 13 intersections would remain unmitigated during the midday peak hour, and 13 intersections would remain unmitigated during the PM peak hour.

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Second Avenue and East 40th Street														
East 40th Street EB	T	<u>0.70</u>	<u>33.4</u>	C	T	<u>0.72</u>	<u>33.7</u>	C	T	<u>0.74</u>	<u>35.5</u>	D	- Modify signal timing: Shift 1 sec of green time from EB phase to SB phase. [SB green time shifts from 43 sec to 44 sec. EB green time shifts from 30 sec to 29 sec. LPI phase time remains the same.]	
	R	0.44	30.0	C	R	0.46	30.1	C	R	0.47	31.1	C		
Second Avenue SB	LT	<u>1.15</u>	<u>80.3</u>	F	LT	<u>1.16</u>	<u>85.1</u>	F	LT	1.14	<u>71.5</u>	E		
	Overall Intersection ²	-	-	<u>71.5</u>	E	-	-	<u>75.1</u>	E	-	-	<u>64.5</u>		E
Second Avenue and East 42nd Street														
East 42nd Street EB	T	<u>1.00</u>	<u>57.9</u>	E	T	<u>1.00</u>	<u>58.9</u>	E	T	<u>1.00</u>	<u>58.9</u>	E		- Unmitigable
	R	<u>0.88</u>	<u>48.6</u>	D	R	<u>0.88</u>	<u>48.6</u>	D	R	<u>0.88</u>	<u>48.6</u>	D		
WB	L	<u>1.32</u>	<u>221.4</u>	F	L	<u>1.37</u>	<u>238.7</u>	F	L	<u>1.37</u>	<u>238.7</u>	F		
	T	1.13	109.6	F	T	1.13	110.2	F	T	1.13	110.2	F		
Second Avenue SB	LT	<u>1.08</u>	<u>80.4</u>	F	LT	<u>1.09</u>	<u>80.3</u>	F	LT	<u>1.09</u>	<u>80.3</u>	F		
	R	1.25	179.0	F	R	1.30	198.4	F	R	1.30	198.4	F		
Overall Intersection ²	-	-	<u>90.3</u>	F	-	-	<u>92.3</u>	F	-	-	<u>92.3</u>	F		
Third Avenue and East 40th Street														
East 40th Street EB	LT	<u>0.84</u>	<u>50.9</u>	D	LT	<u>0.90</u>	<u>58.8</u>	E	LT	<u>0.90</u>	<u>58.7</u>	E	- Unmitigable	
Third Avenue NB	T	1.38	208.3	F	T	1.40	217.0	F	T	1.40	217.0	F		
	R	0.58	<u>45.4</u>	D	R	0.59	<u>47.4</u>	D	R	0.59	<u>47.4</u>	D		
Overall Intersection ²	-	-	<u>160.9</u>	F	-	-	<u>167.8</u>	F	-	-	<u>167.8</u>	F		

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Third Avenue and East 42nd Street														
East 42nd Street	EB	L	<u>1.06</u>	<u>93.8</u>	F	L	<u>1.07</u>	<u>94.9</u>	F	L	<u>1.07</u>	<u>94.9</u>	F	- Unmitigable
		T	<u>0.81</u>	<u>16.7</u>	<u>B</u>	T	<u>0.81</u>	<u>16.7</u>	<u>B</u>	T	<u>0.81</u>	<u>16.7</u>	<u>B</u>	
WB	T	1.66	324.8	F	T	1.68	335.4	F	T	1.68	335.4	F		
	R	1.23	143.3	F	R	1.24	149.3	F	R	1.24	149.3	F		
Third Avenue	NB	L	2.00+	500.0+	F	L	2.00+	500.0+	F	L	2.00+	500.0+	F	
		T	1.11	71.2	E	T	1.11	75.1	E	T	1.11	75.1	E	
		R	2.00+	500.0+	F	R	2.00+	500.0+	F	R	2.00+	500.0+	F	
Overall Intersection²		-	-	<u>197.6</u>	F	-	-	<u>224.4</u>	F	-	-	<u>224.4</u>	F	
Lexington Avenue and East 40th Street														
East 40th Street	EB	T	0.90	45.2	D	T	0.96	52.7	D	T	0.96	52.7	D	- Unmitigable
		R	0.56	41.1	D	R	0.59	41.5	D	R	0.59	41.5	D	
Lexington Avenue	SB	LT	<u>1.02</u>	40.4	D	LT	<u>1.03</u>	<u>44.2</u>	D	LT	<u>1.03</u>	<u>44.2</u>	D	
Overall Intersection²		-	-	<u>41.5</u>	D	-	-	<u>45.9</u>	D	-	-	<u>45.9</u>	D	
Lexington Avenue and East 42nd Street														
East 42nd Street	EB	T	0.76	<u>47.6</u>	D	T	0.76	<u>47.7</u>	D	T	0.76	<u>47.7</u>	D	- Unmitigable <i>- Intersection delays changed as a result of signal timing changed at Lexington Avenue and East 43rd Street</i>
		R	0.23	46.8	D	R	0.23	46.8	D	R	0.23	46.8	D	
WB	LT	1.52	277.3	F	LT	1.58	305.3	F	LT	1.58	305.3	F		
	Lexington Avenue	SB	T	<u>1.37</u>	<u>184.8</u>	F	T	<u>1.39</u>	<u>193.9</u>	F	T	<u>1.39</u>	<u>193.1</u>	
		R	1.09	<u>83.6</u>	F	R	1.34	<u>185.1</u>	F	R	1.34	<u>184.6</u>	F	
Overall Intersection²		-	-	<u>167.3</u>	F	-	-	<u>185.0</u>	F	-	-	<u>184.6</u>	F	

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Lexington Avenue and East 43rd Street													
East 43rd Street WB	L	0.44	24.9	C	L	0.44	24.9	C	L	0.47	27.0	C	- Modify signal timing: Shift 2 sec of green time from WB phase to SB phase. [SB green time shifts from 45 sec to 47 sec. WB green time shifts from 38 sec to 36 sec. LPI phase time remains the same.]
Lexington Avenue SB	T	1.32	166.9	F	T	1.38	193.0	F	T	1.31	160.6	F	
Overall Intersection ²	-	-	141.8	F	-	-	164.3	F	-	-	137.9	F	
Lexington Avenue and East 44th Street													
Lexington Avenue SB	LT	1.81	385.1	F	LT	1.88	416.4	F	LT	1.79	375.5	1.81	- Modify signal timing: Shift 2 sec of green time from Ped phase to SB phase. [SB green time shifts from 40 sec to 42 sec. Pedestrian phase time shifts from 45 sec to 43 sec.]
Overall Intersection ²	-	-	385.1	F	-	-	416.4	F	-	-	375.5	=	
Lexington Avenue and East 45th Street													
East 45th Street WB	Def L	0.56	32.1	C	Def L	0.56	32.1	C	DefL	0.59	35.8	D	- Modify signal timing: Shift 2 sec of green time from WB phase to SB phase. [SB green time shifts from 40 sec to 42 sec. WB green time shifts from 33 sec to 31 sec. LPI phase time remains the same.]
	T	0.68	32.8	C	T	0.70	33.5	C	T	0.74	37.9	D	
Lexington Avenue SB	T	1.60	293.0	F	T	1.67	325.9	F	T	1.59	286.6	F	
	R	1.23	131.3	F	R	1.29	157.1	F	R	1.23	127.8	F	
Overall Intersection ²	-	-	213.4	F	-	-	239.0	F	-	-	211.5	F	
Lexington Avenue and East 46th Street													
East 46th Street EB	T	0.81	40.9	D	T	0.82	42.4	D	T	0.82	42.4	D	- Unmitigable - Intersection delays changed as a result of signal timing
	R	0.61	35.4	D	R	0.69	41.3	D	R	0.69	41.3	D	
Lexington Avenue SB	LT	1.73	360.2	F	LT	1.77	378.7	F	LT	1.77	378.7	F	

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Overall Intersection ²	-	-	<u>264.8</u>	F	-	-	<u>276.5</u>	F	-	-	<u>276.5</u>	F	changed at Lexington Avenue and East 45th Street
Park Avenue and East 40th Street													
East 40th Street (West Side) EB	TR	0.88	50.9	D	TR	0.93	60.4	E	TR	0.93	60.4	E	- Unmitigable
Park Avenue (West Side) SB	T	0.92	35.3	D	T	0.92	35.3	D	T	0.92	35.3	D	
East 40th Street (Tunnel) EB	LT	0.66	12.3	B	LT	0.71	14.2	B	LT	0.71	14.2	B	
Park Avenue (Tunnel) NB	T	0.70	18.7	B	T	0.70	18.8	B	T	0.70	18.8	B	
East 40th Street (East Side) EB	LT	0.92	45.1	D	LT	1.00	63.0	E	LT	1.00	63.0	E	
Park Avenue (East Side) NB	TR	0.92	50.6	D	TR	0.94	55.5	E	TR	0.94	55.5	E	
Overall Intersection ²	-	-	32.1	C	-	-	35.8	D	-	-	35.8	D	
Madison Avenue and East 42nd Street													
East 42nd Street EB	L	1.77	380.3	F	L	1.77	380.3	F	L	1.77	380.3	F	- Unmitigable
	T	1.53	265.9	F	T	1.53	266.9	F	T	1.53	266.9	F	
WB	T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F	
	R	0.08	27.6	C	R	0.08	27.6	C	R	0.08	27.6	C	
Madison Avenue NB	LT	1.12	94.9	F	LT	1.12	95.3	F	LT	1.12	95.3	F	
	R	2.00+	500.0+	F	R	2.00+	500.0+	F	R	2.00+	500.0+	F	
Overall Intersection ²	-	-	353.1	F	-	-	385.5	F	-	-	385.5	F	

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Fifth Avenue and 42nd Street														
42nd Street	EB	T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F	- Unmitigable
		R	0.66	58.7	E	R	0.66	59.0	E	R	0.66	59.0	E	
	WB	L	0.00	0.0	A	L	0.00	0.0	A	L	0.00	0.0	A	
		T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F	
Fifth Avenue	SB	L	0.05	13.0	B	L	0.05	13.0	B	L	0.05	13.0	B	
		T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F	
		R	0.78	133.6	F	R	0.78	133.6	F	R	0.78	133.6	F	
Overall Intersection²		-	-	500.0+	F	-	-	500.0+	F	-	-	500.0+	F	
Sixth Avenue and West 42nd Street														
West 42nd Street	EB	T	1.47	248.4	F	T	1.47	249.3	F	T	1.47	250.4	F	- Unmitigable
		WB	T	1.46	238.3	F	T	1.54	272.3	F	T	1.54	272.3	
Sixth Avenue	NB	R	0.75	41.0	D	R	0.85	43.8	D	R	$\frac{0.898}{5}$	43.8	D	
		LT	0.97	42.1	D	LT	0.97	42.3	D	LT	0.97	42.3	D	
		R	1.58	347.8	F	R	1.58	347.8	F	R	1.58	347.8	F	
Overall Intersection²		-	-	134.8	F	-	-	143.4	F	-	-	143.7	F	

Table 16-3 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – AM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Broadway and West 42nd Street														
West 42nd Street	EB	T	0.91	38.9	D	T	0.91	39.2	D	T	0.91	39.2	D	-Modify signal timing: Shift 2 sec of green time from EB lead phase to EB/WB phase. [EB/WB green time shifts from 31 sec to 33 sec. EB lead green time shifts from 19 sec to 17 sec. LPI phase time remains the same.]
		R	0.45	19.3	B	R	0.45	19.3	B	R	0.45	19.3	B	
	WB	L	0.87	20.0	B	L	0.97	31.1	C	L	0.90	21.8	C	
		T	1.16	90.9	F	T	1.20	107.3	F	T	1.13	78.1	E	
Overall Intersection²		-	-	56.9	E	-	-	65.1	E	-	-	51.8	D	

1 Control delay is measured in seconds per vehicle.

2 Overall intersection v/c ratio is the critical lane groups' v/c ratio.

■ Denotes a significantly impacted movement

Table 16-4 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – Midday Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures		
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS			
Second Avenue and East 40th Street															
East 40th Street	EB	T	<u>0.49</u>	<u>32.4</u>	C	T	<u>0.52</u>	<u>33.2</u>	C	T	<u>0.52</u>	<u>33.2</u>	C	- Unmitigable	
		R	0.99	<u>85.87</u>	F	R	1.00	<u>87.42</u>	F	R	1.00	<u>87.42</u>	F		
Second Avenue	SB	LT	1.21	<u>108.5</u>	F	LT	1.22	<u>111.9</u>	F	LT	1.22	<u>111.9</u>	F		
Overall Intersection²		-	-	<u>100.1</u>	F	-	-	<u>102.6</u>	F	-	-	<u>102.6</u>	F		
Second Avenue and East 42nd Street															
East 42nd Street	EB	T	<u>0.68</u>	<u>19.4</u>	<u>B</u>	T	<u>0.70</u>	<u>20.1</u>	C	T	<u>0.70</u>	<u>20.1</u>	C	- Unmitigable	
		R	<u>1.46</u>	<u>234.7</u>	F	R	<u>1.50</u>	<u>252.2</u>	F	R	<u>1.50</u>	<u>252.2</u>	F		
	WB	L	<u>0.70</u>	<u>41.0</u>	<u>D</u>	L	<u>0.73</u>	<u>44.1</u>	<u>D</u>	L	<u>0.73</u>	<u>44.1</u>	<u>D</u>		
		T	0.98	57.0	E	T	0.98	57.4	E	T	0.98	57.4	E		
Second Avenue	SB	DefL	<u>1.52</u>	<u>275.6</u>	F	DefL	<u>1.52</u>	<u>277.1</u>	F	DefL	<u>1.52</u>	<u>277.1</u>	F		
		T	<u>1.04</u>	82.3	F	T	<u>1.04</u>	<u>84.4</u>	F	T	<u>1.04</u>	<u>84.4</u>	F		
		R	0.97	96.6	F	R	1.04	115.0	F	R	1.04	115.0	F		
Overall Intersection²		-	-	<u>111.6</u>	F	-	-	<u>115.5</u>	F	-	-	<u>115.5</u>	F		
Third Avenue and East 40th Street															
East 40th Street	EB	LT	<u>0.66</u>	<u>21.8</u>	C	LT	<u>0.71</u>	<u>23.1</u>	C	LT	<u>0.71</u>	<u>23.1</u>	C	- Unmitigable	
Third Avenue	NB	T	1.38	208.8	F	T	1.41	220.3	F	T	1.41	220.3	F		
		R	0.78	55.2	<u>E</u>	R	0.78	<u>57.4</u>	E	R	0.78	<u>57.4</u>	E		
Overall Intersection²		-	-	<u>156.3</u>	F	-	-	<u>163.4</u>	F	-	-	<u>163.4</u>	F		

Table 16-4 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – Midday Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Third Avenue and East 42nd Street														
East 42nd Street	EB	L	<u>0.80</u>	<u>61.8</u>	E	L	<u>0.81</u>	<u>62.5</u>	E	L	<u>0.81</u>	<u>62.5</u>	E	- Unmitigable
		T	<u>1.11</u>	<u>94.5</u>	F	T	<u>1.11</u>	<u>94.4</u>	F	T	<u>1.11</u>	<u>94.4</u>	F	
WB	T	1.61	316.8	F	T	1.65	331.4	F	T	1.65	331.4	F		
	R	1.14	137.1	F	R	1.14	137.3	F	R	1.14	137.3	F		
Third Avenue	NB	L	2.00+	500.0+	F	L	2.00+	500.0+	F	L	2.00+	500.0+	F	
		T	1.01	<u>69.7</u>	E	T	1.02	69.8	E	T	1.02	69.8	E	
		R	2.00+	500.0+	F	R	2.00+	500.0+	F	R	2.00+	500.0+	F	
Overall Intersection ²	-	-	<u>216.2</u>	F	-	-	<u>249.5</u>	F	-	-	<u>249.5</u>	F		
Lexington Avenue and East 40th Street														
East 40th Street	EB	T	0.51	30.2	C	T	0.55	31.0	C	T	0.55	31.0	C	- Mitigation not required.
		R	0.36	45.4	D	R	0.40	46.0	D	R	0.40	46.0	D	
Lexington Avenue	SB	LT	<u>0.86</u>	21.9	C	LT	0.88	22.5	C	LT	0.88	22.5	C	
Overall Intersection ²	-	-	<u>25.0</u>	C	-	-	<u>25.7</u>	C	-	-	<u>25.7</u>	C		
Lexington Avenue and East 42nd Street														
East 42nd Street	EB	T	0.84	27.1	C	T	0.85	27.1	C	T	0.85	27.1	C	- Unmitigable
		R	0.09	17.3	B	R	0.09	17.3	B	R	0.09	17.3	B	
WB	LT	1.39	199.9	F	LT	1.49	245.6	F	LT	1.49	245.6	F		
	<u>Lexington Avenue</u>	<u>SB</u>	T	<u>1.09</u>	<u>65.8</u>	E	T	<u>1.10</u>	<u>66.6</u>	E	T	<u>1.10</u>	<u>66.6</u>	
		R	0.77	<u>30.1</u>	C	R	1.03	<u>60.1</u>	E	R	1.03	<u>60.1</u>	E	
Overall Intersection ²	-	-	<u>91.6</u>	F	-	-	<u>108.4</u>	F	-	-	<u>108.4</u>	F		

Table 16-4 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – Midday Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Lexington Avenue and East 43rd Street													
East 43rd Street WB	L	0.62	33.5	C	L	0.64	34.9	C	L	0.64	34.9	C	- Unmitigable
Lexington Avenue SB	T	1.39	197.1	F	T	1.47	235	F	T	1.47	235	F	
Overall Intersection ²	-	-	166.0	F	-	-	198.6	F	-	-	198.6	F	
Lexington Avenue and East 44th Street													
Lexington Avenue SB	LT	1.87	412.6	F	LT	1.95	449.9	F	LT	1.95	449.9	F	- Unmitigable
Overall Intersection ²	-	-	412.6	F	-	-	449.9	F	-	-	449.9	F	
Lexington Avenue and East 45th Street													
East 45th Street WB	LT	0.77	37.3	D	LT	0.78	38.1	D	LT	0.78	38.1	D	- Unmitigable
Lexington Avenue SB	T	1.53	267.9	F	T	1.62	305.3	F	T	1.62	305.3	F	
	R	0.63	18.0	B	R	0.72	21.8	C	R	0.72	21.8	C	
Overall Intersection ²	-	-	200.2	F	-	-	229.1	F	-	-	229.1	F	
Lexington Avenue and East 46th Street													
East 46th Street EB	T	0.92	55.0	D	T	0.93	57.7	E	T	0.93	57.7	E	- Unmitigable
	R	0.04	18.7	B	R	0.19	21.7	C	R	0.19	21.7	C	
Lexington Avenue SB	LT	1.49	255.8	F	LT	1.53	271.5	F	LT	1.53	271.5	F	
Overall Intersection ²	-	-	202.0	F	-	-	211.1	F	-	-	211.1	F	

Table 16-4 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – Midday Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Park Avenue and East 40th Street													
East 40th Street (West Side) EB	TR	0.96	76.0	E	TR	1.02	103.8	F	TR	1.02	103.8	F	-Unmitigable
Park Avenue (West Side) SB	T	1.11	85.2	F	T	1.11	85.2	F	T	1.11	85.2	F	
East 40th Street (Tunnel) EB	LT	0.67	12.6	B	LT	0.74	12.6	B	LT	0.74	12.6	B	
Park Avenue (Tunnel) NB	T	0.63	18.9	B	T	0.63	18.9	B	T	0.63	18.9	B	
East 40th Street (East Side) EB	LT	0.91	45.5	D	LT	1.00	62.2	E	LT	1.00	62.2	E	
Park Avenue (East Side) NB	TR	0.72	29.5	C	TR	0.75	31.6	C	TR	0.75	31.6	C	
Overall Intersection²	-	-	49.9	D	-	-	54.5	D	-	-	54.5	D	
Madison Avenue and East 42nd Street													
East 42nd Street EB	L	0.43	17.5	B	L	0.43	17.4	B	L	0.43	17.4	B	-Unmitigable
	T	1.73	357.6	F	T	1.74	359.9	F	T	1.74	359.9	F	
	WB	T	2.00+	487.3	F	T	2.00+	500.0+	F	T	2.00+	500.0+	
R		0.32	14.3	B	R	0.32	14.3	B	R	0.32	14.3	B	
Madison Avenue NB	LT	1.08	80.0	E	LT	1.08	81.5	F	LT	1.08	81.5	F	
	R	1.20	287.5	F	R	1.20	287.5	F	R	1.20	287.5	F	
Overall Intersection²	-	-	279.7	F	-	-	321.0	F	-	-	321.0	F	

Table 16-4 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – Midday Peak Hour

Intersection & Approach		2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
		Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Fifth Avenue and 42nd Street															
42nd Street	EB	T	1.23	128.3	F	T	1.23	129.9	F	T	1.23	129.9	F	-Unmitigable	
		R	0.83	54.0	D	R	0.83	54.0	D	R	0.83	54.0	D		
	WB	L	0.00	0.0	A	L	0.00	0.0	A	L	0.00	0.0	A		
		T	1.93	439.1	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F		
Fifth Avenue	SB	L	0.15	16.9	B	L	0.15	16.9	B	L	0.15	16.9	B		
		T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F		
		R	0.29	56.0	E	R	0.29	56.0	E	R	0.29	56.0	E		
Overall Intersection²		-	-	500.0+	F	-	-	500.0+	F	-	-	500.0+	F		
Sixth Avenue and West 42nd Street															
West 42nd Street	EB	T	1.08	88.6	F	T	1.09	89.7	F	T	1.09	88.2	F		-Unmitigable -Intersection delays changed as a result of signal timing changes identified at Broadway and West 42nd Street
		R	0.86	28.9	C	R	1.00	45.8	D	R	1.00	45.8	D		
	WB	T	1.12	83.3	F	T	1.23	131.3	F	T	1.23	131.3	F		
		R	0.86	28.9	C	R	1.00	45.8	D	R	1.00	45.8	D		
Sixth Avenue	NB	LT	0.82	26.0	C	LT	0.82	26.0	C	LT	0.82	26.0	C		
		R	1.65	356.6	F	R	1.65	356.6	F	R	1.65	356.6	F		
Overall Intersection²		-	-	66.9	E	-	-	78.0	E	-	-	77.7	E		
Broadway and West 42nd Street															
West 42nd Street	EB	T	0.71	20.7	C	T	0.71	20.7	C	T	0.71	20.7	C	-Modify signal timing: Shift 2 sec of green time from EB lead phase to EB/WB phase. [EB/WB green time shifts from 31 sec to 33 sec. EB lead green time shifts from 19 sec to 17 sec. LPI phase time remains the same.]	
		R	0.27	13.7	B	R	0.27	13.8	B	R	0.27	13.8	B		
	WB	L	0.77	40.8	D	L	0.92	48.0	D	L	0.86	40.3	D		
		T	0.97	47.8	D	T	1.03	60.8	E	T	0.96	43.7	D		
Overall Intersection²		-	-	33.1	C	-	-	39.46	D	-	-	31.9	C		

¹ Control delay is measured in seconds per vehicle.

² Overall intersection v/c ratio is the critical lane groups' v/c ratio.

Denotes a significantly impacted movement

Table 16-5 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – PM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Second Avenue and East 40th Street													
East 40th Street EB	T	0.93	67.9	E	T	1.02	85.6	F	T	1.02	85.6	F	- Unmitigable
	R	0.72	37.0	D	R	0.73	37.5	D	R	0.73	37.5	D	
Second Avenue SB	LT	1.08	54.3	D	LT	1.09	54.8	D	LT	1.09	54.8	D	
	R	1.08	54.3	D	R	1.09	54.8	D	R	1.09	54.8	D	
Overall Intersection²	=	=	54.1	D	=	=	56.1	E	=	=	56.1	E	
Second Avenue and East 42nd Street													
East 42nd Street EB	T	0.95	40.5	D	T	0.98	43.4	D	T	0.98	43.4	D	- Unmitigable
	R	1.08	79.2	E	R	1.09	83.5	F	R	1.09	83.5	F	
WB	L	1.01	124.5	F	L	1.15	170.5	F	L	1.15	170.5	F	
	T	1.16	118.8	F	T	1.16	119.6	F	T	1.16	119.6	F	
Second Avenue SB	LT	1.17	109.9	F	LT	1.18	112.7	F	LT	1.18	112.7	F	
	R	1.09	128.9	F	R	1.17	153.5	F	R	1.17	153.5	F	
Overall Intersection²	=	=	102.3	F	=	=	106.8	F	=	=	106.8	F	
Third Avenue and East 40th Street													
East 40th Street EB	LT	1.04	103.4	F	LT	1.12	106.0	F	LT	1.12	106.0	F	- Unmitigable
Third Avenue NB	T	1.43	228.3	F	T	1.46	242.9	F	T	1.46	242.9	F	
	R	0.80	73.8	E	R	0.78	69.4	E	R	0.78	69.4	E	
Overall Intersection²	=	=	190.6	F	=	=	200.6	F	=	=	200.6	F	

Table 16-5 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – PM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures	
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS		
Third Avenue and East 42nd Street														
East 42nd Street	EB	L	0.92	53.8	D	L	0.93	54.7	D	L	0.93	54.7	D	- Unmitigable
		T	0.92	33.4	C	T	0.92	33.3	C	T	0.92	33.3	C	
WB	T	1.37	208.7	F	T	1.41	223.4	F	T	1.41	223.4	F		
	R	1.23	154.7	F	R	1.24	156.9	F	R	1.24	156.9	F		
Third Avenue	NB	L	2.00+	500.0+	F	L	2.00+	500.0+	F	L	2.00+	500.0+	F	
		T	0.94	66.8	E	T	0.94	66.7	E	T	0.94	66.7	E	
		R	2.00+	500.0+	F	R	2.00+	500.0+	F	R	2.00+	500.0+	F	
Overall Intersection²	=	=	304.1	F	=	=	361.0	F	=	=	361.0	F		
Lexington Avenue and East 40th Street														
East 40th Street	EB	T	0.54	13.5	B	T	0.61	15.0	B	T	0.61	15.0	B	- Modify signal timing: Shift 1 sec of green time from EBT lead phase to EB phase. [EBT lead green time shifts from 24 sec to 23 sec. EB green time shifts from 15 sec to 16 sec. SB green time remains the same.]
		R	0.92	41.4	D	R	0.96	46.4	D	R	0.90	38.7	D	
Lexington Avenue	SB	LT	0.79	7.1	A	LT	0.80	7.3	A	LT	0.80	7.3	A	
		Overall Intersection²	=	=	12.0	B	=	=	13.2	B	=	=	12.4	
Lexington Avenue and East 42nd Street														
East 42nd Street	EB	T	1.09	75.8	E	T	1.09	75.8	E	T	1.09	75.8	E	
		R	0.10	18.1	B	R	0.10	18.1	B	R	0.10	18.1	B	
WB	LT	2.00+	500.0+	F	LT	2.00+	500.0+	F	LT	2.00+	500.0+	F		
	Lexington Avenue	SB	T	1.27	142.5	F	T	1.28	144.6	F	T	1.28	144.6	F
R			0.96	45.3	D	R	1.28	156.8	F	R	1.28	156.8	F	
Overall Intersection²	=	=	225.2	F	=	=	256.4	F	=	=	256.4	F		

Table 16-5 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – PM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
<u>Lexington Avenue and East 43rd Street</u>													
East 43rd Street WB	<u>L</u>	<u>0.92</u>	<u>65.8</u>	<u>E</u>	<u>L</u>	<u>0.93</u>	<u>68.0</u>	<u>E</u>	<u>L</u>	<u>0.93</u>	<u>68.0</u>	<u>E</u>	- Unmitigable
Lexington Avenue SB	<u>T</u>	<u>1.51</u>	<u>250.1</u>	<u>F</u>	<u>T</u>	<u>1.58</u>	<u>281.7</u>	<u>F</u>	<u>T</u>	<u>1.58</u>	<u>281.7</u>	<u>F</u>	
Overall Intersection²	<u>=</u>	<u>=</u>	<u>209.1</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>235.8</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>235.8</u>	<u>F</u>	
<u>Lexington Avenue and East 44th Street</u>													
Lexington Avenue SB	<u>LT</u>	<u>1.97</u>	<u>460.2</u>	<u>F</u>	<u>LT</u>	<u>2.04</u>	<u>491.2</u>	<u>F</u>	<u>LT</u>	<u>2.04</u>	<u>491.2</u>	<u>F</u>	- Unmitigable
Overall Intersection²	<u>=</u>	<u>=</u>	<u>460.2</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>491.2</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>491.2</u>	<u>F</u>	
<u>Lexington Avenue and East 45th Street</u>													
East 45th Street WB	<u>LT</u>	<u>1.06</u>	<u>88.9</u>	<u>F</u>	<u>LT</u>	<u>1.06</u>	<u>90.4</u>	<u>F</u>	<u>LT</u>	<u>1.06</u>	<u>90.4</u>	<u>F</u>	- Unmitigable
Lexington Avenue SB	<u>T</u>	<u>1.57</u>	<u>282.8</u>	<u>F</u>	<u>T</u>	<u>1.64</u>	<u>314.5</u>	<u>F</u>	<u>T</u>	<u>1.64</u>	<u>314.5</u>	<u>F</u>	
	<u>R</u>	<u>1.26</u>	<u>149.1</u>	<u>F</u>	<u>R</u>	<u>1.31</u>	<u>170.4</u>	<u>F</u>	<u>R</u>	<u>1.31</u>	<u>170.4</u>	<u>F</u>	
Overall Intersection²	<u>=</u>	<u>=</u>	<u>217.7</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>242.1</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>242.1</u>	<u>F</u>	
<u>Lexington Avenue and East 46th Street</u>													
East 46th Street EB	<u>T</u>	<u>0.92</u>	<u>53.1</u>	<u>D</u>	<u>T</u>	<u>0.92</u>	<u>54.5</u>	<u>D</u>	<u>T</u>	<u>0.92</u>	<u>54.5</u>	<u>D</u>	- Unmitigable
	<u>R</u>	<u>0.38</u>	<u>26.5</u>	<u>C</u>	<u>R</u>	<u>0.50</u>	<u>30.3</u>	<u>C</u>	<u>R</u>	<u>0.50</u>	<u>30.3</u>	<u>C</u>	
Lexington Avenue SB	<u>LT</u>	<u>1.63</u>	<u>314.9</u>	<u>F</u>	<u>LT</u>	<u>1.65</u>	<u>327.0</u>	<u>F</u>	<u>LT</u>	<u>1.65</u>	<u>327.0</u>	<u>F</u>	
Overall Intersection²	<u>=</u>	<u>=</u>	<u>233.5</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>239.8</u>	<u>F</u>	<u>=</u>	<u>=</u>	<u>239.8</u>	<u>F</u>	

Table 16-5 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – PM Peak Hour

Intersection & Approach	2030 No-Action					2030 With-Action					2030 Mitigation					Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS		Mvt	V/C	Ctrl Delay ¹	LOS		Mvt	V/C	Ctrl Delay ¹	LOS		
Park Avenue and East 40th Street																
East 40th Street (West Side) EB	TR	0.92	64.6	E		TR	0.98	104.1	F		TR	0.98	104.1	F	-Unmitigable	
Park Avenue (West Side) SB	I	1.16	106.1	F		I	1.16	107.0	F		I	1.16	107.0	F		
East 40th Street (Tunnel) EB	LT	0.97	38.3	D		LT	1.05	59.4	E		LT	1.05	59.4	E		
Park Avenue (Tunnel) NB	I	0.54	17.4	B		I	0.54	17.4	B		I	0.54	17.4	B		
East 40th Street (East Side) EB	LT	0.89	19.1	B		LT	0.97	20.2	C		LT	0.97	20.2	C		
Park Avenue (East Side) NB	TR	1.14	112.5	F		TR	1.18	125.4	F		TR	1.18	125.4	F		
Overall Intersection²	=	=	68.2	E		=	=	77.4	E		=	=	77.4	E		
Madison Avenue and East 42nd Street																
East 42nd Street EB	L	0.45	17.9	B		L	0.45	17.8	B		L	0.45	17.8	B	-Unmitigable	
	I	1.90	432.2	F		I	1.91	436.4	F		I	1.91	436.4	F		
	WB	I	2.00+	500.0+	F		I	2.00+	500.0+	F		I	2.00+	500.0+		F
Madison Avenue NB	R	0.10	9.7	A		R	0.10	9.7	A		R	0.10	9.7	A		
	LT	1.10	88.2	F		LT	1.11	90.1	F		LT	1.11	90.1	F		
	R	2.00+	500.0+	F		R	2.00+	500.0+	F		R	2.00+	500.0+	F		
Overall Intersection²	=	=	372.7	F		=	=	419.8	F		=	=	419.8	F		

Table 16-5 No-Action vs With-Action vs Mitigation Traffic Levels of Service Comparison – PM Peak Hour

Intersection & Approach	2030 No-Action				2030 With-Action				2030 Mitigation				Mitigation Measures
	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	Mvt	V/C	Ctrl Delay ¹	LOS	
Fifth Avenue and 42nd Street													
42nd Street EB	T	1.10	93.1	F	T	1.10	94.5	F	T	1.10	94.7	F	-Unmitigable -Intersection delays changed as a result of signal timing changes identified at Broadway and West 42nd Street
	R	0.50	55.0	D	R	0.50	55.0	D	R	0.50	55.0	D	
WB	L	0.00	0.0	A	L	0.00	0.0	A	L	0.00	0.0	A	
	T	1.52	263.5	F	T	1.70	342.1	F	T	1.70	342.1	F	
Fifth Avenue SB	L	0.08	15.2	B	L	0.08	15.2	B	L	0.08	15.2	B	
	T	2.00+	500.0+	F	T	2.00+	500.0+	F	T	2.00+	500.0+	F	
	R	1.11	218.2	F	R	1.11	218.2	F	R	1.11	218.2	F	
Overall Intersection²	=	=	500.0+	F	=	=	500.0+	F	=	=	500.0+	F	
Sixth Avenue and West 42nd Street													
West 42nd Street EB	T	0.98	71.1	E	T	0.98	71.9	E	T	0.98	74.8	E	-Unmitigable -Intersection delays changed as a result of signal timing changes identified at Broadway and West 42nd Street
	R	0.95	52.1	D	R	1.09	89.4	F	R	1.09	89.4	F	
WB	T	1.50	258.5	F	T	1.66	324.9	F	T	1.66	324.9	F	
	L	0.79	20.4	C	L	1.02	50.5	D	L	0.96	35.7	D	
Sixth Avenue NB	LT	0.82	26.6	C	LT	0.82	26.9	C	LT	0.82	26.9	C	
	R	1.55	333.1	F	R	1.55	333.1	F	R	1.55	333.1	F	
Overall Intersection²	=	=	100.8	F	=	=	123.3	F	=	=	123.8	F	
Broadway and West 42nd Street													
West 42nd Street EB	T	0.66	19.0	B	T	0.67	19.1	B	T	0.67	19.1	B	-Modify signal timing: Shift 2 sec of green time from EB lead phase to EB/WB phase. [EB/WB green time shifts from 31 sec to 33 sec. EB lead green time shifts from 19 sec to 17 sec. LPI phase time remains the same.]
	R	0.75	44.1	D	R	0.76	44.8	D	R	0.76	44.8	D	
WB	L	0.79	20.4	C	L	1.02	50.5	D	L	0.96	35.7	D	
	T	1.37	185.4	F	T	1.46	224.3	F	T	1.37	185.7	F	
Overall Intersection²	=	=	92.7	F	=	=	113.1	F	=	=	95.1	F	

¹ Control delay is measured in seconds per vehicle.

² Overall intersection v/c ratio is the critical lane groups' v/c ratio.

Denotes a significantly impacted movement

Fourteen of the 15 intersections have significant adverse traffic impacts that would result from the Proposed Project and could not be fully mitigated in at least one peak hour, including:

- › Second Avenue and East 40th Street (midday and PM peak hours);
- › Second Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Third Avenue and East 40th Street (AM, midday, and PM peak hours);
- › Third Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Lexington Avenue and East 40th Street (AM peak hours);
- › Lexington Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Lexington Avenue and East 43rd Street (midday and PM peak hour);
- › Lexington Avenue and East 44th Street (midday and PM peak hour);
- › Lexington Avenue and East 45th Street (midday and PM peak hours)
- › Lexington Avenue and East 46th Street (AM, midday, and PM peak hours);
- › Park Avenue and East 40th Street (AM, midday, and PM peak hours);
- › Madison Avenue and East 42nd Street (AM, midday, and PM peak hours);
- › Fifth Avenue and 42nd Street (AM, midday, and PM peak hours); and
- › Sixth Avenue and West 42nd Street (AM, midday, and PM peak hours).

Second Avenue

Second Avenue and East 40th Street

Significant impacts at this intersection would occur during the AM, midday, and PM peak hours. Impacts during the AM peak hour could be mitigated by modifying the signal timing. Impacts during the midday and PM peak hours would remain unmitigated.

Second Avenue and East 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. These impacts could not be mitigated.

Third Avenue

Third Avenue and East 40th Street

Significant impacts at this intersection would occur during the AM, midday, and PM peak hours. These impacts could not be mitigated.

Third Avenue and East 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. These impacts could not be mitigated.

Lexington Avenue Corridor

Lexington Avenue and East 40th Street

This intersection would be significantly impacted during the AM and PM peak hours. Impacts during the PM peak hour could be mitigated by modifying the signal timing; impacts during the AM peak hour would remain unmitigated.

Lexington Avenue and East 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. These impacts could not be mitigated.

Lexington Avenue and East 43rd Street

This intersection would be significantly impacted during the AM, midday and PM peak hours. These impacts. Impacts during the AM peak hour could not be mitigated by modifying the signal timing; impacts during the midday and PM peak hours would remain unmitigated.

Lexington Avenue and East 44th Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts during the AM peak hour could be mitigated by modifying the signal timing; impacts during the midday and PM peak hours would remain unmitigated.

Lexington Avenue and East 45th Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts during the AM peak hour could be mitigated by modifying the signal timing while impacts during the midday and PM peak hours would remain unmitigated.

Lexington Avenue and East 46th Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts at this intersection would remain unmitigated.

Park Avenue

Park Avenue and East 40th Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts at this intersection would remain unmitigated.

42nd Street

Madison Avenue and East 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts at this intersection would remain unmitigated.

Fifth Avenue and 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts at this intersection would remain unmitigated.

Sixth Avenue and West 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours. Impacts at this intersection would remain unmitigated.

Broadway and West 42nd Street

This intersection would be significantly impacted during the AM, midday, and PM peak hours and could be mitigated during all three peak hours by modifying the signal timing.

Implementation

Implementation of these measures would be performed by the Applicant, subject to review and approval by NYCDOT, with the exception of signal timing modifications which would be implemented by NYCDOT.

Transit

The Proposed Project would provide a number of transit and public realm improvements which would enhance passenger circulation conditions at the Grand Central – 42nd Street subway station. These changes include:

- › Redesign and expansion of Fare Control Area (FCA) R238 and R238A, including a new surface to station mezzanine stair (M1) and new subway entrance, which would provide direct connection from East 42nd Street to the subway station. In addition, turnstiles will be relocated from the subway mezzanine up to the new and expanded at grade fare control area thus alleviating major congestion points at the subway mezzanine. This will also allow for enhanced passenger distribution along the subway mezzanine and Lexington line platform stairs.
- › A new transit hall, which would contain retail, information screens and booths, and connections to the Terminal, would be constructed on the western side of the Development Site and would expand pedestrian circulation area through the GCT's 42nd Street passage.
- › Redesign of the FCA R240 area, which would include additional turnstiles, a relocated "Strawberry stair" aligned with the mezzanine, and the removal of girders and back-of-house spaces. This suite of improvements would provide better visual and physical connection to the P26 and P27 stairs on the northern end of the Lexington line platform, improving its function for both entry and exiting movements.
- › Removal of girders from the subway mezzanine level to improve circulation and enhance sightlines.
- › A "Short Loop connection" would be constructed to provide direct access for MNR and LIRR riders from GCT to the subway. Without this connection, all MNR and LIRR riders would be required to travel through GCT and use the R238 fare control area stairs to enter the subway station.

While the Proposed Project would improve pedestrian circulation and increase station circulation capacity overall, the analyses conducted for the Grand Central – 42nd Street subway station elements (stairways, escalators, fare control areas, and passageways) identified significant adverse transit impacts at five stairways along the northbound and southbound Lexington line platform during the AM peak hour and one stairway along the northbound Lexington line platform during the PM peak hour due to the changes in travel patterns with the introduction of the "Short Loop connection." Two escalators (ES208 and ES210) located at the west end of the Flushing platform would have significant adverse impacts during both the AM and PM peak hours.

Typical measures to mitigate stairway impacts include widening of the impacted stairways or construction of a new stairway to provide additional vertical circulation capacity. The feasibility and practicability of such measures, taking into account platform level conditions and other constraints at the Grand Central – 42nd Street subway station, ~~will be~~will be evaluated in consultation with New York City Transit (NYCT) between the Draft EIS and Final EIS. The possibility of constructing a new platform stair between two impacted stairs, P16 and P18, was evaluated. Although it was determined that this new stair could draw enough passengers away from the P16 and P18 stairs to mitigate the impacts at those two stairs, NYCT has advised that it also would adversely affect conditions at the platform level. The new diagonal mezzanine (M1) stair and relocation of the R238 fare control area proposed as part of the Proposed Project have been designed to distribute passengers to the center and northern ends of the platform and alleviate crowding on the southern end. The introduction of this new stair would negate this transit benefit by directing riders to the southern end of the platform and would result in loss of platform area at that location. Therefore, NYCT has advised that the addition of this new stair would not be practicable. No feasible mitigation measures were identified that would address impacts at other impacted stairway locations (P13, P19, and P21). Accordingly, the stairway impacts would remain unmitigated.

The impact to the Flushing line escalators could potentially be mitigated by increasing the escalator operating speed from 90 feet per minute to 100 feet per minute; ~~the practicability of implementing this measure would be explored between the Draft EIS and Final EIS.~~ Replacement of the escalators as part of MTA's Capital Program is expected to be completed by 2025 and would allow for the increase of the escalator operating speed to 100 feet per minute. However, if in the future it is determined that there is crowding in the immediate switchback landing as passengers transfer between escalators, then NYCT would have to potentially lower the escalator operating speed back to 90 feet per minute, in which case, the impact would remain unmitigated.

~~Should measures to mitigate these impacts be determined to be infeasible or impracticable, these significant adverse impacts would be considered unmitigated in the Final EIS.~~

Pedestrians

As discussed in **Chapter 9, Transportation**, the Proposed Project would result in significant impacts at one pedestrian element during the AM and PM peak hours (crosswalk), and five pedestrian elements during the midday peak hour (three crosswalks and two corners). Improvements were identified that would mitigate these impacts, with the exception of two pedestrian elements during the midday peak hour - one that would be partially mitigated and the other would remain unmitigated.

Table 16-6 summarizes the significantly impacted pedestrian elements and whether they could be mitigated. Detailed pedestrian levels of services and mitigation measures are summarized in **Table 16-7** and **Table 16-8**.

Table 16-6 Summary of Elements with Significant Adverse Pedestrian Impacts

Peak Hour	Elements Analyzed	Elements with No Significant Impacts	Elements with Significant Impacts	Unmitigated Elements
Crosswalks				
AM	6	5	1	0
Midday	6	3	3	0
PM	6	5	1	0
Corner Areas				
Midday	5	3	2	2

Table 16-7 Crosswalk Impact Mitigation Summary

Intersection	Crosswalk	No-Action		With-Action				Mitigation Measures
		Avg Ped Space, SF/P	LOS	Avg Ped Space, SF/P	LOS	Avg Ped Space, SF/P	LOS	
AM Peak Hour								
Lexington Avenue and East 42nd Street	North	12.9	E	12.6	E	13.4	E	<ul style="list-style-type: none"> › Widen Crosswalk by 1 foot, from 20 feet to 21 feet. This measure is needed to mitigate impacts during the midday peak hour. › Widen Crosswalk by 1 foot, from 13 feet to 14 feet. This measure is needed to mitigate impacts during the midday peak hour. › Widen Crosswalk by 2 feet, from 12 feet to 14 feet.
	East	<u>6.9</u>	F	<u>6.8</u>	F	<u>7.4</u>	F	
	West	2.7	F	2.5	F	3.0	F	
Midday Peak Hour								
Lexington Avenue and East 42nd Street	North	13.8	E	12.3	E	13.0	E	<ul style="list-style-type: none"> › Widen Crosswalk by 1 foot, from 20 feet to 21 feet. › Widen Crosswalk by 1 foot, from 13 feet to 14 feet. › Widen Crosswalk by 2 feet, from 12 feet to 14 feet.
	East	<u>6.4</u>	F	<u>6.0</u>	F	<u>6.6</u>	F	
	West	2.3	F	1.8	F	2.3	F	
PM Peak Hour								
Lexington Avenue and East 42nd Street	North	16.3	D	15.4	D	16.3	D	<ul style="list-style-type: none"> › Widen Crosswalk by 1 foot, from 20 feet to 21 feet. This measure is needed to mitigate impacts during the midday peak hour. › Widen Crosswalk by 1 foot, from 13 feet to 14 feet. This measure is needed to mitigate impacts during the midday peak hour. › Widen Crosswalk by 2 feet, from 12 feet to 14 feet.
	East	<u>8.1</u>	<u>E</u>	<u>7.7</u>	F	<u>8.4</u>	<u>E</u>	
	West	2.9	F	2.5	F	3.1	F	

Denotes a significantly impacted movement

Table 16-8 Corner Impact Mitigation Summary

Intersection	Corner	No-Action		With-Action		Mitigation		Mitigation Measures
		Avg Ped Space, SF/P	LOS	Avg Ped Space, SF/P	LOS	Avg Ped Space, SF/P	LOS	
Midday Peak Hour								
Lexington Avenue and East 42nd Street	Northeast	16.3	D	13.9	E	13.9	E	› Unmitigated › Partially Mitigated › Relocate garbage bin to adjacent sidewalk
	Southwest	11.2	E	8.9	E	9.5	E	

Denotes a significantly impacted movement

Crosswalks

Pedestrian impacts were identified at three crosswalks at the intersection of Lexington Avenue and East 42nd Street during the AM, midday, and PM peak hours. The north and east crosswalks would be significantly impacted during midday peak hour, and the west crosswalk would be significantly impacted during the AM, midday, and PM peak hours. The following mitigation measures were identified for this intersection:

- › Restripe the north crosswalk from its existing width of 20 feet to 21 feet. Impacts to the north crosswalk would be mitigated during the midday peak hour.
- › Restripe the east crosswalk from its existing width of 13 feet to 14 feet. Impacts to the east crosswalk would be mitigated during the midday peak hour.
- › Restripe the west crosswalk from its existing width of 12 feet to 14 feet. Impacts to the west crosswalk would be mitigated during the AM, midday, and PM peak hours.

Corners

Pedestrian impacts were identified at two corner elements at the intersection of Lexington Avenue and East 42nd Street during the midday peak hour. The northeast corner could not be mitigated, and the southwest corner could be partially mitigated by relocating an existing garbage bin from the southwest corner to an adjacent sidewalk. This improvement would increase available pedestrian space at this key location but would not be large enough to eliminate the significant adverse impact identified.

Implementation

Implementation of these measures would be performed by the Applicant, subject to review and approval by NYCDOT, except for the relocation of garbage bins. The Applicant would coordinate with the Grand Central Partnership to implement the relocation of the garbage bin and ensure its compliance.

Construction

Traffic

As discussed in **Chapter 15, Construction**, five key intersections were analyzed for potential significant traffic impacts during the construction traffic peak hours. Significant impacts were identified at all five analysis intersections during the AM and PM construction peak hours. Where impacts during construction may occur, measures similar to those recommended in the operational traffic analysis could be implemented early to aid in alleviating congested traffic conditions. Significant impacts to the intersections of East 42nd Street with Third Avenue and with Lexington Avenue, and the intersection of East 43rd Street with Lexington Avenue during the AM and PM peak hours, and the intersection of Lexington Avenue with East 45th Street during the PM peak hour, could not be mitigated under construction conditions, similar to the findings of the operational With-Action conditions.

Pedestrian

As discussed in **Chapter 15, Construction**, construction activities would result in closure of the Lexington Avenue and East 42nd Street sidewalks fronting the Development Site. An assessment of the proposed walkways level of service during construction was performed and compared to the No-Action condition when the sidewalks would be available and determined that construction activities would result in significant pedestrian impacts that could not be mitigated at both sidewalks during the AM and PM peak hours during construction.