

**Station Capacity Analysis**

Refer to section 3.10.4.3 for more details on how station capacity analysis was calculated. 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 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 2025 future development Scenario 2 ridership. This includes additional trip associated with planned development projects, predicted regional transit growth, and the net trips calculated under RFDS 2, 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 PHF in the study area (0.282 during the AM peak hour, 0.68 during the PM peak hour).

The v/c ratios were calculated for the vertical elements and fare elements, and pedestrian LOS was calculated for platform areas. Analysis for vertical elements, faregate aisles, and fare vending machines used projected ridership from the peak exiting period at each station entrance– the time period when the highest concentration of passengers would be using each element. Table 4-64 summarizes projected ridership during the peak existing period at each station entrance under RFDS 2. Overall, there is not a significant change in ridership between No-action Alternative and RFDS 2.

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 4-65 summarizes projected ridership during the peak entering period at each station platform under RFDS 2 (for peak entering period ridership by station entrance, see “Fare Vending Machine” sections in Appendix B). Overall, there is not a significant change in ridership between the No-action Alternative and RFDS 2.

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.

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 three platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS C or D. At pedestrian LOS D, passengers would likely begin to spread out farther down the platform. Further details on the station capacity analysis and the relevant Metro station emergency evacuation analysis are found in the JEH TIA (Appendix B).

Table 4-64: RFDS 2 Weekday Peak 15-Minute Exiting Period Ridership

Metro Station	Time	2014		2025 No-action Alternative		2025 RFDS 2	
		Entries	Exits	Entries	Exits	Entries	Exits
Archives	8:45 AM – 9:00 AM	25	524	46	670	59	690
Federal Triangle	8:45 AM – 9:00 AM	15	467	28	597	36	597
Gallery Place East	6:15 PM – 6:30 PM	212	355	266	445	273	502
Gallery Place West	8:45 AM – 9:00 AM	12	301	15	378	21	378
Metro Center East	8:45 AM – 9:00 AM	44	434	55	544	76	545
Metro Center South	8:45 AM – 9:00 AM	20	427	36	546	46	546

Source: WMATA (2014d); MWCOC (2015); DDOT Scoping Form (Appendix A)

Table 4-65: RFDS 2 Weekday Peak 15-Minute Entering Period Platform

Metro Station	Time	2014		2025 No-action Alternative		2025 RFDS 2	
		Entries	Exits	Entries	Exits	Entries	Exits
Archives	5:00 PM – 5:15 PM	524	56	665	77	676	90
Federal Triangle	5:00 PM – 5:15 PM	501	38	635	55	646	62
Gallery Place Glenmont	5:00 PM – 5:15 PM	641	975	807	1,220	810	1,245
Gallery Place Shady Grove	5:00 PM – 5:15 PM	1,016	534	1,302	667	1,308	676
Gallery Place Green/Yellow	5:00 PM – 5:15 PM	1,629	1,128	2,051	1,436	2,055	1,451
Metro Center Glenmont	5:30 PM – 5:45 PM	1,171	548	1,472	680	1,477	691
Metro Center Shady Grove	5:30 PM – 5:45 PM	1,183	691	1,490	859	1,494	865
Metro Center Blue/Orange/Silver	5:30 PM – 5:45 PM	1,618	1,651	2,044	2,078	2,052	2,102

Source: WMATA (2014d); MWCOC (2015); DDOT Scoping Form (Appendix A)

**PEAK HOUR FACTOR (PHF)**

PHF is the proportion of hourly ridership that occurs during the peak 15-minute period of that hour.

Table 4-66: RFDS 2 Net Metrobus Trips

Use	Independent Variable	Time Period	All Modes			Transit Mode			
			IN	OUT	TOTAL	Transit Mode Split	IN	OUT	TOTAL
<b>Existing JEH Trips to Subtract</b>									
JEH	5,045 employees	AM Peak	1,020	77	1,097	16.4%	167	13	180
		PM Peak	51	967	1,018	16.4%	8	159	167
<b>RFDS 2 Trips</b>									
Residential	1,066 units	AM Peak	61	241	302	15.3%	9	37	46
		PM Peak	154	95	250	15.3%	24	15	38
Retail	172,956 square feet	AM Peak	52	33	85	15.3%	8	5	13
		PM Peak	205	187	392	15.3%	31	29	60
Office	1,416,348 square feet	AM Peak	919	99	1,018	16.4%	151	16	167
		PM Peak	178	892	1,070	16.4%	29	146	176
<b>Total</b>		<b>AM Peak</b>	<b>1,032</b>	<b>374</b>	<b>1,406</b>	-	<b>168</b>	<b>58</b>	<b>226</b>
		<b>PM Peak</b>	<b>538</b>	<b>1,175</b>	<b>1,712</b>	-	<b>84</b>	<b>190</b>	<b>274</b>
<b>Net Trips for RFDS 2 (RFDS 2 Trips Minus JEH Trips)</b>									
<b>Total</b>		<b>AM Peak</b>					<b>1</b>	<b>46</b>	<b>46</b>
		<b>PM Peak</b>					<b>76</b>	<b>31</b>	<b>107</b>

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

Table 4-67: RFDS 2 Bus Capacity Analysis

	2014		2025 No-action Alternative <sup>a</sup>		2025 RFDS 2	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Total Volume	4,315	3,952	5,383	4,978	5,340	5,085
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	0.48

<sup>a</sup>Including trips from planned development projects.  
 Source: WMATA (2014f); MWCOC (2015); DDOT Scoping Form (Appendix A)

**Metrobus Analysis**

To evaluate the impact of RFDS 2 to the bus network within the study area, the net transit trips calculated for the AM peak hour and PM peak hour were disaggregated into Metrorail and Metrobus trips, using the transit mode splits from table 4-59. Table 4-66 summarizes net Metrobus trips generated by RFDS 2.

The net Metrobus trips associated with RFDS 2 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 2 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.

As shown in table 4-67, Overall, the RFDS 2 bus volumes are projected to be approximately 5,340 passengers during the AM peak period, and 5,085 passengers during the PM peak period. Both of these totals are well below projected capacity. AM peak period volumes would be lower than No-action Alternative volumes, since the current JEH parcel generates more AM peak hour trips than the scenario.

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, and are all intended to help alleviate overcrowding on these routes. It is unclear whether all recommendations would be implemented by 2025. 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 B. Appendix B also has further details on the bus capacity analysis.

**Summary of Transit Analysis**

Under RFDS 2, there would be no measurable impact when compared to the No-action Alternative. The long-term, major adverse impacts described for the No-action Alternative would continue, and 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. Additionally, there could be indirect, short-term, adverse impacts to public transit associated with construction activities. 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, and bus stops may need to be moved during the construction process.

## Parking

It is unlikely redevelopment of the JEH parcel would continue to require security setbacks from the building that restrict all on-street parking. Therefore, the addition of street parking on the JEH parcel would be left to the discretion of DDOT and the future developer. 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.

The total number of off-street garage parking spaces on the parcel would be determined by the market at the time of redevelopment. Under the assumptions of RFDS 2, a similar size garage as the one that currently exists would be built, providing approximately 800 parking spaces. Access to the parking garage is assumed to be on 10th Street NW, similar to the No-action Alternative. Given that the amount of parking would be “determined by the market,” and given the high availability of several mass transit options in the area and trends toward less automobile use by city-dwellers, it is assumed that parking demand would stay similar to the No-action Alternative but that the concentration of peak hour vehicular trips would be more balanced or dispersed due to the introduction of additional uses that would have different inbound and outbound travel patterns and times. However, it should be noted that the attractiveness of future proposed development and retail offerings would result in increased demand for on-street parking at certain times of the day, such as evenings and nights; this demand would be consistent with other downtown parking demands and could partially be accommodated by any on-street parking that was added. It is assumed that vehicles of future residents that were not parked on the street would be stored in off-street parking facilities in the area.

Under RFDS 2, there would likely be in minor increases in the amount of on-street parking supply; because no measurable changes in off-street parking or parking demand are anticipated, the scenario would have indirect, long-term, beneficial impacts to parking. This would be due to the slight increase in public on-street parking. However, there would be indirect, short-term, adverse impacts during construction due to some existing parking spaces that would be unavailable due to construction staging or the presence of construction equipment.

## Truck Access

Redevelopment of the parcel would open up the opportunity for truck access on the parcel to be moved. As DDOT requires truck access and loading to be from an alley where feasible and the site design with interior street access for the on-site buildings is unknown at this time, it is not possible to predict where truck access for RFDS 2 would be located (District Department of Public Works 2000). The location and specific details of truck access would need to be determined with DDOT through the redevelopment process. If more than one truck access point was permitted with redevelopment, as would be the case if the exchange partner introduced an alley to the parcel, there could be increased conflicts between trucks and pedestrians depending on the location of the access points to the parcel. To serve the large amount of development and varied uses under RFDS 2, it is likely the developer would apply for more than one vehicular access point to the site. It should be noted that according to the DDOT Design and Engineering Manual, when changes occur at a property due to redevelopment, “all existing driveways shall be restored with new curb and gutter, tree space, and sidewalk to current DDOT standards” and that “any existing attached curb cut proposed for [a] new use shall be applied for as a new curb cut and driveway” with DDOT (DDOT 2009c).

Redevelopment of the parcel would cause indirect, short-term, adverse construction impacts to truck access because there would be limited areas for site access and the loading areas may shift locations during development of the parcel. With the assumption that truck access would continue to the parcel with minimal access points, but likely more than one vehicular access location, there could be indirect, long-term, adverse impacts to truck access under RFDS 2. This includes the potential diversion of pedestrian conflicts to a different sidewalk location. Without understanding the needs of the future tenants, there is insufficient information available to evaluate the impacts of truck access to the parcel. It is anticipated that a future developer would need to obtain new permits and approvals related to truck access locations and possibly undertake additional truck access studies following approved DDOT methods.

### JEH PARKING RFDS 2 ENVIRONMENTAL CONSEQUENCES SUMMARY



Indirect, long-term, beneficial impacts; indirect, short-term, adverse impacts.

### JEH TRUCK ACCESS RFDS 2 ENVIRONMENTAL CONSEQUENCES SUMMARY



Indirect, short-term, adverse impacts. Insufficient information to evaluate long-term impacts.

Table 4-68: RFDS 2 Person Trips Generated

Land Use/ ITE Code	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)
Apartments/ITE Code: 220	units	1,066	105	421	526	393	211	604
Shopping Center/ ITE Code: 820	SQ feet	172.96	135	83	218	424	441	865
General Office/ ITE Code: 710	SQ feet	1,416.35	1,404	191	1,595	283	1,382	1,665
<b>Total Net Trips</b>			<b>283</b>	<b>593</b>	<b>876</b>	<b>1,032</b>	<b>745</b>	<b>1,777</b>

Table 4-69: RFDS 2 Mode Split Assumptions

Mode Share	FBI	Future Office	Future Residential/ Retail
Single Occupant Vehicle	13.5%	17%	10%
Carpool	8.5%	11%	11%
Bicycle	2%	3%	8%
Walk	1%	2%	12%
Transit	75%	67%	59%

**JEH TRAFFIC ANALYSIS  
RFDS 2 ENVIRONMENTAL  
CONSEQUENCES SUMMARY**

Indirect, short- and long-term, adverse impacts.

### Traffic Analysis

The future projected traffic analysis is based on removing the existing building and redeveloping the parcel to the maximum extent possible. The next sections describe the process the study followed to project future traffic volumes; modal split is covered within the trip generation section.

#### RFDS 2 Trip Generation and Modal Split

Trip generation under RFDS 2 is predicated on the assumed proposed land uses for the parcel: office, residential and retail. The method for quantifying the current FBI trips by peak hour are the same as described in section 3.9.3.4. Trip generation for each type of potential development is derived from ITE's *Trip Generation Manual* (Ninth Edition [ITE 2014]). The selected development types (e.g., apartment and shopping center) represent the higher end of potential development scenarios. For example, condominiums and boutique specialty shops generate fewer trips than apartments and shopping centers. A total of 876 net person trips during the AM peak hour and 1,777 net person trips during the PM peak hour would be generated. It should be noted that by following the FBI trip generation study to calculate the existing person trips to remove and ITE to calculate the future office, residential, and retail person trips to add results in a very conservative net trip value and also maintains consistency between the JEH parcel analysis methods and Consolidated FBI HQ sites. Table 4-68 shows the person trips generated under RFDS 2.

A mixed-use development, as proposed under the RFDS 2, would result in "internal capture," where some portion of the trips would not leave the parcel (i.e., residential to retail use, residential to office use, or office to retail use). The internal capture process is based on the procedures outlined in the ITE's *Trip Generation Handbook* (Second Edition [ITE 2004]) following updated internal capture rates published in NCHRP 684 (TRB 2011). The internal capture process closely follows the ITE *Proposed Recommended Practice Trip Generation Handbook* (Third Edition [ITE 2014]) recommended internal capture procedure. The study calculated the JEH parcel internal capture rates through interaction between the proposed residential, retail, and office uses. Appendix B contains the internal capture worksheets for the JEH building.

The JEH building is located in a dense, urban area with extensive access to many transit options as well as bicycle and pedestrian options. 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 4-69.

After combining the trip generation, removing the internal capture trips and applying the modal split, the forecasted vehicle trips were calculated. The vehicle trips were then separated into SOV and HOV. Since 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 150 net AM peak hour vehicle trips and 233 net PM peak hour vehicle trips. Table 4-70 contains the vehicle trips generated under RFDS 2.

**RFDS 2 Trip Distribution/Trip Assignment**

Because the proposed uses for the JEH parcel produce a different distribution pattern than the existing FBI employee trips, the new uses required a distribution pattern. Consistent with the method used for RFDS 1, current FBI employee trips were removed from the roadways based on their home zip codes and using the most likely route leaving the study area to reach that zip code.

The study used the MWCOG 2025 model to establish distribution patterns for the new trips. Different trip types – in this case residential, commercial and office – all have different distribution patterns. These patterns also differ based on location. The JEH parcel is located in Zone 21 in the MWCOG model. This zone does not currently include enough residential or commercial units to establish a reliable distribution pattern. Therefore, the zone was only used for the new office trips. Zone 19, which is adjacent to Zone 21, does have a good representation of residential units; therefore the residential distribution of trips used Zone 19 distribution. Similarly, Zone 24, also adjacent to Zone 21, has a good representation of retail/commercial trips, and was therefore used to generate the trip distribution for retail/ commercial trips. Office, retail and residential trip distributions are summarized in table 4-71. According to the MWCOG model, 5 percent of residential trips would remain within the study area.

The subtraction of current FBI employee trips combined with the addition of new RFDS 2 employee trips equals the net trip change between the No-action Alternative and the RFDS 2. The total net trip change for AM and PM forecasted turning movement volumes are shown in figure 4-38.

**Development of RFDS 2 Traffic Conditions**

The planned developments, background growth, and RFDS 2 net trips (existing FBI vehicle trips minus the new trips generated by RFDS 2) were combined together to forecast conditions under RFDS 2. Figure 4-39 shows the AM and PM forecasted turning movement volumes under RFDS 2.

Table 4-70: RFDS 2 Vehicle Trips Generated

LAND USE	UNITS/SIZE/ MODE SHARE	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Existing J Edgar Hoover Building FBI HQ	2.1M SF	-1,361	-102	-1,463	-68	-1,289	-1,357
	SOV 13.5 percent	-184	-14	-198	-9	-174	-183
	HOV (5 persons per vehicle) 8.5 percent	-23	-2	-25	-1	-22	-23
	<b>Total Vehicle Trips</b>	<b>-207</b>	<b>-16</b>	<b>-222</b>	<b>-10</b>	<b>-196</b>	<b>-206</b>
Apartments (ITE - 220)	1,066 units	105	421	526	393	211	604
	Internal Capture Trips (following NCHRP 684 Tables)	-2	-12	-14	-131	-50	-181
	Net External Person Trips	103	409	512	262	161	423
	SOV 10 percent	10	41	51	26	16	42
	HOV (5 persons per vehicle) 11 percent	2	9	11	6	4	9
<b>Total Vehicle Trips</b>	<b>13</b>	<b>50</b>	<b>62</b>	<b>32</b>	<b>20</b>	<b>52</b>	
Shopping Center (ITE - 820)	172,956 SF	135	83	218	424	441	865
	Internal Capture Trips (following NCHRP 684 Tables)	-47	-26	-73	-76	-124	-200
	Net External Person Trips	88	57	145	348	317	665
	SOV 10 percent	9	6	15	35	32	67
	HOV (5 persons per vehicle) 11 percent	2	1	3	8	7	15
<b>Total Vehicle Trips</b>	<b>11</b>	<b>7</b>	<b>18</b>	<b>42</b>	<b>39</b>	<b>81</b>	
General Office (ITE - 710)	1416348 SF	1,404	191	1,595	283	1,382	1,665
	Internal Capture Trips (following NCHRP 684 Tables)	-32	-43	-75	-17	-50	-67
	Net External Person Trips	1,372	148	1,520	266	1,332	1,598
	SOV 17 percent	233	25	258	45	226	272
	HOV (5 persons per vehicle) 11 percent	30	3	33	6	29	35
<b>Total Vehicle Trips</b>	<b>263</b>	<b>28</b>	<b>292</b>	<b>51</b>	<b>256</b>	<b>307</b>	
<b>TOTAL VEHICLE TRIPS</b>		<b>80</b>	<b>70</b>	<b>150</b>	<b>115</b>	<b>118</b>	<b>233</b>

Notes:

SF = Square Feet

Table 4-71: RFDS 2 Vehicle Trip Distribution

Destination	Road	Office	Residential	Retail
East DC/MD	Constitution Avenue East	4.0%	6.0%	8.0%
North DC	14th Street North	5.0%	11.0%	4.0%
Northeast DC/MD	7th Street North	26.0%	28.0%	32.0%
Northwest DC	H Street	7.0%	5.0%	11.0%
Northwest MD, Western VA	Constitution Avenue West	29.0%	20.0%	22.0%
South DC, Southeast MD, Southwest VA	12th Street / 9th Street	29.0%	25.0%	23.0%
Study Area	N/A		5.0%	
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Figure 4-38: RFDS 2 Net Trip Change AM and PM Forecasted Turning Movement Volumes

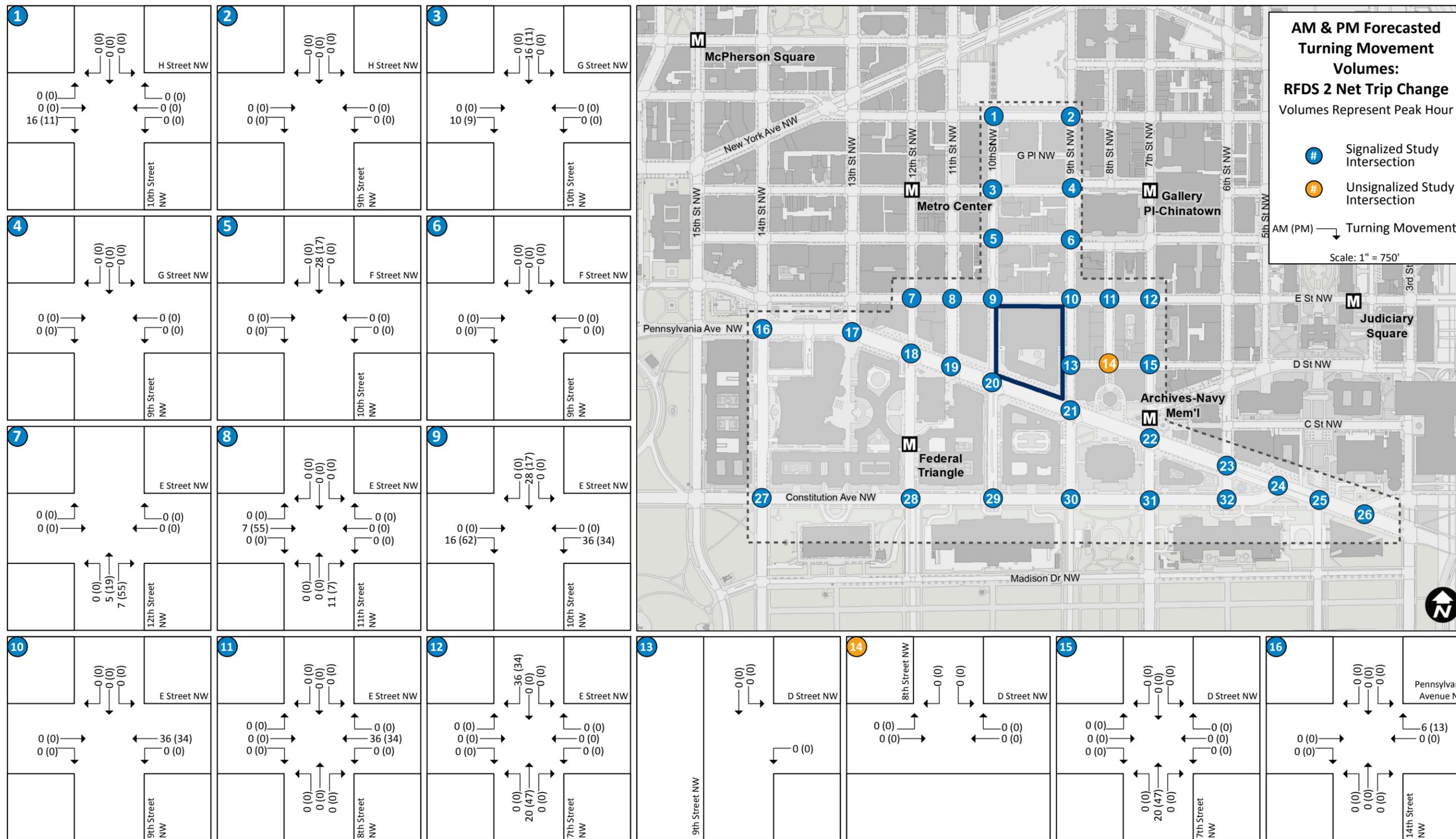


Figure 4-38: RFDS 2 Net Trip Change AM and PM Forecasted Turning Movement Volumes (continued)

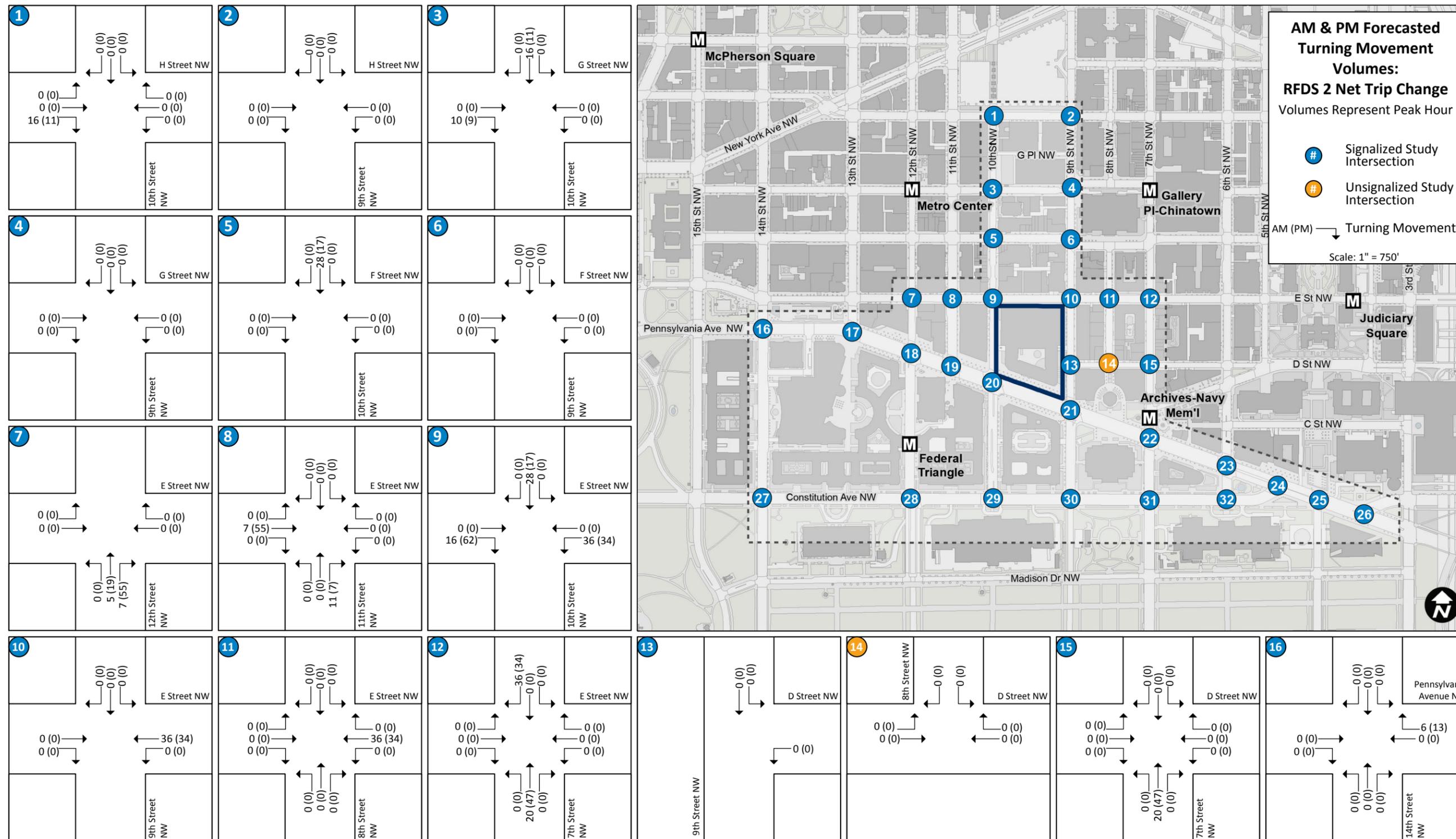


Figure 4-39: RFDS 2 AM and PM Forecasted Turning Movement Volumes

