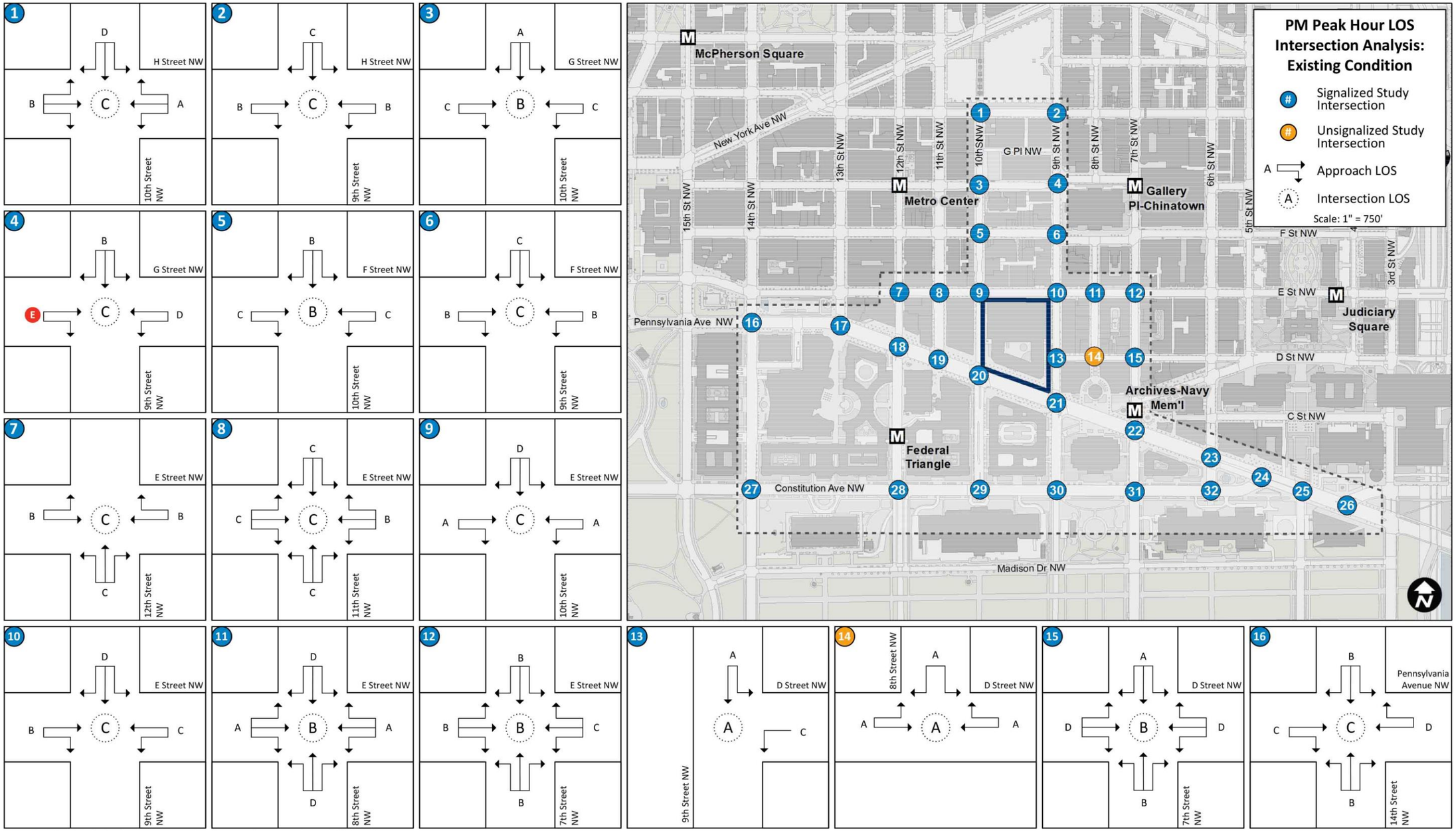
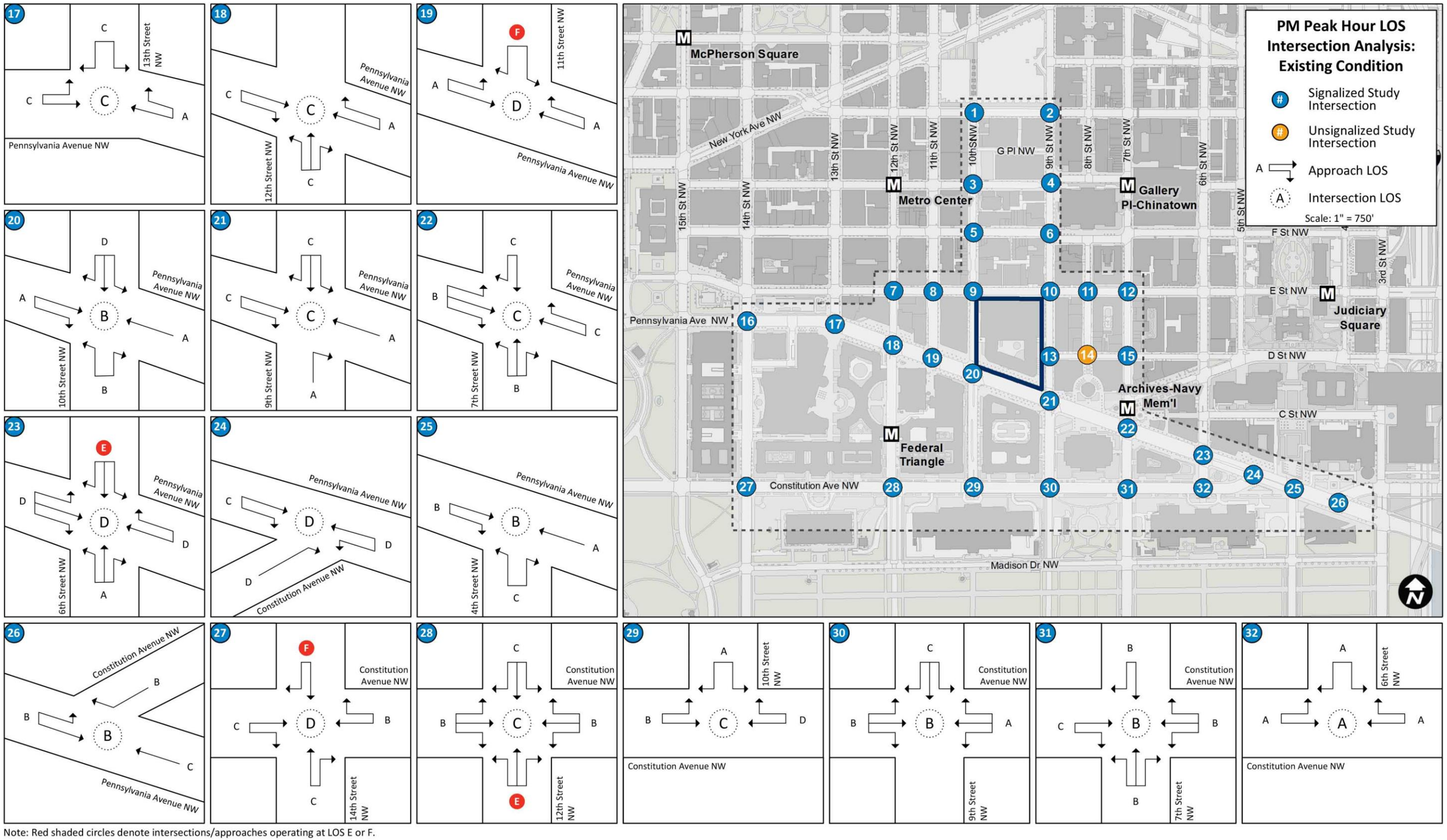
Figure 3-17: Existing Condition Intersection LOS for PM Peak Hour



Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 3-17: Existing Condition Intersection LOS for PM Peak Hour (continued)



Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
1	**10th Street NW & H Street NW (Signalized)**							
	EB (H Street)	LTR	10.5	B		12.4	B	
	Eastbound (H Street)		**10.5**	**B**		**12.4**	**B**	
	WB (H Street)	LTR	2.9	A		4.6	A	
	Westbound (H Street)		**2.9**	**A**		4.6	A	
	SB (10th Street)	LTR	41.3	D		51.5	D	
	Southbound (10th Street)		**41.3**	**D**		51.5	D	
	Overall		**13.3**	**B**	**Pass**	**20.1**	**C**	**Pass**
2	**9th Street NW & H Street NW (Signalized)**							
	EB (H Street)	TR	11.8	B		12.1	B	
	Eastbound (H Street)		**11.8**	**B**		**12.1**	**B**	
	WB (H Street)	LT	19.1	B		15.8	B	
	Westbound (H Street)		**19.1**	**B**		**15.8**	**B**	
	SB (9th Street)	LT	25.1	C		32.5	C	
	SB (9th Street)	R	4.5	A		5.9	A	
	Southbound (9th Street)		**22.9**	**C**		**30.9**	**C**	
	Overall		**19.4**	**B**	**Pass**	**21.6**	**C**	**Pass**
3	**10th Street NW & G Street NW (Signalized)**							
	EB (G Street)	TR	18.0	B		27.8	C	
	Eastbound (G Street)		**18.0**	**B**		**27.8**	**C**	
	WB (G Street)	LT	10.4	B		24.5	C	
	Westbound (G Street)		**10.4**	**B**		**24.5**	**C**	
	SB (10th Street)	LTR	14.0	B		9.2	A	
	Southbound (10th Street)		**14.0**	**B**		**9.2**	**A**	
	Overall		**14.3**	**B**	**Pass**	**18.0**	**B**	**Pass**
4	**9th Street NW & G Street NW (Signalized)**							
	EB (G Street)	TR	13.7	B		72.5	E	
	Eastbound (G Street)		**13.7**	**B**		**72.5**	**E**	
	WB (G Street)	L	43.0	D		45.0	D	
	WB (G Street)	T	47.4	D		44.0	D	
	Westbound (G Street)		**46.0**	**D**		**44.5**	**D**	
	SB (9th Street)	LT	9.1	A		16.1	B	
	SB (9th Street)	R	0.6	A		1.7	A	
	Southbound (9th Street)		**8.7**	**A**		**14.5**	**B**	
	Overall		**12.6**	**B**	**Pass**	**28.1**	**C**	**Pass**
5	**10th Street NW & F Street NW (Signalized)**							
	EB (F Street)	TR	12.0	B		24.0	C	
	Eastbound (F Street)		**12.0**	**B**		**24.0**	**C**	
	WB (F Street)	LT	9.1	A		21.4	C	
	Westbound (F Street)		**9.1**	**A**		**21.4**	**C**	
	SB (10th Street)	LTR	15.2	B		11.2	B	
	Southbound (10th Street)		**15.2**	**B**		**11.2**	**B**	
	Overall		**12.2**	**B**	**Pass**	**17.6**	**B**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
6	**9th Street NW & F Street NW (Signalized)**							
	EB (F Street)	TR	13.1	B		14.1	B	
	Eastbound (F Street)		**13.1**	**B**		**14.1**	**B**	
	WB (F Street)	LT	18.6	B		19.4	B	
	Westbound (F Street)		**18.6**	**B**		**19.4**	**B**	
	SB (9th Street)	LTR	6.9	A		25.5	C	
	Southbound (9th Street)		**6.9**	**A**		**25.5**	**C**	
	Overall		**9.5**	**A**	**Pass**	**21.9**	**C**	**Pass**
7	**12th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	18.6	B		15.7	B	
	EB (E Street)	T	15.4	B		14.6	B	
	Eastbound (E Street)		**16.7**	**B**		**14.9**	**B**	
	WB (E Street)	TR	20.4	C		12.8	B	
	Westbound (E Street)		**20.4**	**C**		**12.8**	**B**	
	NB (12th Street)	LTR	21.5	C		31.2	C	
	Northbound (12th Street)		**21.5**	**C**		**31.2**	**C**	
	Overall		**20.9**	**C**	**Pass**	**25.7**	**C**	**Pass**
8	**11th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	10.5	B		20.9	C	
	EB (E Street)	T	18.7	B		26.3	C	
	EB (E Street)	R	9.9	A		20.9	C	
	Eastbound (E Street)		**17.1**	**B**		**25.4**	**C**	
	WB (E Street)	L	6.3	A		16.6	B	
	WB (E Street)	T	8.0	A		21.7	C	
	WB (E Street)	R	3.5	A		14.5	B	
	Westbound (E Street)		**6.7**	**A**		**19.4**	**B**	
	NB (11th Street)	LT	15.4	B		30.3	C	
	NB (11th Street)	R	12.4	B		17.2	B	
	Northbound (11th Street)		**14.6**	**B**		**27.2**	**C**	
	SB (11th Street)	LT	22.3	C		29.3	C	
	SB (11th Street)	R	5.8	A		20.5	C	
	Southbound (11th Street)		**18.9**	**B**		**27.9**	**C**	
	Overall		**14.6**	**B**	**Pass**	**25.6**	**C**	**Pass**
9	**10th Street NW & E Street NW (Signalized)**							
	EB (E Street)	T	11.5	B		5.2	A	
	EB (E Street)	R	4.8	A		1.9	A	
	Eastbound (E Street)		**8.6**	**A**		**4.3**	**A**	
	WB (E Street)	L	2.8	A		1.3	A	
	WB (E Street)	T	3.0	A		1.5	A	
	Westbound (E Street)		**3.0**	**A**		**1.4**	**A**	
	SB (10th Street)	LTR	18.9	B		45.7	D	
	Southbound (9th Street)		**18.9**	**B**		**45.7**	**D**	
	Overall		**8.7**	**A**	**Pass**	**23.5**	**C**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
10	**9th Street NW & E Street NW (Signalized)**							
	EB (E Street)	T	14.4	B		16.6	B	
	EB (E Street)	R	8.1	A		13.6	B	
	Eastbound (E Street)		**12.8**	**B**		**15.5**	**B**	
	WB (E Street)	L	18.6	B		21.1	C	
	WB (E Street)	T	25.1	C		23.4	C	
	Westbound (E Street)		**24.3**	**C**		**22.8**	**C**	
	SB (9th Street)	LTR	8.2	A		36.5	D	
	Southbound (9th Street)		**8.2**	**A**		**36.5**	**D**	
	Overall		**12.2**	**B**	**Pass**	**29.2**	**C**	**Pass**
11	**8th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	8.0	A		2.4	A	
	EB (E Street)	T	10.3	B		3.2	A	
	EB (E Street)	R	5.0	A		0.4	A	
	Eastbound (E Street)		**8.8**	**A**		**2.9**	**A**	
	WB (E Street)	L	5.4	A		3.1	A	
	WB (E Street)	T	6.2	A		3.5	A	
	WB (E Street)	R	0.9	A		0.5	A	
	Westbound (E Street)		**5.7**	**A**		**3.3**	**A**	
	NB (8th Street)	LTR	39.6	D		42.6	D	
	Northbound (8th Street)		**39.6**	**D**		**42.6**	**D**	
	SB (8th Street)	LTR	28.7	C		41.3	D	
	Southbound (8th Street)		**28.7**	**C**		**41.3**	**D**	
	Overall		**13.8**	**B**	**Pass**	**13.5**	**B**	**Pass**
12	**7th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	20.3	C		13.0	B	
	EB (E Street)	T	23.3	C		17.1	B	
	EB (E Street)	R	9.3	A		9.8	A	
	Eastbound (E Street)		**21.5**	**C**		**14.8**	**B**	
	WB (E Street)	L	15.4	B		21.3	C	
	WB (E Street)	T	20.7	C		25.5	C	
	WB (E Street)	R	7.2	A		13.8	B	
	Westbound (E Street)		**19.2**	**B**		**23.4**	**C**	
	NB (7th Street)	LT	18.7	B		18.7	B	
	NB (7th Street)	R	8.9	A		14.3	B	
	Northbound (7th Street)		**17.2**	**B**		**18.2**	**B**	
	SB (7th Street)	LTR	18.4	B		17.8	B	
	Southbound (7th Street)		**18.4**	**B**		**17.8**	**B**	
	Overall		**18.6**	**B**	**Pass**	**18.8**	**B**	**Pass**
13	**9th Street NW & D Street NW (Signalized)**							
	WB (D Street)	L	20.3	C		26.0	C	
	Westbound (D Street)		**20.3**	**C**		**26.0**	**C**	
	SB (9th Street)	LT	5.3	A		5.7	A	
	Southbound (9th Street)		**5.3**	**A**		**5.7**	**A**	
	Overall		**7.7**	**A**	**Pass**	**8.3**	**A**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
14	**8th Street NW & D Street NW (AWSC)**							
	EB (D Street)	LT	7.8	A		8.0	A	
	Eastbound (D Street)		**7.8**	**A**		**8.0**	**A**	
	WB (D Street)	TR	8.2	A		8.6	A	
	Westbound (D Street)		**8.2**	**A**		**8.6**	**A**	
	SB (8th Street)	LR	8.3	A		8.2	A	
	Southbound (8th Street)		**8.3**	**A**		**8.2**	**A**	
	Overall		**8.2**	**A**	**Pass**	**8.4**	**A**	**Pass**
15	**7th Street NW & D Street NW (Signalized)**							
	EB (D Street)	LTR	27.0	C		38.2	D	
	Eastbound (D Street)		**27.0**	**C**		**38.2**	**D**	
	WB (D Street)	LTR	35.9	D		36.8	D	
	Westbound (D Street)		**35.9**	**D**		**36.8**	**D**	
	NB (7th Street)	LTR	32.7	C		15.3	B	
	Northbound (7th Street)		**32.7**	**C**		**15.3**	**B**	
	SB (7th Street)	LTR	1.5	A		4.4	A	
	Southbound (7th Street)		**1.5**	**A**		**4.4**	**A**	
	Overall		**26.1**	**C**	**Pass**	**16.8**	**B**	**Pass**
16	**14th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	29.7	C		32.2	C	
	Eastbound (Pennsylvania Ave)		**29.7**	**C**		**32.2**	**C**	
	WB (Pennsylvania Ave)	T	36.4	D		45.6	D	
	WB (Pennsylvania Ave)	R	27.9	C		35.6	D	
	Westbound (Pennsylvania Ave)		**34.4**	**C**		**43.4**	**D**	
	NB (14th Street)	L	25.8	C		52.9	D	
	NB (14th Street)	TR	32.7	C		16.8	B	
	Northbound (14th Street)		**32.5**	**C**		**18.7**	**B**	
	SB (14th Street)	LTR	11.8	B		14.4	B	
	Southbound (14th Street)		**11.8**	**B**		**14.4**	**B**	
	Overall		**27.3**	**C**	**Pass**	**21.7**	**C**	**Pass**
17	**13th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	60.0	E		35.9	D	
	EB (Pennsylvania Ave)	T	52.8	D		34.3	C	
	Eastbound (Pennsylvania Ave)		**55.9**	**E**		**34.9**	**C**	
	WB (Pennsylvania Ave)	T	23.7	C		7.5	A	
	WB (Pennsylvania Ave)	R	24.7	C		7.5	A	
	Westbound (Pennsylvania Ave)		**24.1**	**C**		**7.5**	**A**	
	SB (13th Street)	L	35.3	D		40.0	D	
	SB (13th Street)	R	11.2	B		9.8	A	
	Southbound (13th Street)		**30.9**	**C**		**32.8**	**C**	
	Overall		**36.0**	**D**	**Pass**	**23.9**	**C**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
18	**12th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	39.1	D		26.9	C	
	Eastbound (Pennsylvania Ave)		**39.1**	**D**		**26.9**	**C**	
	WB (Pennsylvania Ave)	T	8.4	A		5.1	A	
	WB (Pennsylvania Ave)	R	24.1	C		10.3	B	
	Westbound (Pennsylvania Ave)		**13.6**	**B**		**6.3**	**A**	
	NB (12th Street)	LTR	23.9	C		26.2	C	
	Northbound (12th Street)		**23.9**	**C**		**26.2**	**C**	
	Overall		**23.7**	**C**	**Pass**	**20.3**	**C**	**Pass**
19	**11th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	84.3	F		58.0	E	
	EB (Pennsylvania Ave)	T	6.2	A		2.6	A	
	Eastbound (Pennsylvania Ave)		**26.3**	**C**		**7.9**	**A**	
	WB (Pennsylvania Ave)	T	7.8	A		3.5	A	
	WB (Pennsylvania Ave)	R	72.3	E		10.7	B	
	Westbound (Pennsylvania Ave)		**29.2**	**C**		**5.1**	**A**	
	SB (11th Street)	L	29.6	C		178.0	F	
	SB (11th Street)	R	5.7	A		16.9	B	
	Southbound (11th Street)		**22.3**	**C**		**136.8**	**F**	
	Overall		**27.4**	**C**	**Pass**	**42.6**	**D**	**Pass**
20	**10th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	2.7	A		7.4	A	
	Eastbound (Pennsylvania Ave)		**2.7**	**A**		**7.4**	**A**	
	WB (Pennsylvania Ave)	T	3.7	A		8.2	A	
	Westbound (Pennsylvania Ave)		**3.7**	**A**		**8.2**	**A**	
	NB (10th Street)	L	97.9	F		31.5	C	
	NB (10th Street)	R	24.6	C		5.1	A	
	Northbound (10th Street)		**77.3**	**E**		**14.3**	**B**	
	SB (10th Street)	LT	33.7	C		40.9	D	
	SB (10th Street)	R	6.3	A		16.2	B	
	Southbound (10th Street)		**26.8**	**C**		**36.6**	**D**	
	Overall		**15.2**	**B**	**Pass**	**15.1**	**B**	**Pass**
21	**9th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	7.3	A		27.5	C	
	EB (Pennsylvania Ave)	R	12.3	B		43.3	D	
	Eastbound (Pennsylvania Ave)		**8.3**	**A**		**31.2**	**C**	
	WB (Pennsylvania Ave)	T	6.2	A		5.8	A	
	Westbound (Pennsylvania Ave)		**6.2**	**A**		**5.8**	**A**	
	NB (9th Street)	R	20.3	C		4.6	A	
	Northbound (9th Street)		**20.3**	**C**		**4.6**	**A**	
	SB (9th Street)	LTR	17.8	B		21.2	C	
	Southbound (9th Street)		**17.8**	**B**		**21.2**	**C**	
	Overall		**11.2**	**B**	**Pass**	**21.4**	**C**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
22	**7th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	147.4	F		85.4	F	
	EB (Pennsylvania Ave)	TR	27.6	C		12.9	B	
	Eastbound (Pennsylvania Ave)		**49.8**	**D**		**19.5**	**B**	
	WB (Pennsylvania Ave)	T	36.6	D		20.7	C	
	WB (Pennsylvania Ave)	R	40.9	D		49.3	D	
	Westbound (Pennsylvania Ave)		**37.2**	**D**		**27.7**	**C**	
	NB (7th Street)	L	79.3	E		66.4	E	
	NB (7th Street)	TR	14.0	B		8.3	A	
	Northbound (7th Street)		**29.6**	**C**		**17.2**	**B**	
	SB (7th Street)	TR	30.5	C		25.0	C	
	Southbound (7th Street)		**30.5**	**C**		**25.0**	**C**	
	Overall		**38.2**	**D**	**Pass**	**21.9**	**C**	**Pass**
23	**6th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	62.0	E		38.1	D	
	EB (Pennsylvania Ave)	TR	23.9	C		49.6	D	
	Eastbound (Pennsylvania Ave)		**28.4**	**C**		**49.0**	**D**	
	WB (Pennsylvania Ave)	T	3.9	A		35.2	D	
	WB (Pennsylvania Ave)	R	7.4	A		39.6	D	
	Westbound (Pennsylvania Ave)		**4.7**	**A**		**36.1**	**D**	
	NB (6th Street)	LTR	15.3	B		4.8	A	
	Northbound (6th Street)		**15.3**	**B**		**4.8**	**A**	
	SB (6th Street)	LTR	30.3	C		78.0	E	
	Southbound (6th Street)		**30.3**	**C**		**78.0**	**E**	
	Overall		**16.5**	**B**	**Pass**	**49.7**	**D**	**Pass**
24	**Constitution (WB) Avenue NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	T	2.6	A		31.0	C	
	EB (Pennsylvania Ave)	R	1.0	A		23.0	C	
	Eastbound (Pennsylvania Ave)		**2.6**	**A**		**30.9**	**C**	
	WB (Pennsylvania Ave)	L	21.7	C		61.8	E	
	WB (Pennsylvania Ave)	T	32.1	C		6.3	A	
	Westbound (Pennsylvania Ave)		**27.4**	**C**		**37.5**	**D**	
	NB (Constitution Ave)	R	15.6	B		43.9	D	
	Northbound (Constitution Ave)		**15.6**	**B**		**43.9**	**D**	
	Overall		**19.8**	**B**	**Pass**	**37.1**	**D**	**Pass**
25	**4th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	7.9	A		15.0	B	
	Eastbound (Pennsylvania Ave)		**7.9**	**A**		**15.0**	**B**	
	WB (Pennsylvania Ave)	T	6.8	A		7.9	A	
	Westbound (Pennsylvania Ave)		**6.8**	**A**		**7.9**	**A**	
	NB (4th Street)	L	35.8	D		32.6	C	
	NB (4th Street)	R	9.7	A		24.4	C	
	Northbound (4th Street)		**28.4**	**C**		**29.8**	**C**	
	Overall		**9.9**	**A**	**Pass**	**14.1**	**B**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
26	**Constitution (EB) Avenue NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	6.6	A		15.6	B	
	EB (Pennsylvania Ave)	T	42.2	D		21.2	C	
	Eastbound (Pennsylvania Ave)		**13.4**	**B**		**17.0**	**B**	
	WB (Pennsylvania Ave)	T	22.5	C		23.2	C	
	Westbound (Pennsylvania Ave)		**22.5**	**C**		**23.2**	**C**	
	SB (Constitution Ave)	R	21.7	C		18.8	B	
	Southbound (Constitution Ave)		**21.7**	**C**		**18.8**	**B**	
	Overall		**18.0**	**B**	**Pass**	**17.9**	**B**	**Pass**
27	**14th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	TR	28.1	C		28.4	C	
	Eastbound (Constitution Ave)		**28.1**	**C**		**28.4**	**C**	
	WB (Constitution Ave)	TR	31.4	C		18.9	B	
	Westbound (Constitution Ave)		**31.4**	**C**		**18.9**	**B**	
	NB (14th Street)	TR	23.2	C		20.8	C	
	Northbound (14th Street)		**23.2**	**C**		**20.8**	**C**	
	SB (14th Street)	TR	9.2	A		111.8	F	
	Southbound (14th Street)		**9.2**	**A**		**111.8**	**F**	
	Overall		**24.0**	**C**	**Pass**	**54.7**	**D**	**Pass**
28	**12th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	L	37.9	D		14.8	B	
	EB (Constitution Ave)	TR	4.3	A		12.5	B	
	Eastbound (Constitution Ave)		**10.1**	**B**		**12.7**	**B**	
	WB (Constitution Ave)	LTR	39.9	D		16.7	B	
	Westbound (Constitution Ave)		**39.9**	**D**		**16.7**	**B**	
	NB (12th Street)	LTR	74.7	E		56.4	E	
	Northbound (12th Street)		**74.7**	**E**		**56.4**	**E**	
	SB (12th Street)	LT	13.8	B		29.2	C	
	SB (12th Street)	R	8.5	A		11.4	B	
	Southbound (12th Street)		**10.4**	**B**		**20.5**	**C**	
	Overall		**45.0**	**D**	**Pass**	**27.4**	**C**	**Pass**
29	**10th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	LT	16.0	B		11.0	B	
	Eastbound (Constitution Ave)		**16.0**	**B**		**11.0**	**B**	
	WB (Constitution Ave)	TR	8.6	A		43.8	D	
	Westbound (Constitution Ave)		**8.6**	**A**		**43.8**	**D**	
	SB (10th Street)	L	32.6	C		18.1	B	
	SB (10th Street)	R	16.9	B		4.2	A	
	Southbound (10th Street)		**20.9**	**C**		**6.0**	**A**	
	Overall		**13.6**	**B**	**Pass**	**24.5**	**C**	**Pass**

Table 3-44: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
30	**9th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	LTR	34.2	C		19.1	B	
	Eastbound (Constitution Ave)		**34.2**	**C**		**19.1**	**B**	
	WB (Constitution Ave)	LTR	5.5	A		5.9	A	
	Westbound (Constitution Ave)		**5.5**	**A**		**5.9**	**A**	
	SB (9th Street)	LT	38.4	D		26.6	C	
	SB (9th Street)	R	15.3	B		10.7	B	
	Southbound (9th Street)		**35.6**	**D**		**24.4**	**C**	
	Overall		**26.0**	**C**	**Pass**	**17.8**	**B**	**Pass**
31	**7th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	TR	19.6	B		22.5	C	
	Eastbound (Constitution Ave)		**19.6**	**B**		**22.5**	**C**	
	WB (Constitution Ave)	LTR	15.8	B		12.7	B	
	Westbound (Constitution Ave)		**15.8**	**B**		**12.7**	**B**	
	NB (7th Street)	L	21.9	C		19.6	B	
	NB (7th Street)	TR	18.4	B		18.9	B	
	Northbound (7th Street)		**19.0**	**B**		**19.0**	**B**	
	SB (7th Street)	TR	11.2	B		19.4	B	
	Southbound (7th Street)		**11.2**	**B**		**19.4**	**B**	
	Overall		**17.6**	**B**	**Pass**	**17.8**	**B**	**Pass**
32	**6th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	L	71.7	E		20.1	C	
	EB (Constitution Ave)	LT	30.8	C		3.1	A	
	Eastbound (Constitution Ave)		**41.2**	**D**		**7.2**	**A**	
	WB (Constitution Ave)	TR	54.0	D		7.2	A	
	Westbound (Constitution Ave)		**54.0**	**D**		**7.2**	**A**	
	SB (6th Street)	L	18.1	B		12.7	B	
	SB (6th Street)	R	0.2	A		1.4	A	
	Southbound (6th Street)		**2.7**	**A**		**2.1**	**A**	
	Overall		**42.8**	**D**	**Pass**	**6.0**	**A**	**Pass**

Notes:

AWSC = All-Way STOP-Controlled intersection

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LOS = Level of Service

LTR = left / through / right lanes

Delay is measured in Seconds Per Vehicle.

Red cells denote intersections or approaches operating at unacceptable conditions.

3.7.5 Existing Condition Intersection Queuing Analysis

Observations taken during the week of February 9, 2015, in the study area surrounding the existing JEH parcel in downtown Washington, D.C., noted queuing on many blocks during both the AM and PM peak hours. While queueing was noted along many blocks, most of these queues cleared with the signal cycles controlling the adjacent intersections. However, there were a few points to note with significant queuing that did not clear with the signal cycles. During the AM peak hour, northbound 12th Street operated as a continuous queue from the ramps exiting I-395 and through the Constitution Avenue and Pennsylvania Avenue intersections, dissipating after E Street. During the PM peak hour, southbound 9th Street operated as a continuous queue from G Street through Pennsylvania Avenue to Constitution Avenue.

Synchro™ was used to calculate both the 50th and 95th percentile queue lengths, and SimTraffic™ was used to calculate the 95th percentile queue lengths. Because the SimTraffic™ simulations are unable to accurately portray vehicle conflicts with pedestrians along the Pennsylvania Avenue and Constitution Avenue corridors, one simulation was created and reported, but the Synchro 95th percent queue values provide a more accurate measure of the potential queue. Based on the Synchro™ and SimTraffic™ analysis, the following signalized intersection approaches experience failing queue lengths in either Synchro™ or SimTraffic™. The lane group within the approach that is operating under unacceptable conditions is noted in parentheses.

- 10th Street NW and H Street NW (Intersection #1)
    - Southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and H Street NW (Intersection #2)
    - Southbound 9th Street (all movements) during the PM peak hour
- 10th Street NW and G Street NW (Intersection #3)
    - Eastbound G Street (through and right movements), westbound G Street (through and left movements) and southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and G Street NW (Intersection #4)
    - Eastbound G Street (through and right movements), westbound G Street (through movements) and southbound 9th Street (right turns) during the PM peak hour
- 10th Street NW and F Street NW (Intersection #5)
    - Eastbound F Street (through and right movements) and southbound 10th Street (all lane movements) during the PM peak hour
- 9th Street NW and F Street NW (Intersection #6)
    - Southbound 9th Street (all movements) during the PM peak hour
- 12th Street NW and E Street NW (Intersection #7)
    - Westbound E Street (through and right movements) during the AM peak hour
- 11th Street NW and E Street NW (Intersection #8)
    - Eastbound on E Street (through and right movements) and southbound on 11th Street (all movements) during the PM peak hour
    - Westbound on E Street (right turns) during AM and PM peak hour
- 10th Street NW and E Street NW (Intersection #9)
    - Eastbound E Street (all movements) during the PM peak hour and right turns during the AM peak hour
    - Southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and E Street NW (Intersection #10)
    - Eastbound E Street (right turns), westbound E Street (through and left movements) and southbound 9th Street (all movements) during the PM peak hour
    - Westbound E Street (left turns) during the AM peak hour
- 8th Street NW and E Street NW (Intersection #11)

    - Eastbound E Street (right turns) during AM peak hour and westbound E Street (right turns) during the AM and PM peak hour
- 7th Street NW and E Street NW (Intersection #12)
    - Eastbound E Street (right turns) and westbound E Street (right turns) during the AM peak hour
    - Eastbound E Street (right turns), westbound E Street (left and right turns) and northbound 7th Street (right turns) during the PM peak hour
- 7th Street NW and D Street NW (Intersection #15)
    - Northbound 7th Street (all movements) during the AM peak hour
- 14th Street NW and Pennsylvania Avenue NW (Intersection #16)
    - Eastbound Pennsylvania Avenue (through and right movements), westbound Pennsylvania Avenue (through movements) and northbound 14th Street (left turns) during the PM peak hour
- 13th Street NW and Pennsylvania Avenue NW (Intersection #17)
    - Eastbound Pennsylvania Avenue (through movements) during the AM peak hour
    - Southbound 13th Street (left and right turns) during the PM peak hour
- 12th Street NW and Pennsylvania Avenue NW (Intersection #18)
    - Eastbound Pennsylvania Avenue (through and right movements) during AM and PM peak hour
- 11th Street NW and Pennsylvania Avenue NW (Intersection #19)
    - Eastbound Pennsylvania Avenue (left turns) and westbound Pennsylvania Avenue (right turns) during the AM peak hour, and southbound 11th Street (left turns) during the PM peak hour
- 10th Street NW and Pennsylvania Avenue NW (Intersection #20)
    - Northbound 10th Street (left turns) and southbound 10th Street (right turns) during the AM peak hour
    - Southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and Pennsylvania Avenue NW (Intersection #21)
    - Southbound 9th Street (all movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (right turns) and southbound 9th Street (all movements) during the PM peak hour
- 7th Street NW and Pennsylvania Avenue NW (Intersection #22)
    - Eastbound Pennsylvania Avenue (left turns), northbound 7th Street (left turns) and southbound 7th Street (through and right movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (left turns), westbound Pennsylvania Avenue (right turns), northbound 7th Street (left turns) and southbound 7th Street (through and right movements) during the PM peak hour
- 6th Street NW and Pennsylvania Avenue NW (Intersection #23)
    - Northbound 6th Street (all movements) during both the AM and PM peak hour
    - Southbound 6th Street (all movements) during the PM peak hour
- Constitution (WB) Avenue NW and Pennsylvania Avenue NW (Intersection #24)
    - Westbound Pennsylvania Avenue (through movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (through movements) and westbound Pennsylvania Avenue (left turns) during the PM peak hour
- 4th Street NW and Pennsylvania Avenue NW (Intersection #25)
    - Northbound 4th Street (left turns) during the AM and PM peak hour
    - Westbound Pennsylvania Avenue (through movements) during the PM peak hour
- Constitution (EB) Avenue NW and Pennsylvania Avenue NW (Intersection #26)
    - Southbound Constitution Ave (right turns) during the AM and PM peak hour
- 14th Street NW and Constitution Avenue NW (Intersection #27)
    - Eastbound Constitution Avenue (through movements) during the AM and PM peak hour

    - Eastbound Constitution Avenue (through and right movements) and southbound 14th Street (through and right movements) during the PM peak hour
- 12th Street NW and Constitution Avenue NW (Intersection #28)
    - Eastbound Constitution Avenue (left turns) and northbound 12th Street (all lane movements) during the AM peak hour
    - Eastbound Constitution Avenue (through and right movements) and northbound 12th Street (all lane movements) during the PM peak hour
- 9th Street NW and Constitution Avenue NW (Intersection #30)
    - Eastbound Constitution Avenue (all lane movements) and southbound 9th Street (left and through movements) during the PM peak hour
- 6th Street NW and Constitution Avenue NW (Intersection #32)
    - Eastbound Constitution Avenue (left turns) and westbound Constitution Avenue (through and right movements) during the AM peak hour
    - Westbound Constitution Avenue (through and right movements) and southbound 6th Street (right turns) during the PM peak hour

The one unsignalized intersection does not experience failing queue lengths on approaches for the 95th percentile in Synchro™. The remaining signalized intersections in the study area would also have acceptable queue lengths.

Complete Intersection Queuing Analysis

Based on the Synchro™ and SimTraffic™ analysis, 28 signalized intersections would experience queuing lengths that would exceed the available storage capacity. The remaining intersections in the study area would provide sufficient storage for the anticipated demand. The results of the Existing Condition queuing analysis for both signalized and unsignalized intersections are presented in table 3-45. Note that the percentile values are expressed in feet, and a car occupies about 25 linear feet of roadway, including the space between cars.

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet) Synchro	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet) Synchro	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
1	**10th Street NW & H Street NW**								
	EB (H Street)	LTR	264	74	99	92.0	101	129	264
	WB (H Street)	LTR	504	10	17	85	11	24	360
	SB (10th Street)	LTR	534	146	233	195	221	#335	#686
2	**9th Street NW & H Street NW**								
	EB (H Street)	TR	504	27	40	58	72	86	134
	WB (H Street)	LT	570	62	86	107	29	45	463
	SB (9th Street)	LT	333	209	271	275	284	362	#389
	SB (9th Street)	R	333	0	31	32	0	27	#364
3	**10th Street NW & G Street NW**								
	EB (G Street)	TR	283	57	104	75	153	218	#322
	WB (G Street)	LT	522	29	50	80	84	226	#691
	SB (10th Street)	LTR	459	44	68	67	54	m72	#633
4	**9th Street NW & G Street NW**								
	EB (G Street)	TR	522	5	19	55	105	#273	218
	WB (G Street)	L	244	23	54	34	56	103	107
	WB (G Street)	T	244	49	94	137	54	100	#296
	SB (9th Street)	LT	409	69	83	78	58	72	202
	SB (9th Street)	R	409	0	m0	-	0	m0	#540
5	**10th Street NW & F Street NW**								
	EB (F Street)	TR	273	40	55	82	122	159	#349
	WB (F Street)	LT	537	23	m34	70	41	m76	180
	SB (10th Street)	LTR	293	61	80	75	91	117	#391
6	**9th Street NW & F Street NW**								
	EB (F Street)	TR	537	27	38	75	117	166	81
	WB (F Street)	LT	505	44	68	120	50	78	129
	SB (9th Street)	LTR	281	29	36	107	393	m463	#294
7	**12th Street NW & E Street NW**								
	EB (E Street)	L	150	33	69	95	14	35	60
	EB (E Street)	T	356	45	79	86	34	64	86
	WB (E Street)	TR	181	181	251	#213	90	131	139
	NB (12th Street)	LTR	285	158	m170	149	165	203	224

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic	50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic
8	**11th Street NW & E Street NW**								
	EB (E Street)	L	181	14	m23	64	9	m20	42
	EB (E Street)	T	181	131	192	163	132	188	#226
	EB (E Street)	R	50	12	m19	24	11	m24	#62
	WB (E Street)	L	110	4	10	-	12	m32	90
	WB (E Street)	T	215	40	65	86	123	m208	200
	WB (E Street)	R	50	0	20	#93	38	m82	#92
	NB (11th Street)	LT	346	80	m88	103	78	104	116
	NB (11th Street)	R	346	32	m38	49	18	55	81
	SB (11th Street)	LT	321	70	101	106	206	280	#371
	SB (11th Street)	R	100	0	27	80	44	103	#140
9	**10th Street NW & E Street NW**								
	EB (E Street)	T	215	76	102	144	44	m53	#264
	EB (E Street)	R	25	12	39	#55	8	m12	#63
	WB (E Street)	L	110	5	m8	43	1	m3	#136
	WB (E Street)	T	506	23	31	22	9	m11	139
	SB (10th Street)	LTR	370	31	0	99	217	258	#451
10	**9th Street NW & E Street NW**								
	EB (E Street)	T	506	46	86	76	108	m141	190
	EB (E Street)	R	100	3	14	63	32	m68	#116
	WB (E Street)	L	75	18	m41	#123	39	94	#113
	WB (E Street)	T	225	144	204	219	132	252	#249
	SB (9th Street)	LTR	310	53	62	189	501	#603	296
11	**8th Street NW & E Street NW**								
	EB (E Street)	L	75	10	m23	26	2	m5	28
	EB (E Street)	T	225	81	134	118	23	m30	95
	EB (E Street)	R	50	9	m39	#93	0	m0	33
	WB (E Street)	L	85	11	20	54	3	m7	51
	WB (E Street)	T	223	50	64	93	27	39	59
	WB (E Street)	R	25	0	m2	#48	0	m0	#46
	NB (8th Street)	LTR	392	78	110	110	74	146	164
	SB (8th Street)	LTR	302	27	51	30	59	119	190

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic	50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic
12	**7th Street NW & E Street NW**								
	EB (E Street)	L	85	9	m29	30	7	m20	73
	EB (E Street)	T	223	100	173	198	120	194	211
	EB (E Street)	R	25	1	m15	#39	10	m39	#63
	WB (E Street)	L	100	6	18	-	23	53	#125
	WB (E Street)	T	533	153	232	179	192	284	286
	WB (E Street)	R	75	3	23	#89	17	50	#104
	NB (7th Street)	LT	402	81	m112	95	101	143	157
	NB (7th Street)	R	75	9	m15	42	13	m33	#113
	SB (7th Street)	LTR	314	53	83	136	95	133	163
13	**9th Street NW & D Street NW**								
	WB (D Street)	L	224	75	71	150	107	170	179
	SB (9th Street)	LT	396	30	47	98	67	m77	128
14	**8th Street NW & D Street NW (AWSC)**								
	EB (D Street)	LT	224	-	0	45	-	0	59
	WB (D Street)	TR	229	-	0	67	-	0	84
	SB (8th Street)	LR	392	-	0	67	-	0	53
15	**7th Street NW & D Street NW**								
	EB (D Street)	LTR	229	40	71	85	91	165	197
	WB (D Street)	LTR	521	76	140	194	101	175	182
	NB (7th Street)	LTR	295	471	#689	#332	170	226	262
	SB (7th Street)	LTR	402	4	10	29	24	53	95
16	**14th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	430	116	150	188	96	138	#527
	WB (Pennsylvania Ave)	T	157	85	114	130	123	160	#200
	WB (Pennsylvania Ave)	R	248	36	73	79	47	87	95
	NB (14th Street)	L	1,131	23	m35	42	25	m#68	164
	NB (14th Street)	TR	1,131	328	382	364	124	173	248
	SB (14th Street)	LTR	624	89	113	133	230	275	244
17	**13th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	257	143	219	189	92	154	172
	EB (Pennsylvania Ave)	T	257	98	142	#287	98	138	225
	WB (Pennsylvania Ave)	T	386	78	m92	106	26	48	140
	WB (Pennsylvania Ave)	R	386	72	m88	98	12	m26	103
	SB (13th Street)	L	637	76	112	367	145	200	#735
	SB (13th Street)	R	637	0	33	63	0	54	#914

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic	50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic
18	**12th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	T	386	110	140	212	161	195	178
	EB (Pennsylvania Ave)	TR	150	110	140	#204	161	195	#201
	WB (Pennsylvania Ave)	T	169	27	34	30	20	25	34
	WB (Pennsylvania Ave)	R	169	54	196	67	36	57	104
	NB (12th Street)	LTR	922	208	m200	364	277	m287	325
19	**11th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	169	109	m#186	#179	45	m89	101
	EB (Pennsylvania Ave)	T	169	28	m35	133	20	20	110
	WB (Pennsylvania Ave)	T	216	27	m67	101	26	21	71
	WB (Pennsylvania Ave)	R	216	~177	m#431	#267	21	125	167
	SB (11th Street)	L	346	126	202	87	~364	#530	#447
	SB (11th Street)	R	346	16	28	61	20	m62	195
20	**10th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	216	0	0	85	56	m56	151
	WB (Pennsylvania Ave)	T	467	60	71	162	56	m70	80
	NB (10th Street)	L	695	153	m#278	404	7	m17	89
	NB (10th Street)	R	695	27	m59	29	1	10	123
	SB (10th Street)	LT	469	30	56	107	187	m#234	#574
	SB (10th Street)	R	25	0	12	#48	42	m62	#67
21	**9th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	467	43	63	170	220	261	413
	EB (Pennsylvania Ave)	R	467	34	84	69	197	m#356	#524
	WB (Pennsylvania Ave)	T	496	48	m56	60	32	39	74
	NB (9th Street)	R	-	11	54	-	2	m8	-
	SB (9th Street)	LTR	235	173	211	#240	220	306	#271
22	**7th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	496	101	#197	104	0	m#112	96
	EB (Pennsylvania Ave)	TR	496	91	131	156	83	m126	311
	WB (Pennsylvania Ave)	T	461	165	207	182	116	m146	104
	WB (Pennsylvania Ave)	R	461	80	139	90	103	m#173	128
	NB (7th Street)	L	290	96	#235	143	57	m#140	99
	NB (7th Street)	TR	290	64	81	222	29	37	163
	SB (7th Street)	TR	83	65	106	#102	88	106	#110

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic	50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic
23	**6th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	461	47	m79	66	11	m24	9
	EB (Pennsylvania Ave)	TR	461	121	152	110	178	220	243
	WB (Pennsylvania Ave)	T	212	9	22	34	116	156	137
	WB (Pennsylvania Ave)	R	212	8	22	64	88	148	82
	NB (6th Street)	LTR	72	53	m53	#82	14	19	#73
	SB (6th Street)	LTR	549	79	120	81	~302	#426	#578
24	**Constitution (WB) Avenue NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	T	212	18	23	26	188	m213	#219
	EB (Pennsylvania Ave)	R	212	0	m0	-	1	m1	10
	WB (Pennsylvania Ave)	L	283	168	229	283	261	318	#324
	WB (Pennsylvania Ave)	T	283	263	304	#295	37	48	119
	NB (Constitution Ave)	R	232	67	68	21	209	254	66
25	**4th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	283	49	228	77	200	226	211
	WB (Pennsylvania Ave)	T	257	55	84	181	200	172	#316
	NB (4th Street)	L	208	136	211	#239	121	185	#289
	NB (4th Street)	R	208	10	48	52	48	92	178
26	**Constitution (EB) Avenue NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	257	25	36	48	140	214	255
	EB (Pennsylvania Ave)	T	257	74	110	115	125	174	110
	WB (Pennsylvania Ave)	T	335	4	7	45	12	18	134
	SB (Constitution Ave)	R	219	294	367	#260	225	283	#260
27	**14th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	T	110	200	238	#150	238	280	#193
	EB (Constitution Ave)	TR	439	200	238	316	238	280	#541
	WB (Constitution Ave)	TR	1,005	175	m199	149	321	m355	187
	NB (14th Street)	TR	553	296	341	359	180	214	472
	SB (14th Street)	TR	1,131	39	49	71	~737	#833	900
28	**12th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	L	1,005	60	m#147	401	53	m75	754
	EB (Constitution Ave)	TR	1,005	34	39	112	261	316	#1196
	WB (Constitution Ave)	LTR	494	115	133	98	61	85	138
	NB (12th Street)	LTR	534	~508	#606	#584	295	#394	#645
	SB (12th Street)	LT	922	20	46	51	29	67	625
	SB (12th Street)	R	922	15	56	58	0	40	108

Table 3-45: Existing Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection and Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic	50th Percentile (feet) Synchro	95th Percentile (feet) Synchro	95th Percentile (feet) SimTraffic
29	**10th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	LT	494	114	m127	179	83	m79	436
	WB (Constitution Ave)	TR	457	59	76	80	237	270	249
	SB (10th Street)	L	695	17	34	96	26	m40	61
	SB (10th Street)	R	695	26	37	46	16	m29	78
30	**9th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	LTR	457	190	229	159	121	#197	451
	WB (Constitution Ave)	LTR	480	42	53	48	28	36	113
	SB (9th Street)	LT	502	156	197	157	378	#484	234
	SB (9th Street)	R	502	7	50	74	26	m38	124
31	**7th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	TR	480	190	227	210	77	m110	455
	WB (Constitution Ave)	LTR	473	162	197	169	102	145	450
	NB (7th Street)	L	125	70	117	122	27	54	105
	NB (7th Street)	TR	495	135	172	172	132	180	471
	SB (7th Street)	TR	290	5	34	62	68	100	139
32	**6th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	L	473	148	#329	209	168	m240	163
	EB (Constitution Ave)	LT	473	135	181	161	6	25	106
	WB (Constitution Ave)	TR	232	198	242	#258	77	72	#283
	SB (6th Street)	L	72	16	m34	42	15	m16	42
	SB (6th Street)	R	72	0	0	24	0	m0	#73

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinite.

95th percentile volume exceeds capacity, queue may be longer.

m Volume for 95th percentile queue is metered by upstream signal. Due to upstream metering, the 95th percentile queue may be less than the 50th percentile queue.

AWSC = All-Way STOP-Controlled intersection

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LTR = left / through / right lanes

Red cells denote approaches and lane groups whose queuing length exceeds capacity.

3.8 Crash Analysis

Crash ratings are used in transportation analyses to help determine where additional attention or examination of safety should be undertaken. Crash ratings are evaluated based on recorded crash information collected by a jurisdiction, in this case 3 years of data from DDOT (2011–2013), and calculated using the accident information and the daily volume of vehicles that travel through the intersection. Crash ratings are calculated based on the number of crashes that would occur per million entering vehicles (MEV) using the following formula:

$$\text{Rate} = \frac{C * 1{,}000{,}000}{n * 365 * V}$$

In this formula, C is the total number of intersection-related crashes in the study period, *n* is the number of years of data (i.e., study period), and *V* is the traffic volumes entering the intersection daily. Daily traffic volumes were calculated from the AM peak hour traffic volumes and adjusted based on the percent of daily traffic that would likely use the intersection during the peak hour. Similar to the another recent DC transportation study, the Maryland Avenue SW Transportation Study, it was assumed the peak hour accounted for 11 percent of the daily volumes, based on common assumptions that peak hour traffic volumes account for 8–12 percent of daily traffic depending on the surrounding land use pattern (DDOT 2013a).

Crash ratings for the intersections in the study area are presented in table 3-46. The intersection with the highest crash rating was 10th Street at F Street NW, with a crash rating of 3.35 crashes/MEV. Other intersections with high crash ratings (more than 2.0 crashes/ MEV) included: 13th Street at Pennsylvania Avenue NW, 9th Street at H Street NW, 9th Street at F Street NW, 10th Street at G Street NW, 7th Street at E Street NW, 9th Street at G Street NW, 7th Street at Pennsylvania Avenue NW, and 7th Street at D Street NW. The intersection with the highest injury rating was 7th Street at E Street NW.

Table 3-46: Intersection Crash Summary

Intersection Number	Intersection Name (Cross Streets)	Crash Rate (crashes/MEV*)	Injury Rate (crashes/MEV*)
1	10th Street NW & H Street NW	1.92	0.52
2	9th Street NW & H Street NW	2.61	0.37
3	10th Street NW & G Street NW	2.58	0.86
4	9th Street NW & G Street NW	2.38	0.66
5	10th Street NW & F Street NW	3.35	0.61
6	9th Street NW & F Street NW	2.60	0.67
7	12th Street NW & E Street NW	0.80	0.45
8	11th Street NW & E Street NW	1.62	0.35
9	10th Street NW & E Street NW	1.17	0.35
10	9th Street NW & E Street NW	1.78	0.53
11	8th Street NW & E Street NW	1.29	0.39
12	7th Street NW & E Street NW	2.43	1.87
13	9th Street NW & D Street NW	0.97	0.39
14	8th Street NW & D Street NW (AWSC*)	-	-
15	7th Street NW & D Street NW	2.04	0.43
16	14th Street NW & Pennsylvania Avenue NW	1.23	0.24
17	13th Street NW & Pennsylvania Avenue NW	2.83	0.60
18	12th Street NW & Pennsylvania Avenue NW	0.88	0.28
19	11th Street NW & Pennsylvania Avenue NW	1.60	0.42
20	10th Street NW & Pennsylvania Avenue NW	0.97	0.24
21	9th Street NW & Pennsylvania Avenue NW	1.35	0.70
22	7th Street NW & Pennsylvania Avenue NW	2.09	0.34
23	6th Street NW & Pennsylvania Avenue NW	1.78	0.47
24	Constitution (WB) Avenue NW & Pennsylvania Avenue NW	0.38	0.08
25	4th Street NW & Pennsylvania Avenue NW	0.66	0.15
26	Constitution (EB) Avenue NW & Pennsylvania Avenue NW	0.51	0.00
27	14th Street NW & Constitution Avenue NW	1.83	0.75
28	12th Street NW & Constitution Avenue NW	1.42	0.19
29	10th Street NW & Constitution Avenue NW	0.79	0.04
30	9th Street NW & Constitution Avenue NW	1.88	0.65
31	7th Street NW & Constitution Avenue NW	1.75	0.59
32	6th Street NW & Constitution Avenue NW	1.03	0.31

Sources: DDOT crash data from 2011-2013, received November 2014. Average Daily Volume (used in calculations) from DDOT Traffic Volume Map 2012.

Notes:

*MEV = Million entering vehicles. *AWSC = All Way Stop Controlled intersection, crash data not available.

Intersections depicted in blue warrant further examination as they have a crash rating over 1.0.

According to the Institute for Transportation Engineers (ITE) *Transportation Impact Analyses for Site Development* (2010), an accident rate of 1.0 or higher is an indication that further study is needed. Given the downtown nature of the transportation study area with high concentrations of pedestrians and vehicles crossing at many locations, it is not surprising that a large number of the study intersections are above this threshold. The 23 intersections in the study area with a crash rating above 1.0 are examined more closely in table 3-47 to see if certain crash types are more prevalent. Because full details of the crashes are not generally available, the reasons for why crash rates are higher cannot be directly determined from crash data. However, crash data

trends can provide details about factors that may contribute to or be eliminated from a list of probable causes. Note that a crash rate of 1.0 crash/MEV does not necessarily mean there is a significant safety issue or problem at an intersection; rather, it is a threshold to establish when additional examination is recommended.

Table 3-47: Detailed Intersection Crash Analysis

Intersection Name (Number and Cross Streets)	Crash Rate per MEV*	Right Angle	Left Turn	Right Turn	Rear End	Side Swiped	Head On	Parked	Fixed Object	Ran Off Road	Pedestrian Involved	Backing	Non-Collision	Under/Over Ride	Unspecified	Total
1. 10th Street NW & H Street NW	1.92	1	2	3	**6**	**7**	1	2	0	0	1	1	0	0	2	26
2. 9th Street NW & H Street NW	2.61	4	4	3	5	**16**	0	2	0	0	3	1	1	1	2	42
3. 10th Street NW & G Street NW	2.58	0	1	**2**	1	1	1	**2**	0	0	0	0	0	0	1	9
4. 9th Street NW & G Street NW	2.38	1	3	1	5	**13**	1	0	0	0	2	2	0	0	1	29
5. 10th Street NW & F Street NW	3.35	1	1	1	2	**8**	0	2	2	0	3	2	0	0	0	22
6. 9th Street NW & F Street NW	2.60	1	3	2	5	**11**	1	1	0	0	3	4	1	0	3	35
8. 11th Street NW & E Street NW	1.62	1	1	3	4	**8**	0	1	0	0	1	4	0	0	0	23
9. 10th Street NW & E Street NW	1.17	1	2	0	**3**	1	0	0	1	0	0	2	0	0	0	10
10. 9th Street NW & E Street NW	1.78	2	4	2	2	**7**	1	3	1	0	1	1	1	0	2	27
11. 8th Street NW & E Street NW	1.29	0	2	0	0	**3**	0	2	0	0	0	2	1	0	0	10
12. 7th Street NW & E Street NW	2.43	3	5	2	6	**10**	1	1	0	0	1	0	0	1	5	35
15. 7th Street NW & D Street NW	2.04	2	2	1	4	**8**	0	3	0	0	2	2	0	0	0	24
16. 14th Street NW & Pennsylvania Avenue NW	1.23	3	3	1	6	**13**	2	3	0	0	0	2	0	0	3	36
17. 13th Street NW & Pennsylvania Avenue NW	2.83	1	2	2	5	**16**	0	2	3	1	1	2	0	0	3	38
19. 11th Street NW & Pennsylvania Avenue NW	1.60	0	4	4	6	**11**	0	0	3	0	2	1	0	0	3	34
21. 9th Street NW & Pennsylvania Avenue NW	1.35	2	3	3	5	**8**	1	0	1	0	2	2	0	0	6	33
22. 7th Street NW & Pennsylvania Avenue NW	2.09	2	3	2	9	**23**	0	1	1	0	4	0	0	0	5	50
23. 6th Street NW & Pennsylvania Avenue NW	1.78	2	3	6	6	**11**	1	0	4	0	2	1	1	0	1	38
27. 14th Street NW & Constitution Avenue NW	1.83	6	3	5	**35**	**30**	1	0	0	0	2	0	0	0	6	88
28. 12th Street NW & Constitution Avenue NW	1.42	4	1	4	**21**	**23**	0	1	0	0	0	1	1	0	4	60
30. 9th Street NW & Constitution Avenue NW	1.88	9	5	2	**16**	**12**	2	0	2	0	2	1	0	0	4	55
31. 7th Street NW & Constitution Avenue NW	1.75	11	2	2	9	**26**	1	0	0	0	3	1	0	0	1	56
32. 6th Street NW & Constitution Avenue NW	1.03	1	5	0	**6**	**7**	0	0	0	1	0	0	0	0	0	20

Sources: DDOT crash data from 2011-2013. Average Daily Volume (used in calculations) from DDOT Traffic Volume Map 2012.

Notes:

*MEV = Million entering vehicles.

Crash data that may provide clues about accident trends have been highlighted in orange.

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4.0 Analysis of No-action Alternative

Under the No-action Alternative, GSA would continue to maintain the JEH parcel, and the site would continue to operate as the location of the FBI HQ. The alternative sites (Greenbelt, Landover, and Springfield) would not be redeveloped as a consolidated FBI HQ and would instead be developed by parcel owners in the highest and best use. Existing condition data and analysis of existing roadways provide a baseline for evaluating the roadways serving the FBI HQ parcels and analyzing the No-action Alternative.

The No-action Alternative more importantly provides a "future baseline" to compare to the action condition to determine if any indirect traffic impacts would occur by exchanging the JEH parcel located along Pennsylvania Avenue in Washington, D.C. (for JEH, there are two future development conditions–RFDS 1 and RFDS 2). Analysis of impacts under the No-action Alternative assumes background development and growth through the year 2025, the same horizon year as the RFDS future development conditions. The No-action Alternative also includes programmed transportation improvements in the study area and trips generated by approved yet unbuilt development projects planned to be implemented by 2025. Two primary sources were used to develop future traffic volumes: an approved list of planned developments provided by DDOT and background growth rates agreed on by all parties (DDOT Scoping Form). The DDOT Scoping Form is found in Appendix B1.

The JEH transportation analysis evaluates future year 2025, and the alternative sites evaluate 2022. JEH RFDSs include time after the JEH building tenant (FBI) moves out for renovations or redevelopment of the parcel to occur before a new tenant moves in.

4.1 No-action Improvements

4.1.1 Planned Developments

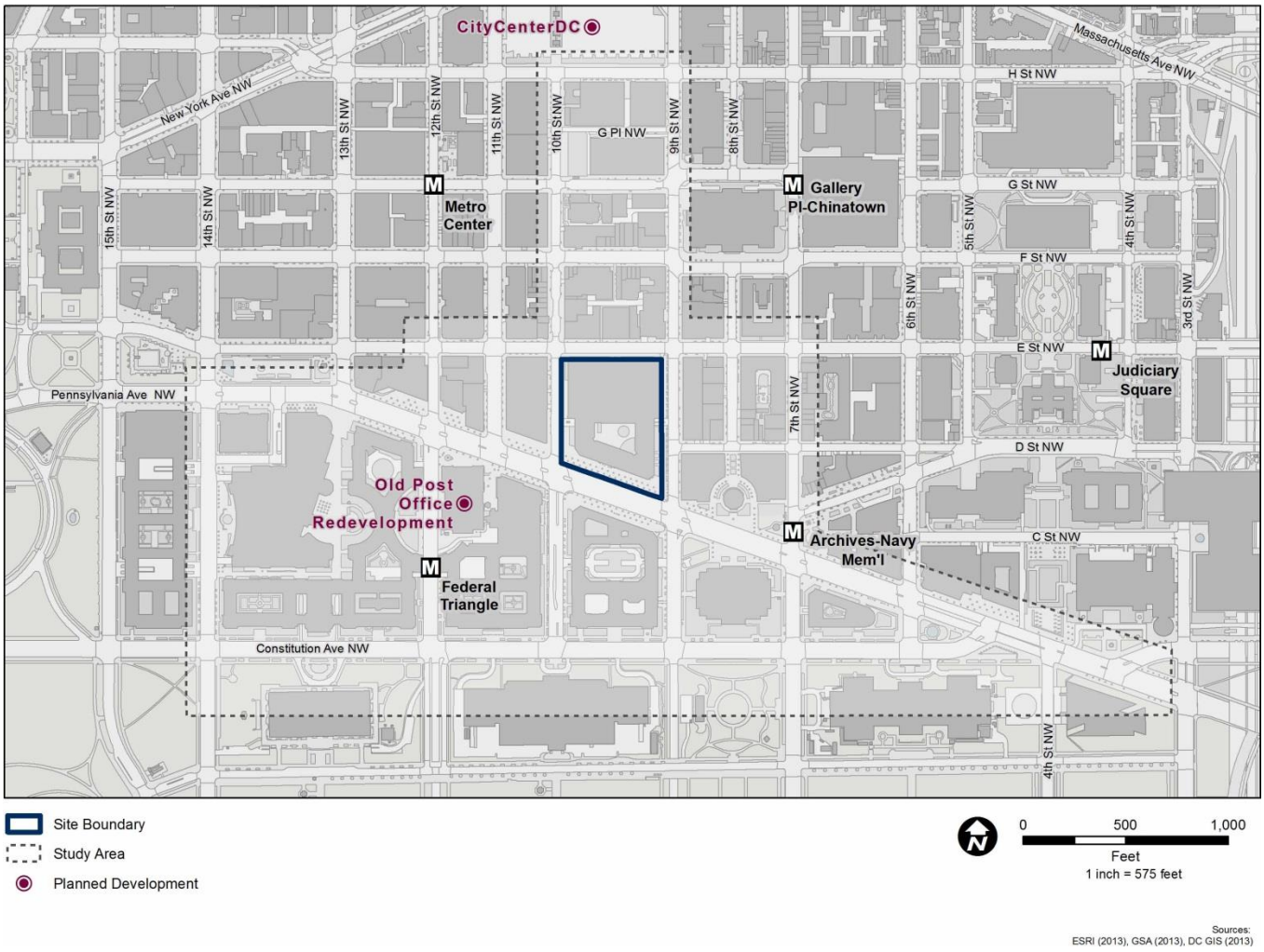
Based on the DDOT Scoping Form (Appendix B1), two planned developments are included as part of the No-action Alternative: a hotel proposed along Pennsylvania Avenue NW and mixed-use development primarily composed of residential and office development along H Street NW (figure 4-1). Both developments are located adjacent to or within the study area.

Old Post Office Redevelopment would include a 267-room hotel; 1,000-seat conference center; 492,000-SF fitness club; 925-seat drinking place; 16,600-SF restaurant; 8,900-SF bread/bagel shop; and 1,700-SF specialty retail center (GSA in cooperation with NCPC 2013a). The proposed redevelopment would be located at the intersection of Pennsylvania Avenue and 12th Street NW, two blocks west of the JEH parcel. This proposed development would change existing office and retail use to hotel and support uses within the historic Old Post Office building. The project proposes to introduce vehicular access to the hotel via the previously closed 11th Street NW; this access point would be the main hotel entrance and the primary vehicular entry point for drop-offs, valet parking, and access to the 150 parking spaces located under the adjacent Old Post Office Annex building (GSA 2013a). The Pennsylvania Avenue entrance would be reinstated as the primary pedestrian point of entry, with additional pedestrian entrances provided on 12th Street and C Street NW. Redevelopment of the building is expected to be complete by 2016.

CityCenterDC is a mixed-use development on the site of the Old DC Convention Center that includes two phases. Phase I of the project includes two office buildings, two apartment buildings, two condominium buildings, ground-floor retail, a public park, and a parking garage with more than 1,500 parking spaces and is included in the No-action Alternative (Development 2013). Phase II of the project includes a hotel and another office building with their own parking garages; because the timetable of Phase II is unknown, it is not included in the no-action

projects in this analysis. The Phase I development included 462,085 SF of office; 252,023 SF of retail; and 674 residential units (GS 2008). The proposed phase I mixed-use would occupy two city blocks bounded by H Street, I Street, 9th Street, and 11th Street NW. The property parking garage would be accessible from both 9th and 11th Streets NW.

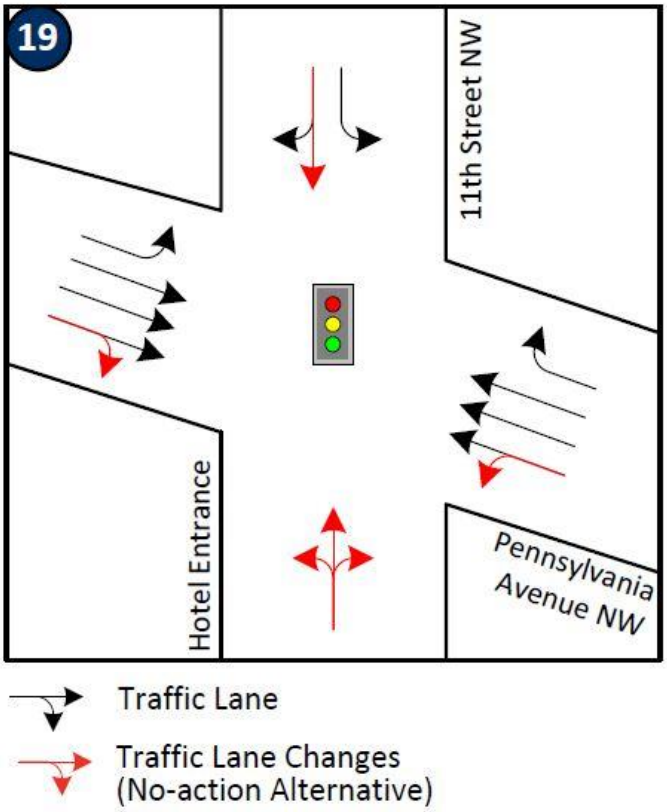
Figure 4-1: Planned Development Locations



4.1.2 Planned Roadway Improvements

DDOT is conducting a citywide traffic signal optimization initiative scheduled to be completed by the end of 2016 (DDOT 2015b). There are no other planned roadway improvements within the study area. However, as noted above for the Old Post Office Redevelopment, the lane geometry at the intersection of 11th Street NW and Pennsylvania Avenue NW (Intersection #19) would change under the No-action Alternative. Figure 4-2 shows the revised lane geometry for this intersection; the changes shown in red include the addition of a northbound approach south of Pennsylvania Avenue NW with all turning movements, a southbound 11th Street NW through movement, an eastbound Pennsylvania Avenue NW right-turn movement, and a westbound Pennsylvania Avenue NW left-turn movement. The lane geometry of all other intersections remains the same as the Existing Condition (figure 3-3).

Figure 4-2: Intersection #19 Revised No-action Alternative Lane Geometry



4.2 Pedestrian Network

With the redevelopment of the Old Post Office site, a curb cut and driveway to access the hotel would be added on the south side of Pennsylvania Avenue at 11th Street NW (GSA in coordination with NCPC 2013b). This driveway would require the reconfiguration and retiming of the 11th Street and Pennsylvania Avenue NW intersection (Intersection #19) and create a pedestrian-vehicle conflict point. To alleviate conflicts, the new intersection would include walk signals to minimize potential safety concerns, and the pedestrian crosswalk would be differentiated with paving to distinguish it from the vehicular areas. The intersection would also be fully accessible. Additionally, with the Old Post Office project, the mid-block crosswalk at the C Street plaza across 12th Street would be improved to have a wider ramp for accessibility.

As per DDOT's 2015-2020 Transportation Improvement Program, published by MWCOG, the District-wide Bicycle and Pedestrian Management Program includes sign and lighting upgrades to benefit pedestrians (MWCOG 2014a). Some surface improvements could also be made to the existing pedestrian facilities with future expected addition of transit options.

Under the No-action Alternative, it is not anticipated that the redevelopment of the Old Post Office, development of CityCenterDC, or other area pedestrian growth through 2025 would result in a substantial change to the volume of pedestrian activity or substantial changes to existing pedestrian infrastructure in proximity to the JEH parcel. Therefore, pedestrians would have no indirect, measurable impacts because the increase in traffic in the study area would not affect pedestrians crossing at the intersections and would not substantially affect their access to the surrounding street network. Introduction of any pedestrian/vehicular conflicts would also be mitigated. Additionally, improvements that stem from the Pennsylvania Avenue Initiative's efforts to effectively manage the

operations, maintenance, programming, and physical improvements to Pennsylvania Avenue would have a beneficial impact to pedestrians if such efforts were implemented prior to 2025.

4.3 Bicycle Network

DDOT plans to construct a number of bicycle facilities throughout the District in 2015, including new cycle tracks, bicycle lanes, and contraflow bicycle lanes (DDOT 2015a). Cycle tracks allow two-way bicycle travel in a marked lane that is typically separated from vehicle travel lanes by a physical barrier. Bicycle lanes are marked lanes that allow one-way bicycle travel, typically in the same direction as adjacent vehicle travel lanes. Bicycle lanes may or may not be separated from vehicle travel lanes by physical barriers. Contra-flow bicycle lanes are marked lanes that allow one-way bicycle travel in the opposite direction as adjacent vehicle travel lanes. Many of these facilities are located within 2 miles of the JEH parcel and summarized in table 4-1. Those bicycle lanes that are located within 0.25 mile of the JEH parcel are highlighted in light blue and are shown as No-action Alternative bicycle lanes on figure 4-3. These proposed bicycle facilities will provide improved access with increased access from the north via the proposed 12th Street bicycle lanes.

Table 4-1: DDOT Planned Bicycle Facilities in 2015

Roadway	From/To	Type
1st Street NE	Massachusetts Avenue NE to G Street NE	Cycle Track
M Street NE	2nd Street NE to 4th Street NE	Cycle Track
4th Street NE	M Street NE to Florida Avenue NE	Cycle Track
12th Street NW	Pennsylvania Avenue NW to L Street NW	Bicycle Lane
E Street NW	North Capitol Street to Columbus Circle NE	Bicycle Lane
2nd Street SE	East Capitol Street to Independence Avenue SE	Bicycle Lane
4th Street NE	C Street NE to D Street NE	Bicycle Lane
6th Street NE	C Street NE to D Street NE	Bicycle Lane
I Street SE	1st Street SE to 2nd Street SE	Bicycle Lane
6th Street SE	G Street SE to Virginia Avenue SE	Bicycle Lane
2nd Street NE	T Street NE to Rhode Island Avenue NE	Bicycle Lane
3rd Street NE	T Street NE to Rhode Island Avenue NE	Bicycle Lane
3rd Street NE/SE	Pennsylvania Avenue SE to D Street NE	Contraflow Bicycle Lane
M Street NE	4th Street NE to Florida Avenue NE	Contraflow Bicycle Lane
Ontario Road NW	Euclid Street NW to Columbia Road NW	Contraflow Bicycle Lane

Note: Those bicycle facilities within 0.25-mile of the JEH parcel are highlighted in light blue.
Source: DDOT (2015)

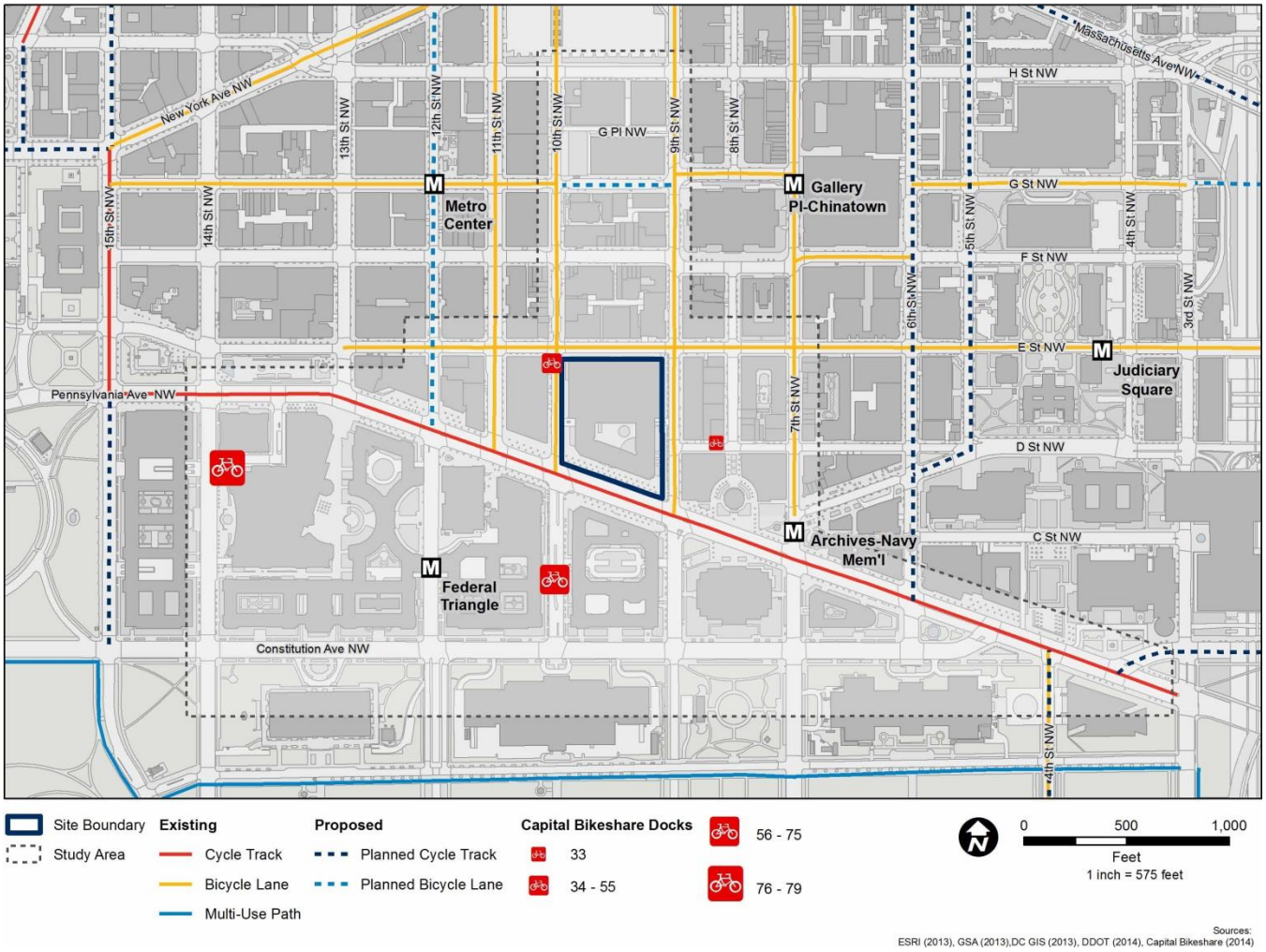
In addition to the bicycle facilities planned for 2015, the MoveDC plan outlines bicycle improvements to expand and enhance the District's bicycle network over the next 25 years (DDOT 2014e). The plan groups improvements into four tiers, with Tier 1 containing the highest priority improvements and Tier 4 containing the lowest priority improvements. There is no set implementation date for any improvements or tiers, however. Table 4-2 summarizes proposed bicycle lanes and cycle tracks in the MoveDC plan within about 0.5 mile of the JEH parcel. The planned bicycle lanes shown in table 4-1 and the proposed bicycle lanes shown in table 4-2 are illustrated in figure 4-3; planned bicycle lanes with known implementation dates are shown as existing in the figure.

Table 4-2: Proposed Bicycle Facilities by in MoveDC Plan

Roadway	From/To	Type	Prioritization
10th Street NW	H Street NW to Massachusetts Avenue NW	Bicycle Lane	Tier 1
15th Street NW	Constitution Avenue NW to Pennsylvania Avenue NW	Cycle Track	Tier 1
15th Street NW	Pennsylvania Avenue NW to I Street NW (remaining portions)	Cycle Track	Tier 1
M Street NW	Thomas Circle to 1st Street NE	Cycle Track	Tier 1
4th Street NW/SW	I Street SW to Pennsylvania Avenue NW	Cycle Track	Tier 2
Vermont Avenue NW	I Street NW to Massachusetts Avenue NW	Bicycle Lane	Tier 2
G Street NW	9th Street NW to 10th Street NW	Bicycle Lane	Tier 2
G Street NW	3rd Street NW to Massachusetts Avenue NW	Bicycle Lane	Tier 2
6th Street NW	Pennsylvania Avenue NW to Rhode Island Avenue NW	Cycle Track	Tier 2
5th Street NW	Indiana Avenue NW to Rhode Island Avenue NW	Cycle Track	Tier 2
Louisiana Avenue NW	Constitution Avenue NW to Columbus Circle NE	Cycle Track	Tier 2
Massachusetts Avenue NW	4th Street NE to Dupont Circle NW	Cycle Track	Tier 3
L Street NW	12th Street NW to 1st Street NE	Cycle Track	Tier 3
Delaware Avenue NE	Constitution Avenue NE to Columbus Circle NE	Cycle Track	Tier 3
New Jersey Avenue NW	Massachusetts Avenue NW to S Street NW	Bicycle Lane	Tier 3
Constitution Avenue NE/NW	7th Street NE to Pennsylvania Avenue NW	Cycle Track	Tier 4

Source: DDOT (2014a)

Figure 4-3: No-Action Alternative and Proposed Bicycle Facilities



In summary, there would be indirect, long-term, beneficial impacts from proposed bicycle improvements in the study area and other nearby areas of Washington, D.C. According to the MoveDC plan, 230,000 additional annual bicycle trips are expected within the District by 2040, and these planned improvements would help to accommodate them (DDOT, 2014a).

4.4 Public Transit

The following sections describe Metrobus and Metrorail modes within the study area under the No-action Alternative. Commuter bus, carsharing, slugging, and shuttles are not evaluated in the No-action Alternative because future ridership information or planning documents were not available for those transportation modes. In the case of slugging, this mode of commuting is demand-based, and future planning does not exist.

4.4.1 Projected Transit Growth

Growth in the transit mode was calculated for the year 2025 using regional transit growth rates and projected ridership from large planned projects in proximity to the study area.

Transit trips associated with the CityCenterDC and the Old Post Office redevelopment projects were calculated based on ITE trip generation rates and the non-single occupancy vehicle mode split determined in the traffic analysis section of this document (Section 4.7.2). The non-single occupancy vehicle mode split was further

disaggregated into bus trips and Metrorail trips using bus and subway proportions from the 2009-2013 *American Community Survey* transportation data for the census tract (District of Columbia Tract 58) containing the CityCenterDC project and the JEH parcel study area (U.S. Census Bureau 2009-2013). While the Old Post Office site is technically in an adjacent census tract (District of Columbia Tract 62.02), this census tract contains the National Mall and other National Park service lands, and therefore is not as representative of the site mode split. Additionally, the Old Post Office site borders tract 58. The *American Community Survey* is an on-going annual sampling of demographic data (including mode of travel) across the United States conducted by the U.S. Census Bureau.

Regional transit growth rates were obtained using the MWCOG Version 2.3.57 Regional Travel Demand Model (MWCOG 2015), which projects an annual growth rate of 2.1 percent between 2008 and 2025 on the Metrorail system and 1.9 percent on the region's bus network (including Metrobus). These growth rates were applied to 2014 Metrorail and Metrobus volumes (with CityCenterDC trips added into 2014 and Old Post Office trips added into 2016) to calculate 2025 volumes. The Regional Travel Demand Model uses socioeconomic inputs to project future travel flows across all modes of travel.

4.4.2 Metrorail Analysis

The Metrorail analysis was conducted using projected ridership growth in the system at the four stations within the study area and each line that serves the study area.

4.4.2.1 Ridership Growth From Planned Projects

Additional Metrorail trips created by the CityCenterDC development, the Old Post Office development, and the study area transit network are summarized in table 4-3. Fifteen-minute ridership totals were calculated by multiplying the AM peak hour and PM peak hour totals by the AM peak hour factor (PHF) of 28 percent and the PM PHF of 27 percent, respectively, for Metrorail in the study area (WMATA 2014g). The 15-minute totals for the Old Post Office development were then distributed proportionally (based on existing ridership) to the closest Metrorail station entrances (Archives-Navy Memorial, Federal Triangle, and Metro Center South). Due to the location of CityCenterDC (north of the study area), it was assumed that patrons accessing the Metrorail system would do so at the north entrances to Metro Center and Gallery Place-Chinatown, neither of which are part of this analysis. However, 15-minute ridership totals for CityCenterDC were added to each platform ridership total (also proportionally based on existing ridership) at Gallery Place-Chinatown and Metro Center Metro Stations.

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Table 4-3: Projected Metrorail Trips Associated with CityCenterDC and Old Post Office Projects

Project	AM Peak Hour Non-SOV Person Trips			PM Peak Hour Non-SOV Person Trips			Metrorail Proportion of Non-SOV	AM Peak Hour Metrorail Trips			PM Peak Hour Metrorail Trips			AM Peak Hour Factor	AM Peak 15-Minute Metrorail Trips			PM Peak Hour Factor	PM Peak 15-Minute Metrorail Trips		
	IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL		IN	OUT	TOTAL
City-CenterDC	443	236	679	599	783	1,382	35.7%	158	84	242	214	279	493	28.2%	45	24	68	26.8%	57	75	132
Old Post Office	288	294	582	201	174	375	35.7%	103	105	208	72	62	134	28.2%	29	30	59	26.8%	19	17	36

Note: Values are rounded.
Source: GS (2008); U.S. Census Bureau (2009-2013)

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4.4.2.2 Regional Transit Growth Rate

Background ridership growth at each station in the study area for 2025 was calculated based on the 2.1 percent Metrorail growth rate from the MWCOG travel demand model. Table 4-4 summarizes projected 2025 weekday entries at Metrorail stations in the study area, including background growth and growth from planned projects.

Table 4-4: Weekday 2025 Projected Metrorail Ridership by Station

Metrorail Station	Average Weekday Entries	
	2014	2025 with Background Growth
Archives-Navy Memorial	7,535	9,441
Federal Triangle	6,982	8,749
Gallery Place-Chinatown	23,875	29,917
Metro Center	24,839	31,124

Sources: WMATA (2014c); MWCOG (2015); GS (2008)

4.4.2.3 Metrorail Passenger Loads

Metrorail passenger loads by line within the study area were obtained from WMATA for the busiest segment of each line during the AM peak hour and PM peak hour. Projections for 2025 used projected trips associated with the CityCenterDC and Old Post Office projects and the regional Metrorail growth rate (2.1 percent annually).

Current (2014) passenger loads and projected passenger loads by 2025 are all below 120 passengers per car, or what WMATA considers to be capacity. All trains were assumed to have six cars with the exception of Blue line trains, which typically have eight during peak periods (WMATA 2014h). No expansion of WMATA's current fleet was assumed for this analysis to provide the most conservative estimate of potential capacity issues. The Momentum Strategic Plan does call for all eight-car trains on all lines during peak periods by the year 2020; however, this would require significant upgrades to electrical systems and a significant expansion of WMATA's current fleet of railcars (WMATA 2014f). Tables 4-5 and 4-6 summarize passenger loads per car between 2014 and 2025 during the AM peak hour and PM peak hour. No-action Alternative background growth trips are shown separately from the planned development projects to show the incremental impact of each component.

Table 4-5: Current and Projected AM Peak Hour Maximum Metrorail Passenger Loads by Line

Line	Segment	Train Cars	2014 Existing		2025 No-action Background Growth		2025 No-action with Planned Development Projects	
			Pax	Load	Pax	Load	Pax	Load
Red	Gallery Place to Metro Center	136	9,125	67.1	11,434	84.1	11,651	85.7
Orange	Smithsonian to Federal Triangle	94	5,870	62.4	7,355	78.2	7,495	79.7
Green	Mt. Vernon Square to Gallery Place	68	3,542	52.1	4,438	65.3	4,522	66.5
Yellow	L'Enfant Plaza to Archives	78	3,058	39.2	3,832	49.1	3,904	50.1
Blue	Smithsonian to Federal Triangle	44	1,691	38.4	2,119	48.2	2,159	49.1

Note: Pax = passengers, Load = number of passengers per Metrorail car
Source: WMATA (2014i), GS (2008)

Table 4-6: Current and Projected PM Peak Hour Maximum Metrorail Passenger Loads by Line

Line	Segment	Train Cars	2014 Existing		2025 No-action Background Growth		2025 No-action with Planned Development Projects	
			Pax	Load	Pax	Load	Pax	Load
Red	Metro Center to Gallery Place	142	10,614	74.7	13,300	93.7	13,605	95.8
Blue	Federal Triangle to Smithsonian	42	2,448	58.3	3,067	73.0	3,138	74.7
Green	Gallery Place to Mt Vernon Square	70	4,034	57.6	5,055	72.2	5,171	73.9
Orange	Metro Center to McPherson Square	114	6,417	56.3	8,041	70.5	8,225	72.1
Yellow	Archives to L'Enfant Plaza	78	3,588	46.0	4,496	57.6	4,599	59.0

Note: Pax = passengers, Load = number of passengers per Metrorail car
Source: WMATA (2014i), GS (2008)

4.4.2.4 Station Capacity Analysis

A capacity analysis was conducted for the vertical elements (escalators and stairs), faregate aisles, fare vending machines, and platforms at Archives-Navy Memorial and Federal Triangle Metro Stations, as well as the south and east entrances to Metro Center and the east and west entrances at Gallery Place-Chinatown (the closest entrances to the JEH building). The analysis used peak 15-minute periods of ridership (entries and exits) at each station according to projected 2025 No-action Alternative ridership. No-action Alternative 2025 ridership includes the CityCenterDC and Old Post Office development trips and predicted regional transit growth.

Volume to capacity (v/c) ratios were calculated for the vertical elements and fare elements, and pedestrian LOS was calculated for platform areas. Analysis for vertical elements and faregate aisles used projected ridership from the peak exiting period at each station entrance. Table 4-7 summarizes ridership growth during the peak exiting periods at each station entrance.

Table 4-7: Weekday Peak 15-Minute Exiting Period Ridership Growth

Metro Station	Time	2014		2025	
		Entries	Exits	Entries	Exits
Archives	8:45 AM – 9:00 AM	25	524	46	670
Federal Triangle	8:45 AM – 9:00 AM	15	467	28	597
Gallery Place East	6:15 PM – 6:30 PM	212	355	266	445
Gallery Place West	8:45 AM – 9:00 AM	12	301	15	378
Metro Center East	8:45 AM – 9:00 AM	44	434	55	544
Metro Center South	8:45 AM – 9:00 AM	20	427	36	546

Sources: WMATA (2014c), MWCOG (2015), GS (2008)

The platform area analysis and fare vending machine analysis used projected ridership from the peak entering period at each station. Table 4-8 summarizes ridership growth during the peak entering period at each station platform (for peak entering period ridership by station entrance, see *Fare Vending Machine* sections in Appendix B4).

Table 4-8: Weekday Peak 15-Minute Entering Period Platform Ridership Growth

Metro Station	Time	2014		2025	
		Entries	Exits	Entries	Exits
Archives	5:00 PM – 5:15 PM	524	56	665	77
Federal Triangle	5:00 PM – 5:15 PM	501	38	635	55
Gallery Place--Glenmont	5:00 PM – 5:15 PM	641	975	807	1,220
Gallery Place--Shady Grove	5:00 PM – 5:15 PM	1,016	534	1,302	667
Gallery Place--Green/Yellow	5:00 PM – 5:15 PM	1,629	1,128	2,051	1,436
Metro Center--Glenmont	5:30 PM – 5:45 PM	1,171	548	1,472	680
Metro Center--Shady Grove	5:30 PM – 5:45 PM	1,183	691	1,490	859
Metro Center--Blue/Orange/Silver	5:30 PM – 5:45 PM	1,618	1,651	2,044	2,078

Sources: WMATA (2014c), MWCOG (2015), GS (2008)

Overall, vertical elements and faregate aisles at each station are projected to operate below a v/c of 0.7, which is considered under capacity. Fare vending machines are projected to operate above capacity at Archives-Navy Memorial, the east and west entrances to Gallery Place-Chinatown, and the east and south entrances to Metro Center (highlighted in light blue in table 4-9). WMATA's Momentum Plan, the agency's strategic plan for the future, does not include any mention of proposed additions to fare vending machines within the system (WMATA 2014f).

Platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable level of B at Archives-Navy Memorial and Federal Triangle. The Red Line platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS D, while the lower platforms are projected to operate at pedestrian LOS C. At pedestrian LOS D, passengers would likely begin to spread out farther up and down the platform.

Table 4-9 summarizes the results of the station capacity analysis, including the vertical elements, fare elements, and platforms. Complete station capacity analysis details are included in Appendix B4.

Table 4-9: 2025 No-action Alternative Metro Station Capacity Analysis Summary

Element		Archives-Navy Memorial	Federal Triangle	Gallery Place East	Gallery Place West	Metro Center East	Metro Center South
Street/ Mezzanine v/c	Entry Escalators	0.04	0.03	0.11	0.01	0.05	0.03
	Exit Escalators	0.30	0.27	0.18	0.36	0.26	0.26
	Stairs	-	-	0.13	-	-	-
Mezzanine/ Platform 1 [a] v/c	Entry Escalators	0.04	0.03	0.13	0.01	0.02	-
	Exit Escalators	0.60	0.27	0.30	0.17	0.31	-
	Stairs	-	-	-	-	-	-
Mezzanine/ Platform 2 [a] v/c	Entry Escalators	-	-	0.17	0.01	0.03	-
	Exit Escalators	-	-	0.23	0.19	0.21	-
	Stairs	-	-	-	-	-	-
Lower Platform/ Glenmont Platform v/c	Entry Escalators	-	-	0.34	-	-	0.36
	Exit Escalators	-	-	0.18	-	-	0.55
	Stairs	-	-	0.56	-	-	0.15
Faregate Aisles		0.29	0.25	0.16	0.24	0.24	0.24
Fare Vending		**0.84**	0.59	**1.14**	**1.45**	**0.79**	**1.07**
Glenmont Platform Peak LOS		-	-	D		D	
Shady Grove Platform Peak LOS		-	-	D		D	
Green/Yellow Platform Peak LOS		B	-	C		-	
Blue/Orange/Silver Platform Peak LOS		-	B	-		C	

[a] For Gallery Place and Metro Center, Platform 1 = Glenmont, Platform 2 = Shady Grove.
Note: v/c = volume-to-capacity ratio; LOS = level of service
Source: WMATA (2014c); MWCOG (2015); GS (2008)

4.4.2.5 NFPA 130 Emergency Evacuation Analysis

An emergency evacuation analysis was conducted to compare evacuation capacity of each station to NFPA 130 code standards (TRB 2013). NFPA 130 requires that station platforms be fully evacuated within 4 minutes and that all passengers reach a "point of safety" within 6 minutes. WMATA Metrorail stations, however, are not required to meet these criteria. Details on the assumptions and calculations necessitated in NFPA 130 are found in Appendix B5. A summary of the emergency evacuation analyses is included below, with further details of each entrance analysis included in Appendix B5.

The NFPA 130 analysis used the projected number of passengers waiting to board trains (entries and transfers) from the peak entering period at each station. Table 4-10 summarizes projected growth in passengers waiting to board trains during the peak entering period for each station platform under the No-action Alternative. The number of waiting passengers are combined with the number of passengers on board trains to calculate the total number of passengers who would need to evacuate each station. Table 4-11 summarizes projected 2025 platform evacuation times and station evacuation times (to a point of safety) in minutes for each station entrance in the study area.

Table 4-10: Weekday Peak 15-Minute Entering Period Waiting Passenger Growth for NFPA 130 Analysis

Metro Station	Platform	Time	Passengers Waiting on Platform	
			2014	2025
Archives-Navy Memorial	Green/Yellow	5:00 PM – 5:15 PM	524	665
Federal Triangle	Blue/Orange/Silver	5:00 PM – 5:15 PM	501	635
Gallery Place-Chinatown East	Glenmont	5:00 PM – 5:15 PM	320	399
	Shady Grove	5:00 PM – 5:15 PM	339	430
	Green/Yellow	5:00 PM – 5:15 PM	794	990
Gallery Place-Chinatown West	Glenmont	5:00 PM – 5:15 PM	320	399
	Shady Grove	5:00 PM – 5:15 PM	339	430
Metro Center East	Glenmont	5:30 PM – 5:45 PM	390	485
	Shady Grove	5:30 PM – 5:45 PM	394	491
Metro Center South	Glenmont	5:30 PM – 5:45 PM	390	485
	Blue/Orange/Silver	5:30 PM – 5:45 PM	807	1,009

Sources: WMATA (2014c); MWCOG (2015); GS (2008)

Table 4-11: NFPA 130 Evacuation Analysis Summary Projected for No-action Alternative

Metro Station/Entrance	Platform Evacuation Time (Minutes)	Total Station Evacuation Time (Minutes)
Archives-Navy Memorial	32.7	36.1
Federal Triangle	14.4	18.1
Gallery Place-Chinatown East	30.0	33.7
Gallery Place-Chinatown West	8.6	12.2
Metro Center East	7.1	10.2
Metro Center South	3.3	16.5

Source: TRB (2013); WMATA (2014c)

Archives-Navy Memorial Metro Station

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the platform at Archives-Navy Memorial Metro Station could be evacuated in 32.7 minutes, and the entire station could be evacuated to a point of safety within 36.1 minutes under the projected No-action Alternative. The long evacuation time at this station is because there are only two platform-to-mezzanine escalators.

Federal Triangle Metro Station

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the platform at Federal Triangle Metro Station could be evacuated in 14.4 minutes, and the entire station could be evacuated to a point of safety within 18.1 minutes under the No-action Alternative.

Gallery Place-Chinatown Metro Station East Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Green/Yellow and Red-Glenmont platforms at the Gallery Place-Chinatown Metro Station east entrance could be evacuated in 30.0 minutes, and the entire station entrance could be evacuated to a point of safety within 33.7 minutes under the No-action Alternative. The long platform evacuation time is because there are only two platform-to-mezzanine escalators per platform at this station entrance.

Gallery Place-Chinatown Metro Station West Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the two Red line platforms at the Gallery Place-Chinatown Metro Station west entrance could be evacuated in 8.6 minutes, and the entire station entrance could be evacuated to a point of safety within 12.2 minutes under the No-action Alternative.

Metro Center Metro Station East Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Red line platforms at the Metro Center Metro Station east entrance could be evacuated in 7.1 minutes, and the entire station entrance could be evacuated to a point of safety within 10.2 minutes under the No-action Alternative.

Metro Center Metro Station South Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Blue/Orange/Silver and Red line platforms at the Metro Center Metro Station south entrance could be evacuated in 3.3 minutes, and the entire station could be evacuated to a point of safety within 16.5 minutes under the No-action Alternative.

4.4.3 Metrobus Analysis

For this analysis, it is assumed that there would be no major changes in Metrobus service in the study area by 2025. The 2025 No-action Alternative peak hour bus volumes were calculated by:

- Averaging existing maximum weekday passenger loads for each route and direction at stops within the study area by stop;
- Multiplying the passenger load by the number of AM peak hour and PM peak hour trips to calculate ridership per peak hour by route and direction; and
- Growing the resulting ridership totals to 2025 using the regional bus growth rate (1.9 percent).

These totals were then summed to calculate a total ridership per peak hour for the study area. To calculate the AM peak hour and PM peak hour capacity of bus services within the study area, the capacity per trip of each Metrobus route during each peak hour was multiplied by the number of trips scheduled in each peak hour. Capacities per trip for each Metrobus route were based on the typical number of seats available on each trip and the WMATA load standard (WMATA 2013b).

Total 2014 AM peak hour bus ridership in the study area was calculated at just more than 4,300 passengers, while PM peak hour bus ridership was calculated at approximately 3,950 passengers. Additional bus trips associated with the CityCenterDC project were added to these 2014 totals, while trips associated with the Old Post Office project were added to 2016 totals (see table 4-12). The trips were added proportionally to each route and direction in the study area based on their share of existing ridership. In combination with the 1.9 percent growth rate, bus passenger volumes in the study area by 2025 are forecasted to be approximately 5,350 during the AM peak hour and nearly 5,000 during the PM peak hour. This is well below the capacity of bus services within the study area, which is approximately 11,400 passengers during the AM peak hour and 10,700

passengers during the PM peak hour. Table 4-13 summarizes current and projected bus ridership in the study area.

Table 4-12: Bus Passenger Trips Associated with CityCenterDC and Old Post Office Developments

Project (Year)	Non-SOV AM Peak Hour	Non-SOV PM Peak Hour	Bus Proportion of Non-SOV	Bus AM Peak Hour	Bus PM Peak Hour
CityCenterDC (2014)	679	1,382	6.3%	43	87
Old Post Office (2016)	582	375	6.3%	37	24

Note: Bus passenger trips noted in the table are for the completion year of each project, as noted in parenthesis in the "Project (Year)" column.
Source: GS (2008)

Table 4-13: Current and Projected Bus Ridership in the Study Area

Year	AM Peak Hour			PM Peak Hour		
	Volume	Capacity	V/C	Volume	Capacity	V/C
2014 Existing Condition	4,315	11,425	0.38	3,952	10,698	0.37
2025 with Background Growth	5,288		0.46	4,843		0.45
2025 with Background Growth and Planned Development Projects (Total No-action)	5,383		0.47	4,978		0.47

Note: v/c = volume to capacity ratio
Source: GS (2008); WMATA (2014e), MWCOG (2015)

While bus capacity in the study area as a whole will be sufficient in 2025, several individual routes will likely experience capacity issues during peak hours. Peak volumes per hour on Routes 11Y, 32, 36, 80, and G8 are all projected to be over capacity by 2025 within the study area. WMATA has completed studies of the 30s Line (Routes 32 and 36), Route 80, and Route G8, according to its website. Certain recommendations from these studies have already been implemented, and all are intended to mitigate overcrowding on these routes. Further analysis would be required to determine the extent to which the recommendations would impact capacity on these routes. Specific recommendations from WMATA's studies to improve bus capacity are found in Appendix B7.

With the redevelopment of the Old Post Office site, the preferred selected developer would seek to relocate the bus stop on Pennsylvania Avenue and 12th Street NW directly in front of the main Old Post Office Building entrance farther east, closer to 10th Street (GSA in cooperation with NCPC 2013a). This relocation of the bus stop would reduce existing conflicts between pedestrians, vehicles, and buses by increasing visibility between pedestrians and oncoming traffic and would have an overall beneficial impact by providing better access to crosswalks across Pennsylvania Avenue and 10th Street NW. The Old Post Office redevelopment study provides more details on the existing and proposed conditions at this location.

4.4.4 Level of Impact

The increase in public transit trips under the No-action Alternative would have the following impacts on transit:

- Metrobus Routes 11Y, 32, 36, 80, and G8 would continue to have capacity issues due to their current capacity issues; no overall projected transit service increase or changes in Metrobus service are assumed

in the analysis. The overall capacity of bus services in the study area, however, would accommodate the projected ridership.

- Metrorail passenger loads through the study area are projected to be at acceptable levels.
- Overall, Metrorail vertical elements and faregate aisles at each station are projected to operate below capacity.
- Metrorail fare vending machines are projected to continue to operate above capacity at the east and west entrances to Galley Place-Chinatown and the south entrance to Metro Center as they do under existing conditions. Additionally, fare vending machines at Archives-Navy Memorial and the east entrance to Metro Center will operate above capacity.
- Metrorail platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to remain at the acceptable LOS B at Archives-Navy Memorial and Federal Triangle. The Red Line platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS D, while the lower platforms are projected to operate at pedestrian LOS C. This represents a degradation in level of service from existing conditions at all Metro Center platforms and the Green/Yellow (lower) and Red-Glenmont platforms at Gallery Place-Chinatown. There would be no change in level of service at the Red-Shady Grove platform at Gallery Place-Chinatown.
- Platform evacuation times will increase slightly at all station entrances over existing conditions and will continue to exceed NFPA 130 standards at Archives-Navy Memorial, Federal Triangle, the east and west entrances to Gallery Place-Chinatown, and the east entrance to Metro Center. The platform evacuation time at the south entrance to Metro Center, however, will continue to meet NFPA 130 standards. Station evacuation times will increase slightly over existing conditions and will continue to exceed NFPA 130 standards at all station entrances. WMATA Metrorail stations, however, are not required to meet NFPA 130 standards.

Therefore, the No-action Alternative would have indirect, long-term, major adverse impacts on public transit.

4.5 Parking

Non-street parking in the study area will increase with the CityCenterDC and the Old Post Office building redevelopment, which will have parking garages of 1,555 and 150 parking spaces, respectively (Riker 2013). Although 500 spaces of the CityCenterDC parking garage will be open to the public due to the retail use within the project, the Old Post Office building parking will be limited to Old Post Office patrons who use valet as well as up to five employee spaces (CityCenterDC 2014; GSA in coordination with NCPC 2013b). Due to the limited nature of parking at the Old Post Office site, off-street parking conditions will likely only see minor changes from the few employees who may opt to pay for parking at CityCenterDC and walk the remaining blocks to the JEH building.

There are no anticipated changes to street parking within the study area within the timeframe of this study, but several street parking spaces will be added to the CityCenterDC blocks with the reinstatement of the 10th Street and I Street NW rights-of-way as streets. These additional on-street parking spaces will likely be time-constrained and are intended for retail customers, deliveries, and mid-day trips to surrounding commercial buildings.

Although minor, under the No-action Alternative, there would be indirect, long-term, beneficial impacts on parking due to increased supply, mainly as a result of the CityCenterDC development project. However, the additional parking may or may not have a negative impact to future traffic (see Section 4.7 *Traffic Analysis*).

4.6 Truck Access

Truck access routes would not change under the No-action Alternative. Therefore, the No-action Alternative would have no measureable indirect impacts on truck access.

4.7 Traffic Analysis

The following section describes the process for analyzing traffic for the No-action Alternative and the results of the analysis. Note that the procedures to forecast future traffic volumes throughout the TIA include rounding; therefore, values may not add up to the precise value indicated. Planned roadway improvements; background traffic growth, projected future vehicular, transit, bike, and pedestrian traffic; and the distribution of this projected traffic over the roadway network are all inputs to forecast future traffic on the roadway network, or the 2025 No-action Alternative. Volumes are then used as an input, along with delay, signal timing, and geometrics, to evaluate traffic operations and queueing at signalized and unsignalized intersections, and on freeways, to determine the impacts of traffic growth and potential mitigation measures.

DDOT is conducting a citywide traffic signal optimization initiative scheduled to be completed by the end of 2016 (DDOT 2015b). The traffic signals within the study area were not optimized as part of the No-action Alternative because DDOT's signal optimization initiative would not be bound by the JEH parcel study area, but cover many other areas of the city. The signal optimization study may consider corridor-based signal plans, bus priority corridors, or other methods to improve traffic flow on an area-wide basis that could include the JEH study area.

4.7.1 Background Growth

Background growth was added to the roadway network to account for vehicle trips traveling through the study area during the AM and PM peak hours. These trips are important to include because they account for vehicle volume growth due to land use changes outside of the study area. Following DDOTs guidelines, AADTs were relied to develop background growth rates. The AADT volumes provide a historic reference. DDOT recommends five years of historic data to determine a historical average growth. The latest available DDOT historic average daily vehicle counts were compared from 2008-2012 to provide an average annual growth rate to apply to the study area roadways (DDOT 2009b, 2011, 2012c, 2012d, 2013a).

The comparison separated roadways into arterials, minor arterials, and local roadways based on DDOT's assigned functional classification map. Arterial and local roadways had an average negative growth while minor arterials had a 0.5 percent positive growth. This information was presented to DDOT, which agreed for the study to apply a 0.5 percent growth for the minor arterials only and a 0 percent growth rate for all other roadways. Based on the DDOT roadway functional classification map, the minor arterials are 4th Street NW, 6th Street NW, 9th Street NW, 12th Street NW, 11th Street NW, 13th Street NW, E Street NW, and H Street NW (DDOT 2014c). The background growth was forecasted out 11 years (future horizon year 2025) by using the compound formula method. Table 4-14 summarizes the background growth rates applied to the study area network.

Table 4-14: Background Growth Rates for No-action Alternative Roadways

Roadway	Annual Growth Rate	Eleven-Year Growth
4th Street NW	0.5%	5.64%
6th Street NW		
9th Street NW		
11th Street NW		
12th Street NW		
13th Street NW		
E Street NW		
H Street NW		

Source: GS (2008); JEH Redevelopment Scenarios e-mail from A. Chamberlain, DDOT, to M. Berger, Louis Berger, on July 31, 2014.

4.7.2 Trip Generation and Modal Split

The trip generation and modal split process relied on the transportation studies conducted for both development projects, the Old Post Office Renovation and CityCenterDC (GS 2008). They both followed the DDOT Guidelines by using the ITE *Trip Generation Manual* trip rates where possible (2012). The Old Post Office Redevelopment Transportation Study also referenced the Washington Convention Center EIS to develop trip rates and modal split for the proposed hotel conference center. Both studies relied on the 2005 WMATA Development-Related Ridership Survey to determine the percentage of transit trips (WMATA 2006). The analysis used the full trip generation published in the Old Post Office transportation study, not the net trip generation, because (1) the building probably was not occupied during the time traffic counts for this project were obtained, and (2) the analysis approach was conservative. Table 4-15 contains a summary of the forecasted trip generation and mode split for the two developments.

Table 4-15: Planned Development Trips for No-action Alternative

PROJECT	UNITS/SIZE/ CREDITS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
CityCenterDC [a]							
General Office (ITE - 710)	462,085 SF	561	77	638	101	495	596
Alternative Travel Mode Reduction	50% credit	-281	-39	-320	-51	-248	-299
Net External Trips		280	38	318	50	247	297
Shopping Center (ITE - 820)	252,023 SF	167	110	277	553	599	1,152
Alternative Travel Mode Reduction	80% credit	-134	-88	-222	-442	-479	-921
Net External Trips		33	22	55	111	120	231
Apartments (ITE - 220)	458 units	46	182	228	176	94	270
Alternative Travel Mode Reduction	60% credit	-28	-109	-137	-106	-56	-162
Net External Trips		18	73	91	70	38	108
Condominiums (ITE - 230)	216 units	16	80	96	76	37	113
Alternative Travel Mode Reduction	60% credit	-10	-48	-58	-46	-22	-68
Net External Trips		6	32	38	30	15	45
TOTAL VEHICLE TRIPS		**337**	**165**	**502**	**261**	**420**	**681**
Old Post Office Redevelopment [b]							
Hotel (ITE - 310)	267 rooms	92	60	152	84	76	160
Alternative Travel Mode Reduction	75% credit	-69	-45	-114	-63	-57	-120
Net Vehicle Trips		23	15	38	21	19	40
Drinking Place (ITE - 925)	1.7 service bays	0	0	0	12	8	20
Alternative Travel Mode Reduction	75% credit	0	0	0	-9	-6	-15
Net Vehicle Trips		0	0	0	3	2	5
Quality Restaurant (ITE - 931)	16,600 SF	0	0	0	86	43	129
Pass-by Trips (Prince George's County Guidance)	44% pass-by	0	0	0	-38	-19	-57
Net Person Trips		0	0	0	48	24	72
Alternative Travel Mode Reduction	75% credit	0	0	0	-36	-18	-54
Net Vehicle Trips		0	0	0	12	6	18
Bread/Bagel Shop (ITE - 939)	10,000 SF	292	332	624	124	124	248
Alternative Travel Mode Reduction	75% credit	-219	-249	-468	-93	-93	-186
Net Vehicle Trips		73	83	156	31	31	62
Conference Center - Automobiles	1,000 seats						
Net Vehicle Trips		37	1	38	2	28	30
Conference Center - Taxicabs	1,000 seats						
Net Vehicle Trips		13	13	26	11	11	22
TOTAL VEHICLE TRIPS		**146**	**112**	**258**	**80**	**97**	**177**

Notes: SF = Square Feet

[a] Based on trip generation tables contained in the technical memorandum from Gorove Slade Associates to Old Convention Center Site Master Developer (GS 2008)

[b] Based on trip generation tables published in the Old Post Office Redevelopment Transportation Study (GSA in coordination with NCPC 2013a)

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4.7.3 Trip Distribution

Once the number of trips was forecasted through trip generation, and their mode was projected through the above-noted studies, destinations of the trips were forecasted. This process followed the two transportation studies (Old Post Office Redevelopment and CityCenterDC). The Old Post Office Redevelopment Study distributed the trips based on the existing turning movement pattern (GSA in coordination with NCPC 2013a). The same projected trip pattern was followed. The trips were assumed to continue on the same roadway heading through the study area. The CityCenterDC trip distribution followed the same pattern assigned through the transportation study and was also assumed to continue on the same roadway heading through the study area (GS 2014). Tables 4-16 through 4-18 contain the trip distributions covering the two planned developments, and Appendix B8 contains maps showing the trip distributions for both planned developments.

Table 4-16: No-action Alternative CityCenterDC and Old Post Office Redevelopment Trip Distribution

Destination	Road	CityCenterDC Distribution Percent	Old Post Office Redevelopment Distribution Percent			
		All Conditions	AM Inbound	AM Outbound	PM Inbound	PM Outbound
East DC/MD	Constitution Ave East	8.0%	17.6%	17.3%	11.4	11.8
North DC	14th Street North	0.0%	8.8%	8.7%	11.4	11.8
Northeast DC/MD	10th Street North	0.0%	3.0%	0.0%	9	0.0
North DC	11th Street North	0.0%	5.9%	6.5%	9.1	23.5
South DC	7th Street South	0.0%	14.7%	1.8%	18.2	5.3
Northwest MD, Western VA	Constitution Ave West	5.0%	23.5%	39.2%	22.7	29.4
South DC, Southeast MD, Southwest VA	12th Street/ 9th Streets	12.0%	26.5%	26.5%	18.2	18.2
TOTAL		**24.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: GS (2014); GSA in coordination with NCPC (2013a)

4.7.4 Development of No-action Alternative

The planned developments, background growth, and planned roadway improvements were summed together to create the total background trip change between the Existing Condition and the No-action Alternative. Figure 4-4 shows these combined total background trip AM and PM turning movement volumes, while Appendix B8 contains the individual planned developments and background growth total turning movement volumes. The No-action Alternative turning movement vehicle volumes covering all study area intersections are then shown in figure 4-5.

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Figure 4-4: No-action Alternative AM and PM Weekday Peak Total Background Trips

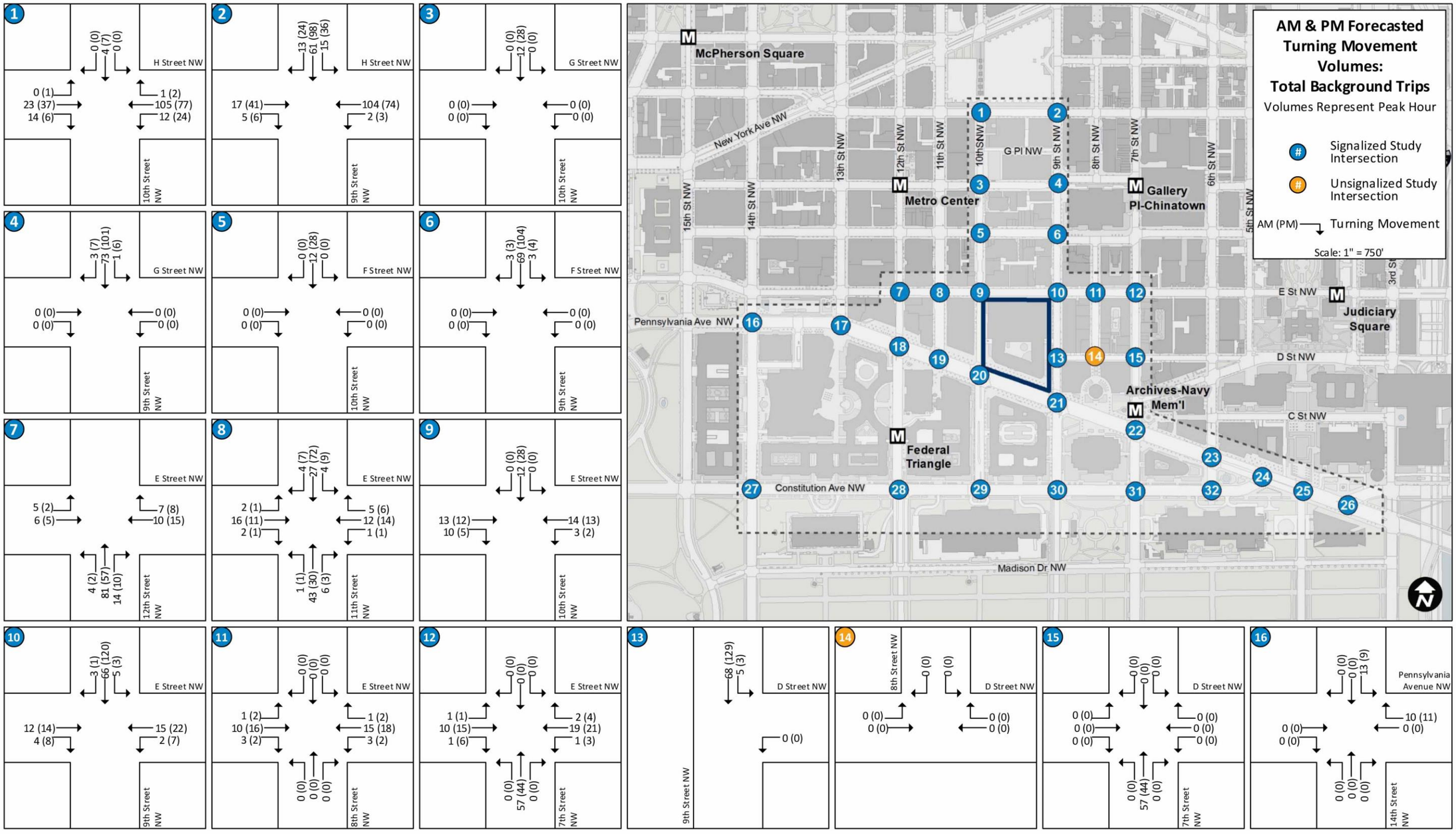


Figure 4-4: No-action Alternative AM and PM Weekday Peak Total Background Trips (continued)

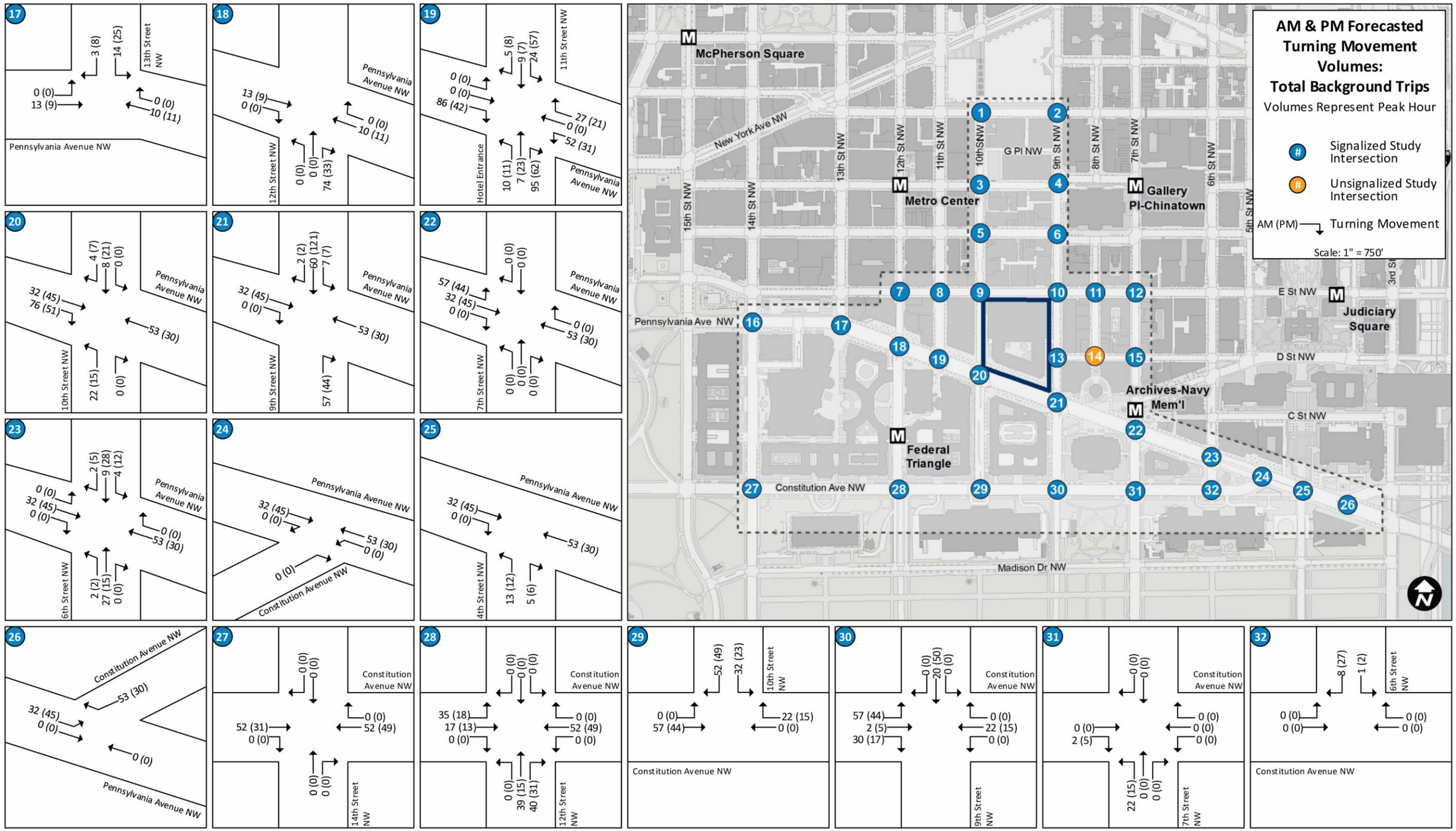


Figure 4-5: No-action Alternative AM and PM Weekday Peak Turning Movement Volumes

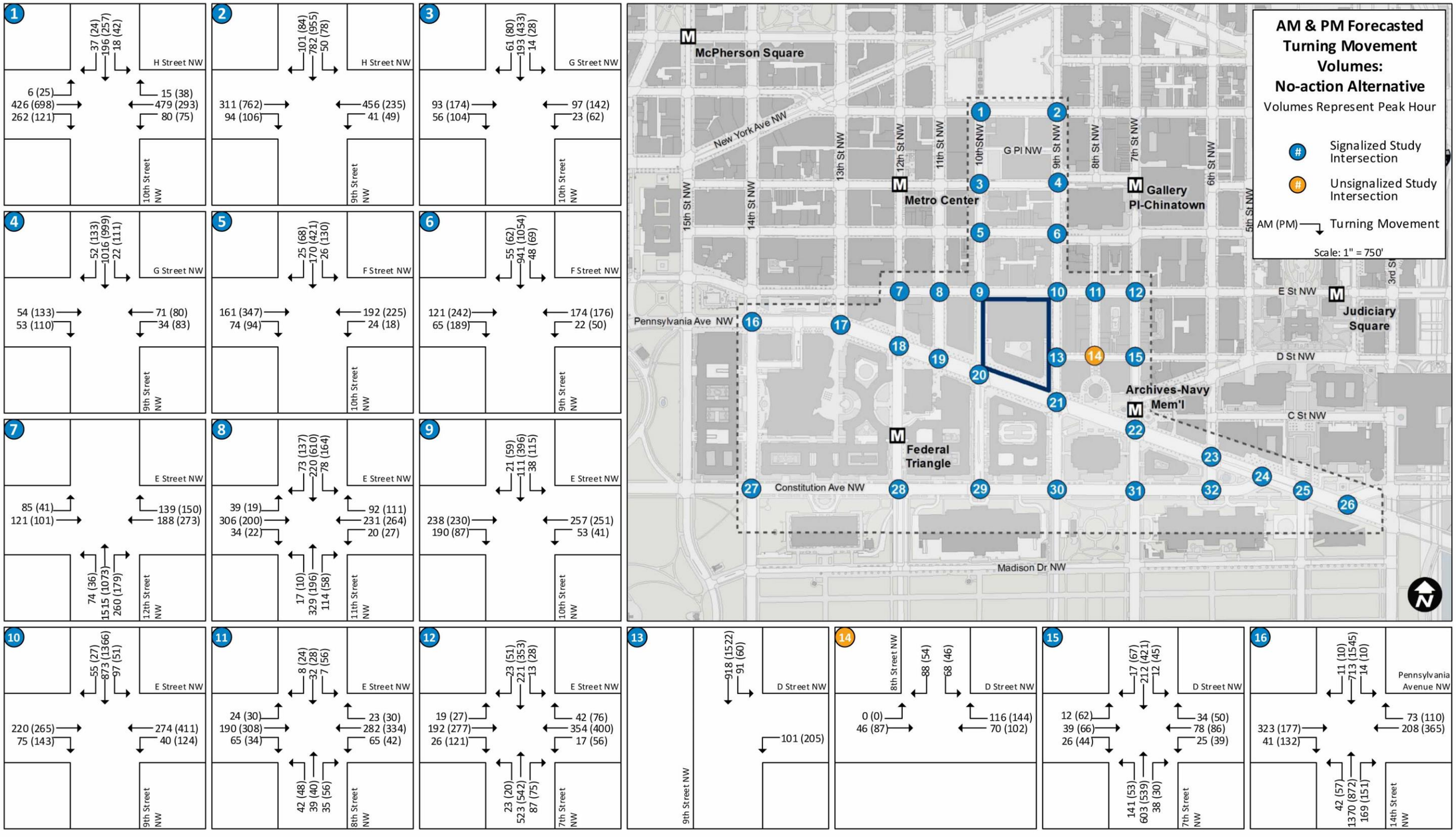
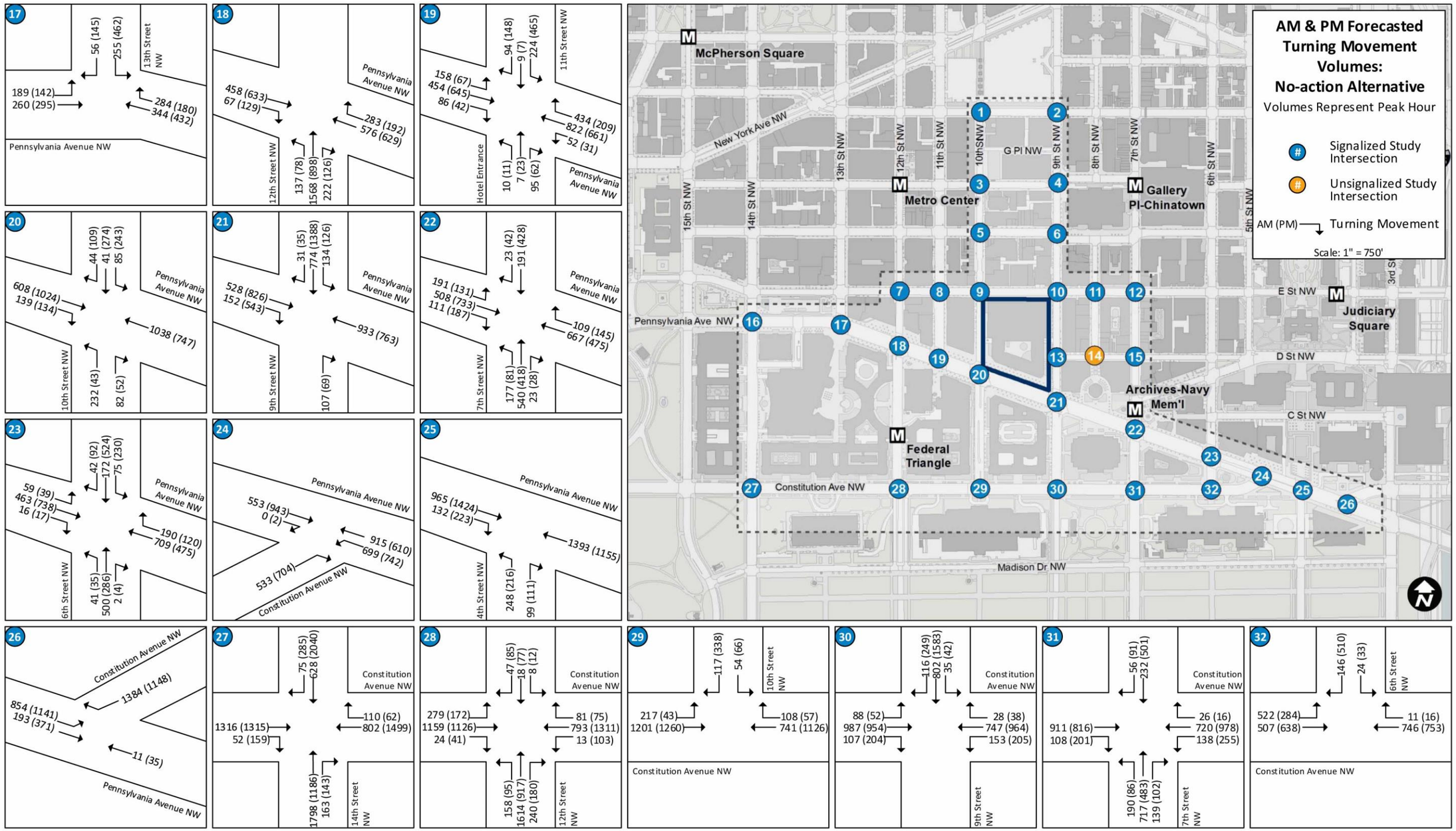


Figure 4-5: No-action Alternative AM and PM Weekday Peak Turning Movement Volumes (continued)



4.7.5 No-action Alternative Operations Analysis

Based on the Synchro™ signalized intersection analysis, the majority of the study intersections would operate at acceptable conditions during the AM and PM peak hours in 2025. However, the intersection of 6th Street NW and Pennsylvania Avenue NW would operate at LOS E during the PM peak hour. This is the only intersection within the study area that would operate under unacceptable conditions (LOS E or LOS F) during a peak hour period in 2025. None of the study area intersections would operate at LOS F during a peak hour.

The following individual intersection lane groups or overall approaches would operate at unacceptable conditions (LOS E or LOS F) during the morning or afternoon peak hour in 2025 under the No-action Alternative. The lane group within the approach that would be operating under unacceptable conditions is noted in parentheses; when "overall" is noted, the overall approach movements would operate under unacceptable conditions.

- 9th Street NW and G Street NW (Intersection #4)
  - Eastbound G Street (overall) during the PM peak hour
- 9th Street NW and F Street NW (Intersection #6)
  - Southbound 9th Street (overall) during the PM peak hour
- 9th Street NW and E Street NW (Intersection #10)
  - Southbound 9th Street (overall) during the PM peak hour
- 13th Street NW and Pennsylvania Avenue NW (Intersection #17)
  - Eastbound Pennsylvania Avenue (overall) during the AM peak hour
- 11th Street NW and Pennsylvania Avenue NW (Intersection #19)
  - Eastbound Pennsylvania Avenue (left turns) and westbound Pennsylvania Avenue (right turns) during the AM and PM peak hour
  - Southbound 11th Street (overall) during the AM and PM peak hour
- 10th Street NW and Pennsylvania Avenue NW (Intersection #20)
  - Northbound 10th Street (overall) during the AM peak hour
- 7th Street NW and Pennsylvania Avenue (Intersection #22)
  - Eastbound Pennsylvania Avenue (overall) and northbound 7th Street (left turns) during the AM peak hour
  - Eastbound Pennsylvania Avenue (left turns) and northbound 7th Street (left turns) during the PM peak hour
- 6th Street NW and Pennsylvania Avenue NW (Intersection #23)
  - Eastbound Pennsylvania Avenue (left turns) during the AM peak hour, and southbound 6th Street (overall) during the PM peak hour
- Constitution Avenue (WB) NW and Pennsylvania Avenue NW (Intersection #24)
  - Westbound Pennsylvania Avenue (left turns) during the PM peak hour
- 14th Street NW and Constitution Avenue NW (Intersection #27)
  - Southbound 14th Street (overall) during the PM peak hour
- 12th Street NW and Constitution Avenue NW (Intersection #28)
  - Northbound 12th Street (overall) during both the AM and PM peak hours
- 9th Street NW and Constitution Avenue NW (Intersection #30)
  - Eastbound Constitution Avenue (overall) during the PM peak hour
- 6th Street NW and Constitution Avenue NW (Intersection #32)
  - Eastbound Constitution Avenue (left turns) during the AM peak hour

Based on the Synchro™ unsignalized intersection analysis, the one unsignalized intersection in the study area would operate at acceptable conditions during the morning and afternoon peak hours.

4.7.5.1 Complete Intersection Operations Analysis

This section summarizes the differences in LOS impacts between the Existing Condition and the No-action Alternative by quantifying the change in intersection operation failures. Following the summary, this section also includes the complete results of the operations analysis in both figures and a table.

Based on the Synchro™ signalized intersection analysis, a total of 13 signalized intersections would experience an unacceptable conditions for one or more turning movements. Compared to the Existing Condition, the No-Action Alternative would have no change in the number of intersections failing during the AM peak hour and there would be one more intersection failing during the PM peak hour. In the AM peak hour, compared to the Existing Condition, no intersections that passed overall would fail under the No-action Alternative, 32 would not change, and none that were failing would now pass. In the PM peak hour, there is one intersection that passed overall but would fail under the No-action Alternative, 31 would not change, and none that were failing would now pass.

Table 4-17 shows a summary of the number of intersections that meet the following criteria for the overall directional approach that would change between the Existing Condition and the No-action Alternative:

- New Failing Approach
  - Number of intersections that have at least one failing overall approach that did **NOT** have a failing overall approach in the previous condition
- Additional Failing Approaches
  - Number of intersections that had at least one failing overall approach in the previous condition and now would have additional/more failing overall approaches than before
- No Change
  - Number of intersections that would have no change in the number of failing overall approaches, or the number of failing overall approaches would be the same as in the previous condition
- Fewer Failing Approaches
  - Number of intersections that would have less failing overall approaches than the previous condition, but still would have some failing overall approaches
- No Failing Approaches
  - Number of intersections that had failing overall approaches in the previous condition, but would no longer have failing overall approaches

Table 4-17: Intersection Operations Summary Comparing Existing Condition to No-action Alternative

Type of Change Between Conditions	AM	PM
New Failing Approach	2	3
Additional Failing Approaches	0	0
No Change	30	29
Fewer Failing Approaches	0	0
No Failing Approaches	0	0
Total Signalized and Unsignalized Intersections	**32**	**32**

The average LOS for the various approaches to the intersections and the overall intersection LOS grades for the No-action Alternative are shown in figures 4-6 and 4-7 for the AM and PM peak hours, respectively. Table 4-18 shows the results of the LOS capacity analysis and the intersection projected delay under the No-action Alternative during the AM and PM peak hours.

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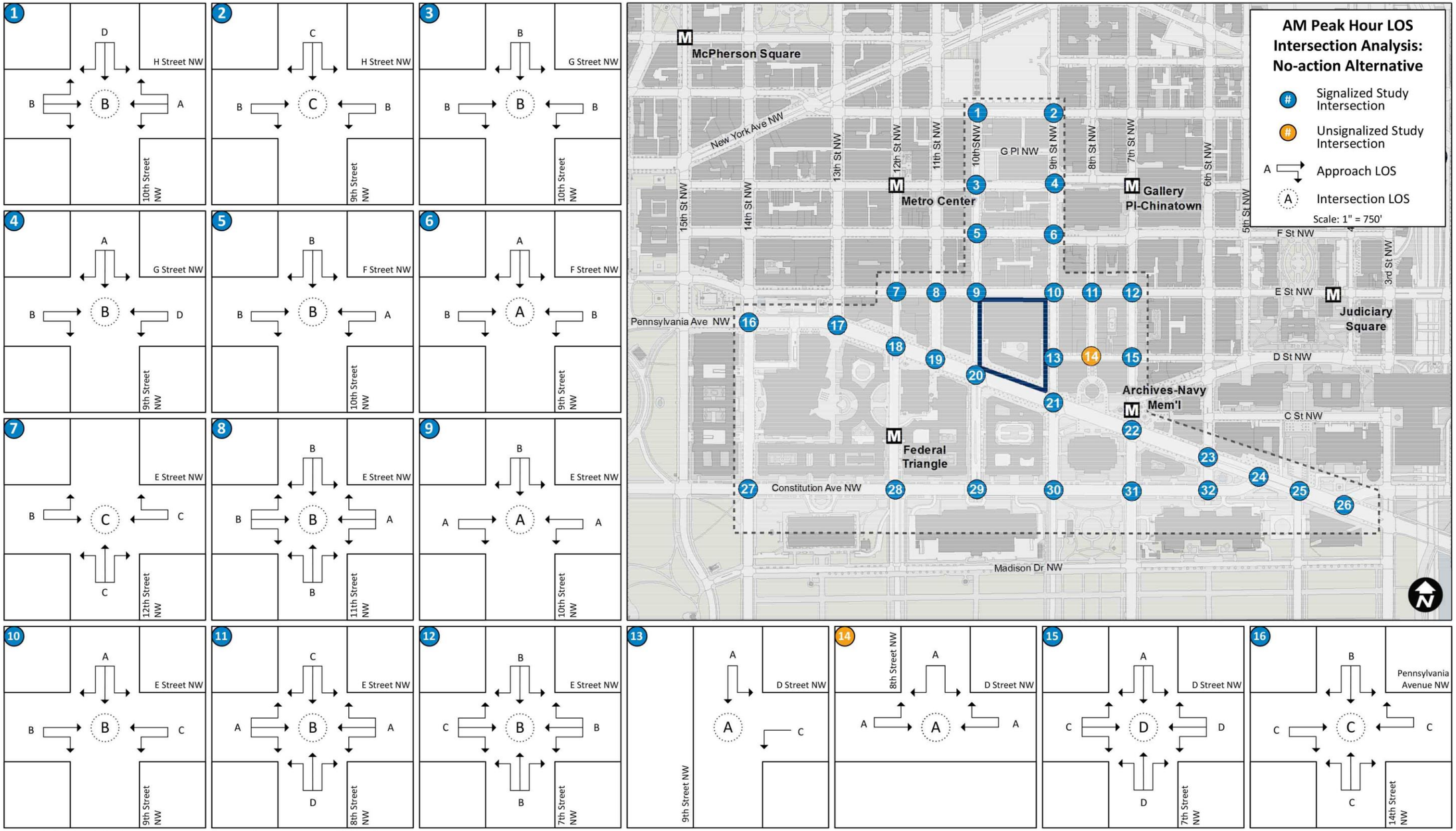
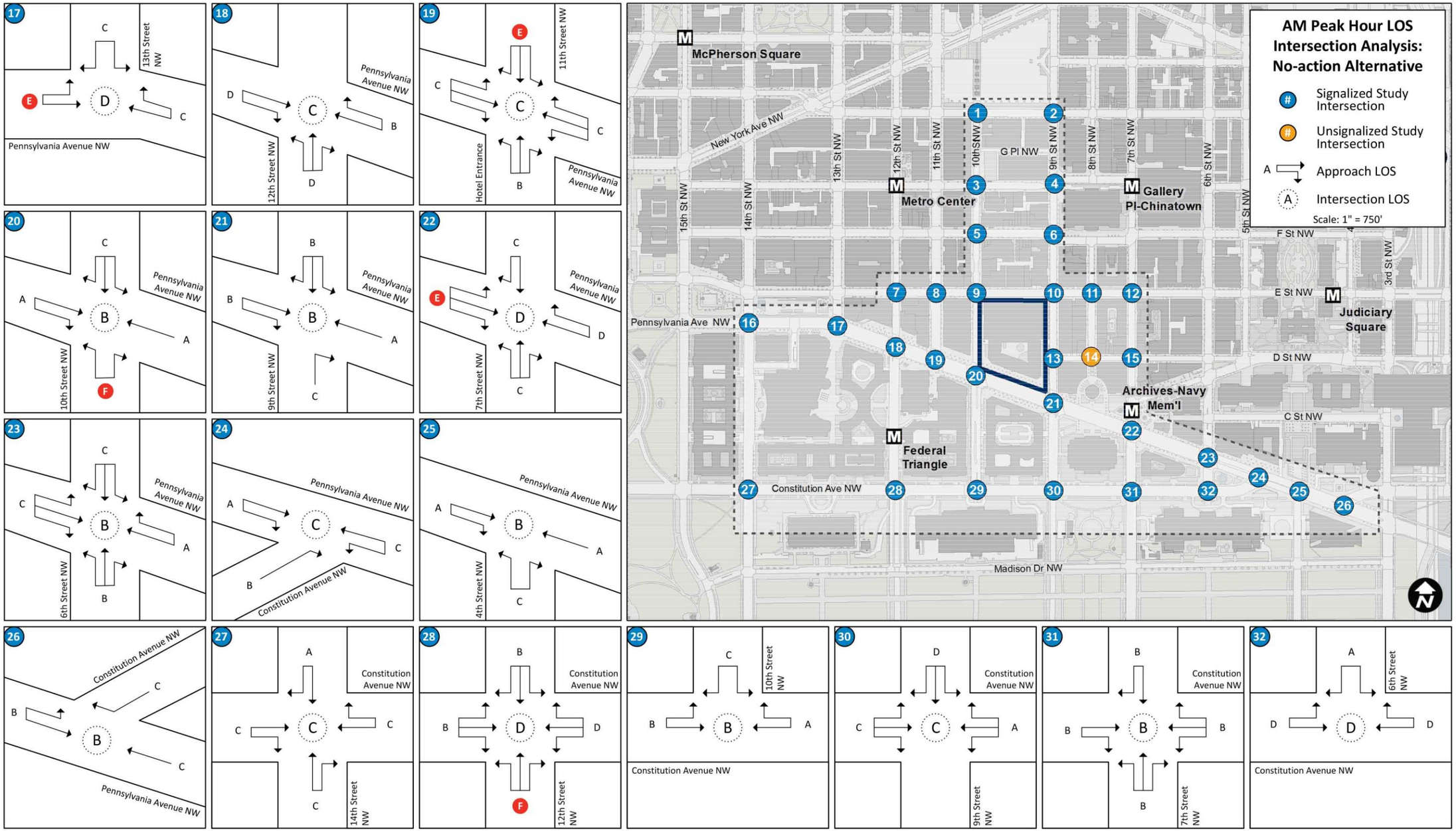
Figure 4-6: No-action Alternative Intersection LOS for AM Peak Hour



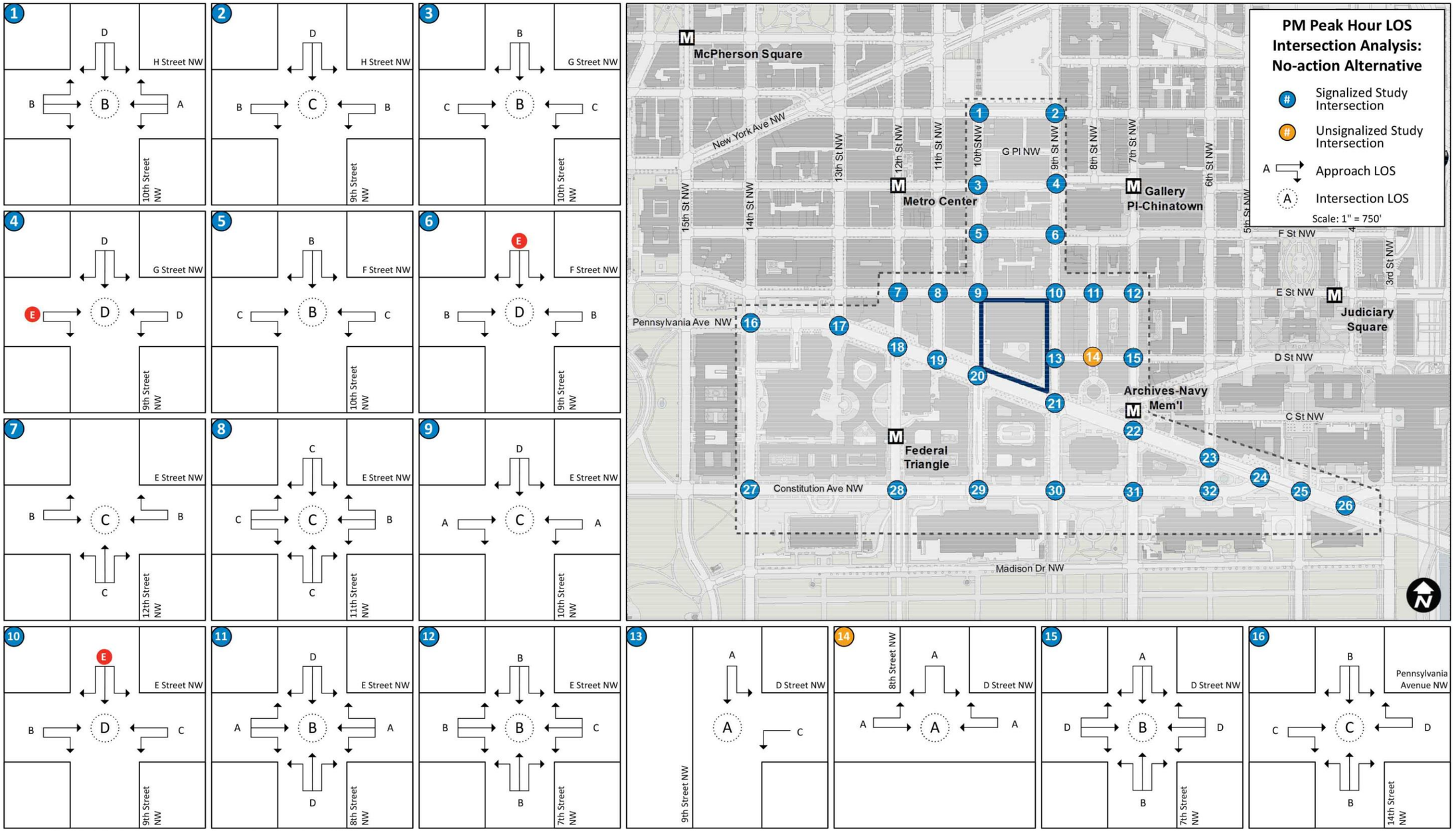
Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 4-6: No-action Alternative Intersection LOS for AM Peak Hour (continued)



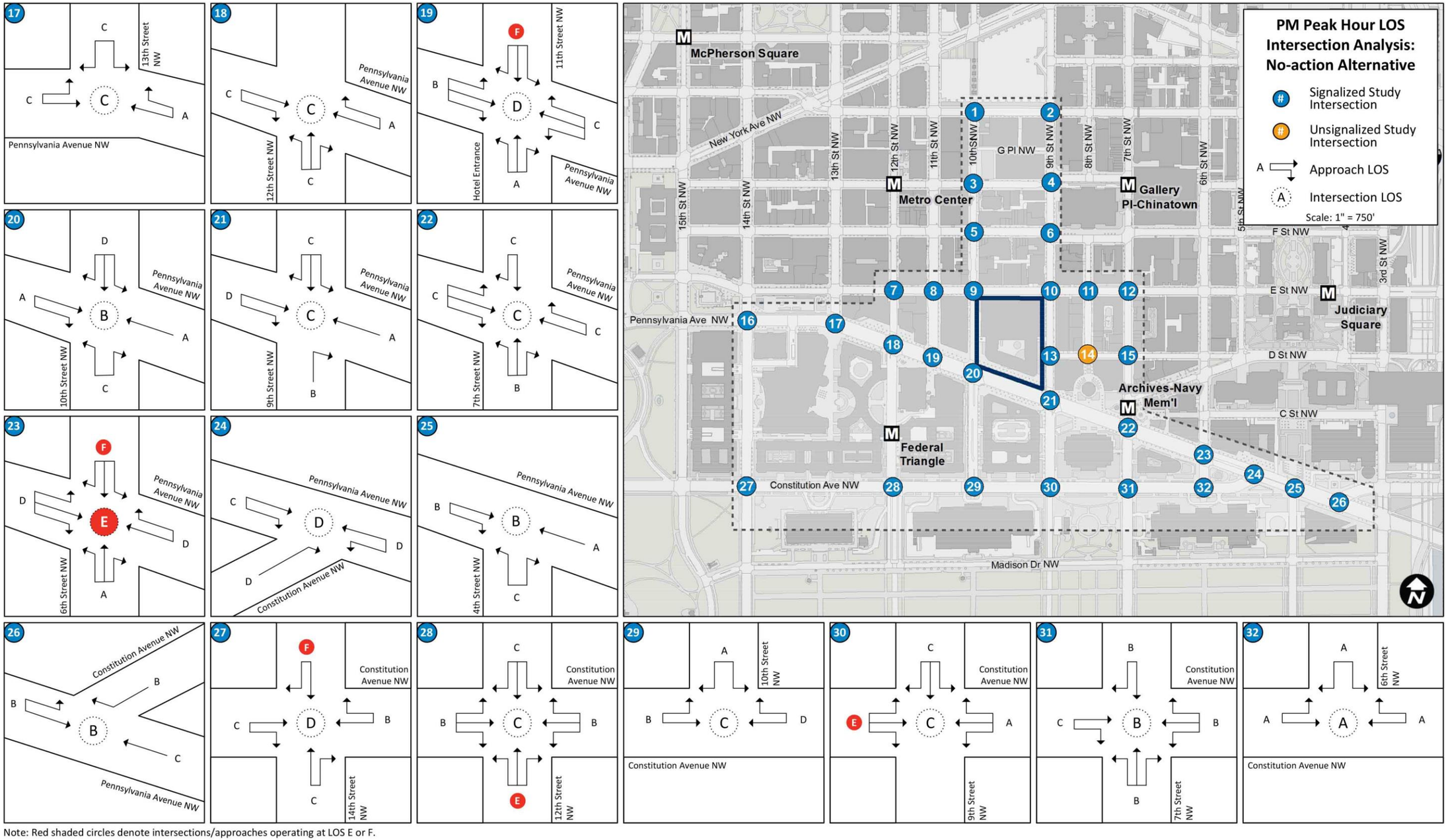
Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 4-7: No-action Alternative Intersection LOS for PM Peak Hour



Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 4-7: No-action Alternative Intersection LOS for PM Peak Hour (continued)



Note: Red shaded circles denote intersections/approaches operating at LOS E or F.

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
1	**10th Street NW & H Street NW (Signalized)**							
	EB (H Street)	LTR	10.8	B		12.6	B	
	Eastbound (H Street)		**10.8**	**B**		**12.6**	**B**	
	WB (H Street)	LTR	3.1	A		4.9	A	
	Westbound (H Street)		**3.1**	**A**		**4.9**	**A**	
	SB (10th Street)	LTR	41.8	D		53.0	D	
	Southbound (10th Street)		**41.8**	**D**		**53.0**	**D**	
	Overall		**12.8**	**B**	**Pass**	**19.6**	**B**	**Pass**
2	**9th Street NW & H Street NW (Signalized)**							
	EB (H Street)	TR	12.7	B		12.5	B	
	Eastbound (H Street)		**12.7**	**B**		**12.5**	**B**	
	WB (H Street)	LT	19.8	B		16.3	B	
	Westbound (H Street)		**19.8**	**B**		**16.3**	**B**	
	SB (9th Street)	LT	26.3	C		38.8	D	
	SB (9th Street)	R	4.3	A		5.2	A	
	Southbound (9th Street)		**23.9**	**C**		**36.2**	**D**	
	Overall		**20.3**	**C**	**Pass**	**24.7**	**C**	**Pass**
3	**10th Street NW & G Street NW (Signalized)**							
	EB (G Street)	TR	18.0	B		27.8	C	
	Eastbound (G Street)		**18.0**	**B**		**27.8**	**C**	
	WB (G Street)	LT	10.5	B		24.2	C	
	Westbound (G Street)		**10.5**	**B**		**24.2**	**C**	
	SB (10th Street)	LTR	14.5	B		10.2	B	
	Southbound (10th Street)		**14.5**	**B**		**10.2**	**B**	
	Overall		**14.6**	**B**	**Pass**	**18.2**	**B**	**Pass**
4	**9th Street NW & G Street NW (Signalized)**							
	EB (G Street)	TR	13.7	B		72.5	E	
	Eastbound (G Street)		**13.7**	**B**		**72.5**	**E**	
	WB (G Street)	L	43.0	D		45.0	D	
	WB (G Street)	T	47.4	D		44.0	D	
	Westbound (G Street)		**46.0**	**D**		**44.5**	**D**	
	SB (9th Street)	LT	10.0	A		44.3	D	
	SB (9th Street)	R	0.6	A		1.5	A	
	Southbound (9th Street)		**9.5**	**A**		**39.8**	**D**	
	Overall		**13.0**	**B**	**Pass**	**45.7**	**D**	**Pass**
5	**10th Street NW & F Street NW (Signalized)**							
	EB (F Street)	TR	12.0	B		24.1	C	
	Eastbound (F Street)		**12.0**	**B**		**24.1**	**C**	
	WB (F Street)	LT	9.1	A		21.0	C	
	Westbound (F Street)		**9.1**	**A**		**21.0**	**C**	
	SB (10th Street)	LTR	14.9	B		11.0	B	
	Southbound (10th Street)		**14.9**	**B**		**11.0**	**B**	
	Overall		**12.1**	**B**	**Pass**	**17.4**	**B**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
6	**9th Street NW & F Street NW (Signalized)**							
	EB (F Street)	TR	13.4	B		14.2	B	
	Eastbound (F Street)		**13.4**	**B**		**14.2**	**B**	
	WB (F Street)	LT	18.6	B		19.4	B	
	Westbound (F Street)		**18.6**	**B**		**19.4**	**B**	
	SB (9th Street)	LTR	7.4	A		55.5	E	
	Southbound (9th Street)		**7.4**	**A**		**55.5**	**E**	
	Overall		**9.8**	**A**	**Pass**	**41.5**	**D**	**Pass**
7	**12th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	19.2	B		16.0	B	
	EB (E Street)	T	15.5	B		14.6	B	
	Eastbound (E Street)		**17.1**	**B**		**15.0**	**B**	
	WB (E Street)	TR	21.9	C		13.5	B	
	Westbound (E Street)		**21.9**	**C**		**13.5**	**B**	
	NB (12th Street)	LTR	22.4	C		31.9	C	
	Northbound (12th Street)		**22.4**	**C**		**31.9**	**C**	
	Overall		**21.8**	**C**	**Pass**	**26.3**	**C**	**Pass**
8	**11th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	10.4	B		21.4	C	
	EB (E Street)	T	20.1	C		27.0	C	
	EB (E Street)	R	9.6	A		20.7	C	
	Eastbound (E Street)		**18.2**	**B**		**26.0**	**C**	
	WB (E Street)	L	6.3	A		16.2	B	
	WB (E Street)	T	8.1	A		21.8	C	
	WB (E Street)	R	3.6	A		14.7	B	
	Westbound (E Street)		**6.8**	**A**		**19.5**	**B**	
	NB (11th Street)	LT	13.7	B		22.0	C	
	NB (11th Street)	R	11.6	B		15.4	B	
	Northbound (11th Street)		**13.2**	**B**		**20.5**	**C**	
	SB (11th Street)	LT	23.0	C		33.3	C	
	SB (11th Street)	R	5.7	A		21.8	C	
	Southbound (11th Street)		**19.6**	**B**		**31.5**	**C**	
	Overall		**14.7**	**B**	**Pass**	**26.4**	**C**	**Pass**
9	**10th Street NW & E Street NW (Signalized)**							
	EB (E Street)	T	11.4	B		5.3	A	
	EB (E Street)	R	5.0	A		1.9	A	
	Eastbound (E Street)		**8.5**	**A**		**4.4**	**A**	
	WB (E Street)	L	2.9	A		1.2	A	
	WB (E Street)	T	3.1	A		1.5	A	
	Westbound (E Street)		**3.0**	**A**		**1.4**	**A**	
	SB (10th Street)	LTR	19.0	B		48.4	D	
	Southbound (9th Street)		**19.0**	**B**		**48.4**	**D**	
	Overall		**8.8**	**A**	**Pass**	**24.8**	**C**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
10	**9th Street NW & E Street NW (Signalized)**							
	EB (E Street)	T	14.8	B		16.7	B	
	EB (E Street)	R	8.6	A		14.0	B	
	Eastbound (E Street)		**13.2**	**B**		**15.8**	**B**	
	WB (E Street)	L	18.8	B		22.8	C	
	WB (E Street)	T	25.8	C		24.9	C	
	Westbound (E Street)		**24.9**	**C**		**24.4**	**C**	
	SB (9th Street)	LTR	9.3	A		64.7	E	
	Southbound (9th Street)		**9.3**	**A**		**64.7**	**E**	
	Overall		**13.0**	**B**	**Pass**	**46.2**	**D**	**Pass**
11	**8th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	8.2	A		2.4	A	
	EB (E Street)	T	10.7	B		3.2	A	
	EB (E Street)	R	4.9	A		0.4	A	
	Eastbound (E Street)		**9.2**	**A**		**2.9**	**A**	
	WB (E Street)	L	5.4	A		3.0	A	
	WB (E Street)	T	6.2	A		3.4	A	
	WB (E Street)	R	1.0	A		0.5	A	
	Westbound (E Street)		**5.8**	**A**		**3.2**	**A**	
	NB (8th Street)	LTR	39.6	D		44.9	D	
	Northbound (8th Street)		**39.6**	**D**		**44.9**	**D**	
	SB (8th Street)	LTR	28.7	C		42.6	D	
	Southbound (8th Street)		**28.7**	**C**		**42.6**	**D**	
	Overall		**13.7**	**B**	**Pass**	**13.5**	**B**	**Pass**
12	**7th Street NW & E Street NW (Signalized)**							
	EB (E Street)	L	20.2	C		12.9	B	
	EB (E Street)	T	23.6	C		17.2	B	
	EB (E Street)	R	9.5	A		9.9	A	
	Eastbound (E Street)		**21.8**	**C**		**14.8**	**B**	
	WB (E Street)	L	15.5	B		21.6	C	
	WB (E Street)	T	21.3	C		26.2	C	
	WB (E Street)	R	7.5	A		14.3	B	
	Westbound (E Street)		**19.6**	**B**		**24.0**	**C**	
	NB (7th Street)	LT	20.1	C		18.0	B	
	NB (7th Street)	R	10.1	B		13.5	B	
	Northbound (7th Street)		**18.7**	**B**		**17.5**	**B**	
	SB (7th Street)	LTR	18.5	B		17.8	B	
	Southbound (7th Street)		**18.5**	**B**		**17.8**	**B**	
	Overall		**19.4**	**B**	**Pass**	**18.7**	**B**	**Pass**
13	**9th Street NW & D Street NW (Signalized)**							
	WB (D Street)	L	20.3	C		26.0	C	
	Westbound (D Street)		**20.3**	**C**		**26.0**	**C**	
	SB (9th Street)	LT	5.5	A		5.8	A	
	Southbound (9th Street)		**5.5**	**A**		**5.8**	**A**	
	Overall		**7.7**	**A**	**Pass**	**8.1**	**A**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
14	**8th Street NW & D Street NW (AWSC)**							
	EB (D Street)	LT	7.8	-		8.0	-	
	Eastbound (D Street)		**7.8**	**A**		**8.0**	**A**	
	WB (D Street)	TR	8.2	-		8.6	-	
	Westbound (D Street)		**8.2**	**A**		**8.6**	**A**	
	SB (8th Street)	LR	8.3	-		8.2	-	
	Southbound (8th Street)		**8.3**	**A**		**8.2**	**A**	
	Overall		**8.2**	**A**	**Pass**	**8.4**	**A**	**Pass**
15	**7th Street NW & D Street NW (Signalized)**							
	EB (D Street)	LTR	27.0	C		38.2	D	
	Eastbound (D Street)		**27.0**	**C**		**38.2**	**D**	
	WB (D Street)	LTR	35.9	D		37.0	D	
	Westbound (D Street)		**35.9**	**D**		**37.0**	**D**	
	NB (7th Street)	LTR	52.6	D		18.4	B	
	Northbound (7th Street)		**52.6**	**D**		**18.4**	**B**	
	SB (7th Street)	LTR	1.5	A		4.7	A	
	Southbound (7th Street)		**1.5**	**A**		**4.7**	**A**	
	Overall		**38.7**	**D**	**Pass**	**18.2**	**B**	**Pass**
16	**14th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	29.7	C		32.2	C	
	Eastbound (Pennsylvania Ave)		**29.7**	**C**		**32.2**	**C**	
	WB (Pennsylvania Ave)	T	36.3	D		41.7	D	
	WB (Pennsylvania Ave)	R	28.9	C		32.9	C	
	Westbound (Pennsylvania Ave)		**34.4**	**C**		**39.7**	**D**	
	NB (14th Street)	L	25.9	C		54.9	D	
	NB (14th Street)	TR	32.7	C		16.8	B	
	Northbound (14th Street)		**32.5**	**C**		**18.8**	**B**	
	SB (14th Street)	LTR	12.1	B		14.6	B	
	Southbound (14th Street)		**12.1**	**B**		**14.6**	**B**	
	Overall		**27.3**	**C**	**Pass**	**21.3**	**C**	**Pass**
17	**13th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	59.1	E		35.7	D	
	EB (Pennsylvania Ave)	T	52.3	D		34.3	C	
	Eastbound (Pennsylvania Ave)		**55.2**	**E**		**34.8**	**C**	
	WB (Pennsylvania Ave)	T	22.7	C		9.8	A	
	WB (Pennsylvania Ave)	R	23.6	C		10.1	B	
	Westbound (Pennsylvania Ave)		**23.1**	**C**		**9.9**	**A**	
	SB (13th Street)	L	35.6	D		41.0	D	
	SB (13th Street)	R	11.0	B		9.8	A	
	Southbound (13th Street)		**31.2**	**C**		**33.6**	**C**	
	Overall		**35.4**	**D**	**Pass**	**25.2**	**C**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
18	**12th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	39.3	D		26.6	C	
	Eastbound (Pennsylvania Ave)		**39.3**	**D**		**26.6**	**C**	
	WB (Pennsylvania Ave)	T	11.3	B		5.2	A	
	WB (Pennsylvania Ave)	R	24.9	C		9.4	A	
	Westbound (Pennsylvania Ave)		**15.8**	**B**		**6.2**	**A**	
	NB (12th Street)	LTR	38.6	D		26.1	C	
	Northbound (12th Street)		**38.6**	**D**		**26.1**	**C**	
	Overall		**32.9**	**C**	**Pass**	**20.1**	**C**	**Pass**
19	**11th Street NW/Hotel Entrance & Pennsylvania Avenue**							
	EB (Pennsylvania Ave)	L	112.6	F		134.7	F	
	EB (Pennsylvania Ave)	TR	7.3	A		8.4	A	
	Eastbound (Pennsylvania Ave)		**31.1**	**C**		**19.7**	**B**	
	WB (Pennsylvania Ave)	LT	6.4	A		13.3	B	
	WB (Pennsylvania Ave)	R	69.9	E		104.1	F	
	Westbound (Pennsylvania Ave)		**27.5**	**C**		**34.3**	**C**	
	NB (Hotel Entrance)	LTR	11.0	B		6.4	A	
	Northbound (Hotel Entrance)		**11.0**	**B**		**6.4**	**A**	
	SB (11th Street)	L	93.3	F		137.9	F	
	SB (11th Street)	TR	6.9	A		1.2	A	
	Southbound (11th Street)		**66.0**	**E**		**103.8**	**F**	
	Overall		**32.8**	**C**	**Pass**	**48.1**	**D**	**Pass**
20	**10th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	6.4	A		8.7	A	
	Eastbound (Pennsylvania Ave)		**6.4**	**A**		**8.7**	**A**	
	WB (Pennsylvania Ave)	T	3.6	A		8.2	A	
	Westbound (Pennsylvania Ave)		**3.6**	**A**		**8.2**	**A**	
	NB (10th Street)	L	126.2	F		50.5	D	
	NB (10th Street)	R	24.3	C		4.6	A	
	Northbound (10th Street)		**99.6**	**F**		**25.3**	**C**	
	SB (10th Street)	LT	34.2	C		41.6	D	
	SB (10th Street)	R	7.5	A		16.9	B	
	Southbound (10th Street)		**27.3**	**C**		**37.3**	**D**	
	Overall		**19.2**	**B**	**Pass**	**16.1**	**B**	**Pass**
21	**9th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	9.4	A		31.6	C	
	EB (Pennsylvania Ave)	R	12.8	B		47.8	D	
	Eastbound (Pennsylvania Ave)		**10.1**	**B**		**35.3**	**D**	
	WB (Pennsylvania Ave)	T	5.9	A		6.1	A	
	Westbound (Pennsylvania Ave)		**5.9**	**A**		**6.1**	**A**	
	NB (9th Street)	R	31.7	C		10.4	B	
	Northbound (9th Street)		**31.7**	**C**		**10.4**	**B**	
	SB (9th Street)	LTR	18.7	B		31.0	C	
	Southbound (9th Street)		**18.7**	**B**		**31.0**	**C**	
	Overall		**12.5**	**B**	**Pass**	**26.8**	**C**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
22	**7th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	158.3	F		121.0	F	
	EB (Pennsylvania Ave)	TR	28.8	C		15.4	B	
	Eastbound (Pennsylvania Ave)		**59.4**	**E**		**28.6**	**C**	
	WB (Pennsylvania Ave)	T	37.3	D		20.6	C	
	WB (Pennsylvania Ave)	R	40.6	D		48.7	D	
	Westbound (Pennsylvania Ave)		**37.8**	**D**		**27.1**	**C**	
	NB (7th Street)	L	79.3	E		66.5	E	
	NB (7th Street)	TR	14.0	B		8.4	A	
	Northbound (7th Street)		**29.6**	**C**		**17.3**	**B**	
	SB (7th Street)	TR	30.3	C		24.8	C	
	Southbound (7th Street)		**30.3**	**C**		**24.8**	**C**	
	Overall		**41.8**	**D**	**Pass**	**25.2**	**C**	**Pass**
23	**6th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	62.5	E		40.3	D	
	EB (Pennsylvania Ave)	TR	24.4	C		50.2	D	
	Eastbound (Pennsylvania Ave)		**28.6**	**C**		**49.7**	**D**	
	WB (Pennsylvania Ave)	T	4.3	A		35.4	D	
	WB (Pennsylvania Ave)	R	7.8	A		39.4	D	
	Westbound (Pennsylvania Ave)		**5.1**	**A**		**36.2**	**D**	
	NB (6th Street)	LTR	15.6	B		6.0	A	
	Northbound (6th Street)		**15.6**	**B**		**6.0**	**A**	
	SB (6th Street)	LTR	31.3	C		100.2	F	
	Southbound (6th Street)		**31.3**	**C**		**100.2**	**F**	
	Overall		**16.9**	**B**	**Pass**	**57.4**	**E**	**Fail**
24	**Constitution (WB) Avenue NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	T	2.5	A		31.8	C	
	EB (Pennsylvania Ave)	R	-	-		23.0	C	
	Eastbound (Pennsylvania Ave)		**2.5**	**A**		**31.8**	**C**	
	WB (Pennsylvania Ave)	L	21.9	C		60.3	E	
	WB (Pennsylvania Ave)	T	32.3	C		6.5	A	
	Westbound (Pennsylvania Ave)		**27.8**	**C**		**36.0**	**D**	
	NB (Constitution Ave)	R	16.6	B		44.7	D	
	Northbound (Constitution Ave)		**16.6**	**B**		**44.7**	**D**	
	Overall		**20.2**	**C**	**Pass**	**36.8**	**D**	**Pass**
25	**4th Street NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	TR	7.9	A		15.0	B	
	Eastbound (Pennsylvania Ave)		**7.9**	**A**		**15.0**	**B**	
	WB (Pennsylvania Ave)	T	7.1	A		7.9	A	
	Westbound (Pennsylvania Ave)		**7.1**	**A**		**7.9**	**A**	
	NB (4th Street)	L	41.1	D		33.5	C	
	NB (4th Street)	R	11.2	B		25.5	C	
	Northbound (4th Street)		**32.6**	**C**		**30.7**	**C**	
	Overall		**10.6**	**B**	**Pass**	**14.2**	**B**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
26	**Constitution (EB) Avenue NW & Pennsylvania Avenue NW (Signalized)**							
	EB (Pennsylvania Ave)	L	6.9	A		16.7	B	
	EB (Pennsylvania Ave)	T	42.0	D		20.9	C	
	Eastbound (Pennsylvania Ave)		**13.4**	**B**		**17.8**	**B**	
	WB (Pennsylvania Ave)	T	22.5	C		23.2	C	
	Westbound (Pennsylvania Ave)		**22.5**	**C**		**23.2**	**C**	
	SB (Constitution Ave)	R	22.7	C		19.1	B	
	Southbound (Constitution Ave)		**22.7**	**C**		**19.1**	**B**	
	Overall		**18.6**	**B**	**Pass**	**18.5**	**B**	**Pass**
27	**14th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	TR	28.5	C		28.7	C	
	Eastbound (Constitution Ave)		**28.5**	**C**		**28.7**	**C**	
	WB (Constitution Ave)	TR	32.1	C		19.6	B	
	Westbound (Constitution Ave)		**32.1**	**C**		**19.6**	**B**	
	NB (14th Street)	TR	23.2	C		20.8	C	
	Northbound (14th Street)		**23.2**	**C**		**20.8**	**C**	
	SB (14th Street)	TR	9.2	A		111.8	F	
	Southbound (14th Street)		**9.2**	**A**		**111.8**	**F**	
	Overall		**24.4**	**C**	**Pass**	**54.5**	**D**	**Pass**
28	**12th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	L	53.9	D		18.6	B	
	EB (Constitution Ave)	TR	4.1	A		12.4	B	
	Eastbound (Constitution Ave)		**13.6**	**B**		**13.2**	**B**	
	WB (Constitution Ave)	LTR	40.0	D		17.7	B	
	Westbound (Constitution Ave)		**40.0**	**D**		**17.7**	**B**	
	NB (12th Street)	LTR	91.6	F		68.7	E	
	Northbound (12th Street)		**91.6**	**F**		**68.7**	**E**	
	SB (12th Street)	LT	13.9	B		29.8	C	
	SB (12th Street)	R	8.4	A		11.6	B	
	Southbound (12th Street)		**10.4**	**B**		**20.9**	**C**	
	Overall		**53.7**	**D**	**Pass**	**31.7**	**C**	**Pass**
29	**10th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	LT	17.6	B		12.3	B	
	Eastbound (Constitution Ave)		**17.6**	**B**		**12.3**	**B**	
	WB (Constitution Ave)	TR	8.5	A		44.1	D	
	Westbound (Constitution Ave)		**8.5**	**A**		**44.1**	**D**	
	SB (10th Street)	L	31.4	C		17.6	B	
	SB (10th Street)	R	15.3	B		4.2	A	
	Southbound (10th Street)		**20.4**	**C**		**6.4**	**A**	
	Overall		**14.8**	**B**	**Pass**	**24.7**	**C**	**Pass**

Table 4-18: No-action Alternative AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	Check	Delay (sec/veh)	LOS	Check
30	**9th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	LTR	34.8	C		72.1	E	
	Eastbound (Constitution Ave)		**34.8**	**C**		**72.1**	**E**	
	WB (Constitution Ave)	LTR	5.8	A		6.4	A	
	Westbound (Constitution Ave)		**5.8**	**A**		**6.4**	**A**	
	SB (9th Street)	LT	40.7	D		26.4	C	
	SB (9th Street)	R	17.6	B		9.0	A	
	Southbound (9th Street)		**37.9**	**D**		**24.0**	**C**	
	Overall		**27.3**	**C**	**Pass**	**32.8**	**C**	**Pass**
31	**7th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	TR	17.6	B		26.9	C	
	Eastbound (Constitution Ave)		**17.6**	**B**		**26.9**	**C**	
	WB (Constitution Ave)	LTR	15.8	B		12.5	B	
	Westbound (Constitution Ave)		**15.8**	**B**		**12.5**	**B**	
	NB (7th Street)	L	23.2	C		20.7	C	
	NB (7th Street)	TR	18.4	B		18.9	B	
	Northbound (7th Street)		**19.3**	**B**		**19.1**	**B**	
	SB (7th Street)	TR	11.3	B		19.1	B	
	Southbound (7th Street)		**11.3**	**B**		**19.1**	**B**	
	Overall		**17.1**	**B**	**Pass**	**19.1**	**B**	**Pass**
32	**6th Street NW & Constitution Avenue NW (Signalized)**							
	EB (Constitution Ave)	L	71.8	E		20.8	C	
	EB (Constitution Ave)	LT	30.9	C		3.3	A	
	Eastbound (Constitution Ave)		**41.3**	**D**		**7.5**	**A**	
	WB (Constitution Ave)	TR	53.9	D		7.2	A	
	Westbound (Constitution Ave)		**53.9**	**D**		**7.2**	**A**	
	SB (6th Street)	L	17.8	B		12.8	B	
	SB (6th Street)	R	0.2	A		1.5	A	
	Southbound (6th Street)		**2.7**	**A**		**2.2**	**A**	
	Overall		**42.6**	**D**	**Pass**	**6.1**	**A**	**Pass**

Notes:

AWSC = All-Way STOP-Controlled intersection

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LOS = Level of Service

LTR = left / through / right lanes

Delay is measured in Seconds Per Vehicle.

Red cells denote intersections or approaches operating at unacceptable conditions.

4.7.6 No-action Alternative Queuing Analysis

Synchro™ was used to calculate the 50th and 95th percentile queue lengths, and SimTraffic™ was used to calculate the 95th percentile queue lengths. The SimTraffic™ simulations are unable to accurately portray vehicle conflicts with pedestrians along the Pennsylvania Avenue and Constitution Avenue corridors; therefore, only one simulation was created and reported. Synchro 95th percent queue values provide a more accurate measure of the potential queue. Based on the Synchro™ and SimTraffic™ analysis, the following signalized intersection approaches experience failing queue lengths in either Synchro™ or SimTraffic™. The lane group within the approach that is operating under unacceptable conditions is noted in parentheses.

- 10th Street NW and H Street NW (Intersection #1)
  - Southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and H Street NW (Intersection #2)
  - Southbound 9th Street (all movements) during the PM peak hour
- 10th Street NW and G Street NW (Intersection #3)
  - Eastbound G Street (through and right movements), westbound G Street (through and left movements) and southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and G Street NW (Intersection #4)
  - Eastbound G Street (through and right movements), westbound G Street (through movements), and southbound 9th Street (right turns) during the PM peak hour
- 10th Street NW and F Street NW (Intersection #5)
  - Eastbound F Street (through and right movements) and southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and F Street NW (Intersection #6)
  - Southbound 9th Street (all movements) during the PM peak hour
- 12th Street NW and E Street NW (Intersection #7)
  - Westbound E Street (through and right movements) during the AM and PM peak hours
- 11th Street NW and E Street NW (Intersection #8)
  - Eastbound on E Street (right turns), westbound on E Street (right turns), and southbound on 11th Street (left and through movements) during the AM peak hour
  - Eastbound on E Street (right turns), westbound on E Street (right and through movements), and southbound on 11th Street (all movements) during the PM peak hour
- 10th Street NW and E Street NW (Intersection #9)
  - Eastbound E Street (right turns) during the AM and PM peak hours
  - Southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and E Street NW (Intersection #10)
  - Westbound E Street (through and left movements) and southbound 9th Street (all movements) during the PM peak hour
  - Westbound E Street (left turns) during the AM peak hour
- 8th Street NW and E Street NW (Intersection #11)
  - Eastbound E Street (right turns) during AM peak hour and westbound E Street (right turns) during the AM and PM peak hour
- 7th Street NW and E Street NW (Intersection #12)
  - Eastbound E Street (right turns) and northbound 7th Street (right turns) during the AM peak hour
  - Eastbound E Street (right turns), westbound E Street (right turns), and northbound 7th Street (right turns) during the PM peak hour
- 7th Street NW and D Street NW (Intersection #15)
  - Northbound 7th Street (all movements) during the AM peak hour
- 14th Street NW and Pennsylvania Avenue NW (Intersection #16)

    - Eastbound Pennsylvania Avenue (through and right movements), westbound Pennsylvania Avenue (through movements), and northbound 14th Street (left turns) during the PM peak hour
    - Westbound Pennsylvania Avenue (through movements) during the AM peak hour
- 13th Street NW and Pennsylvania Avenue NW (Intersection #17)
    - Eastbound Pennsylvania Avenue (through movements) and southbound 13th Street (left turns) during the AM peak hour
    - Eastbound Pennsylvania Avenue (through movements) and southbound 13th Street (left and right turns) during the PM peak hour
- 12th Street NW and Pennsylvania Avenue NW (Intersection #18)
    - Eastbound Pennsylvania Avenue (through and right movements) during AM and PM peak hour
    - Westbound Pennsylvania Avenue (right turns) and northbound 12th Street (all movements) during AM peak hour
- 11th Street NW and Pennsylvania Avenue NW (Intersection #19)
    - Eastbound Pennsylvania Avenue (left turns), westbound Pennsylvania Avenue (all movements), and southbound 11th Street (left turns) during AM and PM peak hour
- 10th Street NW and Pennsylvania Avenue NW (Intersection #20)
    - Northbound 10th Street (left and right turns) and southbound 10th Street (right turns) during the AM peak hour
    - Northbound 10th Street (left turns) and southbound 10th Street (all movements) during the PM peak hour
- 9th Street NW and Pennsylvania Avenue NW (Intersection #21)
    - Southbound 9th Street (all movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (right turns) and southbound 9th Street (all movements) during the PM peak hour
- 7th Street NW and Pennsylvania Avenue NW (Intersection #22)
    - Eastbound Pennsylvania Avenue (left turns), northbound 7th Street (left turns), and southbound 7th Street (through and right movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (left turns), westbound Pennsylvania Avenue (right turns), northbound 7th Street (left turns), and southbound 7th Street (through and right movements) during the PM peak hour
- 6th Street NW and Pennsylvania Avenue NW (Intersection #23)
    - Eastbound Pennsylvania Avenue (through and right movements) and southbound 6th Street (all movements) during the PM peak hour
- Constitution (WB) Avenue NW and Pennsylvania Avenue NW (Intersection #24)
    - Westbound Pennsylvania Avenue (through movements) during the AM peak hour
    - Eastbound Pennsylvania Avenue (through movements) and westbound Pennsylvania Avenue (left turns) during the PM peak hour
- 4th Street NW and Pennsylvania Avenue NW (Intersection #25)
    - Northbound 4th Street (left turns) during the AM and PM peak hour
    - Westbound Pennsylvania Avenue (through movements) during the PM peak hour
- Constitution (EB) Avenue NW and Pennsylvania Avenue NW (Intersection #26)
    - Southbound Constitution Ave (right turns) during the AM and PM peak hour
    - Eastbound Pennsylvania Avenue (left turns) during PM peak hour
- 14th Street NW and Constitution Avenue NW (Intersection #27)
    - Eastbound Constitution Avenue (through movements) during the AM and PM peak hour
    - Eastbound Constitution Avenue (through and right movements) and southbound 14th Street (through and right movements) during the PM peak hour
- 12th Street NW and Constitution Avenue NW (Intersection #28)

    - Eastbound Constitution Avenue (all movements) and northbound 12th Street (all movements) during the AM peak hour
    - Eastbound Constitution Avenue (through and right movements) and northbound 12th Street (all movements) during the PM peak hour
- 10th Street NW and Constitution Avenue NW (Intersection #29)
    - Eastbound Constitution Avenue (left and through movements) during the AM and PM peak hour
- 9th Street NW and Constitution Avenue NW (Intersection #30)
    - Eastbound Constitution Avenue (all movements) and southbound 9th Street (left and through movements) during the PM peak hour
- 7th Street NW and Constitution Avenue NW (Intersection #31)
    - Northbound 7th Street (left turns) during the AM peak hour
- 6th Street NW and Constitution Avenue NW (Intersection #32)
    - Eastbound Constitution Avenue (left turns) and westbound Constitution Avenue (through and right movements) during the AM peak hour
    - Westbound Constitution Avenue (through and right movements) and southbound 6th Street (right turns) during the PM peak hour

Based on the analysis, the queue lengths for the one unsignalized intersection in the study area would be acceptable. The remaining intersections in the study area would have acceptable queue lengths.

4.7.6.1 Complete Intersection Queuing Analysis

This section summarizes the differences in queuing impacts between the Existing Condition and the No-action Alternative by quantifying the change in intersection queuing failures. Following the summary, this section also includes the complete results of the queuing analysis.

Based on the Synchro™ and SimTraffic™ analysis, 30 signalized intersections and one unsignalized intersection would experience queuing lengths that would exceed the available storage capacity. The remaining intersections in the study area would provide sufficient storage for the anticipated demand. Compared to the Existing Condition, the No-action Alternative would have failing queues for two more intersections during the AM peak hour and two more intersections during the PM peak hour. In the AM peak hour in the Existing Condition, there would be 20 intersections with a failing queue approach compared with 22 in the No-action Alternative, an increase of two. In the PM peak hour in the Existing Condition, there would be 26 intersections with a failing queue approach compared with 28 in the No-action Alternative, an increase of two.

Table 4-19 shows a summary of the number of intersections that meet the following criteria for approach lane group in a queue that would change between the Existing Condition and the No-action Alternative:

- New Failing Movement
    - Number of intersections that have a queuing problem in one or more movements that would **NOT** have a queuing problem in the previous condition

- Additional Failing Movement
    - Number of intersections that had at least one queuing movement failure in the previous condition and now would have additional/more queuing movement failures than before

- No Change
    - Number of intersections that would have no change in the number of queuing movement failures or the number of queuing movement failures would be the same as in the previous condition

- Fewer Failing Movements
    - Number of intersections that would have less queuing movement failures than in the previous condition, but still would have some failing movements

- No Failing Movements
    - Number of intersections that had queuing movement failures in the previous condition, but would no longer have queuing movement failures

Table 4-19: Queuing Summary Comparing Existing Condition to No-action Alternative

Type of Change Between Conditions	AM	PM
New Failing Movement	3	2
Additional Failing Movement	6	5
No Change	22	23
Fewer Failing Movements	0	2
No Failing Movements	1	0
Total Signalized and Unsignalized Intersections	**32**	**23**

The results of the No-action Alternative queuing analysis for the AM and PM peak hours for both the signalized and unsignalized intersections are presented in table 4-20. Note that the percentile values are expressed in feet, and a car occupies about 25 linear feet of roadway, including the space between cars.

Table 4-20: No-action Alternative Queuing Analysis for AM and PM Peak Hours

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
1	**10th Street NW & H Street NW**								
	EB (H Street)	LTR	264	80	106	130	108	138	214
	WB (H Street)	LTR	504	12	19	90	16	30	141
	SB (10th Street)	LTR	534	149	237	474	227	#346	#690
2	**9th Street NW & H Street NW**								
	EB (H Street)	TR	504	31	44	99	78	m92	180
	WB (H Street)	LT	570	81	109	152	41	59	125
	SB (9th Street)	LT	333	237	304	305	346	#450	#377
	SB (9th Street)	R	333	0	33	70	0	32	#370
3	**10th Street NW & G Street NW**								
	EB (G Street)	TR	283	57	104	149	153	218	#374
	WB (G Street)	LT	522	31	52	105	86	227	#683
	SB (10th Street)	LTR	459	49	74	86	63	m81	#605
4	**9th Street NW & G Street NW**								
	EB (G Street)	TR	522	5	19	88	105	#273	319
	WB (G Street)	L	244	23	54	66	56	103	83
	WB (G Street)	T	244	49	94	113	54	100	#317
	SB (9th Street)	LT	409	74	88	121	64	m76	399
	SB (9th Street)	R	409	0	m0	2	0	m0	#532
5	**10th Street NW & F Street NW**								
	EB (F Street)	TR	273	40	55	104	122	160	#277
	WB (F Street)	LT	537	24	m35	72	40	m72	180
	SB (10th Street)	LTR	293	65	83	73	92	118	#397
6	**9th Street NW & F Street NW**								
	EB (F Street)	TR	537	27	38	67	118	167	111
	WB (F Street)	LT	505	44	68	72	50	78	122
	SB (9th Street)	LTR	281	30	36	123	440	m510	#329
7	**12th Street NW & E Street NW**								
	EB (E Street)	L	150	35	74	100	15	37	69
	EB (E Street)	T	356	47	82	81	36	66	106
	WB (E Street)	TR	181	195	269	#198	97	141	#189
	NB (12th Street)	LTR	285	172	m171	222	179	220	190

Table 4-20 No-action Alternative Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
8	**11th Street NW & E Street NW**								
	EB (E Street)	L	181	15	m22	61	10	m21	36
	EB (E Street)	T	181	143	m199	128	141	198	159
	EB (E Street)	R	50	12	m19	#60	12	m24	#58
	WB (E Street)	L	110	4	11	88	13	m31	88
	WB (E Street)	T	215	42	69	157	132	m223	#268
	WB (E Street)	R	50	8	21	#90	42	m87	#97
	NB (11th Street)	LT	346	87	m87	80	89	m89	122
	NB (11th Street)	R	346	35	m36	76	29	m32	82
	SB (11th Street)	LT	321	80	114	#421	242	327	#401
	SB (11th Street)	R	100	0	27	83	49	112	#139
9	**10th Street NW & E Street NW**								
	EB (E Street)	T	215	80	104	122	49	m50	213
	EB (E Street)	R	25	17	39	#58	10	m11	#59
	WB (E Street)	L	110	5	m9	57	2	m3	74
	WB (E Street)	T	506	23	m34	105	9	m11	164
	SB (10th Street)	LTR	370	33	47	72	232	#276	#457
10	**9th Street NW & E Street NW**								
	EB (E Street)	T	506	50	91	111	111	m151	157
	EB (E Street)	R	100	5	17	83	43	m74	85
	WB (E Street)	L	75	19	m43	#105	43	102	#112
	WB (E Street)	T	225	154	216	214	147	269	#237
	SB (9th Street)	LTR	310	55	82	207	~586	#688	#354
11	**8th Street NW & E Street NW**								
	EB (E Street)	L	75	11	m22	55	2	m5	41
	EB (E Street)	T	225	91	m139	162	23	m32	70
	EB (E Street)	R	50	11	m37	#70	0	m0	14
	WB (E Street)	L	85	12	20	57	3	m6	39
	WB (E Street)	T	223	53	66	107	27	39	70
	WB (E Street)	R	25	0	m2	#38	0	m0	#52
	NB (8th Street)	LTR	392	78	110	144	74	146	156
	SB (8th Street)	LTR	302	27	51	56	59	119	174

Table 4-20: No-action Alternative Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
12	**7th Street NW & E Street NW**								
	EB (E Street)	L	85	9	m30	82	7	m21	77
	EB (E Street)	T	223	109	182	197	128	203	193
	EB (E Street)	R	25	1	m17	#60	10	m40	#64
	WB (E Street)	L	100	6	19	31	24	54	94
	WB (E Street)	T	533	165	248	245	206	304	327
	WB (E Street)	R	75	4	24	70	19	53	#105
	NB (7th Street)	LT	402	97	m117	160	103	156	173
	NB (7th Street)	R	75	11	m15	#94	11	m30	#101
	SB (7th Street)	LTR	314	53	83	107	95	133	149
13	**9th Street NW & D Street NW**								
	WB (D Street)	L	224	75	71	89	107	170	166
	SB (9th Street)	LT	396	32	55	132	76	m76	179
14	**8th Street NW & D Street NW (AWSC)**								
	EB (D Street)	LT	224	-	-	50	-	-	59
	WB (D Street)	TR	229	-	-	60	-	-	67
	SB (8th Street)	LR	392	-	-	52	-	-	56
15	**7th Street NW & D Street NW**								
	EB (D Street)	LTR	229	40	71	91	91	165	188
	WB (D Street)	LTR	521	76	140	183	102	175	169
	NB (7th Street)	LTR	295	513	m#696	#303	184	m520	255
	SB (7th Street)	LTR	402	4	11	52	27	56	103
16	**14th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	430	116	150	188	96	138	#579
	WB (Pennsylvania Ave)	T	157	84	114	#169	125	152	#192
	WB (Pennsylvania Ave)	R	248	39	83	79	54	89	109
	NB (14th Street)	L	1,131	23	m35	78	25	m#71	118
	NB (14th Street)	TR	1,131	328	382	399	124	173	245
	SB (14th Street)	LTR	624	92	118	196	234	280	329
17	**13th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	257	143	217	233	91	153	153
	EB (Pennsylvania Ave)	T	257	103	148	#372	100	141	#287
	WB (Pennsylvania Ave)	T	386	79	m89	137	31	68	149
	WB (Pennsylvania Ave)	R	386	71	m83	126	14	m35	80
	SB (13th Street)	L	637	81	119	#658	155	211	#740
	SB (13th Street)	R	637	0	33	519	0	55	#915

Table 4-20: No-action Alternative Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
18	**12th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	T	386	113	145	179	163	198	184
	EB (Pennsylvania Ave)	TR	150	113	145	#199	163	198	#201
	WB (Pennsylvania Ave)	T	168	36	51	62	30	35	41
	WB (Pennsylvania Ave)	R	168	57	197	#185	26	m32	83
	NB (12th Street)	LTR	922	~274	m206	#1092	285	m284	287
19	**11th Street NW/Hotel Entrance & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	168	109	m#196	#181	49	m#128	104
	EB (Pennsylvania Ave)	TR	168	38	m47	47	29	36	133
	WB (Pennsylvania Ave)	LT	190	28	m57	#240	38	46	#269
	WB (Pennsylvania Ave)	R	190	~194	m#449	#206	~158	#288	#212
	NB (Hotel Entrance)	LTR	272	9	56	94	12	40	74
	SB (11th Street)	L	346	~162	#315	#371	~435	#579	#418
	SB (11th Street)	TR	346	23	48	284	0	m0	114
20	**10th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	190	20	m10	72	75	m75	74
	WB (Pennsylvania Ave)	T	467	61	72	393	56	m75	412
	NB (10th Street)	L	695	~177	m#308	#859	10	m#66	130
	NB (10th Street)	R	695	26	m58	#904	0	9	91
	SB (10th Street)	LT	469	32	61	170	194	m#238	#552
	SB (10th Street)	R	25	0	16	#75	47	m65	#68
21	**9th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	467	48	80	113	230	272	312
	EB (Pennsylvania Ave)	R	467	37	82	51	202	m#361	305
	WB (Pennsylvania Ave)	T	496	48	m56	331	32	45	192
	NB (9th Street)	R	-	56	114	-	26	m41	-
	SB (9th Street)	LTR	235	184	242	#252	276	#451	#280
22	**7th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	496	~157	#303	#507	0	m#198	117
	EB (Pennsylvania Ave)	TR	496	107	134	229	117	m150	398
	WB (Pennsylvania Ave)	T	461	180	223	202	124	m154	102
	WB (Pennsylvania Ave)	R	461	80	138	116	103	m#171	137
	NB (7th Street)	L	290	96	#235	277	57	m#140	129
	NB (7th Street)	TR	290	64	81	127	29	37	118
	SB (7th Street)	TR	83	65	106	#113	87	105	#101

Table 4-20: No-action Alternative Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
23	**6th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	461	47	m76	59	12	m23	380
	EB (Pennsylvania Ave)	TR	461	131	162	148	190	233	#487
	WB (Pennsylvania Ave)	T	212	10	30	42	124	165	143
	WB (Pennsylvania Ave)	R	212	8	27	131	88	148	127
	NB (6th Street)	LTR	72	56	m56	66	18	23	69
	SB (6th Street)	LTR	549	85	128	326	~338	#464	#674
24	**Constitution (WB) Avenue NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	T	212	19	23	38	197	m220	#290
	EB (Pennsylvania Ave)	R	212	-	-	-	1	m1	15
	WB (Pennsylvania Ave)	L	283	161	235	223	258	315	#345
	WB (Pennsylvania Ave)	T	283	281	311	#328	40	52	91
	NB (Constitution Ave)	R	232	74	75	38	210	256	102
25	**4th Street NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	TR	283	50	234	102	202	227	216
	WB (Pennsylvania Ave)	T	257	57	99	225	201	172	#326
	NB (4th Street)	L	208	146	224	#219	130	195	#294
	NB (4th Street)	R	208	15	54	121	53	98	155
26	**Constitution (EB) Avenue NW & Pennsylvania Avenue NW**								
	EB (Pennsylvania Ave)	L	257	27	37	78	154	229	#285
	EB (Pennsylvania Ave)	T	257	74	110	95	125	172	112
	WB (Pennsylvania Ave)	T	279	4	7	17	12	18	87
	SB (Constitution Ave)	R	219	314	393	#298	234	294	#293
27	**14th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	T	110	210	249	#143	245	288	#177
	EB (Constitution Ave)	TR	439	210	249	437	245	288	#480
	WB (Constitution Ave)	TR	1,005	188	m211	204	333	m365	183
	NB (14th Street)	TR	553	296	341	409	180	214	362
	SB (14th Street)	TR	1,131	39	49	97	~737	#833	938
28	**12th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	L	1,005	90	m#223	#1011	61	m86	481
	EB (Constitution Ave)	TR	1,005	33	39	#1051	265	321	#1155
	WB (Constitution Ave)	LTR	494	127	146	175	70	95	142
	NB (12th Street)	LTR	534	~548	#646	#634	~336	#423	#643
	SB (12th Street)	LT	922	20	46	120	30	67	218
	SB (12th Street)	R	922	16	56	53	0	41	78

Table 4-20: No-action Alternative Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection	Lane Group	Turning Bay/Link Length (feet)	AM Peak Hour			PM Peak Hour		
				50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic	50th Percen-tile (feet)	95th Percen-tile (feet) Synchro	95th Percen-tile (feet) SimTraffic
29	**10th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	LT	494	125	m135	#515	89	m83	#602
	WB (Constitution Ave)	TR	457	63	79	290	238	273	230
	SB (10th Street)	L	695	41	62	157	36	m55	175
	SB (10th Street)	R	695	47	60	89	18	m35	73
30	**9th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	LTR	457	206	246	202	~252	#325	#545
	WB (Constitution Ave)	LTR	480	47	53	127	31	39	133
	SB (9th Street)	LT	502	162	204	220	371	m#488	193
	SB (9th Street)	R	502	13	58	87	23	m29	122
31	**7th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	TR	480	191	212	206	96	m89	474
	WB (Constitution Ave)	LTR	473	161	197	203	106	149	433
	NB (7th Street)	L	125	80	131	#157	33	63	109
	NB (7th Street)	TR	495	135	172	221	132	180	421
	SB (7th Street)	TR	290	7	34	75	70	100	142
32	**6th Street NW & Constitution Avenue NW**								
	EB (Constitution Ave)	L	473	148	#329	243	169	m238	134
	EB (Constitution Ave)	LT	473	135	181	207	11	26	119
	WB (Constitution Ave)	TR	232	198	242	#249	79	72	#301
	SB (6th Street)	L	72	17	m34	57	16	m16	24
	SB (6th Street)	R	72	0	0	30	0	m1	#100

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinite.

95th percentile volume exceeds capacity, queue may be longer.

m Volume for 95th percentile queue is metered by upstream signal. Due to upstream metering, the 95th percentile queue may be less than the 50th percentile queue.

AWSC = All-Way STOP-Controlled intersection

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LTR = left / through / right lanes

Red cells denote approaches and lane groups whose queuing length exceeds capacity.

4.7.7 Overall Traffic Impact Assessment

Overall, the AM peak hour would experience isolated through-movement delays caused by queuing at three intersections (Intersections #19, #22, and #28). During the PM peak hour, 11 intersections would experience through-movement delays caused by queueing (Intersections #1, #2, #4, #9, #10, #20, #21, #23, #27, #28, and #29). Together these conditions would result in indirect, long-term, adverse impacts. Table 4-20 contains the intersection names tied to the intersection numbers listed above.

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5.0 Analysis of Future RFDS Alternatives

Two RFDSs that could occur subsequent to implementation of the proposed action (see Section 2.3, *NEPA Requirements* for an explanation of an RFDS) were developed to analyze the indirect impacts that may result from the exchange of the JEH parcel. Therefore, this study examines the action alternative with two RFDSs for exchange of the JEH parcel in Washington D.C.—RFDS 1: the existing 7-story, 2.4 million SF building would undergo interior renovation, with no exterior structural changes; or RFDS 2: the existing building would be demolished and redeveloped, and the exchange partner would maximize the available square footage.

The direct impact from the ownership exchange for the parcel would result in the removal of all existing vehicle, bicycle, pedestrian, and transit trips generated by the JEH building and would have long-term major beneficial impacts. Therefore, the indirect transportation impacts are evaluated to determine whether any impacts from an action alternative caused by FBI HQ consolidation at an alternative site would occur. Indirect impacts are defined by NEPA regulations as impacts that are *"caused by the action and are later in time… but are still reasonably foreseeable"* (40 CFR). Indirect impacts may include the environmental impacts that may occur from any future development of the exchange parcel. Because there are no site plans or other detailed site access plans, the development scenarios were used to develop a conservative estimate of the transportation impacts that may occur as a result of future development of the parcel.

Any future private development of the parcel would require a traffic impact study according to DDOT standards and District of Columbia regulations. Depending on the actual redevelopment plan for the parcel, a more thorough traffic study, which may include additional intersections, would be warranted. The scope of any future studies to be conducted by the exchange partner, as well as requirements for mitigation measures to offset impacts, would be at DDOT's discretion.

The No-action Alternative provides a 2025 baseline to compare with the two RFDSs and includes the background growth that would occur regardless of whether or not the parcel is exchanged. Both RFDSs start with the No-action Alternative, making a comparison of potential transportation impacts relatively straightforward.

5.1 RFDS 1

Under the RFDS 1, the building on the JEH parcel would be retained and renovated using the existing footprint and building shell. The existing 7-story, 2.4 million GSF building would likely undergo interior renovations to complete necessary upgrades for continued commercial use; no exterior structural changes are assumed under this scenario. It is assumed that the parcel would continue to support approximately 5,000 daily employees during a regular work week and a parking garage with approximately 800 parking spaces, resulting in a similar use to the No-action Alternative.

5.1.1 RFDS 1 Trip Generation and Modal Split

Trip generation for RFDS 1 is predicated on the assumed proposed land use for the parcel (general office). The scenario assumes that the current building would continue as office space only, with the same number of employees as currently supported. The existing FBI-generated vehicle trips must be removed prior to adding new vehicle trips to account for the FBI relocating from the JEH parcel to one of the alternative sites.

5.1.1.1 FBI Employee Person Trips

Many employees begin or end work earlier or later than the peak hours. The ITE *Trip Generation Manual* has identified estimates for peak hour trip generation rates for different types of office buildings based on various studies; however, most of these studies are in suburban rather than urban environments, "having little or no

transit service, nearby pedestrian amenities, or travel demand management (TDM) programs" (ITE 2012). In addition, FBI employee arrival and departure patterns, including the number of employees who would be offsite at any given time is not typical of most office uses. For these reasons, it was determined that the existing FBI trip generation rate is not accurately represented by the ITE *Trip Generation Manual*; therefore, a special study was undertaken to determine appropriate trip generation rates using the JEH building. As stated in the manual, "when practical, the user is encouraged to supplement the data in this document with local data that have been collected at similar sites" (ITE 2012).

Morning peak hour rates were calculated based on turnstile counts obtained from the FBI representing all persons entering the JEH building. Following the guidance of the ITE *Trip Generation Handbook, 2nd edition*, three days of turnstile counts (November 12, 2013 [Tuesday], December 4, 2013 [Wednesday], and January 9, 2014 [Thursday]) were obtained. The sample days for normal operations days were selected by the FBI. The survey results produced a peak hour count of 1,344 on November 12, 2013, 1,361 on December 4, 2013, and 1,324 on January 9, 2014, and a peak hour of 7:15 AM to 8:15 AM. To provide a more conservative forecast, the maximum count from the 3-day turnstile counts (1,361) was used, instead of the average. The turnstile counts only represent the inbound flows, but most organizations have two-way flows of workers, even in peak hours. Therefore the ITE *Trip Generation Manual* Corporate Headquarters land use entering/exiting percentages (AM: 93 percent entering/7 percent exiting) were used to calculate the morning outbound peak hour flow, based on the maximum count from the survey results. The total person trips (entering and exiting) divided by 5,045 (current number of FBI employees working at the JEH building) was used to develop the AM peak hour rate, which resulted in a 0.29 person trip rate (29.0 percent of employees arrive or leave during the AM peak hour).

Afternoon peak hour rates were calculated based on a JEH building exit-only trip generation survey. Following the ITE guidance (ITE 2004), the trip generation survey was conducted for three days (September 16, 17, and 18, 2014) on a non-holiday week resulting in outgoing trip volumes of 1,174, 1,259, and 1,130, respectively. Based on the PM peak hour occurring between 4:30 PM and 5:30 PM, the PM rate was calculated from the trip generation survey (outbound flow) and the inbound turnstile counts from the inbound survey days.

Based on the turnstile volumes, the highest value for the 4:30 PM to 5:30 PM time slot was 114. The average for the time slot was 73, higher than both the other day's values for the same 1-hour period. This meant that the 114 value was skewing the values when averaged and was not a good representation of a typical evening inbound flow. Therefore, the next 15-minute slot (4:45 PM-5:45 PM) was examined. The average of the 4:45 PM to 5:45 PM time slot equals the average of the 3 days for the 4:45–5:45 PM time slot, and therefore appears to be more typical of a normal operation. To follow the same process as the inbound flow and to be consistent with the methods followed for the other proposed FBI HQ site traffic studies, the highest value of this time slot was used, for a value of 98. Because the values for the inbound PM flows fluctuated between days and one day seemed to at least double the other two, the percent entering and exiting was adjusted to model the outbound flows in a more conservative manner and to be consistent with the methods followed for the other proposed FBI HQ site traffic studies. The calculated split was 7 percent inbound and 93 percent outbound. Instead the split was rounded down and up to a 5 percent inbound and 95 percent outbound split. Table 5-1 summarizes the JEH trip generation rates.

Table 5-1: JEH Existing Peak Hour Person Trips

Source	Independent Variable	Time Period	IN	OUT	TOTAL
Turnstiles (11/12/13, 12/4/13, and 1/9/14) Survey (9/16/14 - 9/18/14)	5,045 employees	AM Peak Hour	1,361	102	1,463
		PM Peak Hour	98	1,259	1,357
Existing number of employees at JEH Building		5,045			
AM peak hour trip generation rate		0.290			
PM peak hour trip generation rate		0.269			

The proposed office use replacing the existing FBI use relied on the ITE general office land use code 710 (ITE 2012). It is assumed that the FBI are using the existing space to the fullest at the JEH building; therefore, replacing the FBI use with general office would fit the same number of people as present or 5,045. This value was used to develop the future office trip generation resulting in a net positive growth in trips because the FBI trip generation (0.29 during the AM peak hour and 0.269 during the PM peak hour) is far less than the ITE rate of 0.48 during the AM peak hour and 0.46 during the PM peak hour. It should be noted that following the FBI trip generation study process to calculate the existing person trips that need to be removed and following the ITE process to calculate the future office person trips that need to be added results in a very conservative net trip value and also maintains consistency between the JEH parcel analysis methods and Consolidated FBI HQ sites. Table 5-2 summarizes the net generated trips for RFDS 1.

Table 5-2: RFDS 1 JEH Net Generated Trips

Total Generated Trips								
Land Use	Independent Variable	Units	AM In	AM Out	Total AM	PM In	PM Out	Total PM
Existing FBI	Employees	(5,045)	(1,361)	(102)	(1,463)	(68)	(1,289)	(1,357)
New Office	Employees	5,045	2,131	291	2,422	395	1,926	2,321
Net Trips			**770**	**188**	**959**	**327**	**637**	**964**

Note: Numbers in parenthesis are negative numbers.

5.1.1.2 RFDS 1 Modal Split

Trip generation rates have been observed and developed primarily in single use facilities in suburban locations without pedestrian or transit access. The JEH parcel is located in a dense, urban area with extensive access to many transit options as well as bicycle and pedestrian options. For example, the JEH parcel is centered among four WMATA Metrorail stations: Metro Center to the Northwest, Gallery Place/ Chinatown to the Northeast, Federal Triangle to the Southwest, and Archives to the Southeast. Therefore, the study reduced the trip generation to reflect typical vehicle use in such an urban setting. Based on discussions with DDOT through the scoping process, it was agreed for the future office modal split to follow WMATA's *2005 Development-Related Ridership Survey* (WMATA 2006) and the MWCOG 2025 Travel Demand Model (MWCOG 2014c) mode split projections, as shown in table 5-3. See Appendix B1 for the DDOT Scoping Form.

Table 5-3: RFDS 1 Mode Split Assumptions

Mode Share	FBI	Future Office
Single Occupancy Vehicle	13.5%	17%
Carpool	8.5%	11%
Bicycle	2%	3%
Walk	1%	2%
Transit	75%	67%

5.1.2 Pedestrian Network

Under RFDS 1, pedestrian trips on the JEH parcel and between the JEH parcel and the nearest Metrorail stations, other transit options, and nearby land uses would remain generally consistent with the current levels of pedestrian trips because the parcel would continue to accommodate approximately 5,000 employees.

In figure 3-5 in Section 3.2, a map of the ADA-compliant curb ramps depicts the existing state of ADA compliance at crosswalks in the network. As this map shows, most of the curbs in the immediate vicinity of the JEH parcel are at least partly ADA compliant. However, all of the curbs on the same block as the JEH parcel are only partly ADA compliant because they all lack rumble strips or detectable warnings (i.e., dome-shaped bumps) (USDOJ 2007). Although the anticipated modal split favors pedestrians and the use of alternative travel modes, it is assumed that without significant redevelopment or building upgrades that require reconstruction of substantial portions of the sidewalk, the exchange partner may not upgrade the sidewalk frontages and curb ramps to full ADA compliance outside the JEH building in the reuse of the parcel. According to DDOT's Design and Engineering Manual, for rehabilitation projects (not new construction or reconstruction projects), the "design of pedestrian and bicycle facilities should be considered where warranted and cost effective" (DDOT 2009c, p. 5-5). If and when the exchange partner redevelops the parcel or substantial sidewalk rehabilitation is required, it is assumed that it would be asked to ensure that the sidewalks and ramps on this block are also ADA compliant at that time (District Department of Public Works 2000). Depending on the DDOT requirements, other sidewalk and public space upgrades or improvements may also be required to adhere to the DDOT Downtown Streetscape Regulations and the regulations noted in the Public Realm Design Manual, a joint publication of DCOP and DDOT (2011). Therefore, RFDS 1 would have no measurable indirect impacts to the pedestrian environment unless DDOT required sidewalk or public space upgrades or improvements. If exterior construction is needed as part of RFDS 1, there would be short-term, adverse indirect impacts to pedestrian circulation from the full or partial blockage of sidewalks by construction and/or construction staging.

5.1.3 Bicycle Network

There are no additional planned bicycle facilities directly adjacent to the JEH parcel in the MoveDC plan (DDOT 2014a), and therefore, no bicycle facilities would be constructed along with the parcel redevelopment. It is anticipated that a similar number or slight increase of people would commute to the parcel via bicycle given that it would continue to accommodate approximately 5,000 employees, and other bicycle improvements in the larger metropolitan area may make bicycling more attractive to additional users. Therefore, under RFDS 1 there would be measurable indirect impacts to bicycle facilities or the bicycle network in the study area.

5.1.4 Public Transit

The following sections describe RFDS 1 for the Metrorail and Metrobus modes within the study area. The other transit modes, commuter bus, shuttles, and slugging, were not analyzed because these modes do not have

existing or future ridership statistics, or comprehensive planning documents. It is anticipated that a similar number or slight increase of people would commute to the parcel via commuter bus, shuttle, or slugging given the similar amount of development on the parcel compared to the No-action Alternative.

5.1.4.1 Projected Transit Growth

The projected person trips are explained in the Trip Generation and Modal Split section (see Section 5.1.1). Projected transit trips associated with the future development conditions were calculated for RFDS 1 and then added to the 2025 No-action Alternative ridership totals for the Metrobus and Metrorail modes. The transit mode was split into Metrorail and Metrobus trips using average Metrobus/Metrorail mode splits from the 2005 WMATA Development Survey (WMATA 2006) and the MWCOG Round 8.3 Cooperative Forecasts (MWCOG 2014b). Table 5-4 summarizes these mode splits by land use.

Table 5-4: Mode Share by Land Use

Percent of Transit Mode	FBI	Future Office	Future Residential / Retail
Metrorail	84%	84%	85%
Metrobus	16%	16%	15%

Source: DDOT Scoping Form (Appendix B1); MWCOG (2014c); WMATA (2006)

The total number of trips by peak period associated with RFDS 1 was determined using the general office trip generation rates from the ITE *Trip Generation Manual* (ITE 2012). To calculate net trips for the scenario by peak period, existing trips to and from the parcel were subtracted from the total trips calculated for the scenario. Table 5-5 summarizes the net transit trips for RFDS 1. Overall, the scenario would result in approximately 525 additional AM peak transit trips and 537 additional PM peak transit trips (in and out columns combined).

Table 5-5: RFDS 1 Net Transit Trips

Use	Number of Employees	Time Period	All Modes			Transit Mode			
			IN	OUT	TOTAL	Transit Mode Split	IN	OUT	TOTAL
Existing JEH Trips to Subtract									
JEH	5,045	AM Peak	1,361	102	1,463	75%	1,020	77	1,097
		PM Peak	68	1,289	1,357	75%	51	967	1,018
RFDS 1 Trips									
General Office	5,045	AM Peak	2,131	291	2,422	67%	1,428	195	1,622
		PM Peak	395	1,926	2,321	67%	264	1,291	1,555
Net Trips for RFDS 1 (RFDS 1 Trips Minus JEH Trips)									
Total		**AM Peak**					**407**	**118**	**525**
		PM Peak					**213**	**324**	**537**

Note: Calculations may not appear correct due to rounding.
Source: DDOT Scoping Form (Appendix B1); MWCOG (2014c); WMATA (2006)

5.1.4.2 Metrorail Analysis

To evaluate the impact of RFDS 1 on the Metrorail system within the study area, the net transit trips calculated for the AM peak hour and PM peak hour in table 5-5 were disaggregated into Metrorail and Metrobus trips, using the transit mode splits from table 5-4. Table 5-6 summarizes net Metrorail trips generated for RFDS 1.

Table 5-6: RFDS 1 Net Metrorail Trips

Use	Number of Employees	Time Period	Transit Mode			Metrorail Mode			
			IN	OUT	TOTAL	Metrorail Mode Split	IN	OUT	TOTAL
Existing JEH Trips to Subtract									
JEH	5,045	AM Peak	1,020	77	1,097	83.6%	853	64	917
		PM Peak	51	967	1,018	83.6%	43	808	851
RFDS 1 Trips									
General Office	5,045	AM Peak	1,428	195	1,622	83.6%	1,194	163	1,356
		PM Peak	264	1,291	1,555	83.6%	221	1,079	1,300
Net Trips for RFDS 1 (RFDS 1 Trips Minus JEH Trips)									
Total		**AM Peak**					**341**	**99**	**439**
		PM Peak					**178**	**271**	**449**

Note: Calculations may not appear correct due to rounding.
Source: DDOT Scoping Form (Appendix B1); MWCOG (2014c); WMATA (2006)

The net Metrorail trips associated with RFDS 1 were added to the projected 2025 No-action Alternative ridership totals for each station entrance and line proportionally based on projected 2025 No-action Alternative ridership.

Metrorail Passenger Loads

Metrorail passenger loads by line within the study area were calculated for the busiest segment of each line within the study area using forecasted ridership for RFDS 1 during the AM and PM peak periods. The scenario trips were distributed to the busiest segment of each line within the study area according to each segment's proportion of ridership within the study area. No expansion of WMATA's current fleet was assumed for this analysis to provide the most conservative estimate of potential capacity issues. The Momentum Strategic Plan does call for all eight-car trains on all lines during peak periods by the year 2020; however, this would require significant upgrades to electrical systems and a significant expansion of WMATA's current fleet of railcars (WMATA 2014f).

WMATA has three thresholds for railcar occupancy: less than 100 passengers per car (acceptable), between 100 and 120 passengers per car (crowded), and greater than 120 passenger per car (extremely crowded). Capacity is generally considered to be 120 passengers per car. Projected passenger loads by 2025 are all below 100 passengers per car, and therefore would be considered acceptable. Loads are highest on the Red line between Gallery Place and Metro Center during the PM peak period. Tables 5-7 and 5-8 summarize the RFDS 1 passenger loads per car during the AM peak and PM peak periods.

Table 5-7: RFDS 1 AM Peak Period Projected Maximum Metrorail Passenger Loads by Line

Line	Segment	2014			2025 No-action Alternative		2025 RFDS 1	
		Passengers	Train Cars	Load	Passengers	Load	Passengers	Load
Red	Gallery Place to Metro Center	9,125	136	67.1	11,651	85.7	11,823	86.9
Orange	Smithsonian to Federal Triangle	5,870	94	62.4	7,495	79.7	7,605	80.9
Green	Mt. Vernon Square to Gallery Place	3,542	68	52.1	4,522	66.5	4,589	67.5
Yellow	L'Enfant Plaza to Archives	3,058	78	39.2	3,904	50.1	3,962	50.8
Blue	Smithsonian to Federal Triangle	1,691	44	38.4	2,159	49.1	2,191	49.8

Source: WMATA (2014i); DDOT Scoping Form (Appendix B1)

Table 5-8: RFDS 1 PM Peak Period Projected Maximum Metrorail Passenger Loads by Line

Line	Segment	2014			2025 No-action Alternative		2025 RFDS 1	
		Passengers	Train Cars	Load	Passengers	Load	Passengers	Load
Red	Metro Center to Gallery Place	10,614	142	74.7	13,605	95.8	13,781	97.0
Blue	Federal Triangle to Smithsonian	2,448	42	58.3	3,138	74.7	3,178	75.7
Green	Gallery Place to Mt Vernon Square	4,034	70	57.6	5,171	73.9	5,237	74.8
Orange	Metro Center to McPherson Square	6,417	114	56.3	8,225	72.1	8,331	73.1
Yellow	Archives to L'Enfant Plaza	3,588	78	46.0	4,599	59.0	4,658	59.7

Source: WMATA (2014i); DDOT Scoping Form (Appendix B1)

Station Capacity Analysis

A capacity analysis was conducted for the vertical elements (escalators and stairs), faregate aisles, fare vending machines, and platforms at Archives-Navy Memorial and Federal Triangle Metro Stations, as well as the south and east entrances to Metro Center and the east and west entrances at Gallery Place-Chinatown (the closest entrances to the JEH parcel). The analysis used peak 15-minute periods of ridership (entries and exits) at each station according to projected ridership for RFDS 1 for the year 2025. This includes additional trips associated with planned development projects, predicted regional transit growth, and the net trips calculated for RFDS 1 (distributed to each station entrance proportionally based on existing ridership). To calculate 15-minute ridership from peak hour ridership, AM and PM peak hour ridership totals were disaggregated using the average Peak Hour Factor (PHF) in the study area (0.282 during the AM peak hour, 0.268 during the PM peak hour). A PHF is the proportion of hourly ridership that occurs during the peak 15-minute period of that hour.

Volume-to-capacity (v/c) ratios were calculated for the vertical elements and fare elements, and pedestrian LOS was calculated for platform areas. Analysis for vertical elements and faregate aisles used projected ridership from the peak exiting period at each station entrance based on the time period when the highest concentration of passengers would be using each element. Overall, there is not a significant change in ridership between the No-action Alternative and RFDS 1. Table 5-9 summarizes projected ridership during the peak existing period at each station entrance under RFDS 1.

Table 5-9: RFDS 1 Weekday Peak 15-Minute Exiting Period Ridership

Metro Station	Time	2014		2025 No-action Alternative		2025 RFDS 1	
		Entries	Exits	Entries	Exits	Entries	Exits
Archives	8:45 AM – 9:00 AM	25	524	46	670	51	690
Federal Triangle	8:45 AM – 9:00 AM	15	467	28	597	31	614
Gallery Place East	6:15 PM – 6:30 PM	212	355	266	445	277	470
Gallery Place West	8:45 AM – 9:00 AM	12	301	15	378	18	389
Metro Center East	8:45 AM – 9:00 AM	44	434	55	544	63	561
Metro Center South	8:45 AM – 9:00 AM	20	427	36	546	40	562

Source: WMATA (2014c); MWCOG (2015); DDOT Scoping Form (Appendix B1)

The platform area analysis and fare vending machine analysis used projected ridership from the peak entering period at each station–the time period when the most passengers would likely use fare vending machines and the highest number of passengers would be waiting on the platform. Table 5-10 summarizes projected ridership during the peak entering period at each station platform under RFDS 1 (for peak entering period ridership by station entrance, see *Fare Vending Machine* sections in Appendix B4). Overall, there is not a significant change in ridership between the No-action Alternative and RFDS 1.

Table 5-10: RFDS 1 Weekday Peak 15-Minute Entering Period Platform Ridership

Metro Station	Time	2014		2025 No-action Alternative		2025 RFDS 1	
		Entries	Exits	Entries	Exits	Entries	Exits
Archives	5:00 PM – 5:15 PM	524	56	665	77	682	83
Federal Triangle	5:00 PM – 5:15 PM	501	38	635	55	652	57
Gallery Place Glenmont	5:00 PM – 5:15 PM	641	975	807	1,220	812	1,231
Gallery Place Shady Grove	5:00 PM – 5:15 PM	1,016	534	1,302	667	1,311	671
Gallery Place Green/Yellow	5:00 PM – 5:15 PM	1,629	1,128	2,051	1,436	2,056	1,443
Metro Center Glenmont	5:30 PM – 5:45 PM	1,171	548	1,472	680	1,479	685
Metro Center Shady Grove	5:30 PM – 5:45 PM	1,183	691	1,490	859	1,496	861
Metro Center Blue/Orange/Silver	5:30 PM – 5:45 PM	1,618	1,651	2,044	2,078	2,056	2,090

Source: WMATA (2014c); MWCOG (2015); DDOT Scoping Form (Appendix B1)

Overall, vertical elements and faregate aisles at each station are projected to operate below a v/c of 0.7, which is considered capacity. Fare vending machines are projected to operate above capacity at Archives-Navy Memorial, the east and west entrances to Gallery Place-Chinatown, and the east and south entrances to Metro Center (highlighted in light blue in table 5-11).

Platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable pedestrian LOS B at Archives-Navy Memorial and Federal Triangle. The Red line platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS D, while the lower platforms at each station are projected to operate at a pedestrian LOS C. At pedestrian LOS D, passengers would likely begin to spread out farther down the platform. Further details on the station capacity analysis can be found in Appendix B4.

Table 5-11 summarizes the results of RFDS 1 station capacity analysis, including the vertical elements, fare elements, and platforms.

Table 5-11: RFDS 1 Metro Station Capacity Analysis Summary

Element		Archives-Navy Memorial	Federal Triangle	Gallery Place East	Gallery Place West	Metro Center East	Metro Center South
Street/ Mezzanine v/c	Entry Escalators	0.05	0.03	0.11	0.02	0.06	0.04
	Exit Escalators	0.31	0.28	0.19	0.37	0.27	0.27
	Stairs	-	-	0.14	-	-	-
Mezzanine/ Platform 1 [a] v/c	Entry Escalators	0.05	0.03	0.13	0.01	0.03	-
	Exit Escalators	0.62	0.28	0.32	0.18	0.32	-
	Stairs	-	-	-	-	-	-
Mezzanine/ Platform 2 [a] v/c	Entry Escalators	-	-	0.18	0.01	0.03	-
	Exit Escalators	-	-	0.24	0.19	0.21	-
	Stairs	-	-	-	-	-	-
Lower Platform/ Glenmont Platform v/c	Entry Escalators	-	-	0.34	-	-	0.37
	Exit Escalators	-	-	0.18	-	-	0.56
	Stairs	-	-	0.57	-	-	0.15
Faregate Aisles		0.29	0.30	0.26	0.17	0.25	0.25
Fare Vending		**0.87**	0.60	**1.19**	**1.50**	**0.82**	**1.11**
Glenmont Platform Peak LOS		-	-	D		D	
Shady Grove Platform Peak LOS		-	-	D		D	
Green/Yellow Platform Peak LOS		B	-	C		-	
Blue/Orange/Silver Platform Peak LOS		-	B	-		C	

Notes: v/c = volume to capacity ratio; LOS = level of service
[a] For Gallery Place and Metro Center, Platform 1 = Glenmont, Platform 2 = Shady Grove
Source: WMATA (2014c); MWCOG (2015); DDOT Scoping Form (Appendix B1)

NFPA 130 Emergency Evacuation Analysis

An emergency evacuation analysis was conducted to compare evacuation capacity of each station to standards set by the NFPA 130 code (TRB 2013). NFPA 130 requires that station platforms be fully evacuated with 4 minutes and that all passengers reach a point of safety within 6 minutes. WMATA Metrorail stations, however, are not required to meet these criteria. Details on the assumptions and calculations necessitated in NFPA 130 are found in Appendix B5. A summary of the emergency evacuation analyses is included below, with further details of each entrance analysis included in Appendix B5.

The NFPA 130 analysis used the projected number of passengers waiting to board trains (entries and transfers) from the peak entering period at each station. Table 5-12 summarizes growth in passengers waiting to board trains during the peak entering period for each station platform. The RFDS 1 forecasted passenger trips were added to No-action Alternative passenger volumes proportionally based on current ridership patterns. The number of waiting passengers was combined with the number of passengers on board trains to calculate the total number of passengers who would need to evacuate each station. Table 5-13 summarizes platform evacuation times and total station evacuation times (to a point of safety) in minutes for each station entrance in the study area. Appendix B5 has further details on the emergency evacuation analysis for each station.

Table 5-12: RFDS 1 Weekday Peak 15-Minute Entering Period Waiting Passenger Growth

Station	Platform	Time	Passengers Waiting on Platform		
			2014	2025 No-action Alternative	2025 RFDS 1
Archives-Navy Memorial	Green/Yellow	5:00 PM – 5:15 PM	524	665	682
Federal Triangle	Blue/Orange/Silver	5:00 PM – 5:15 PM	501	635	652
Gallery Place-Chinatown East	Glenmont	5:00 PM – 5:15 PM	320	399	402
	Shady Grove	5:00 PM – 5:15 PM	339	430	433
	Green/Yellow	5:00 PM – 5:15 PM	794	990	992
Gallery Place-Chinatown West	Glenmont	5:00 PM – 5:15 PM	320	399	402
	Shady Grove	5:00 PM – 5:15 PM	339	430	433
Metro Center East	Glenmont	5:30 PM – 5:45 PM	390	485	487
	Shady Grove	5:30 PM – 5:45 PM	394	491	493
Metro Center South	Glenmont	5:30 PM – 5:45 PM	390	485	487
	Blue/Orange/Silver	5:30 PM – 5:45 PM	807	1,009	1,015

Source: WMATA (2014c); MWCOG (2015); DDOT Scoping Form (Appendix B1)

Table 5-13: RFDS 1 NFPA 130 Evacuation Analysis Summary

Station/ Entrance	Platform Evacuation Time (minutes)	Total Station Evacuation Time (minutes)
Archives-Navy Memorial	32.9	36.3
Federal Triangle	14.5	18.1
Gallery Place-Chinatown East	30.0	33.7
Gallery Place-Chinatown West	8.6	12.2
Metro Center East	7.1	10.3
Metro Center South	3.3	16.5

Source: TRB (2013); WMATA (2014c)

Archives-Navy Memorial Station

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the platform at Archives-Navy Memorial Station could be evacuated in 32.9 minutes, and the entire station could be evacuated to a point of safety within 36.3 minutes. The long evacuation time at this station is a function of the fact that there are only two platform-to-mezzanine escalators.

Federal Triangle Station

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the platform at Federal Triangle Station could be evacuated in 14.5 minutes, and the entire station could be evacuated to a point of safety within 18.1 minutes.

Gallery Place-Chinatown East Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Green/Yellow and Red-Glenmont platforms at the Gallery Place-Chinatown east entrance could be evacuated in 30.0 minutes, and the entire station entrance could be evacuated to a point of safety within 33.7 minutes. The long platform evacuation time is a result of the fact that there are only two platform-to-mezzanine escalators per platform at this station entrance.

Gallery Place-Chinatown West Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the two Red line platforms at the Gallery Place-Chinatown west entrance could be evacuated in 8.6 minutes, and the entire station entrance could be evacuated to a point of safety within 12.2 minutes.

Metro Center East Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Red line platforms at the Metro Center east entrance could be evacuated in 7.1 minutes, and the entire station entrance could be evacuated to a point of safety within 10.3 minutes.

Metro Center South Entrance

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the Blue/Orange/Silver and Red line platforms at the Metro Center south entrance could be evacuated in 3.3 minutes, and the entire station could be evacuated to a point of safety within 16.5 minutes.

5.1.4.3 Metrobus Analysis

To evaluate the impact of RFDS 1 on the bus network within the study area, the net transit trips calculated for the AM peak hour and PM peak hour in table 5-5 were disaggregated into Metrorail and Metrobus trips, using the transit mode splits from table 5-4. Table 5-14 summarizes net Metrobus trips generated by the scenario.

Table 5-14: RFDS 1 Net Metrobus Trips

Use	Number of Employees	Time Period	Transit Mode			Bus Mode			
			IN	OUT	TOTAL	Bus Mode Split	IN	OUT	TOTAL
Existing JEH Trips to Subtract									
JEH	5,045	AM Peak	1,020	77	1,097	16.4%	167	13	180
		PM Peak	51	967	1,018	16.4%	8	159	167
RFDS 1 Trips									
General Office	5,045	AM Peak	1,428	195	1,622	16.4%	234	32	266
		PM Peak	264	1,291	1,555	16.4%	43	212	255
Net Trips for RFDS 1 (RFDS 1 Trips Minus JEH Trips)									
Total		**AM Peak**					**67**	**19**	**86**
		PM Peak					**35**	**53**	**88**

Note: Calculations may not appear correct due to rounding.
Source: DDOT Scoping Form (Appendix B1); MWCOG (2014c); WMATA (2006)

The net Metrobus trips associated with RFDS 1 were added to the AM peak hour and PM peak hour bus volumes calculated for the study area in the 2025 No-action Alternative. Both the AM peak hour and the PM peak hour were analyzed due to the fact that the AM peak hour had the highest No-action Alternative bus volumes, but the PM peak hour had a higher number of additional RFDS 1 trips than the AM peak hour. The trips were distributed proportionally to each route and direction within the study area based on 2025 No-action Alternative ridership levels.

Overall, under the RFDS 1 bus volumes are projected to be approximately 5,470 passengers during the AM peak period, and 5,066 passengers during the PM peak period. Both of these totals are well below projected capacity, as summarized in table 5-15.

Despite the fact that the total bus volume within the study area does not exceed the total bus capacity, several individual routes would likely experience capacity issues during peak hours. Peak volumes per hour on Routes 11Y, 32, 36, 80, and G8 are all projected to be over capacity by 2025 within the study area. WMATA has completed studies of the 30s Line (Routes 32 and 36), Route 80, and Route G8. Certain recommendations from these studies have already been implemented by WMATA prior to this study, and are all intended to help alleviate overcrowding on these routes. Further analysis would be required to determine the extent to which the recommendations would impact capacity on these routes. Appendix B7 has further details on the bus capacity analysis.

Table 5-15: RFDS 1 Total Bus Capacity Analysis

	2014		2025 No-action Alternative [a]		2025 RFDS 1	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Total Volume	4,315	3,952	5,383	4,978	5,470	5,066
Total Capacity	11,425	10,698	11,425	10,698	11,425	10,698
Volume to Capacity Ratio (v/c)	0.38	0.37	0.47	0.47	0.48	0.47

[a] Including trips from planned development projects.
Source: WMATA (2014e); MWCOG (2015); DDOT Scoping Form (Appendix B1)

5.1.4.4 Level of Impact

The increase in public transit trips from the future development conditions would have the following impacts on transit:

- Several Metrobus routes would continue to have capacity issues due to their capacity issues present in the No-action Alternative, given that no overall projected transit service increase or changes in Metrobus service are assumed in the analysis. However, no new Metrobus capacity issues would be created as a result of RFDS 1. The overall capacity of bus services in the study area would accommodate the projected ridership and projected ridership would only be slightly higher than No-action ridership.
- Metrorail passenger loads through the study area are projected to be at acceptable levels.
- Overall, Metrorail vertical elements and faregate aisles at each station are projected to operate below capacity.
- Metrorail fare vending machines are projected to continue to operate above capacity at Archives-Navy Memorial, the east and west entrances to Gallery Place-Chinatown, and the east and south entrances to Metro Center, as they did under the No-action Alternative. No new Metrorail fare vending machines would operate above capacity as a result of RFDS 1.
- Metrorail platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable pedestrian LOS B at Archives-Navy Memorial and Federal Triangle. The Red line platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS D, while the lower platforms are projected to operate at pedestrian LOS C. This represents no change over the No-action Alternative.
- Platform and station evacuation times would increase slightly over the No-action Alternative, mostly at the Archives-Navy Memorial Metro Station, and continue to exceed NFPA 130 standards at all station entrances except the platform evacuation time at the south entrance to Metro Center. WMATA Metrorail stations, however, are not required to meet NFPA 130 standards.

Therefore, although RFDS 1 would add trips to the transit network, based on the impacts methodology in Section 2.3 of the TIA, there would be no measurable long-term indirect impacts to transit as compared to the impacts under the No-action Alternative. Therefore, there would be no measurable long-term impacts on public transit under RFDS 1. RFDS 1 would result in continued indirect, long-term, major adverse impacts, as discussed under the No Action Alternative. There would be an incremental increase in the magnitude of adverse impacts due to further impacts to bus lines and the inadequate functioning of fare vending machines.

Construction of RFDS 1 would cause indirect, short-term, adverse construction impacts to public transit because some bus routes that use roadways adjacent to the JEH parcel may experience delays and congestion if traffic lanes are reduced to allow staging area for construction. Additionally, bus stops may need to be moved during the construction process, also causing adverse impacts.

5.1.5 Parking

It is unlikely the new building occupants would need to maintain security setbacks from the building that restrict all on-street parking on the JEH parcel. Therefore, the addition of street parking on the JEH parcel block would be

left to the discretion of DDOT and the exchange partner. It is assumed that at least one or more sides of the JEH parcel would be opened to on-street time restricted parking, with time limits established based on the parking restrictions in the immediate area and the need of the traffic network to accommodate peak volumes.

Under the assumptions of RFDS 1, the total number of off-street garage parking spaces on the parcel would remain largely consistent with the current off-street parking supply with parking garage access being provided along 10th Street NW. With similar projections of building users for RFDS 1 as under the Existing Condition, it is assumed that parking demand would stay similar.

Because RFDS 1 would likely result in minor increases in the amount of on-street parking supply and no measurable changes to off-street parking or demand are anticipated, the scenario would have indirect, long-term, beneficial impacts to parking because of the slight increase in public on-street parking. During the construction period, there may be some existing parking spaces that would be used by construction equipment; therefore, there would be indirect, short-term, adverse construction impacts.

5.1.6 Truck Access

It is anticipated that trucks accessing the JEH parcel under RFDS 1 would use one of the current vehicular access points to the parcel because no substantial changes would be made to site circulation. Therefore it is assumed that trucks would access the JEH parcel through the same entrance as they currently do on 10th Street NW, unless DDOT required access on an alternative street due to traffic or safety reasons. If trucks were to access the JEH parcel at a different location or at more than just the 10th Street NW vehicular entrance, there would likely be different, and possibly more, conflicts with pedestrians.

Truck access would likely remain similar to the Existing Condition; therefore, under RFDS 1 there would be no measurable indirect impacts to truck access other than possibly diverting truck and pedestrian conflicts to a different sidewalk location. Because rehabilitation of the JEH building would require extensive interior demolition and new material, the one truck access point to the parcel may not be sufficient during construction. Therefore, truck access from redevelopment of the parcel under RFDS 1 would cause indirect, short-term, adverse construction impacts. Without understanding the needs of the future tenants, this study is unable to further evaluate the impacts of truck access to the parcel. It is anticipated that the exchange partner may need to undertake truck access or site distance studies following an approved DDOT method, depending on future proposed conditions.

5.1.7 Traffic Analysis

The next sections describe the process the study followed to project future traffic volumes; the modal split is covered within the trip generation section.

The projected person trips are explained in RFDS 1 Trip Generation and Modal Split section (see Section 5.1.1). After combining the trip generation with the modal split, the forecasted vehicle trips were calculated. The vehicle trips were then separated into SOV and HOV. Because the study area is located in a downtown setting, the HOV were assumed to be an average of five persons per vehicle. This resulted in 241 total AM peak hour vehicle trips and 239 total PM peak hour vehicle trips. Table 5-16 contains the vehicle trips generated under RFDS 1.

Table 5-16: RFDS 1 Vehicle Trips Generated

Land Use	Travel Mode	Modal Split (Percent)	AM In	AM Out	AM Hour	PM In	PM Out	PM Hour
Existing FBI	SOV	13.5	(184)	(14)	(198)	(9)	(174)	(183)
	HOV	8.5	(23)	(2)	(25)	(1)	(22)	(23)
New Office	SOV	17.0	362	49	411	67	327	394
	HOV	11.0	47	6	53	9	42	51
Net Trips			202	39	241	66	170	239

Note: Negative numbers are shown in parentheses (#).

5.1.7.1 RFDS 1 Trip Distribution/Trip Assignment

Trip distribution represents the origin-destination pattern by percentage for trips generated or removed to/from points beyond the study area boundary (e.g., 26 percent destined to northeast DC and on to Maryland via 7th Street north, or 29 percent destined to southern DC, southeast Maryland and southwest Virginia via 12th Street and 9th Street).

Trips for current FBI employees were removed from the roadways. This was accomplished by identifying the zip codes of current employees, calculating the percentage of employees traveling to and from different sections of the region based on the number of employees in each of those zip codes, identifying the most logical routes to different sections of the region, and removing the peak FBI trips from those routes.

The MWCOG 2025 Travel Demand Model trip tables (MWCOG 2014c) were used to determine the trip distribution for new employees at the parcel. The model is broken into 3,700 traffic analysis zones (TAZ) (a statistical boundary similar in size to census blocks) covering the Washington Metropolitan area. The JEH parcel is in Zone 21. The new employee trips were apportioned to origins and destinations outside the study area boundary based on the MWCOG trip tables. The trip distribution is summarized in table 5-17.

Table 5-17: RFDS 1 Vehicle Trip Distribution

Destination	Road	Office Distribution Percent
East DC/MD	Constitution Ave East	4.0%
North DC	14th Street North	5.0%
Northeast DC/MD	7th Street North	26.0%
Northwest DC	H Street West	7.0%
Northwest MD, Western VA	Constitution Ave West	29.0%
South DC, Southeast MD, Southwest VA	12th Street/ 9th Streets	29.0%
TOTAL		**100.0%**

The subtraction of current FBI employee trips combined with the addition of new employee trips equals the net trip change between the No-action Alternative and RFDS 1. The total scenario net trip generation AM and PM forecasted turning movement volumes are shown in figure 5-1.

5.1.7.2 Development of RFDS 1 Traffic Conditions

The planned developments, background growth, and RFDS 1 net trips (existing FBI vehicle trips minus the new trips generated by RFDS 1) were combined together to forecast conditions under RFDS 1. Figure 5-2 shows the AM and PM forecasted turning movement volumes under RFDS 1

Figure 5-1: RFDS 1 Net Trip Generation AM and PM Forecasted Turning Movement Volumes

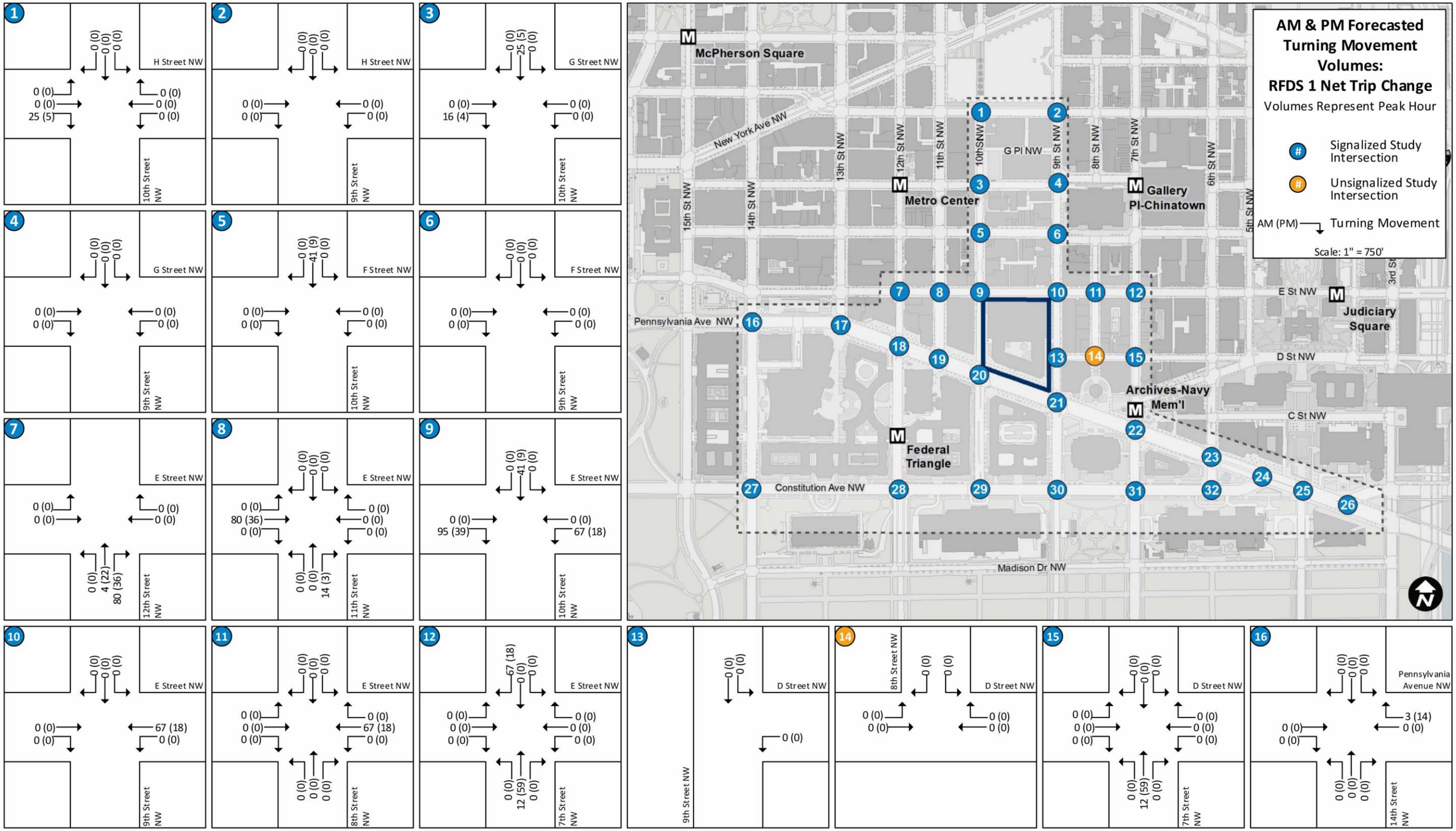

Figure 5-1: RFDS 1 Net Trip Generation AM and PM Forecasted Turning Movement Volumes (continued)

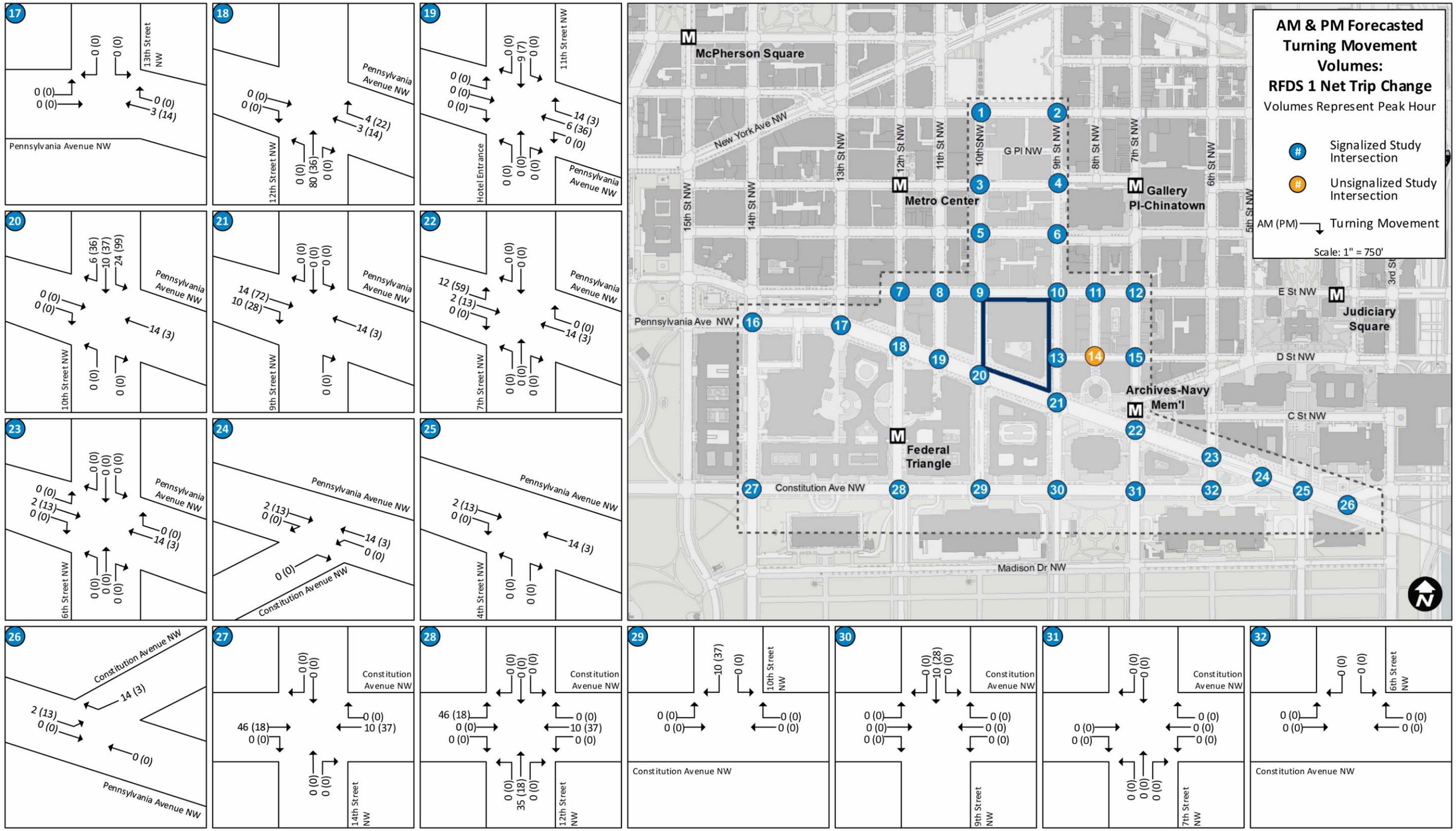

Figure 5-2: RFDS 1 AM and PM Forecasted Turning Movement Volumes