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Memorandum

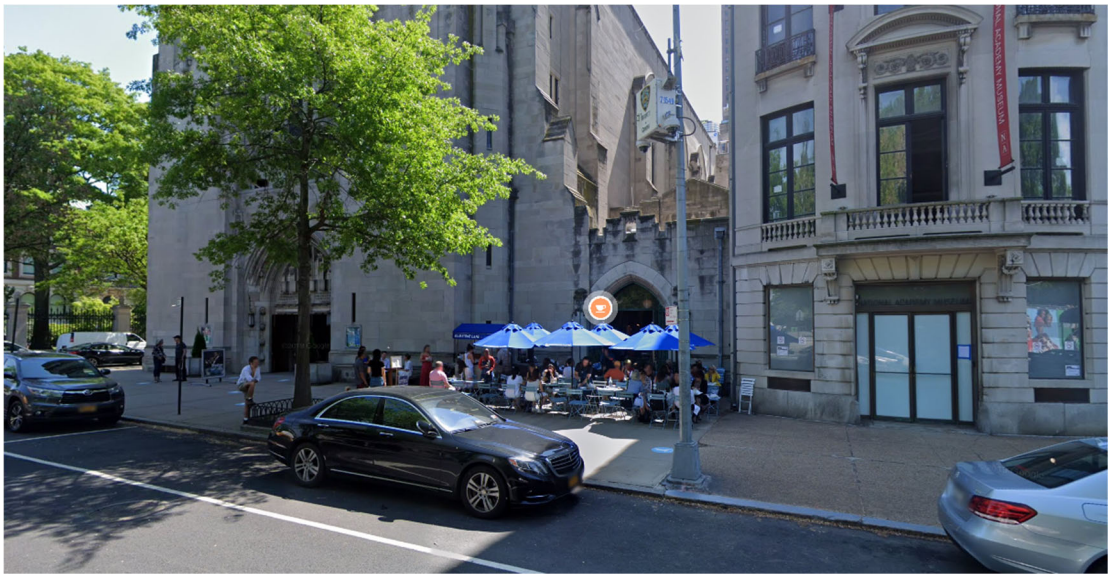
To: Brian Connolly, Zivkovic Connolly Architects PC
From: Aviva Laurenti
Date: November 5, 2020
Re: 1083 Fifth Avenue Pedestrian Assessment
Project No: 20-01-1640

A development site at 1083 Fifth Avenue, in Manhattan, New York, is currently under construction for conversion into a private, single-unit residence. As part of the conversion, new low-wall planters are being proposed along the building frontage on Fifth Avenue. Sam Schwartz Engineering (Sam Schwartz) has been retained by Zivkovic Connolly Architects PC to conduct a sidewalk assessment to determine if the proposed planters would affect/obstruct pedestrian flow on east sidewalk of Fifth Avenue adjacent to the project site. The study concludes that the planters would not adversely affect sidewalk operations.

Study Area

The development site, located at 1083 Fifth Avenue, between East 89th and East 90th Streets in Manhattan, is under construction to be converted into a single-unit residence. The site previously housed one of the three buildings housing the National Academy of Design, which was a publicly accessible museum. To the north of the site are the Church of the Heavenly Rest and the Bluestone Lane Café; the latter typically provides outdoor seating for its patrons, as shown on **Figure 1**. South of the site is a multi-unit residential building; farther south, across East 89th Street, is the Guggenheim Museum, as shown on **Figure 2**. Central Park is located across from the site, on the west side of Fifth Avenue, with pedestrian access at East 90th Street.

Figure 1: 1083 Fifth Avenue, looking northeast



Source: Googlemaps

Figure 2: 1083 Fifth Avenue, looking southeast

Source: Googlemaps

Project Details

The development site, shown in dark gray on **Figure 3**, currently has no planters along the building frontage. The proposed design, shown on **Figure 4**, includes new low-wall planters, extending from the building frontage into the public sidewalk similar to the pattern of permitted architectural embellishments and low greenery commonly found elsewhere along the residential sidewalks of Upper Fifth Avenue. The proposed design is shown in greater detail on **Figure 5**, which illustrates that the proposed low-wall planters would reduce the width of the sidewalk adjacent to 1083 Fifth Avenue by approximately 6.7 feet.

Figure 3: 1083 Fifth Avenue – Existing Conditions

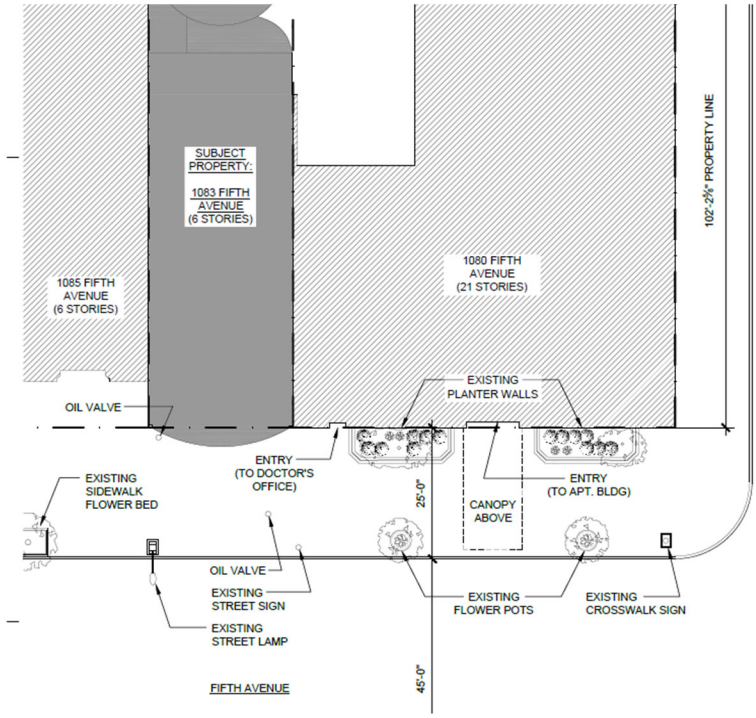


Figure 4: 1083 Fifth Avenue – Proposed Design

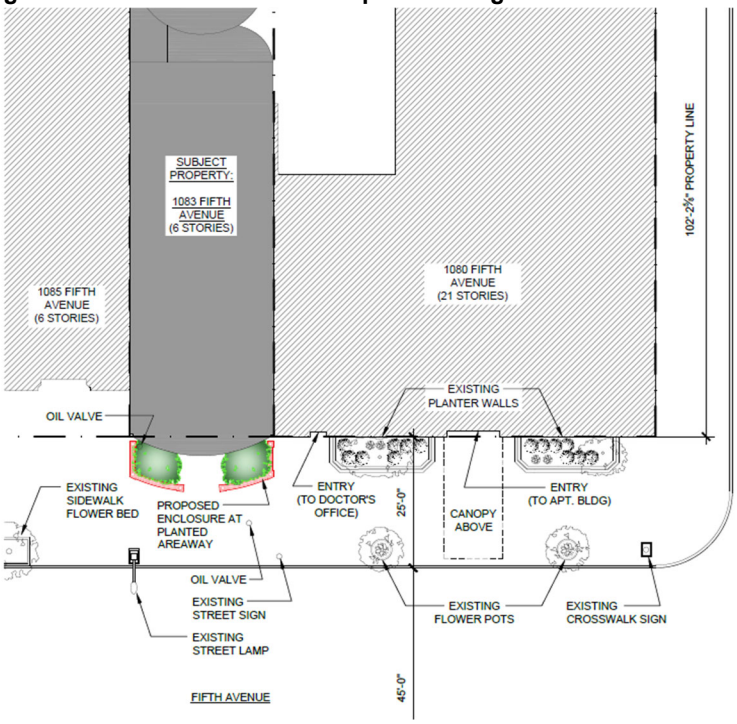
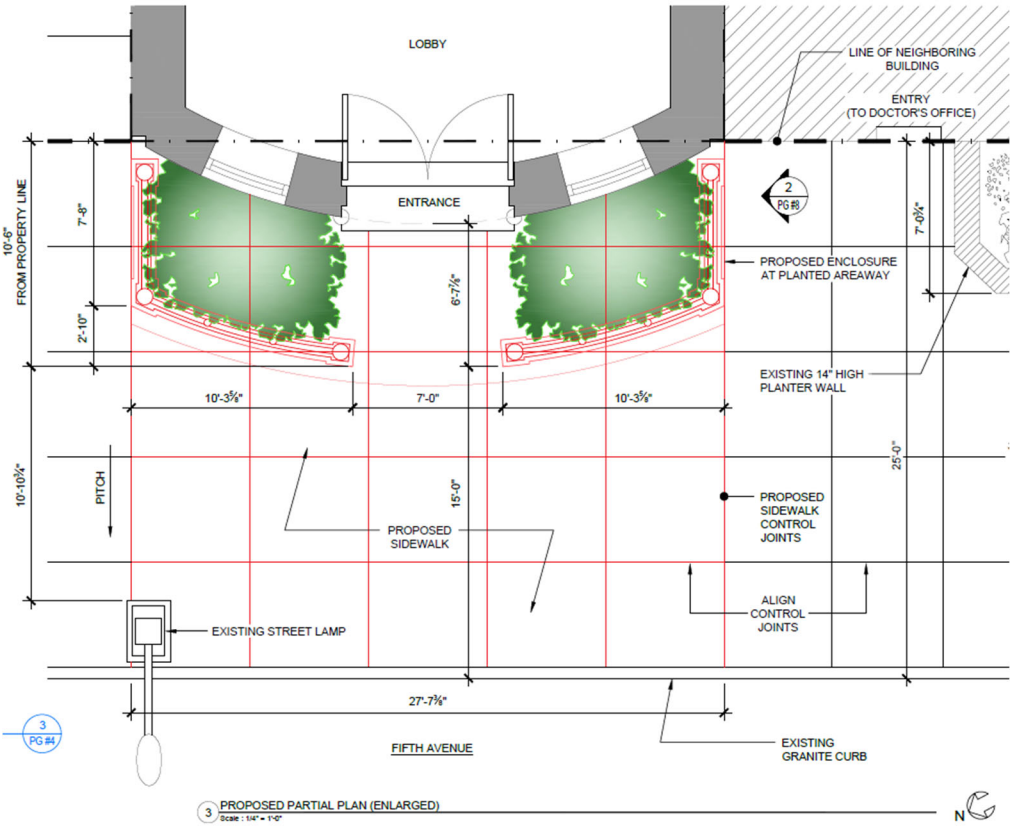


Figure 5: 1083 Fifth Avenue – Proposed Design Details



Analysis Methodology

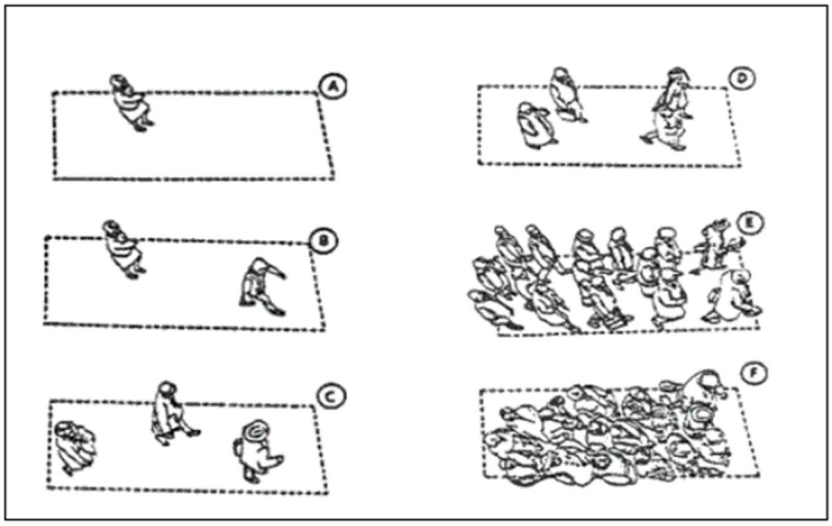
The purpose of this study is to determine if the addition of the low-wall planters at 1083 Fifth Avenue would adversely affect pedestrian flow on the east sidewalk adjacent to the development site. The analysis followed methodologies outlined in the 2010 *Highway Capacity Manual* (2010 *HCM*), pursuant to procedures detailed in the 2014 *City Environmental Quality Review Technical Manual* (*2014 CEQR Technical Manual*). Sidewalk analyses consider pedestrian space, expressed as square feet per pedestrian (SFP), which is an indicator of the quality of pedestrian movement and comfort. The calculation of sidewalk SFP is based on hourly pedestrian volumes by direction, effective sidewalk width, and average walking speed.

- Hourly directional pedestrian volumes are based on counts of the number of pedestrians on a sidewalk walking in either direction
- Effective sidewalk width is the portion of the sidewalk that can used effectively by pedestrians. It is calculated based on the total sidewalk width, reduced to account for any obstructions that may inhibit pedestrian flow, such as street sign poles, planters, trees, etc.
- Average walking speed for pedestrians, as noted in the *2014 CEQR Technical Manual*, is 3.5 feet per second (fps) unless the proportion of elderly and school children represents more than 20 percent of the pedestrian volumes; in which case a walking speed of 3.0 fps should be used.

The calculated SFP are then related to a Level of Service (LOS), which provide a rating for sidewalk operations from A to F. As shown on **Figure 6**, LOS A and B indicate free flow operating conditions with minimal crowding/delay. At LOS C, the number of pedestrians is greater, but congestion is still fairly light. LOS D describes a condition where sidewalk congestion levels are more noticeable. Conditions at LOS E and F reflect congestion and more substantive crowding. The determination of sidewalk LOS is also dependent on whether the pedestrian flow being analyzed is best described as “non-platoon” or “platoon.” Non-platoon flow occurs when pedestrian volume is relatively evenly spaced, whereas platoon flow occurs when pedestrian volumes vary, with surges of volume. Platoon conditions typically occur near bus stops, subway stations, and/or where adjacent crosswalks account for much of the walkway’s pedestrian volume.

The *2014 CEQR Technical Manual* specifies an acceptable LOS C or better for areas outside central business districts (CBD), and mid-LOS D or better in CBD settings.

Figure 6: Pedestrian Level of Service



Source: TRB, 1994

Analysis Inputs

Based on the methodology outlined in the previous section, the following inputs were developed for the pedestrian analyses of the sidewalk adjacent to 1083 Fifth Avenue.

- Hourly directional pedestrian volumes
  - Bidirectional pedestrian volumes were collected on the sidewalk adjacent to the development site in October 2020 during the Weekday AM (7-10 AM), Weekday Midday (MD) (12-3 PM), Weekday PM (4-7 PM), Saturday MD (12-3 PM) peak periods, and Sunday MD (12-3 PM) peak hours. The October 2020 pedestrian sidewalk counts are summarized in the **Appendix**.
  - Due to the potential for the COVID-19 pandemic to reduce pedestrian volumes below typical levels, especially as the Guggenheim Museum is not operating at full capacity, additional data was collected to develop factors to adjust the October 2020 counts to reflect more typical conditions. The New York City Department of Transportation (NYCDOT) has publicly available pedestrian crosswalk counts from October 2019 at the intersections of Fifth Avenue at East 84th and East 96th Streets for the Weekday AM, Weekday PM, and Saturday MD peak periods. These crosswalks were recounted in October 2020 at the same time as the counts collected at 1083 Fifth Avenue. The 2019 and 2020 count data for the crosswalks at East 84th and East 96th Streets were compared to develop adjustment factors that were then applied to the October 2020 sidewalk counts at 1083 Fifth Avenue. The 2019 and adjusted 2020 crosswalk counts are summarized in the **Appendix**. The adjustment factors are shown in **Table 1** and resulted in increases in the 2020 count data during all peak periods with the exception of the Weekday PM peak hour, which was found to be generally consistent between 2019 and 2020.

Table 1: 2020 Adjustment Factors

Weekday AM	1.13
Weekday MD	1.06
Weekday PM	1.00
Saturday MD	1.35
Sunday MD	1.35

  - When collecting the October 2020 count data, it was noted that some pedestrians chose to walk on the west side of Fifth Avenue rather than walk by the Bluestone Lane Café outdoor dining area, possibly to avoid crowding and provide additional social distancing space. Bidirectional counts were therefore also collected for the west sidewalk on Fifth Avenue, between East 89th and East 90th Street. The pedestrian analyses conservatively assumed all sidewalk volumes counted on both the west and east sidewalks would walk on the east sidewalk, assuming that during typical conditions, a portion of pedestrians would not seek additional space for social distancing. The total adjusted 2020 pedestrian volumes used for the analysis are summarized in the **Appendix**. Two-way pedestrian volumes ranged from 887 pedestrians during the Weekday MD peak hour to 1,455 during the Saturday peak hour.
- Effective sidewalk width
  - Field measurements were collected at 1083 Fifth Avenue to determine the total sidewalk width and note the dimensions and locations of any obstructions, which were then used to establish the effective width for the pedestrian analyses. At 1083 Fifth Avenue, the total distance from the building frontage to the curb is 20.5 feet. A light pole and signpost located in front of the building, result in obstructions of 6.2 feet, for a resulting effective width of 14.3 feet.

  - Scaffolding is currently erected outside 1083 Fifth Avenue; obstructions associated with the scaffolding were not included in the field measurements/analyses as they will be removed once construction is complete.
  - The pedestrian analyses consider the existing effective width based on the field measurements and the future effective width, which will be reduced due to the proposed low-wall planters. The sidewalk width would be further reduced by approximately 6.7 feet due to the low-wall planters, as shown in **Figure 5**, for a total effective width of 7.6 feet.
- Average walking speed for pedestrians
  - The average walking speed was assumed at 3.5 fps.
- Pedestrian flow
  - It was assumed that pedestrian flow at the project site is best described as "non-platoon" as pedestrian flows are relatively evenly spaced, with no platooning observed, and the development site is not located near bus stops or subway stations or other generators that would result in surges in pedestrian flow. However, both platoon and non-platoon results have been provided.
- Acceptable LOS
  - It is generally accepted that Manhattan south of 60th Street is considered to experience levels of activity with "central business district" characteristics, whereas north of 60th Street is outside the CBD. As far as pedestrian analysis, the key difference between CBD vs non-CBD is that within the CBD, pedestrians expect higher volumes on the sidewalks and are therefore more willing to accept more crowded conditions, which is why within the CBD the acceptable LOS threshold is mid-LOS D. Outside the CBD, it is expected that sidewalks will be less crowded, which is why the acceptable LOS threshold is LOS C. Although the development site is located on Museum Mile, adjacent to Central Park, where one might expect higher pedestrian volumes, this analysis conservatively assumes that the area is more representative of a non-CBD location and that LOS C is the threshold for acceptable sidewalk operations.

Analysis Results

Based on the inputs described above, the results of the pedestrian analysis indicate that under existing conditions, the sidewalk adjacent to 1083 Fifth Avenue operates at LOS A during all peak hours under non-platoon conditions and LOS B during all peak hours under platoon conditions, as shown in **Table 2**.

Table 2: Existing Sidewalk Operations

Total Width (ft)	Obstruction Width (ft)	Effective Width (ft)	Peak Hour Volume										Non-Platoon Conditions LOS					Platoon Conditions LOS				
			Weekday						Saturday		Sunday		Weekday			Sat	Sun	Weekday			Sat	Sun
			AM		MD		PM		MD		MD											
			NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	AM	MD	PM	MD	MD	AM	MD	PM	MD	MD
20.5	6.2	14.3	449	478	506	381	484	412	800	655	756	649	A	A	A	A	A	B	B	B	B	B

The addition of the low-wall planter would reduce the sidewalk width by an additional 6.7 feet. With a reduction in sidewalk width, the sidewalk adjacent to 1083 Fifth Avenue would operate at LOS A during all peak hours under non-platoon conditions and LOS C or better during all peak hours under platoon conditions, as shown in **Table 3**.

Table 3: Sidewalk Operations with the Low-Wall Planter

Total Width (ft)	Obstruction Width (ft)	Effective Width (ft)	Peak Hour Volume										Non-Platoon Conditions LOS					Platoon Conditions LOS				
			Weekday						Saturday		Sunday		Weekday			Sat	Sun	Weekday			Sat	Sun
			AM		MD		PM		MD		MD											
			NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	AM	MD	PM	MD	MD	AM	MD	PM	MD	MD
13.8	6.2	7.6	449	478	506	381	484	412	800	655	756	649	A	A	A	A	A	C	C	B	C	C

As LOS C is considered acceptable for sidewalk operations outside the CBD according to NYCDOT, the low-wall planters would not adversely affect sidewalk operations at 1083 Fifth Avenue, even if platoon conditions were assumed.

Under non-platoon conditions, the sidewalk could accommodate over 2,000 additional pedestrians per hour before they would operate at worse than LOS C during any peak hour. It is also worth noting that the effective width of the sidewalk north of 1083 Fifth Avenue, adjacent to the Bluestone Lane Café, is narrower than the sidewalk adjacent to 1083 Fifth Avenue due to the cafe seating and a tree planter, even with the addition of the low-wall planters. Therefore, regardless of the addition of the low-wall planters, the sidewalk adjacent to the Bluestone Lane Café would represent the narrowest section of the east sidewalk on Fifth Avenue between East 89th and East 90th Streets.

Additional Considerations

In addition to measurable pedestrian LOS, this study also considered if the low-wall planters would affect pedestrian circulation as it relates to path of travel on the east sidewalk of Fifth Avenue between East 89th and East 90th Streets. Based on observations at the site and other locations in New York City, pedestrians tend to walk in straight lines, opting to travel the shortest path while avoiding other pedestrians and obstructions. The concept of effective width in the 2010 *HCM*, described previously, captures the fact that pedestrians avoid obstructions by subtracting the width of the sidewalk space that is typically not used, such as space adjacent to a building, curb, or light/street pole. Since pedestrians are more likely to be walking towards the middle of the sidewalk to avoid those obstructions, it is unlikely that the proposed low-wall planters would affect the path pedestrians would take to walk on the sidewalk adjacent to 1083 Fifth Avenue. This is particularly true because of the obstructions located on either side of 1083 Fifth Avenue that already influence pedestrian paths on this sidewalk, as shown on **Figures 1 and 2**. To the south, there are planters in front of 1080 Fifth Avenue that shift pedestrians away from the building frontages, and to the north, pedestrians walk towards the middle of the sidewalk to avoid the sidewalk seating at the Bluestone Lane Café, which protrudes farther onto the sidewalk than the planters at 1080 Fifth Avenue or the proposed low-wall planters at 1083 Fifth Avenue. Therefore, it is unlikely that the proposed low-wall planters will affect pedestrian circulation and/or path of travel.

Conclusions

Sam Schwartz conducted a pedestrian analysis of the sidewalk adjacent to 1083 Fifth Avenue to determine if the addition of new low-wall planters along the building frontage would affect pedestrian flow. The planters would narrow the sidewalk by 6.7 feet compared to the existing conditions. Even with a reduction of the sidewalk space available for pedestrians, and conservatively assuming that all pedestrians observed walking on both the east and west sidewalks would be walking on the east sidewalk, it is expected that the sidewalk would continue to operate at LOS A during the Weekday AM, MD, PM, Saturday MD, and Sunday MD peak hours under non-platoon conditions, and at LOS C or better during all peak hours under platoon conditions. Using the criteria for sidewalk operations outside the central business district, typically defined to be south of 60th Street in Manhattan, LOS C is considered acceptable for sidewalk operations. The proposed low-wall planters are also not expected to adversely affect pedestrian circulation and/or path of travel due to the other obstructions that exist to the north and south of 1083 Fifth Avenue. Lastly, the conversion of the property to a single-unit residence will reduce the number of pedestrians generated by the building itself and the likelihood of pedestrian queues outside the building compared to previous operations as a publicly accessible museum. Therefore, the addition of the new low-wall planter would not adversely affect sidewalk operations.

APPENDIX

Development of Pre-Pandemic Adjustment Factors

15-Minute Volumes	Pre=Pandemic Counts Thu, Oct 24, 2019				Current Counts Thu, Oct 15, 2020				
	Fifth Ave / 84th St		Fifth Ave / 96th St		Fifth Ave / 84th St		Fifth Ave / 96th St		
Crosswalk	North	East	East	South	North	East	East	South	
7:00 AM	13	18	39	27	22	29	27	33	
7:15 AM	18	37	70	35	53	37	19	56	
7:30 AM	35	60	83	53	46	52	46	74	
7:45 AM	37	85	116	62	47	55	43	85	
8:00 AM	60	112	118	39	32	65	36	89	
8:15 AM	62	88	87	55	44	107	51	128	
8:30 AM	31	55	107	59	36	90	36	95	
8:45 AM	49	53	88	37	30	50	81	116	
9:00 AM	43	67	120	47	21	34	54	71	
9:15 AM	36	68	74	27	34	46	57	62	
9:30 AM	48	57	87	66	23	49	48	69	
9:45 AM	53	76	71	31	21	54	31	54	
Wkdy AM Peak	***485***	***776***	***1060***	***538***	***409***	***668***	***529***	***932***	***Weekday AM Adjustment Factor***
Period Total	***2859***				***2538***				***1.126***
4:00 PM	57	106	67	66	59	76	60	85	
4:15 PM	48	102	101	43	61	110	78	96	
4:30 PM	40	116	105	75	36	79	57	85	
4:45 PM	38	108	111	63	45	107	87	84	
5:00 PM	44	129	87	45	48	95	74	69	
5:15 PM	47	93	88	52	52	87	94	84	
5:30 PM	71	103	82	46	39	81	56	60	
5:45 PM	38	88	70	47	24	64	72	57	
6:00 PM	34	79	58	41	33	56	64	60	
6:15 PM	19	59	74	41	33	73	43	72	
6:30 PM	23	68	59	24	35	83	54	60	
6:45 PM	12	60	59	13	20	60	39	46	
Wkdy PM Peak	***471***	***1111***	***961***	***556***	***485***	***971***	***778***	***858***	***Weekday PM Adjustment Factor***
Period Total	***3099***				***3092***				***1.002***
	Sat, Oct 26, 2019				Sat, Oct 17, 2020				
	Fifth Ave / 84th St		Fifth Ave / 96th St		Fifth Ave / 84th St		Fifth Ave / 96th St		
Crosswalk	North	East	East	South	North	East	East	South	
12:00 PM	68	143	38	46	51	69	58	29	
12:15 PM	84	131	50	47	56	86	44	25	
12:30 PM	81	143	43	70	64	50	51	70	
12:45 PM	82	160	53	49	33	72	53	29	
1:00 PM	74	126	95	60	56	81	78	62	
1:15 PM	89	137	72	81	76	76	61	28	
1:30 PM	72	142	73	51	44	64	76	40	
1:45 PM	64	120	67	68	59	91	78	48	
2:00 PM	95	150	47	44	43	92	60	58	
2:15 PM	94	159	45	55	64	124	58	57	
2:30 PM	73	174	59	77	72	139	66	66	
2:45 PM	102	220	41	72	92	130	62	60	
Sat MD Peak	***978***	***1805***	***683***	***720***	***710***	***1074***	***745***	***572***	***Saturday MD Adjustment Factor***
Period Total	***4186***				***3101***				***1.350***

Other Adjustment Factors:

Weekday MD Adjustment Factor = Average of Weekday AM & PM Adjustment Factors

= ***1.064***

Sunday MD Adjustment Factor = Saturday MD Adjustment Factor

= ***1.350***

Study Location Sidewalk Volumes

15-Minute Volumes	Current Counts Thu, Oct 15, 2020 Fifth Ave between 89th & 90th St			Adjustment	Pre-Pandemic Counts Oct 2019 Estimate Fifth Ave between 89th & 90th St		
Sidewalk	East	West	Total	Factor	East	West	Total
7:00 AM	28	21	49		32	24	55
7:15 AM	22	50	72		25	56	81
7:30 AM	48	57	105		54	64	118
7:45 AM	100	70	170		113	79	192
8:00 AM	154	82	236		173	92	266
8:15 AM	131	121	252	*1.126*	148	136	284
8:30 AM	62	103	165		70	116	186
8:45 AM	63	93	156		71	105	176
9:00 AM	47	60	107		53	68	121
9:15 AM	41	67	108		46	75	122
9:30 AM	50	100	150		56	113	169
9:45 AM	41	61	102		46	69	115
12:00 PM	92	65	157		98	69	167
12:15 PM	88	99	187		94	105	199
12:30 PM	68	128	196		72	136	209
12:45 PM	60	104	164		64	111	175
1:00 PM	52	108	160		55	115	170
1:15 PM	66	89	155	*1.064*	70	95	165
1:30 PM	72	111	183		77	118	195
1:45 PM	66	78	144		70	83	153
2:00 PM	61	133	194		65	142	206
2:15 PM	82	111	193		87	118	205
2:30 PM	95	159	254		101	169	270
2:45 PM	72	120	192		77	128	204
4:00 PM	78	109	187		78	109	187
4:15 PM	108	135	243		108	135	244
4:30 PM	77	158	235		77	158	236
4:45 PM	97	91	188		97	91	188
5:00 PM	84	144	228		84	144	229
5:15 PM	89	117	206	*1.002*	89	117	206
5:30 PM	75	156	231		75	156	232
5:45 PM	64	155	219		64	155	219
6:00 PM	79	110	189		79	110	189
6:15 PM	93	137	230		93	137	231
6:30 PM	85	89	174		85	89	174
6:45 PM	54	59	113		54	59	113
	Sat, Oct 17, 2020 Fifth Ave between 89th & 90th St			Adjustment	Sat, Oct 17, 2020 Fifth Ave between 89th & 90th St		
Sidewalk	East	West	Total	Factor	East	West	Total
12:00 PM	66	114	180		89	154	243
12:15 PM	83	186	269		112	251	363
12:30 PM	67	114	181		90	154	244
12:45 PM	92	157	249		124	212	336
1:00 PM	83	152	235		112	205	317
1:15 PM	95	158	253	*1.350*	128	213	342
1:30 PM	101	135	236		136	182	319
1:45 PM	84	157	241		113	212	325
2:00 PM	129	152	281		174	205	379
2:15 PM	103	135	238		139	182	321
2:30 PM	80	187	267		108	252	360
2:45 PM	114	178	292		154	240	394
	Sun, Oct 18, 2020 Fifth Ave between 89th & 90th St			Adjustment	Sun, Oct 18, 2020 Fifth Ave between 89th & 90th St		
Sidewalk	East	West	Total	Factor	East	West	Total
12:00 PM	87	115	202		117	155	273
12:15 PM	118	149	267		159	201	360
12:30 PM	83	98	181		112	132	244
12:45 PM	87	121	208		117	163	281
1:00 PM	97	157	254		131	212	343
1:15 PM	79	157	236	*1.350*	107	212	319
1:30 PM	65	147	212		88	198	286
1:45 PM	103	154	257		139	208	347
2:00 PM	121	147	268		163	198	362
2:15 PM	101	148	249		136	200	336
2:30 PM	107	127	234		144	171	316
2:45 PM	109	181	290		147	244	391

Pedestrian volume used for analysis