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Figure 4-35: RFDS 1 Net Trip Change AM and PM Forecasted Turning Movement Volumes

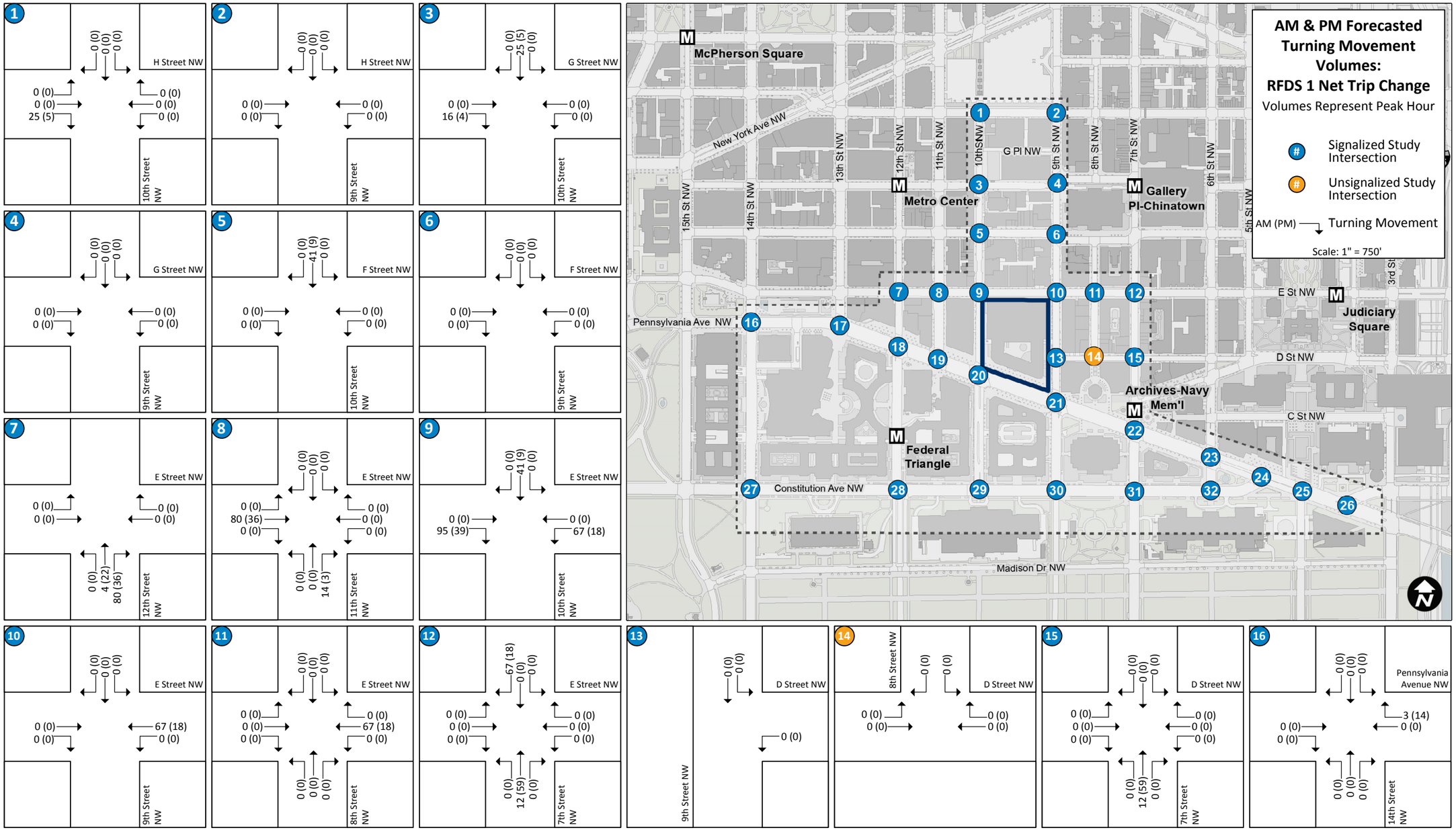


Figure 4-35: RFDS 1 Net Trip Change AM and PM Forecasted Turning Movement Volumes (continued)

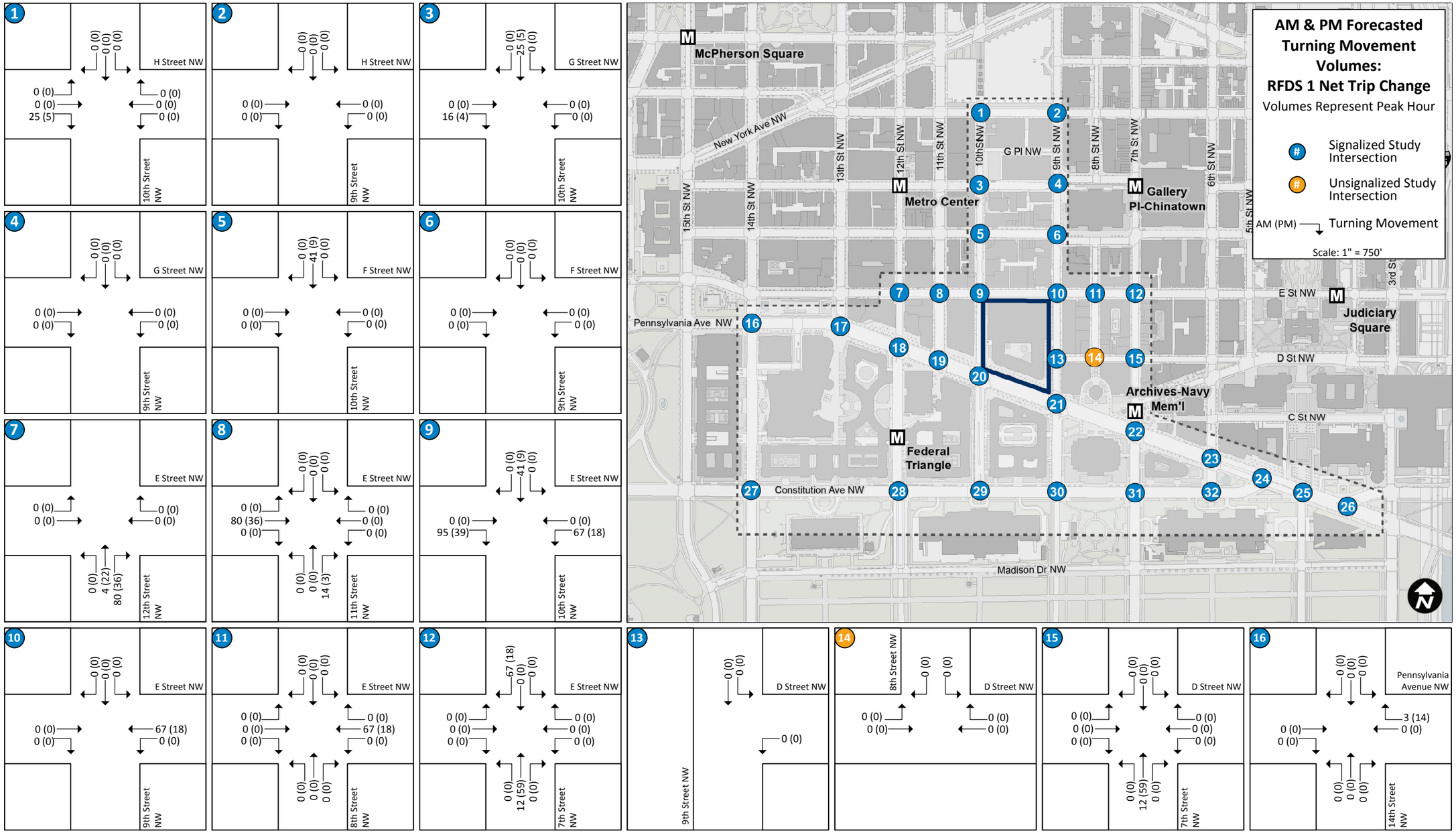


Figure 4-36: RFDS 1 AM and PM Forecasted Turning Movement Volumes

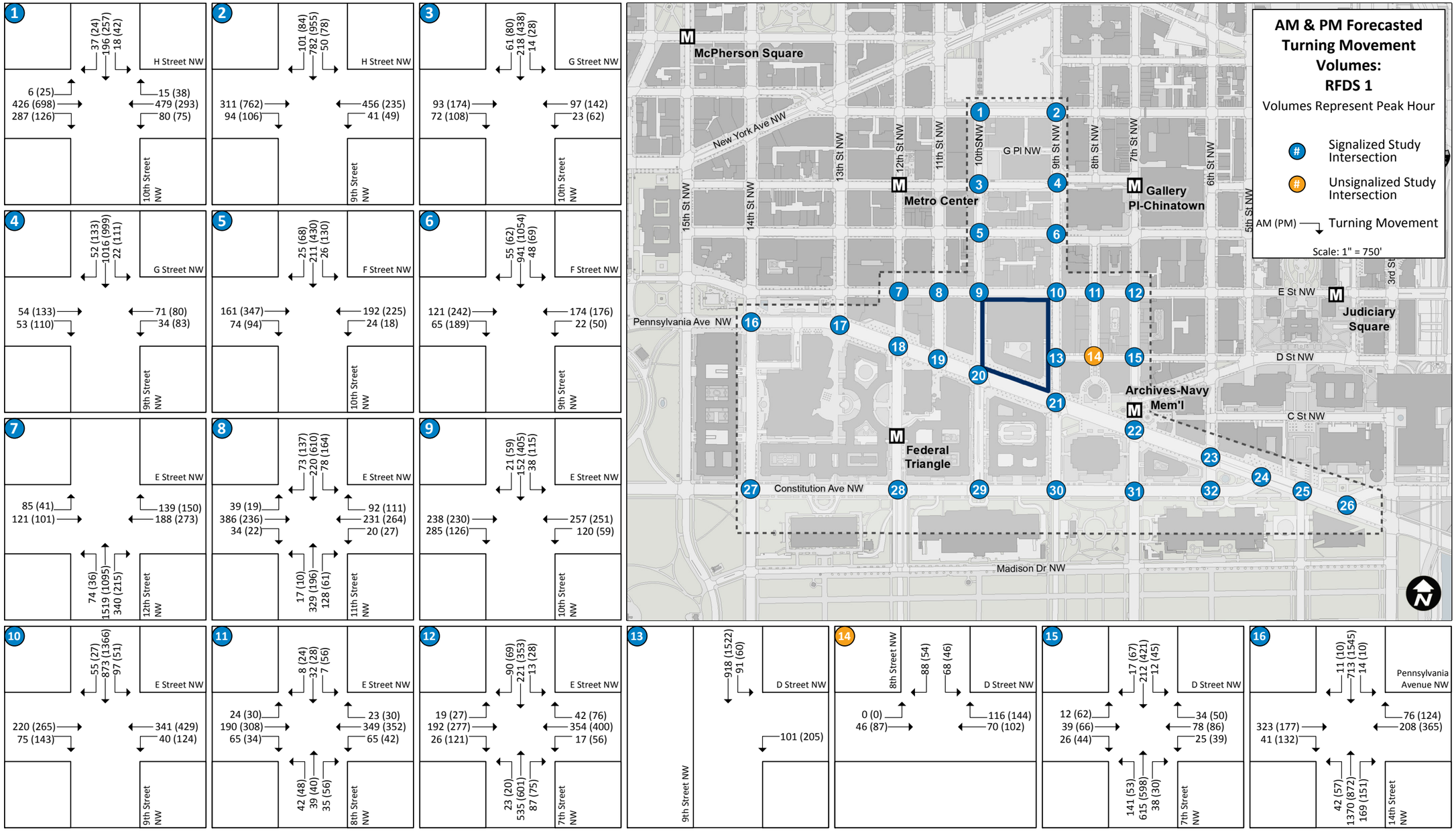


Figure 4-36: RFDS 1 AM and PM Forecasted Turning Movement Volumes (continued)

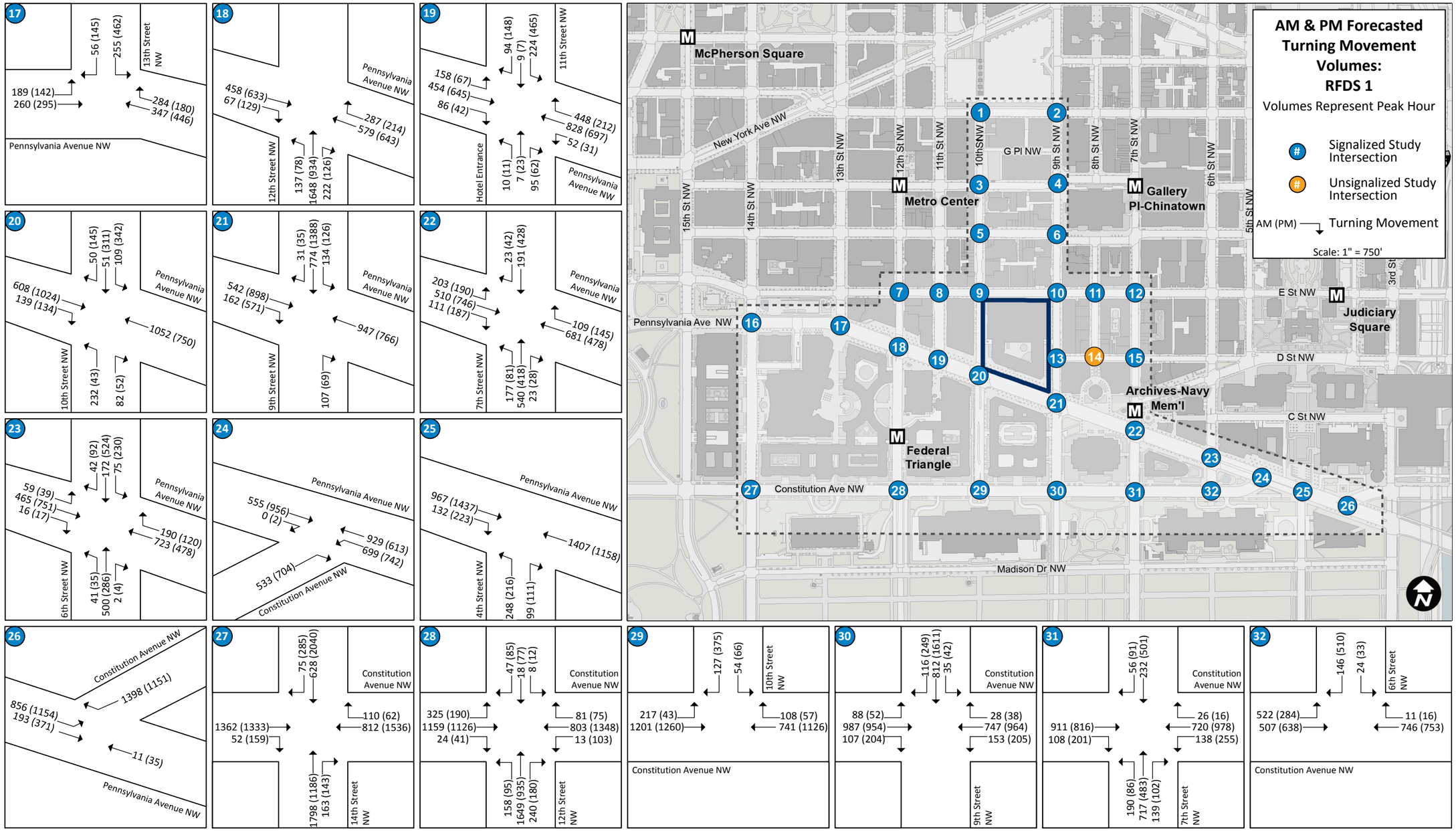
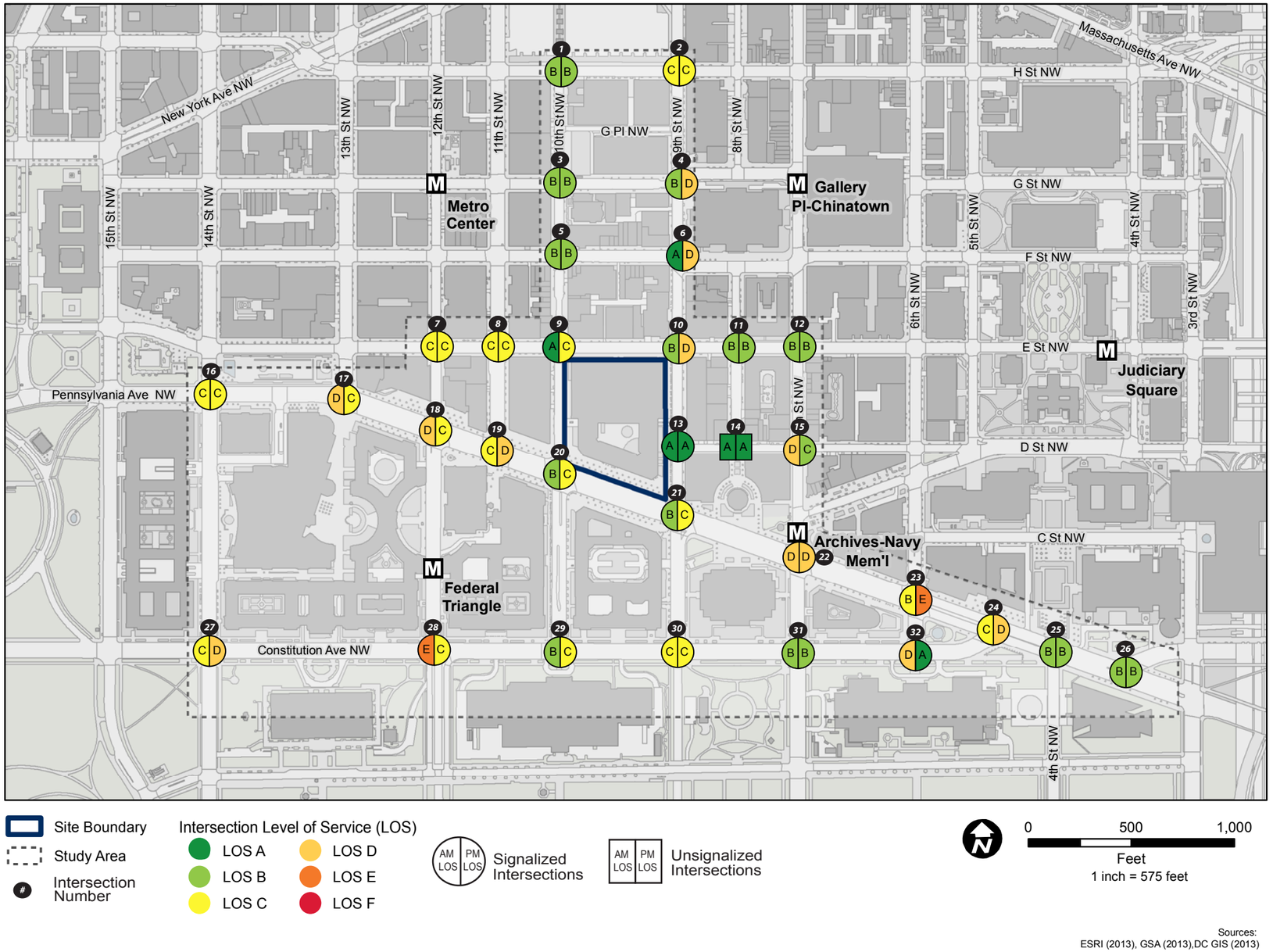


Figure 4-37: RFDS 1 Intersection LOS for AM and PM Peak Hours



RFDS 1 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, as in the No-action Alternative, the intersection of 6th Street NW and Pennsylvania Avenue NW would operate at LOS E during the PM peak hour. Under RFDS 1, the intersection of 12th Street NW and Constitution Avenue NW would also fail, operating at LOS E during the PM peak hour. These are the only intersections within the study area that would operate under unacceptable conditions during a peak hour period in 2025. None of the study area intersections would operate at LOS F during a peak hour. A total of 16 signalized intersections would experience an unacceptable conditions for one or more turning movements. Compared to the No-action Alternative, RFDS 1 would have one more intersection failing during the AM peak hour and no change in the number of intersections failing during the PM peak hour. The JEH TIA (Appendix B) contains a more detailed traffic operations analysis for RFDS 1.

The overall intersection LOS grades for the RFDS 1 are shown in figure 4-37 for the AM and PM peak hours. Table 4-58 shows the results of the LOS capacity analysis and the intersection projected delay under the RFDS 1 during the AM and PM peak hours.

RFDS 1 Queuing Analysis

Based on the Synchro™ queuing analysis, 30 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. Compared to the No-action Alternative, RFDS 1 would have failing queues for four less intersections during the AM peak hour and one less intersection during the PM peak hour. The JEH TIA (Appendix B) contains a more detailed traffic queuing analysis.

Table 4-58: Comparison of JEH Parcel No-action Alternative and RFDS 1 Intersection Operations for AM and PM Peak Hours

#	Intersection	No-action Alternative						RFDS 1					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check
1	10th Street NW & H Street NW (Signalized)												
		12.8	B	Pass	19.6	B	Pass	12.9	B	Pass	19.6	B	Pass
2	9th Street NW & H Street NW (Signalized)												
		20.3	C	Pass	24.7	C	Pass	20.3	C	Pass	24.6	C	Pass
3	10th Street NW & G Street NW (Signalized)												
		14.6	B	Pass	18.2	B	Pass	15.1	B	Pass	18.4	B	Pass
4	9th Street NW & G Street NW (Signalized)												
		13.0	B	Pass	45.7	D	Pass	13.0	B	Pass	45.7	D	Pass
5	10th Street NW & F Street NW (Signalized)												
		12.1	B	Pass	17.4	B	Pass	12.6	B	Pass	17.3	B	Pass
6	9th Street NW & F Street NW (Signalized)												
		9.8	A	Pass	41.5	D	Pass	9.8	A	Pass	41.5	D	Pass
7	12th Street NW & E Street NW (Signalized)												
		21.8	C	Pass	26.3	C	Pass	22.6	C	Pass	26.8	C	Pass
8	11th Street NW & E Street NW (Signalized)												
		14.7	B	Pass	26.4	C	Pass	22.9	C	Pass	26.8	C	Pass
9	10th Street NW & E Street NW (Signalized)												
		8.8	A	Pass	24.8	C	Pass	9.7	A	Pass	24.4	C	Pass
10	9th Street NW & E Street NW (Signalized)												
		13.0	B	Pass	46.2	D	Pass	14.4	B	Pass	46.1	D	Pass
11	8th Street NW & E Street NW (Signalized)												
		13.7	B	Pass	13.5	B	Pass	16.6	B	Pass	13.7	B	Pass
12	7th Street NW & E Street NW (Signalized)												
		19.4	B	Pass	18.7	B	Pass	19.1	B	Pass	18.9	B	Pass
13	9th Street NW & D Street NW (Signalized)												
		7.7	A	Pass	8.1	A	Pass	7.7	A	Pass	8.1	A	Pass
14	8th Street NW & D Street NW (AWSC)												
		8.2	A	Pass	8.4	A	Pass	8.2	A	Pass	8.4	A	Pass
15	7th Street NW & D Street NW (Signalized)												
		38.7	D	Pass	18.2	B	Pass	43.1	D	Pass	20.4	C	Pass
16	14th Street NW & Pennsylvania Avenue NW (Signalized)												
		27.3	C	Pass	21.3	C	Pass	27.3	C	Pass	21.2	C	Pass
17	13th Street NW & Pennsylvania Avenue NW (Signalized)												
		35.4	D	Pass	25.2	C	Pass	35.3	D	Pass	25.8	C	Pass

Table 4-58: Comparison of JEH Parcel No-action Alternative and RFDS 1 Intersection Operations fo AM and PM Peak Hours (continued)

#	Intersection	No-action Alternative						RFDS 1					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check
18	12th Street NW & Pennsylvania Avenue NW (Signalized)												
		32.9	C	Pass	20.1	C	Pass	47.5	D	Pass	20.1	C	Pass
19	11th Street NW/Hotel Entrance & Pennsylvania Avenue NW (Signalized)												
		32.8	C	Pass	48.1	D	Pass	34.7	C	Pass	49.2	D	Pass
20	10th Street NW & Pennsylvania Avenue NW (Signalized)												
		19.2	B	Pass	16.1	B	Pass	19.9	B	Pass	31.1	C	Pass
21	9th Street NW & Pennsylvania Avenue NW (Signalized)												
		12.5	B	Pass	26.8	C	Pass	12.4	B	Pass	26.6	C	Pass
22	7th Street NW & Pennsylvania Avenue NW (Signalized)												
		41.8	D	Pass	25.2	C	Pass	44.4	D	Pass	35.9	D	Pass
23	6th Street NW & Pennsylvania Avenue NW (Signalized)												
		16.9	B	Pass	57.4	E	Fail	16.8	B	Pass	57.4	E	Fail
24	Constitution (WB) Avenue NW & Pennsylvania Avenue NW (Signalized)												
		20.2	C	Pass	36.8	D	Pass	20.3	C	Pass	36.9	D	Pass
25	4th Street NW & Pennsylvania Avenue NW (Signalized)												
		10.6	B	Pass	14.2	B	Pass	10.8	B	Pass	14.2	B	Pass
26	Constitution (EB) Avenue NW & Pennsylvania Avenue NW (Signalized)												
		18.6	B	Pass	18.5	B	Pass	18.8	B	Pass	18.6	B	Pass
27	14th Street NW & Constitution Avenue NW (Signalized)												
		24.4	C	Pass	54.5	D	Pass	24.6	C	Pass	54.4	D	Pass
28	12th Street NW & Constitution Avenue NW (Signalized)												
		53.7	D	Pass	31.7	C	Pass	59.5	E	Fail	33.6	C	Pass
29	10th Street NW & Constitution Avenue NW (Signalized)												
		14.8	B	Pass	24.7	C	Pass	14.7	B	Pass	24.4	C	Pass
30	9th Street NW & Constitution Avenue NW (Signalized)												
		27.3	C	Pass	32.8	C	Pass	27.3	C	Pass	33.6	C	Pass
31	7th Street NW & Constitution Avenue NW (Signalized)												
		17.1	B	Pass	19.1	B	Pass	17.1	B	Pass	19.1	B	Pass
32	6th Street NW & Constitution Avenue NW (Signalized)												
		42.6	D	Pass	6.1	A	Pass	42.6	D	Pass	6.1	A	Pass

Notes:
AWSC = All-Way STOP-Controlled unsignalized intersection
EB = Eastbound, WB = Westbound
LOS = Level of Service
Delay is Measured in Seconds Per Vehicle.
Red cells denote intersections operating at unacceptable conditions.

Summary of Traffic Analysis: RFDS 1

Under RFDS 1, there would be indirect, long-term, adverse impacts to traffic. AM peak hour would experience isolated added delays at four intersections (7th and D Streets NW, 8th and E Streets NW, 12th Street and Pennsylvania Avenue NW, and 12th Street and Constitution Avenue NW) when compared to the No-action Alternative. During the PM peak hour, two intersections would have added delays (7th Street and Pennsylvania Avenue and 10th Street and Pennsylvania Avenue NW) when compared to the No-action Alternative.

Additionally, there could be indirect, short-term, adverse impacts to traffic during construction because of large amounts of construction truck traffic and the staging of construction equipment or materials in the roadway at certain times of the day.

4.2.9.3 RFDS 2

This section introduces the conditions under RFDS 2 for the JEH parcel and provides a summary of each mode of travel and the potential impact. This includes descriptions of the pedestrian network, bicycle network, public transit system, parking conditions, truck access, and traffic operations. Impacts under RFDS 2 are compared to the No-action Alternative.

Pedestrian Network

Without a detailed analysis of its own, there is no reliable and reasonably simple way to predict the amount of pedestrian trips from a given development site (DDOT 2014d). Therefore, given that the total development under RFDS 2 is 2.32 million GSF and the current JEH building is 2.8 million GSF, it is assumed the number of pedestrian trips would be similar due to similar overall sizes and the understanding that the scenario would add retail development which typically has higher pedestrian trip generation rates in downtown environments. Given the addition of new land uses for RFDS 2 and an alternate site layout with additional site circulation options, it is clear that the timing, direction, and circulation patterns of pedestrians on the parcel would change. While many of the pedestrian trips would still occur on the perimeter of the block, the introduction of multiple buildings on the parcel and pathways between buildings would introduce street level pedestrian trips, and possibly elevated pedestrian trips via physical connections or walkways to the interior of the parcel.

Based on a full redevelopment of the parcel, it is assumed that the exchange partner would upgrade the sidewalk frontages on the JEH parcel to DDOT's Downtown Streetscape Standards, including full ADA compliance at intersection crossing points on the block, and other applicable requirements in the reuse of the parcel (District Department of Public Works 2000). Given the current chasm or moat around the existing JEH building would no longer be present, there would likely be direct at-grade access to the retail on the ground floor and updated and improved pedestrian amenities. Furthermore, the removal of the security guard booths and barricade planters in the public right-of-way would improve sidewalk conditions. Therefore, the overall sidewalk conditions under RFDS 2 would provide substantial improvements for pedestrians over the No-action Alternative.

Therefore, under RFDS 2, there would be indirect, long-term, beneficial impacts to pedestrians. Although the proposed development is envisioned to produce a similar amount of pedestrian trips, different pedestrian circulation patterns and an improved pedestrian streetscape would occur. The improvement is due primarily to the introduction of pathways between the buildings allowing for pedestrian access, in addition to streetscape improvements and new amenities that may be implemented.

Redevelopment of the parcel would also cause indirect, short-term, adverse impacts to pedestrian circulation due to the temporary blockage of sidewalks or rerouting of pedestrian traffic during construction and/or construction staging.

Bicycle Network

There are no additional planned bicycle facilities directly adjacent to the JEH parcel in the MoveDC plan (DDOT 2014c), 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 travel to the parcel via bicycle given the similar amount of development on the parcel compared to the No Action Alternative and other bicycle improvements in the larger metropolitan area that are anticipated that may make bicycling more attractive to additional users. Therefore, there would be no measurable indirect impacts to bicycle facilities or the bicycle network in the study area under RFDS 2.

JEH PEDESTRIAN NETWORK RFDS 2 ENVIRONMENTAL CONSEQUENCES SUMMARY

Indirect, long-term, beneficial impacts.

JEH BICYCLE NETWORK RFDS 2 ENVIRONMENTAL CONSEQUENCES SUMMARY

No measurable impacts.

Table 4-59: RFDS 2 Mode Share by Land Use

Mode Share	FBI	Future Office	Future Residential/ Retail
Vehicle	13.5%	17%	10%
Carpool	8.5%	11%	11%
Bicycle	2%	3%	8%
Walk	1%	2%	12%
Transit	75%	67%	59%
Percent of Transit Mode	**FBI**	**Future Office**	**Future Residential/ Retail**
Metrorail	84%	84%	85%
Metrobus	16%	16%	15%

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

JEH PUBLIC TRANSIT RFDS 2 ENVIRONMENTAL CONSEQUENCES SUMMARY

Indirect, short-term, adverse impacts; the long-term major adverse impacts under the No-action Alternative would continue.

INTERNAL CAPTURE TRIPS

Person trips that only travel between land uses within the JEH parcel.

Table 4-60: RFDS 2 Net Transit Trips

Use	Independent Variable	Time Period	All Modes			Transit Mode			
			IN	OUT	TOTAL	Transit Mode Split	IN	OUT	TOTAL
Existing JEH Trips to Subtract									
JEH	5,045 employees	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 2 Trips									
Residential	1,066 units	AM Peak	103	409	512	59%	61	241	302
		PM Peak	262	161	145	59%	154	95	250
Retail	172,956 square feet	AM Peak	88	57	665	59%	52	33	85
		PM Peak	348	317	665	59%	205	187	392
Office	1,416,348 square feet	AM Peak	1,372	148	1,520	67%	919	99	1,018
		PM Peak	266	1,332	1,598	67%	178	892	1,072
TOTAL		**AM Peak**	**1,563**	**614**	**2,177**	**-**	**1,032**	**374**	**1,406**
		PM Peak	**875**	**1,810**	**2,686**	**-**	**538**	**1,175**	**1,712**
Net Trips for RFDS 2 (RFDS 2 Trips Minus JEH trips)									
Total		**AM Peak**					**11**	**297**	**309**
		PM Peak					**487**	**208**	**694**

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

Public Transit

The following sections describe the Metrorail and Metrobus modes within the study area under RFDS 2. The other transit modes, commuter bus, shuttles, and slugging, were not analyzed as 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.

Projected Transit Growth

Projected transit trips associated with the future development conditions were calculated for RFDS 2 and then added to the 2025 No-action Alternative ridership totals for the Metrobus and Metrorail modes. The site mode split was determined for each land use in the final scoping session with the DDOT, and was based on a number of previous studies and the parking supply planned for the scenario (see DDOT Scoping Form, Appendix A for further details). The transit mode was further 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 4-59 summarizes these mode splits by land use.

The total number of trips by peak period associated with RFDS 2 were determined using general office, apartment, and shopping center 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 4-60 summarizes the net transit trips for the scenario. Note that values listed in table 4-60 under “All Modes” for the RFDS 2 Trips represent person trips after all internal capture trips (person trips that only travel between uses within the JEH parcel) were removed. RFDS 2 trips represent the number of net trips. Overall, RFDS 2 would result in approximately 309 additional AM peak transit trips and 694 additional PM peak transit trips (in and out columns combined).

Metrorail Analysis

To evaluate the impact under RFDS 2 to the Metrorail system within the study area, the net transit trips calculated for the AM peak hour and PM peak hour in table 4-60 were disaggregated into Metrorail and Metrobus trips, using the transit mode splits from table 4-59. Table 4-61 summarizes net Metrorail trips generated by RFDS 2.

The net Metrorail trips associated with RFDS 2 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.

Table 4-61: RFDS 2 Net Metrorail Trips

Use	Independent Variable	Time Period	All Modes			Transit Mode			
			IN	OUT	TOTAL	Transit Mode Split	IN	OUT	TOTAL
Existing JEH Trips to Subtract									
JEH	5,045 employees	AM Peak	1,020	77	1,097	83.6%	853	64	917
		PM Peak	51	967	1,018	83.6%	43	808	851
RFDS 2 Trips									
Residential	1,066 units	AM Peak	61	241	302	84.7%	52	204	256
		PM Peak	154	95	250	84.7%	131	81	211
Retail	172,956 square feet	AM Peak	52	33	85	84.7%	44	28	72
		PM Peak	205	187	392	84.7%	174	158	332
Office	1,416,348 square feet	AM Peak	919	99	1,018	83.6%	768	83	851
		PM Peak	178	892	1,070	83.6%	149	746	895
TOTAL		**AM Peak**	**1,032**	**374**	**1,406**	**-**	**864**	**316**	**1,180**
		PM Peak	**538**	**1,175**	**1,712**	**-**	**454**	**985**	**1,439**
Net Trips for RFDS 2 (RFDS 2 Trips Minus JEH trips)									
Total		**AM Peak**					**11**	**252**	**262**
		PM Peak					**411**	**177**	**588**

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

Table 4-62: RFDS 2 AM Peak Period Projected Maximum Metrorail Passenger Loads by Line

Line	Segment	2014			2025 No-action Alternative		2025 RFDS 2	
		Passengers	Train Cars	Load	Passengers	Load	Passengers	Load
Red	Gallery Place to Metro Center	9,125	136	67.1	11,651	85.7	11,754	86.4
Orange	Smithsonian to Federal Triangle	5,870	94	62.4	7,495	79.7	7,561	80.4
Green	Mt. Vernon Square to Gallery Place	3,542	68	52.1	4,522	66.5	4,562	67.1
Yellow	L'Enfant Plaza to Archives	3,058	78	39.2	3,904	50.1	3,939	50.5
Blue	Smithsonian to Federal Triangle	1,691	44	38.4	2,159	49.1	2,178	49.5

Source: WMATA (2015h); DDOT Scoping Form. (Appendix A)

Table 4-63: RFDS 2 PM Peak Period Projected Maximum Metrorail Passenger Loads by Line

Line	Segment	2014			2025 No-action Alternative		2025 RFDS 2	
		Passengers	Train Cars	Load	Passengers	Load	Passengers	Load
Red	Gallery Place to Metro Center	10,614	142	74.7	13.605	95.8	13,835	97.4
Orange	Smithsonian to Federal Triangle	2,448	42	58.3	3,158	74.4	3,191	76.0
Green	Mt. Vernon Square to Gallery Place	4,034	70	57.6	5,171	73.9	5,258	75.1
Yellow	L'Enfant Plaza to Archives	6,417	114	56.3	8,225	72.1	8,364	73.4
Blue	Smithsonian to Federal Triangle	3,588	78	46.0	4,599	59.0	4,677	60.0

Source: WMATA (2015h); DDOT Scoping Form. (Appendix A)

Metrorail Passenger Loads

Refer to section 3.10.4.3 for more details on how Metrorail passenger loads were calculated. Metrorail passenger loads by line within the study area were obtained from WMATA for the busiest segment of each line within the study area using forecasted ridership during the AM and PM peak periods for RFDS 2. 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.

Loads are highest on the Red Line between Gallery Place and Metro Center during the PM peak period. Tables 4-62 and 4-63 summarize RFDS 2 passenger loads per car during the AM peak and PM peak periods.