

WELLS + ASSOCIATES

MEMORANDUM



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To: Jonathan D. Rogers, District Department of Transportation

Cc: Matthew Robinson, MRP Realty
Leila M. Jackson Batties, Holland & Knight

From: Chris L. Kabatt, P.E.
Kevin A. Berger, E.I.T

Date: December 2, 2016

Re: Transportation Assessment
Washington Gateway Phases Two and Three PUD Modification
Zoning Commission Case No. 06-14D

OVERVIEW

MidAtlantic Realty Partners, LLC (referenced herein as the Applicant) proposes a Planned Unit Development (PUD) modification pertaining to Zoning Commission Order No. 06-14. The site is in the Mixed Use (MU)-9 Zone and is located in Ward 5 on Square 3584 Lots 814-815 and 820-822, which are to the east of the Elevation apartment building at New York and Florida Avenues, NE (Washington Gateway Phase One), south of New York Avenue NE, north of Florida Avenue NE, and west of the Metropolitan Branch Trail (MBT), WMATA Metrorail Red Line, and a rail yard, as shown on Figure 1.

Phase One of the Washington Gateway project was developed in 2014 and included public benefits and improvements such as the construction of a plaza, widened sidewalks along Florida Avenue NE and New York Avenue NE, a traffic signal at the Florida Avenue NE/2nd Street NE intersection, a stairway connecting pedestrian and bicycle modes from the plaza to New York Avenue NE, as well as a temporary multipurpose connection to the MBT via the plaza.

Additional public benefits and amenities that were conditions of the previously approved PUD, and will be delivered with the construction of Phases Two and Three, include a public bike lobby (to be also known as the MBT Atrium) to connect the plaza with the MBT; improved paving, landscaping, and lighting on the MBT; and the extension of the widened sidewalks along Florida and New York Avenues. With the proposed PUD modification, further public benefits include achievement of LEED Gold certification for the office uses

and LEED Silver certification for the residential uses as well as the provision of affordable housing.

As part of the proposed PUD modification, two (2) development options are under consideration:

Option 1

The north tower would be developed with 372 residential dwelling units, whereas the south tower would be developed with 221,691 SF of office space and retail space.

Option 2

The north tower would be developed with 372 residential dwelling units, whereas the south tower would be developed with 252 residential dwelling units.

An interim and final site plan are proposed, such that the north tower would be constructed during the interim condition, with the construction of a temporary bike connection to the MBT via the plaza. During the final condition site plan, the south tower would be constructed, and a bike connection to the MBT would be provided by way of the MBT Atrium inside of the south tower. The proposed interim condition site plan is shown on Figure 2, while the final condition site plan is shown on Figure 3.

The main pedestrian access to the north tower would be provided by way of the plaza that is on the western edge of the property. The south tower will be accessible to pedestrians via the plaza on the western property edge as well as from the sidewalk on Florida Avenue NE that is on the southern property edge. The MBT Atrium in the south tower will be accessible to the MBT on the eastern property edge.

Vehicular access to the site would be provided by way of the full-movement, signalized intersection of Florida Avenue NE and 2nd Street NE as well as the existing right-in/right-out driveway that is located on the south side of New York Avenue NE to the east of the intersection with Florida Avenue NE. An underground parking garage currently serves the Washington Gateway Phase One building and would connect to the eastern portion of the garage that will serve Washington Gateway Phases Two and Three.

The PUD site is in proximity to several transportation options that serve as alternatives to private automobiles. The NoMa-Gallaudet U Metro station, operated by the Washington Metropolitan Area Transit Authority (WMATA) and which provides access to the Red line of the Metrorail system, is located approximately 1/8 mile south of the subject site. The site is also served by Metrobus stops located along Florida Avenue NE, which provide passengers with access to routes 90, 92, and X3. The site is also served by four (4) Zipcar car-share locations, two (2) Enterprise car-share locations, and three (3) Capital Bikeshare stations that are within ¼ mile of the site.

A formal scoping process was undertaken with the District Department of Transportation (DDOT) at the outset of the project to determine the scope and proposed methodologies of the study. The agreed upon scoping document is included in Attachment A.

NON-AUTO MODES OF TRANSPORTATION

The PUD site is served by Metrorail, Metrobus, car-sharing services, Capital Bikeshare, on-street bike routes, and the MBT. The facilities are all generally accessible within ¼ mile from the site. Figure 4 shows the existing non-auto facilities in the site area.

Metrorail Service/Facilities

As shown on Figure 4, the subject site is located approximately 1/8 mile to the north of the NoMa-Gallaudet U Metro station. The NoMa-Gallaudet U Metro station provides access to the Red line of Metrorail. Passengers may transfer to the Yellow or Green lines at either the Gallery Place-Chinatown or Fort Totten stations or transfer to the Blue, Orange, and Silver lines at Metro Center station. The minimum and maximum headways for the Red line are summarized in Table 1.

Table 1
Metrorail Red Line Weekday Headways (in minutes)

HEADWAY	TO GLENMONT			TO SHADY GROVE		
	AM Peak Period 5:00 AM to 9:30 AM	Midday Period 9:30 AM to 3:00 PM	PM Peak Period 3:00 PM to 7:00 PM	AM Peak Period 5:00 AM to 9:30 AM	Midday Period 9:30 AM to 3:00 PM	PM Peak Period 3:00 PM to 7:00 PM
RED LINE						
Min	0:03	0:12	0:03	0:03	0:12	0:03
Max	0:06	0:12	0:06	0:06	0:12	0:06

Bus Service/Facilities

The Washington Metropolitan Area Transit Authority currently provide public bus service in the site vicinity. Three (3) Metrobus lines provide service with stops located along Florida Avenue NE that are within ¼ mile of the site.

The U Street-Garfield Line (routes 90 and 92) connect passengers from Congress Heights Metro station to Duke Ellington Bridge, with service from Monday through Sunday.

The Benning Road-H Street Line (route X3) connects passengers from Minnesota Avenue Metro station to Lafayette Square, with service from Monday through Sunday.

Figure 4 displays the bus routes that service the area surrounding the site and Table 2 presents the minimum, maximum, and average headways for the Metrobus routes in the site vicinity.

Table 2
Metrobus Weekday Headways (in minutes)

HEADWAY	NORTHBOUND/WESTBOUND			SOUTHBOUND/EASTBOUND		
	AM Peak Period	Midday Period	PM Peak Period	AM Peak Period	Midday Period	PM Peak Period
	7:00 AM to 10:00 AM	10:00 AM to 4:00 PM	4:00 PM to 7:00 PM	7:00 AM to 10:00 AM	10:00 AM to 4:00 PM	4:00 PM to 7:00 PM
U STREET – GARFIELD LINE (90, 92)						
Min	0:04	0:07	0:08	0:07	0:07	0:06
Max	0:08	0:08	0:12	0:08	0:08	0:10
Avg	0:08	0:08	0:10	0:08	0:08	0:08
BENNING ROAD – H STREET LINE (X3)						
Min	0:08	0:08	0:05	0:08	0:08	0:05
Max	0:08	0:08	0:08	0:08	0:08	0:08
Avg	0:08	0:08	0:08	0:08	0:08	0:08

Car-Sharing Services

Car-sharing services by Zipcar and Enterprise are located within the vicinity of the site. Within ¼ mile of the site, there are four (4) Zipcar car-share locations, including Elevation @ NoMa-Gallaudet Metro at 100 Florida Avenue NE (the site of Washington Gateway Phase One), The Gale Eckington at 151 Q Street NE, 66 New York Avenue NE (Tag B Lot), and at 3rd & M Street NE (Tag B Lot). Within ¼ mile of the site, there are two (2) Enterprise car-share locations, including spaces at the intersection of Harry Thomas Way NE/Eckington Place NE and at 66 New York Avenue NE.

Car-sharing locations near the site are shown on Figure 4.

Capital BikeShare

Three (3) Capital Bikeshare stations are located within approximately ¼ mile of the site. These include one at Eckington Place NE & Q Street NE (11 total bike docks), M Street NE & Delaware Avenue NE (21 total bike docks), and 1st Street NE & M Street NE (15 total bike docks). The Capital Bikeshare stations are shown on Figure 5.

Bicycle Facilities

The site is served by a network of bicycle facilities that has been expanding in recent years. These include the presence of a cycle track along First Street extending from M Street to Union Station; bike lanes on 4th Street, 6th Street, and I Street; a bike lane on M Street from First Street to a ramp to the MBT; and the MBT itself.

The Metropolitan Branch Trail (MBT) is an 8-mile long off-street trail that extends from Union Station in the District of Columbia to Silver Spring, Maryland, connecting users to employment centers, recreational areas, residential neighborhoods, Metro stations, and other trail networks including the Capital Crescent Trail and Anacostia Trails System. Whereas trail users may embark or depart the trail using a ramp on M Street NE west of Delaware Avenue NE, there are otherwise no permanent ramps connecting trail users to the NoMa district. A temporary connection to the MBT is provided by way of the PUD site, and leads users to or from the public plaza located in the central portion of the site. Permanent integration with the MBT is a key component of the PUD. The Applicant would build a publicly-accessible bike lobby (the Atrium) on the second floor of the south tower of the site development, enabling a direct path for users from the public plaza to the MBT. The Atrium will connect MBT users to the NoMa district as well as adjacent neighborhoods and institutions including Eckington, Union Market, Gallaudet University, and Capitol Hill while providing bike storage, bike tracks, a display of information about the MBT and adjacent neighborhoods, station maps, a drinking water fountain, and a tire pump.

The Rails-to-Trails Conservancy produced a study in March 2016 that proposed an alignment of the New York Avenue trail, which would connect New York Avenue to the United States National Arboretum. The proposed alignment is currently under review and in the early stages of design.

Existing bicycle facilities are shown in Figure 5.

Pedestrian Facilities

The site is served by a network of sidewalks, crosswalks, and ADA ramps that facilitate the movement of pedestrians throughout the NoMa district and adjacent areas. The site is served by the signalized intersection of Florida Avenue and 2nd Street. Sidewalks are provided along both sides of Florida Avenue and 2nd Street. High-visibility crosswalks are available on the northern, eastern, and southern legs. ADA ramps with detectable warning strips and pedestrian countdown heads are provided along the three legs of the intersection that also provide crosswalks. Additionally, right turns on red are restricted on the southbound approach of the intersection (which directly serves the site.)

Existing pedestrian facilities are shown in Figure 6.

EXISTING CONDITIONS ANALYSIS

Traffic Volumes

Existing vehicular turning movement, bicycle, and pedestrian counts were conducted on Tuesday, June 14, 2016, from 7:00 AM to 10:00 AM and from 4:00 PM to 7:00 PM.

The commuter peak hours of the Florida Avenue NE/2nd Street NE intersection were observed to have occurred from 8:15 to 9:15 AM and from 4:30 to 5:30 PM. Existing vehicular, pedestrian, and bicycle peak hour traffic volumes are shown on Figure 7. Traffic count data are included in Attachment B.

Capacity Analysis

Capacity/level of service (LOS) analyses were conducted at the study intersection based on the existing lane use and traffic control, existing vehicular volumes, existing pedestrian volumes, and existing bicycle volumes shown on Figure 7 as well as the existing traffic signal timings obtained from DDOT, included in Attachment C.

Synchro software (Version 9.1, Build 909, Revision 20) was used to evaluate levels of service at the study intersection during the peak hours. Synchro is a macroscopic model used to evaluate the effects of changing intersection geometrics, traffic demands, traffic control, and/or traffic signal settings and to optimize traffic signal timings. The levels of service reported were taken from the Highway Capacity Manual 2000 (HCM) reports generated by Synchro. Level of service descriptions are included in Attachment D.

The results of the analyses are summarized in Table 3. Capacity analysis worksheets are included in Attachment E.

As shown in Table 3, under existing conditions, the intersection of Florida Avenue/2nd Street operates at LOS “D” during the AM peak hour and LOS “C” during the PM peak hour. The westbound shared through-right lane group operates at LOS “E” during the AM peak hour, while the northbound approach of 2nd Street operates at LOS “E” during the PM peak hour.

Queue Analysis

A queue analysis was conducted for existing conditions. Synchro was used to conduct the analyses, using the 50th and 95th percentile queue lengths. The results are summarized in Table 4. Queue reports are provided in Attachment E.

As shown in Table 4, each of the lane groups at the Florida Avenue/2nd Street intersection have 50th and 95th percentile queue lengths that are within the available storage, except for the northbound approach of 2nd Street, whose 95th percentile queue exceeds the available storage during the PM peak hour.

Safety Analysis

Crash data at the study intersection was obtained from DDOT. The information provided by DDOT included the total number of crashes over the latest three years of available data (i.e. 2013, 2014, and 2015) at the Florida Avenue/2nd Street intersection was further categorized by type of crash. Based on the data, Table 5 shows the overall intersection crash rate for the study intersection.

As shown in Table 5, the crash rate at the Florida Avenue/2nd Street intersection is above 1.0, which is considered high by DDOT.

A review of the crash types at the Florida Avenue/2nd Street intersection reveals that the majority (53 percent) of the crashes at the intersection were side swipe collisions. Rear end collisions made up 15 percent of collisions at the intersection. There was one (1) crash involving pedestrians at the intersection.

Based on the limited information provided, no discernable pattern, trend, or causation factors could be identified.

Table 3
Washington Gateway Two PUD
Intersection Levels of Service Summary

Intersection	Intersection Control	Critical Movement	Existing Conditions		Background Conditions (without Approved PUD)		Background Conditions (with Approved PUD)		Total Future Conditions (Option 1)		Total Future Conditions (Option 2)	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Florida Avenue NE/2nd Street NE/ Site Entrance	Signal	EBLT WBTR NBLTR SBLT SBR OVERALL	A (6.2)	B (11.1)	A (7.2)	B (13.1)	A (9.9)	B (14.2)	A (8.6)	B (14.8)	A (7.3)	B (15.2)
			E (79.7)	D (44.1)	F (169.8)	F (211.7)	F (286.6)	F (227.9)	F (216.3)	F (227.9)	F (174.9)	F (227.3)
			D (41.4)	E (64.1)	D (39.9)	E (72.1)	D (44.7)	E (76.2)	D (41.3)	E (78.4)	D (40.2)	F (80.1)
			D (38.9)	C (32.1)	D (37.6)	C (30.7)	D (36.1)	D (39.0)	D (37.4)	C (32.4)	D (38.7)	C (30.3)
			A (7.7)	A (8.1)	A (8.1)	A (8.1)	A (8.3)	B (10.0)	A (8.6)	A (9.1)	A (8.7)	A (8.5)
			C (31.1)	F (98.5)	F (105.0)	F (140.3)	F (101.2)	F (115.0)	F (105.5)	F (95.1)	F (109.2)	

Notes:

(1) Numbers in parentheses indicate average delay in seconds per vehicle for signal controlled intersections.

(2) Numbers in brackets indicate average delay in seconds per vehicle for unsignalized intersections.

Table 4
Washington Gateway Two PUD
Queues Summary - Synchro

Intersection	Intersection Control	Critical Movement	Available Storage	Existing Conditions		Background Conditions (without Approved PUD)		Background Conditions (with Approved PUD)		Total Future Conditions (Option 1)		Total Future Conditions (Option 2)											
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour										
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th								
1. Florida Avenue NE/2nd Street NE/ Site Entrance	Signal	EBLT WBTR NBLTR SBLT SBR	175 340 240 75 75	18	52	74	94	26	71	101	126	54	98	106	132	39	84	108	135	28	72	109	136
				187	#268	150	#213	~287	#375	~322	#413	~353	#444	~333	#425	~320	#411	~334	#425	~292	#382	~333	#424
				25	64	116	#246	25	69	139	#297	77	134	143	#309	54	105	155	#325	29	74	161	#337
				7	18	11	30	6	19	10	30	13	33	55	113	17	39	32	70	21	44	21	44
				3	8	4	11	3	9	4	11	9	21	57	91	16	32	30	53	21	39	13	27

Notes:

- (1) Synchro 9 (build 909, rev 20) was used to calculate 50th and 95th percentile queues, unless otherwise specified.
- (2) Queues are reported in units of feet. In general, one vehicle length approximates to 25 feet.
- (3) Queues with a # footnote indicate that the 95th percentile volume exceeds the capacity.
- (4) Queues with a m footnote indicate that volume for the 95th percentile is metered by an upstream signal.
- (5) Queues with a ~ footnote indicate that the volume exceeds capacity, and the queue may be longer.

Table 5
 Washington Gateway Two PUD
 Crash Data Summary

Intersection	Type of Control	No. of Crashes (3 Years)	ADT (veh/day)	Crash Rate (MEV)
1. Florida Avenue NE/2nd Street NE	Signal	40	16,500	2.21

FUTURE BACKGROUND CONDITIONS (WITHOUT APPROVED PUD)

Traffic Volumes

Overview

In order to forecast year 2020 background traffic volumes in the study area without the proposed development, increases in traffic associated with growth outside the immediate site vicinity (regional growth) and increases in traffic associated with planned or approved but not yet constructed developments in the study area (pipeline developments) were considered.

The site is approved for the development of a total of 601,896 SF of office space. Whereas this section does not include the approved PUD, the next section— “Future Background Conditions (With Approved PUD)” —analyzes its impact.

Regional Growth

In order to account for potential increases in traffic associated with growth from developments outside of the study area, a regional growth rate was applied to existing traffic volumes. DDOT’s historical average daily traffic (ADT) volume maps were examined to determine an appropriate growth rate for the study area. The historical ADTs indicate that traffic volumes in the study area have generally plateaued, having exhibited minimal growth. Therefore, a growth rate of one percent per year, compounded annually over four years (2016 to 2020), conservatively was applied to the existing vehicular volumes shown on Figure 7. The resulting volumes associated with regional growth are shown on Figure 7.

Pipeline Developments

Eight (8) other developments that are planned in and around the study area were considered as part of the background traffic forecasts for the 2020 study year, based on sources including previously approved traffic impact studies, the most currently available (November 2016) development activity listed in the NoMa Development Map prepared by the NoMa Business Improvement District (BID), and Zoning Commission Orders prepared by the Zoning Commission for the District of Columbia. As mentioned, whereas the approved PUD includes 601,896 SF of office space, the approved PUD was not included as a pipeline development and its impact will be analyzed in the next section. Figure 8 presents the locations of the pipeline developments that were considered.

In general, pipeline development peak hour trips were estimated based on peak hour rates/equations included in the ITE Trip Generation, 9th Edition, and estimates of transit,

rideshare, and non-auto mode splits. As shown in Table 6, it is estimated that these eight (8) pipeline projects would generate a total of 1,339 AM peak hour vehicle-trips and 1,675 PM peak hour vehicle-trips, upon completion and full-occupancy.

The peak hour trip assignments associated with the combined pipeline developments is shown on Figure 7.

Background Forecasts (without Approved PUD)

Background 2020 traffic forecasts (without the proposed redevelopment and without the approved PUD) were developed by combining the existing traffic volumes shown on Figure 7 with the regional growth volumes and the pipeline traffic volumes also shown on Figure 7. The resulting 2020 background traffic forecasts are shown on Figure 9.

Capacity Analysis

Capacity/level of service (LOS) analyses were conducted at the Florida Avenue/2nd Street intersection based on the existing lane use and traffic control shown on Figure 7, future background traffic forecasts shown on Figure 9, and existing DDOT traffic signal timings.

The level of service results for the 2020 background conditions are presented in Attachment F and summarized in Table 3. As shown in Table 3, under background conditions, the Florida Avenue/2nd Street intersection would operate at overall LOS “F” during the AM and PM peak hours, as a result of the background traffic growth and the pipeline projects. The westbound shared through-right lane group would operate at LOS “F” during both the AM and PM peak hours, while the northbound approach of 2nd Street NE would continue to operate at LOS “E” during the PM peak hour.

Queue Analysis

A queue analysis was conducted for 2020 conditions without the development. Synchro was used to conduct the analyses, using the 50th and 95th percentile queue lengths. The results are summarized in Table 4. Queue reports are provided in Attachment F.

As shown in Table 4, each of the lane groups at the Florida Avenue/2nd Street intersection would have 95th percentile queue lengths that are within the available storage, except for the westbound shared through-right lane group, whose 95th percentile queues would exceed the available storage during the AM and PM peak hours. In addition, the northbound approach of 2nd Street would have a 95th percentile queue that continues to exceed its available storage during the PM peak hour, but with a longer queue length compared to the existing condition.

Table 6
Washington Gateway Two PUD
Pipeline Development Trip Generation

Development/Land Use	ITE Code	Size	Unit	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
1. 50 Florida Avenue NE									
High-Rise Apartments	222	182	DU	14	41	55	43	28	71
<i>Transit Mode Share Reduction</i>		35%		(5)	(14)	(19)	(15)	(10)	(25)
Residential Subtotal				9	27	36	28	18	46
Retail	820	7,800	SF	20	13	33	52	56	108
<i>Transit Mode Share Reduction</i>		30%		(6)	(4)	(10)	(16)	(17)	(33)
Retail Vehicle Trips Subtotal				14	9	23	36	39	75
<i>Pass-by Trip Reduction</i>		17% / 34%		(2)	(2)	(4)	(12)	(13)	(25)
Retail External Vehicle Trips Subtotal				12	7	19	24	26	50
50 Florida Avenue NE Subtotal				21	34	55	52	44	96
2. N Street NoMa (33 N Street NE)									
High-Rise Apartments	222	346	DU	26	78	104	75	48	123
<i>Transit Mode Share Reduction</i>		35%		(9)	(27)	(36)	(26)	(17)	(43)
Residential Subtotal				17	51	68	49	31	80
Retail	820	5,000	SF	16	9	25	39	42	81
<i>Transit Mode Share Reduction</i>		30%		(5)	(3)	(8)	(12)	(13)	(25)
Retail Subtotal				11	6	17	27	29	56
<i>Pass-by Trip Reduction</i>		17% / 34%		(2)	(1)	(3)	(9)	(10)	(19)
Retail External Vehicle Trips Subtotal				9	5	14	18	19	37
N Street NoMa (33 N Street NE) Subtotal				26	56	82	67	50	117
3. 300 M Street NE (Phase I)									
High-Rise Apartments	222	400	DU	30	90	120	85	55	140
<i>Transit Mode Share Reduction</i>		35%		(11)	(32)	(43)	(30)	(19)	(49)
Residential Subtotal				19	58	77	55	36	91
Retail	820	12,000	SF	27	16	43	70	75	145
<i>Transit Mode Share Reduction</i>		30%		(8)	(5)	(13)	(21)	(23)	(44)
Retail Subtotal				19	11	30	49	52	101
<i>Pass-by Trip Reduction</i>		17% / 34%		(3)	(2)	(5)	(17)	(18)	(35)
Retail External Vehicle Trips Subtotal				16	9	25	32	34	66
300 M Street NE (Phase I) Subtotal				35	67	102	87	70	157
4. The Coliseum									
Office	710	153,000	SF	237	32	269	43	207	250
<i>Transit Mode Share Reduction</i>		35%		(83)	(11)	(94)	(15)	(72)	(87)
Office Subtotal				154	21	175	28	135	163
Retail	820	54,000	SF	66	41	107	190	206	396
<i>Transit Mode Share Reduction</i>		30%		(20)	(12)	(32)	(57)	(62)	(119)
Retail Subtotal				46	29	75	133	144	277
<i>Pass-by Trip Reduction</i>		17% / 34%		(8)	(5)	(13)	(45)	(49)	(94)
Retail External Vehicle Trips Subtotal				38	24	62	88	95	183
The Coliseum Subtotal				192	45	237	116	230	346
5. The Edison at Union Market									
Apartments	220	187	DU	19	76	95	79	42	121
<i>Transit Mode Share Reduction</i>		50%		(10)	(38)	(48)	(40)	(21)	(61)
Residential Subtotal				9	38	47	39	21	60
Retail	820	28,000	SF	45	27	72	122	133	255
<i>Transit Mode Share Reduction</i>		30%		(14)	(8)	(22)	(37)	(40)	(77)
Retail Subtotal				31	19	50	85	93	178
<i>Pass-by Trip Reduction</i>		17% / 34%		(5)	(3)	(8)	(29)	(32)	(61)
Retail External Vehicle Trips Subtotal				26	16	42	56	61	117
Gateway Market Subtotal				35	54	89	95	82	177
6. The Highline at Union Market									
Apartments	220	313	DU	31	126	157	124	66	190
<i>Transit Mode Share Reduction</i>		50%		(16)	(63)	(79)	(62)	(33)	(95)
Residential Subtotal				15	63	78	62	33	95
Retail	820	9,880	SF	24	14	38	61	66	127
<i>Transit Mode Share Reduction</i>		30%		(7)	(4)	(11)	(18)	(20)	(38)
Retail Subtotal				17	10	27	43	46	89
<i>Pass-by Trip Reduction</i>		17% / 34%		(3)	(2)	(5)	(15)	(16)	(31)
Retail External Vehicle Trips Subtotal				14	8	22	28	30	58
Gateway Market Subtotal				29	71	100	90	63	153
7. Three Constitution Square									
Office	710	343,568	SF	452	62	514	79	384	463
<i>Transit Mode Share Reduction</i>		44%		(199)	(27)	(226)	(35)	(169)	(204)
Office Subtotal				253	35	288	44	215	259
Retail	820	11,378	SF	25	16	41	67	73	140
<i>Transit Mode Share Reduction</i>		75%		(19)	(12)	(31)	(50)	(55)	(105)
Retail Vehicle Trips Subtotal				6	4	10	17	18	35
<i>Pass-by Trip Reduction</i>		17% / 34%		(1)	(1)	(2)	(6)	(6)	(12)
Retail External Vehicle Trips Subtotal				5	3	8	11	12	23
Three Constitution Square Subtotal				258	38	296	55	227	282
8. Four Constitution Square									
Office	710	484,472	SF	595	81	676	106	515	621
<i>Transit Mode Share Reduction</i>		44%		(262)	(36)	(298)	(47)	(227)	(274)
Office Subtotal				333	45	378	59	288	347
Four Constitution Square Subtotal				333	45	378	59	288	347
Total Pipeline Development Trip Generation				929	410	1,339	621	1,054	1,675

Notes:
1. Number of trips generated estimated using Institute of Transportation Engineers (ITE), *Trip Generation*, Ninth Edition.
2. Transit mode share reductions were estimated based on the proximity to the NoMA-Gallaudet U Metro Station.

FUTURE BACKGROUND CONDITIONS (WITH APPROVED PUD)

Overview

The previous section— “Future Background Conditions (Without Approved PUD)” — analyzed the impact of regional growth and increases in traffic associated with planned or approved but not yet constructed developments in the study area (pipeline developments). In this section, the traffic associated with the approved PUD was considered and added to the 2020 background traffic volumes shown on Figure 9.

Approved PUD

Per Zoning Commission Order No. 06-14, the property that is the subject of the PUD modification application is approved for a building, divided into two towers (i.e. a north tower and a south tower), with a total of 601,896 SF of office space.

Approved PUD Vehicular Trip Generation

The number of trips to be generated by the approved PUD to include 601,896 SF of office space was estimated based on peak hour rates/equations included in the ITE Trip Generation, 9th Edition, and estimates of transit, rideshare, and non-auto mode splits based on the 2005 Development-Related Ridership Survey. The trip generation for the approved PUD (601,896 SF of office space) is shown as Table 7 and indicates that it would generate 483 AM peak hour trips (425 in, 58 out) and 452 PM peak hour trips (77 in, 375 out).

Approved PUD Trip Distribution and Assignment

The distribution of peak hour trips generated by the approved PUD was based on the existing traffic network, previously approved traffic impact studies, and local knowledge. The following directions of approach for the approved PUD site were utilized:

<u>To/From</u>	<u>Percentage (Office)</u>
East via New York Avenue	30%
West via New York Avenue	12%
East via Florida Avenue	14%
West via Florida Avenue	12%
North via North Capitol Street	16%
South via North Capitol Street	8%
North via Eckington Place	3%
South via First Street NE	3%
South via 4 th Street NE	2%
TOTAL	100%

Based on these distributions, trips generated by the approved PUD were assigned to the roadway network. The resulting approved PUD trip assignments for are shown on Figure 9.

Background Forecasts (with Approved PUD)

Background 2020 traffic forecasts (with the approved PUD) were developed by combining the background 2020 traffic forecasts (without the approved PUD) shown on Figure 9 with the approved PUD trip assignments that are also shown on Figure 9. The resulting 2020 background traffic forecasts (with the approved PUD) are shown on Figure 9.

Capacity Analysis

Capacity/level of service (LOS) analyses were conducted at the Florida Avenue/2nd Street intersection based on the existing lane use and traffic control shown on Figure 7, future background traffic forecasts (with the approved PUD) shown on Figure 9, and existing DDOT traffic signal timings.

The level of service results for the 2020 background conditions with the approved PUD are presented in Attachment F and summarized in Table 3. As shown in Table 3, under background conditions with the approved PUD, the Florida Avenue/2nd Street intersection would operate at overall LOS “F” during the AM and PM peak hours. The westbound shared through-right lane group would operate at LOS “F” during both the AM and PM peak hours, while the northbound approach of 2nd Street NE would continue to operate at LOS “E” during the PM peak hour. Compared with background conditions without the approved PUD, the levels of service are consistent, though with generally longer delays.

Queue Analysis

A queue analysis was conducted for 2020 conditions without the subject development and with the approved PUD. Synchro was used to conduct the analyses, using the 50th and 95th percentile queue lengths. The results are summarized in Table 4. Queue reports are provided in Attachment F.

As shown in Table 4, each of the lane groups at the Florida Avenue/2nd Street intersection would have 50th and 95th percentile queue lengths that are within the available storage, except for the westbound shared through-right lane group, whose 50th and 95th percentile queues would exceed the available storage during the AM peak hour and whose 95th percentile queue would exceed the available storage during the PM peak hour. In addition, the northbound approach of 2nd Street NE would have a 95th percentile queue that continues to exceed its available storage during the PM peak hour.

Table 7
 Washington Gateway Two PUD
 Site Trip Generation (Approved PUD)

Development/Land Use	ITE Code	Size	Unit	AM Peak Hour		PM Peak Hour		Total
				In	Out	In	Out	
Approved Use								
Office	710	601,896	SF	708	96	128	625	753
<i>Transit Mode Share Reduction</i>		40%		<i>(283)</i>	<i>(38)</i>	<i>(51)</i>	<i>(250)</i>	<i>(301)</i>
Office Vehicle Trips				425	58	77	375	452

Notes:

1. Number of trips generated estimated using Institute of Transportation Engineers (ITE), *Trip Generation*, Ninth Edition.
2. Transit mode share reductions were estimated based on regression equations used in the 2005 Development-Related Ridership Survey Final Report by the Washington Metropolitan Area Transit Authority, March 2006; and the proximity to the NoMA-Gallaudet U Metro Station.

SITE ANALYSIS

Overview

Per Zoning Commission Order No. 06-14, the site that is the subject of the PUD modification is approved for a building, divided into two towers (i.e. a north tower and a south tower), with a total of 601,896 SF of office space. Based on the PUD Modification that is proposed by the Applicant, the site would permit a residential use for at least one of the two building towers.

This analysis considers two (2) development options that are being proposed as part of the PUD modification. In proposed development Option 1, the north tower would be developed with 372 residential dwelling units, whereas the south tower would be developed with 221,691 SF of office space and retail space. In proposed development Option 2, the north tower would be developed with 372 residential dwelling units, whereas the south tower would be developed with 252 residential dwelling units.

Site Access and Circulation

Overview

The proposed development has been designed to facilitate access via all modes of transportation including vehicular, pedestrian, and bicycle. No new curb cuts are proposed in conjunction with the project.

Site Access Points

Vehicular access to Phases Two and Three of the PUD will be gained from the two existing access points that serve Phase One of the PUD. These access points include the full-movement, signalized intersection of Florida Avenue and 2nd Street, as well as a right-in/right-out entrance on eastbound New York Avenue immediately east of the intersection with Florida Avenue. No new points of access that require additional curb cuts to the public roadway are proposed.

The north and south towers of the site would be integrated with the existing below-grade parking garage that serves the Phase One of the project. In addition to the garage ramp that is accessible from the right-in/right-out entrance on New York Avenue, a garage ramp is accessible from the driveway adjacent to the plaza.

Pedestrian and Bicycle Access

Pedestrian access to the residential lobby of the north tower will be provided by way of the plaza that is on the western edge of the property. The south tower will be accessible to pedestrians via the plaza on the western property edge as well as from the sidewalk on Florida Avenue that is on the southern property edge. The sidewalks along the property frontage on Florida Avenue and New York Avenue, which were widened along the Phase One site frontage, will be extended with the development of Phases Two and Three. Crosswalks are provided for the northern, eastern, and southern legs of the signalized Florida Avenue/2nd Street intersection.

For Options 1 and 2, a total of 131 long-term bicycle parking spaces will be installed within the building during Phases Two and Three. During Phase Two, with the construction of the north tower, a temporary connection will be established between the MBT and the public plaza. As indicated in Zoning Commission Order No. 06-14 for the previously approved PUD—and continuing with the proposed PUD modification—an atrium (i.e. the Atrium) is proposed to be constructed on the second floor of the south tower during Phase Three of the site development. The Atrium will be publicly accessible to the MBT on the eastern property edge from the second floor of the south tower, with stairs connecting users to the plaza located at ground level. The Atrium will connect MBT users to the NoMa district as well as adjacent neighborhoods and institutions including Eckington, Union Market, Gallaudet University, and Capitol Hill while providing bike storage, bike tracks, a display of information about the MBT and adjacent neighborhoods, station maps, a drinking water fountain, and a tire pump. Short-term parking for bicycles will be provided, as required, on the surface level or within the Atrium. For Option 1, 25 short-term bicycle parking spaces are required and 38 are required for Option 2.

Loading Access

Loading requirements for the proposed development are scheduled in the DC Municipal Regulations (DCMR). For residential uses, the requirements for loading include the provision of one (1) 55-foot loading berth. For the office use, the requirements for loading include the provision of three (3) 30-foot loading berths.

The proposed PUD modification assuming development Option 1 with 372 residential dwelling units and 221,691 SF of office/retail space would provide two (2) 30-foot loading berths and one (1) 55-foot loading berth. The loading areas would be accessible from the eastern side of the driveway that is adjacent to the plaza and extends from north of the Florida Avenue/2nd Street intersection.

Diagrams showing the truck maneuvers for single-unit (SU) and WB-50 trucks in and out of the proposed loading areas were prepared by Wiles Mensch and are included in Attachment G. The turn maneuvers for WB-50 trucks shown in Attachment G indicate that

the trucks would enter the site via westbound right turn movements from Florida Avenue NE. The inbound movements from the rightmost lane of westbound Florida Avenue NE would result in the trucks traversing portions of the southbound approach of the site entrance. In addition, maneuvers into and out of the loading dock would require the trucks to occupy portions of the plaza space.

Proposed Parking

Vehicular Parking

Since the subject site is within one-half mile from the NoMa-Gallaudet U Metro station, the parking requirements prescribed in the DCMR are reduced by 50 percent. As such, 0.25 vehicular parking spaces are required per 1,000 SF of office space in excess of 3,000 SF, one (1) vehicular parking space is required for every six (6) residential dwelling units, and 0.665 vehicular parking spaces are required per 1,000 SF of retail space in excess of 3,000 SF. For Option 1, 118 parking spaces are required for the residential and office towers with ground floor retail. For Option 2, 107 parking spaces are required for the residential towers and ground floor retail.

The proposed PUD modification assuming development Option 1 with 372 residential dwelling units and 221,691 SF of office space would provide 123 vehicle parking spaces for the south tower and 186 vehicle parking spaces for the north tower. Three (3) vehicle parking spaces would be provided for retail. Thus, a total of 312 vehicle parking spaces are proposed for the Washington Gateway Phases Two and Three development, Option 1. With Option 2, the same number of parking spaces would be provided as with Option 1 given the same garage footprint. Comparatively, the approved PUD would have provided 338 vehicle parking spaces.

The proposed number of parking spaces for either Option 1 or 2 exceed the number required per the DCMR.

Bicycle Parking

Based on parking requirements prescribed in the DCMR, long-term and short-term bicycle parking spaces are required for the residential, office and retail uses. For multi-family residential buildings, one (1) long-term space for each three (3) dwellings units and one (1) short-term space for each 20 dwelling units are required. For office, one (1) long-term space for each 2,500 SF and one (1) short-term space for each 40,000 SF are required. For retail, one (1) long-term space for each 10,000 SF and one (1) short-term space for each 3,500 SF are required. Per the DCMR, after the first 50 bicycle parking spaces are provided for a use, additional spaces are required at one-half the ratio.

With for development Option 1, 156 long-term bicycle parking spaces are required; 87 for the residential dwelling units, 68 for the office and 1 for the retail. The total number of short-term parking spaces required is 26 spaces; 19 for the residential units, 5 for the office, and 2 for the retail.

With for development Option 2, 155 long-term bicycle parking spaces are required; 87 for the north building residential dwelling units, 67 for the south building residential dwelling units, and 1 for the retail. The total number of short-term parking spaces required is 34 spaces; 19 for the north building residential units, 13 for the south building residential units, and 2 for the retail.

The appropriate number of long-term bicycle parking spaces will be provided within both the north tower and south tower buildings. Short-term bicycle parking spaces will be provided on the surface level adjacent to the buildings or within the Atrium.

TOTAL FUTURE CONDITIONS

Trip Generation Analysis

The number of trips to be generated by development Option 1 and Option 2 was estimated based on peak hour rates/equations included in the ITE Trip Generation, 9th Edition, and estimates of transit, rideshare, and non-auto mode splits based on the 2005 Development-Related Ridership Survey.

Proposed Vehicular Trip Generation

The proposed trip generation for development Option 1, which would include 372 residential dwelling units and 221,691 SF of office space, is shown as Table 8. The proposed trip generation for development Option 2, which would include 372 residential dwelling units in the north tower and 252 residential dwelling units in the south tower, is shown as Table 9.

As shown in Table 8, Option 1 would generate a total of 308 AM peak hour trips (209 inbound, 99 outbound) and 306 PM peak hour trips (105 inbound, 201 outbound). Compared to the approved PUD, which would construct 601,896 SF of office space, Option 1 of the proposed PUD modification would result in a net reduction of 175 AM peak hour trips and a net reduction of 146 PM peak hour trips.

As shown in Table 9, Option 2 would generate a total of 153 AM peak hour trips (30 inbound, 123 outbound) and 185 PM peak hour trips (120 inbound, 65 outbound). Compared to the approved PUD, which would construct 601,896 SF of office space,

Option 2 of the proposed PUD modification would result in a net reduction of 330 AM peak hour trips and a net reduction of 267 PM peak hour trips.

Site Trip Distribution and Assignment

The distribution of new peak hour site trips generated by the proposed development was based on the existing traffic network, previously approved traffic impact studies, and local knowledge. The following directions of approach for the site were utilized:

To/From	Percentage (Residential/Office)	
East via New York Avenue	15%	30%
West via New York Avenue	25%	12%
East via Florida Avenue	9%	14%
West via Florida Avenue	15%	12%
North via North Capitol Street	9%	16%
South via North Capitol Street	15%	8%
North via Eckington Place	5%	3%
South via First Street NE	5%	3%
South via 4 th Street NE	2%	2%
TOTAL	100%	100%

Based on these distributions, trips generated by development Option 1 and Option 2 were assigned to the roadway network. For purposes of this analysis, the total future condition forecasts and ensuing analyses consider two scenarios: one in which Option 1 is developed, and the other in which Option 2 is developed. The resulting site trip assignments for both Options 1 and 2 are shown on Figure 10 in separate boxes.

Traffic Forecasts

Forecasts with Option 1

Total future traffic forecasts with the proposed development Option 1 were determined by combining the 2020 background traffic forecasts (without the approved PUD) shown on Figure 9 with the Option 1 site traffic volumes shown on Figure 10 to yield the 2020 total future traffic forecasts with Option 1 shown on Figure 10.



Forecasts with Option 2

Total future traffic forecasts with the proposed development Option 2 were determined by combining the 2020 background traffic forecasts (without the approved PUD) shown on Figure 9 with the Option 2 site traffic volumes shown on Figure 10 to yield the 2020 total future traffic forecasts with Option 2 shown on Figure 10.

Capacity Analysis

Capacity Analysis with Option 1

Capacity/level of service (LOS) analyses under total future conditions with Option 1 were conducted at the Florida Avenue/2nd Street intersection based on the existing lane use and traffic control shown on Figure 7, total future traffic forecasts with Option 1 shown on Figure 10, and existing DDOT traffic signal timings.

The level of service results for the 2020 total future conditions with development option 1 are presented in Attachment H and summarized in Table 3. As shown in Table 3, under total future conditions with development Option 1, the Florida Avenue/2nd Street intersection would operate at overall LOS “F” during the AM and PM peak hours, consistent with background conditions with the approved PUD, though with shorter delays during the AM peak hour. During the PM peak hour, the overall intersection delay would increase by approximately four (4) seconds compared with background conditions with the approved PUD. The westbound shared through-right lane group would operate at LOS “F” during both the AM and PM peak hours, consistent with background conditions and with the approved PUD, though with shorter delays during the AM peak hour. The northbound approach of 2nd Street would continue to operate at LOS “E” during the PM peak hour, consistent with background conditions and with the approved PUD, though with an increase in delay by about two (2) seconds.

Capacity Analysis with Option 2

Capacity/level of service (LOS) analyses under total future conditions with Option 2 were conducted at the Florida Avenue/2nd Street intersection based on the existing lane use and traffic control shown on Figure 7, total future traffic forecasts with Option 2 shown on Figure 10, and existing DDOT traffic signal timings.

The level of service results for the 2020 total future conditions with development Option 2 are presented in Attachment H and summarized in Table 3. As shown in

Table 3, under total future conditions with development Option 2, the Florida Avenue/2nd Street intersection would operate at overall LOS “F” during the AM and PM peak hours, though with shorter delays during the AM peak hour. During the PM peak hour, the overall intersection delay would increase by approximately eight (8) seconds compared with background conditions with the approved PUD. The westbound shared through-right lane group would operate at LOS “F” during both the AM and PM peak hours, consistent with background conditions and with the approved PUD, though with shorter delays during the AM peak hour. The northbound approach of 2nd Street would operate at LOS “F” during the PM peak hour, an increase of about four (4) seconds compared with background conditions with the approved PUD.

Queue Analysis

A queue analysis was conducted for 2020 conditions with development Option 1 and Option 2. Synchro was used to conduct the analyses, using the 50th and 95th percentile queue lengths. The results are summarized in Table 4. Queue reports are provided in Attachment H.

Queue Analysis with Option 1

As shown in Table 4, with the development of Option 1, each of the lane groups at the Florida Avenue/2nd Street intersection would have 95th percentile queue lengths that are within the available storage, except for the westbound shared through-right lane group, whose 95th percentile queues would exceed the available storage during the AM and PM peak hours. In addition, the northbound approach of 2nd Street would have a 95th percentile queue that continues to exceed its available storage during the PM peak hour, but with a longer queue length.

Queue Analysis with Option 2

As shown in Table 4, with the development of Option 2, each of the lane groups at the Florida Avenue/2nd Street intersection would have 95th percentile queue lengths that are within the available storage, except for the westbound shared through-right lane group, whose 95th percentile queues would exceed the available storage during the AM and PM peak hours. In addition, the northbound approach of 2nd Street would have a 95th percentile queue that continues to exceed its available storage during the PM peak hour, but with a longer queue length.

Table 8

Washington Gateway Two PUD
Site Trip Generation (Option 1)

Development/Land Use	ITE Code	Size	Unit	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Approved Use									
Office	710	601,896	SF	708	96	804	128	625	753
<i>Transit Mode Share Reduction</i>		40%		(283)	(38)	(321)	(51)	(250)	(301)
Office Vehicle Trips				425	58	483	77	375	452
Proposed Use									
North Tower									
Residential (Apartments)	220	372	DU's	37	149	186	144	78	222
<i>Transit Mode Share Reduction</i>		51%		(19)	(76)	(95)	(73)	(40)	(113)
Residential Vehicle Trips				18	73	91	71	38	109
South Tower									
Office	710	221,691	SF	319	43	362	56	271	327
<i>Transit Mode Share Reduction</i>		40%		(128)	(17)	(145)	(22)	(108)	(130)
Office Vehicle Trips				191	26	217	34	163	197
Total Proposed Vehicle Trips				209	99	308	105	201	306
Net-New Trips				(216)	41	(175)	28	(174)	(146)
Net-New Peak Direction Trips					(216)			(174)	

Notes:

1. Number of trips generated estimated using Institute of Transportation Engineers (ITE), Trip Generation, Ninth Edition.
2. Transit mode share reductions were estimated based on regression equations used in the 2005 Development-Related Ridership Survey Final Report by the Washington Metropolitan Area Transit Authority, March 2006; and the proximity to the NoMA-Gallaudet U Metro Station.

Table 9

Washington Gateway Two PUD
Site Trip Generation (Option 2)

Development/Land Use	ITE Code	Size	Unit	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Approved Use									
Office	710	601,896	SF	708	96	804	128	625	753
<i>Transit Mode Share Reduction</i>		40%		<u>(283)</u>	<u>(38)</u>	<u>(321)</u>	<u>(51)</u>	<u>(250)</u>	<u>(301)</u>
Office Vehicle Trips				425	58	483	77	375	452
Proposed Use									
North Tower									
Residential (Apartments)	220	372	DU's	37	149	186	144	78	222
<i>Transit Mode Share Reduction</i>		51%		<u>(19)</u>	<u>(76)</u>	<u>(95)</u>	<u>(73)</u>	<u>(40)</u>	<u>(113)</u>
Residential Vehicle Trips				18	73	91	71	38	109
South Tower									
Residential (Apartments)	220	252	DU's	25	102	127	101	55	156
<i>Transit Mode Share Reduction</i>		51%		<u>(13)</u>	<u>(52)</u>	<u>(65)</u>	<u>(52)</u>	<u>(28)</u>	<u>(80)</u>
Office Vehicle Trips				12	50	62	49	27	76
Total Proposed Vehicle Trips				30	123	153	120	65	185
Net-New Trips				(395)	65	(330)	43	(310)	(267)
Net-New Peak Direction Trips					(302)			(255)	

Notes:

1. Number of trips generated estimated using Institute of Transportation Engineers (ITE), Trip Generation, Ninth Edition.
2. Transit mode share reductions were estimated based on regression equations used in the 2005 Development-Related Ridership Survey Final Report by the Washington Metropolitan Area Transit Authority, March 2006; and the proximity to the NoMA-Gallaudet U Metro Station.

CONCLUSIONS

The conclusions of this TIS are as follows:

1. The Washington Gateway PUD site has strong regional and local vehicular, pedestrian, bicycle, and transit access. It is located within a connected network of streets, with sidewalks and on-street bike routes, has access to the Metropolitan Branch Trail, and is immediately adjacent to the NoMa-Gallaudet U Metro Station.
2. The PUD modification improvements—including the public plaza, widened sidewalks, and stairs connecting the plaza to New York Avenue that were completed with Phase 1, and with the development of MBT Atrium with a direct connection to the MBT, and improvements to the MBT that would be completed with development of the north and south towers—strongly integrate the site development with the surrounding public space and encourage the access and mobility of pedestrian and bicycle travel throughout the NoMa district and outlying areas.
3. The signalized study intersection of Florida Avenue and 2nd Street currently operate with overall levels of service “D” or better during the AM and PM peak hours, with some movements operating near or beyond capacity.
4. Eight (8) approved, but unbuilt, pipeline projects in the study area will generate a total of 1,339 AM peak hour vehicle-trips and 1,675 PM peak hour vehicle-trips, upon completion and full occupancy.
5. In future conditions without Washington Gateway Phases Two and Three and without the approved PUD, but with the addition of background traffic generated by the pipeline projects and regional traffic growth, the signalized study intersection of Florida Avenue NE and 2nd Street NE would operate with overall levels of service “F” during the AM and PM peak hours, with some movements operating near or beyond capacity.
6. The approved PUD for the north and south towers, 601,896 SF of office space, would generate a total of 483 AM peak hour trips and 452 PM peak hour trips.
7. Under development Option 1, the Washington Gateway Phases Two and Three site would generate a total of 308 AM peak hour trips and 306 PM peak hour trips. Compared to the approved PUD, Option 1 of the proposed PUD would generate 175 fewer AM peak hour trips and 146 fewer PM peak hour trips. Under development Option 2, the Washington Gateway Phases Two and Three site would generate a total of 153 AM peak hour trips and 185 PM peak hour trips.

Compared to the approved PUD, Option 2 of the proposed PUD would generate 330 fewer AM peak hour trips and 267 fewer PM peak hour trips.

8. In future conditions with regional growth and the addition of traffic generated by pipeline projects and the office uses per the approved PUD, the signalized study intersection of Florida Avenue and 2nd Street would operate with overall levels of service “F” during the AM and PM peak hours, with some movements operating near or beyond capacity.
9. In future conditions with either Options 1 or 2 of the Washington Gateway Phases Two and Three site, the signalized study intersection of Florida Avenue and 2nd Street would operate with overall levels of service “F” during the AM and PM peak hours, with some movements operating near or beyond capacity. Compared with background conditions with the approved PUD, the impact of the proposed PUD modification to the Florida Avenue/2nd Street intersection is minimal.
10. The proposed PUD is well-served by its proximity to the NoMa-Gallaudet Metrorail station, several Metrobus routes, car-sharing services, Capital Bikeshare, and the MBT, enabling residents and employees to the site a variety of transportation alternatives.

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Figures

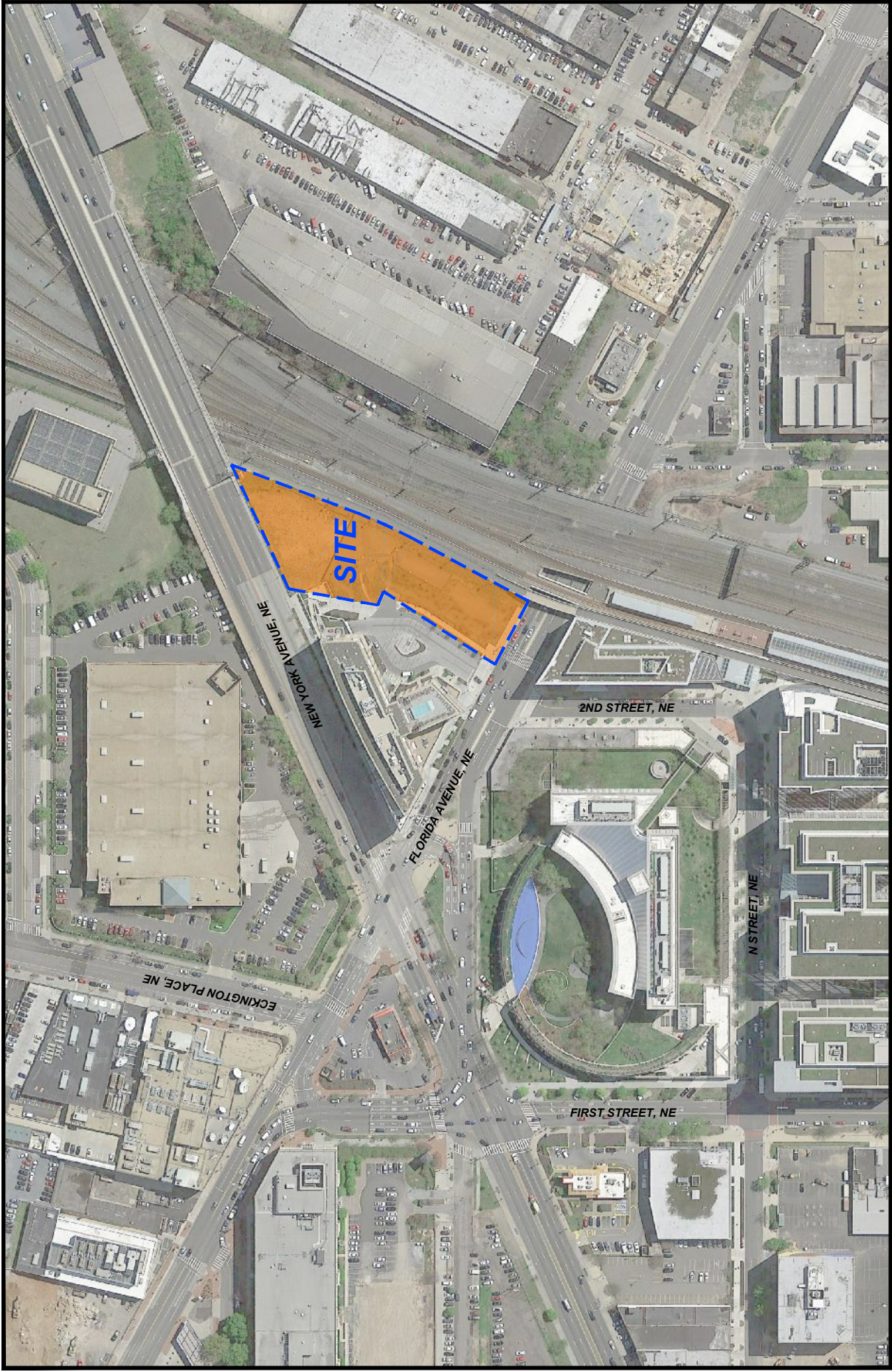


Figure 1
Site Location
Washington Gateway
Washington, DC



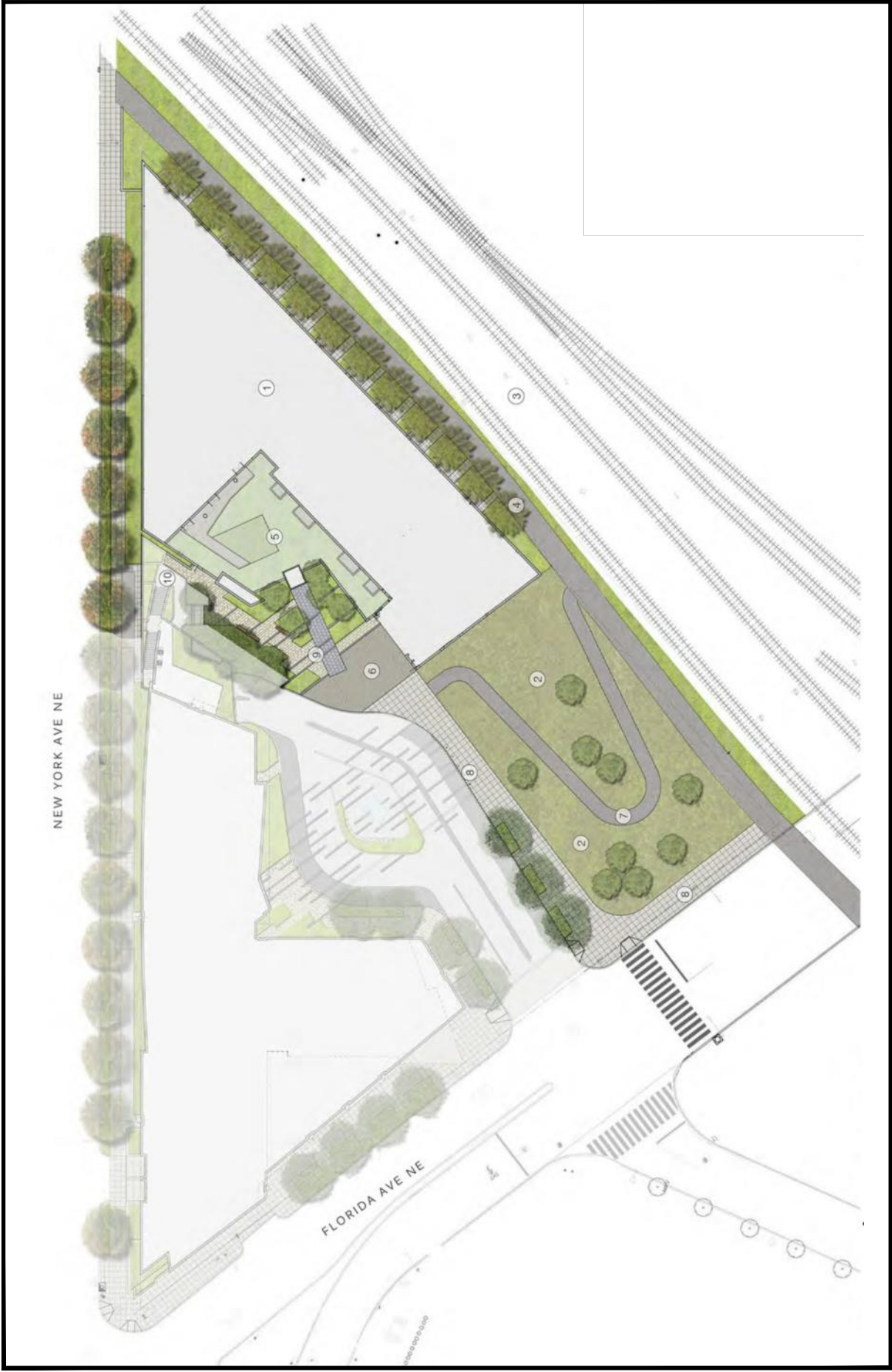


Figure 2
Interim Condition Site Plan
Washington Gateway
Washington, DC





Figure 3
Final Condition Site Plan
Washington Gateway
Washington, DC



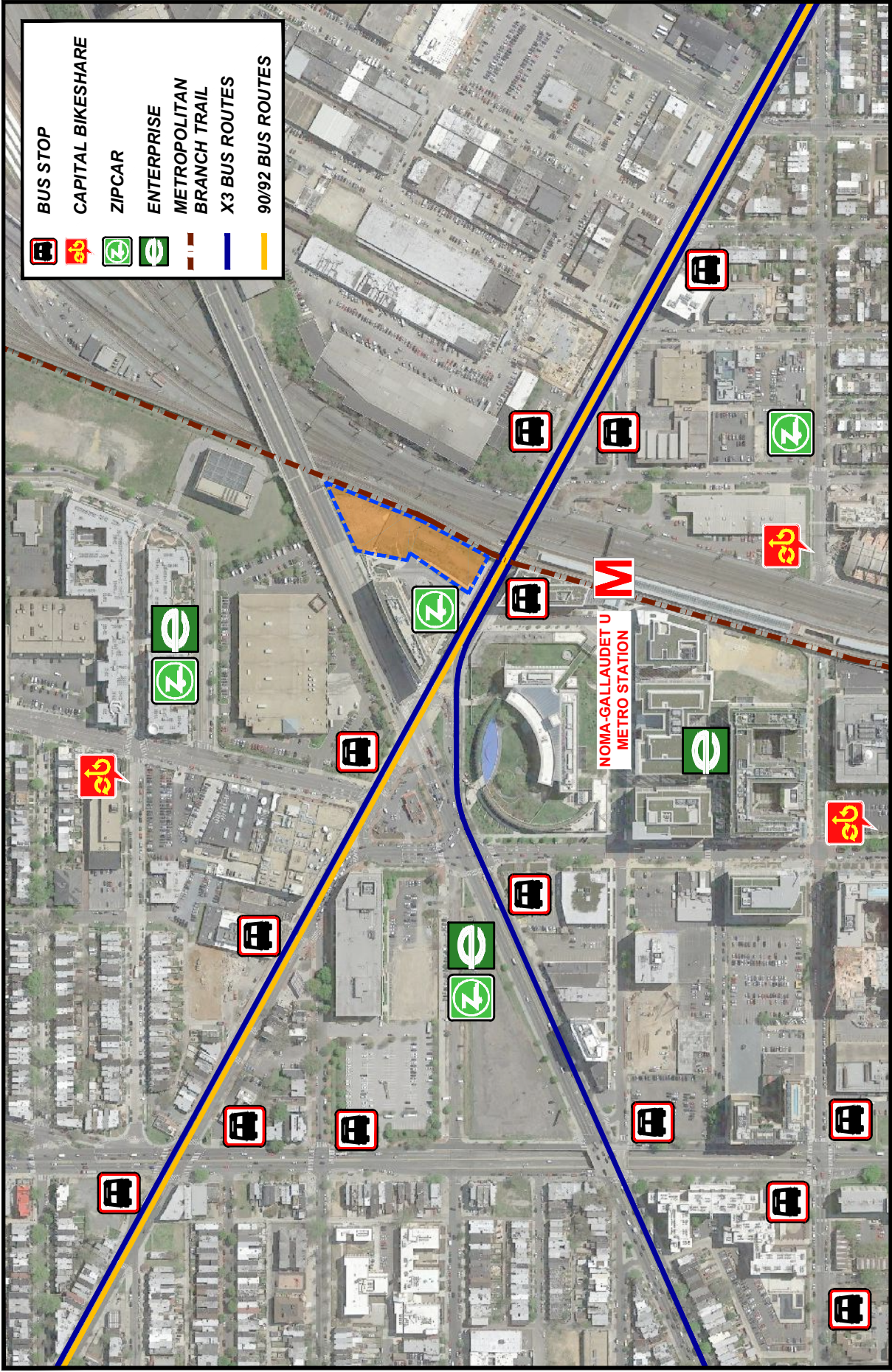


Figure 4
Alternative Modes of Transportation

Washington Gateway
Washington, DC

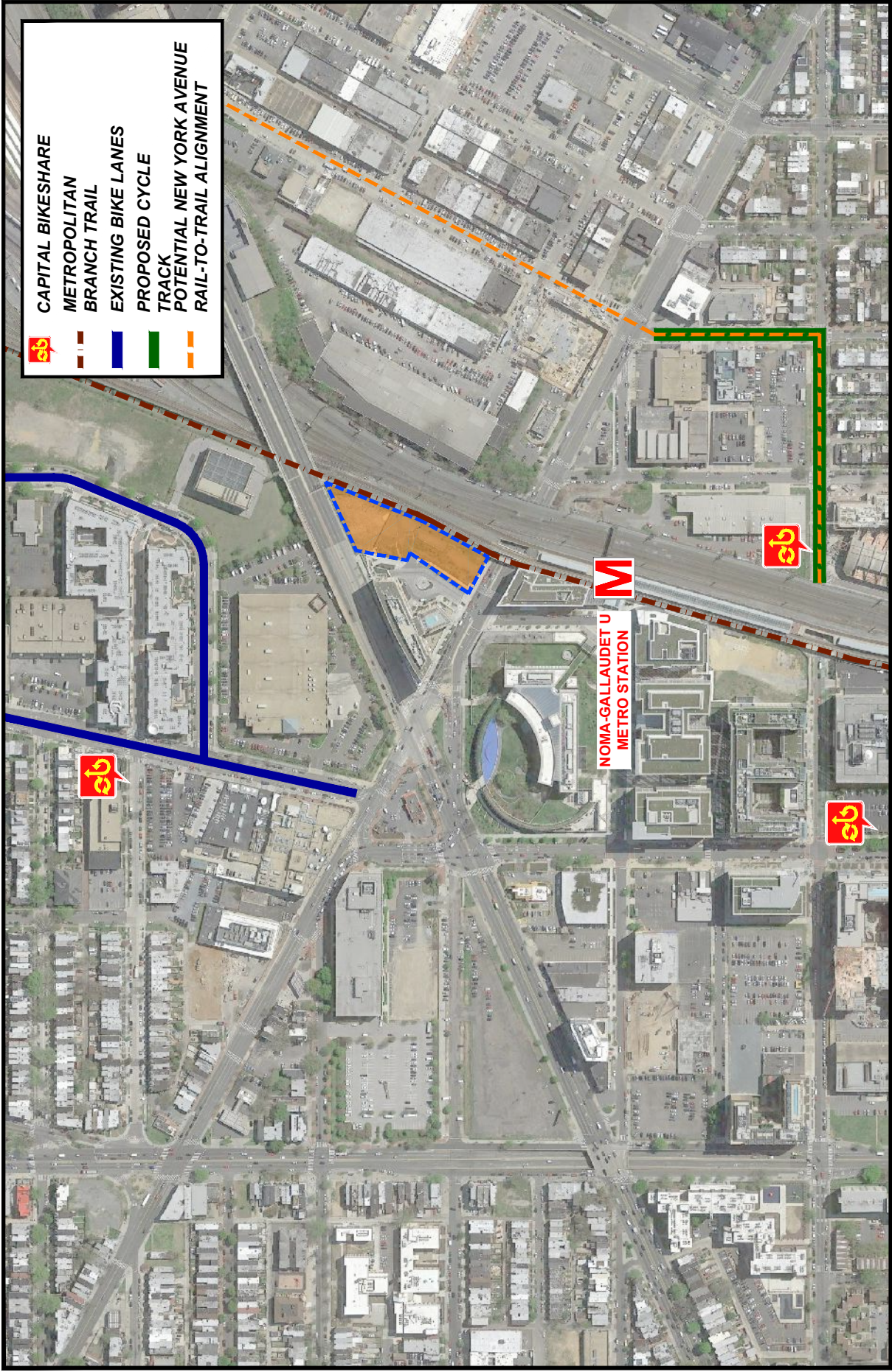
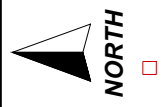


Figure 5
Bicycle Facilities and Infrastructure
 Washington Gateway
 Washington, DC



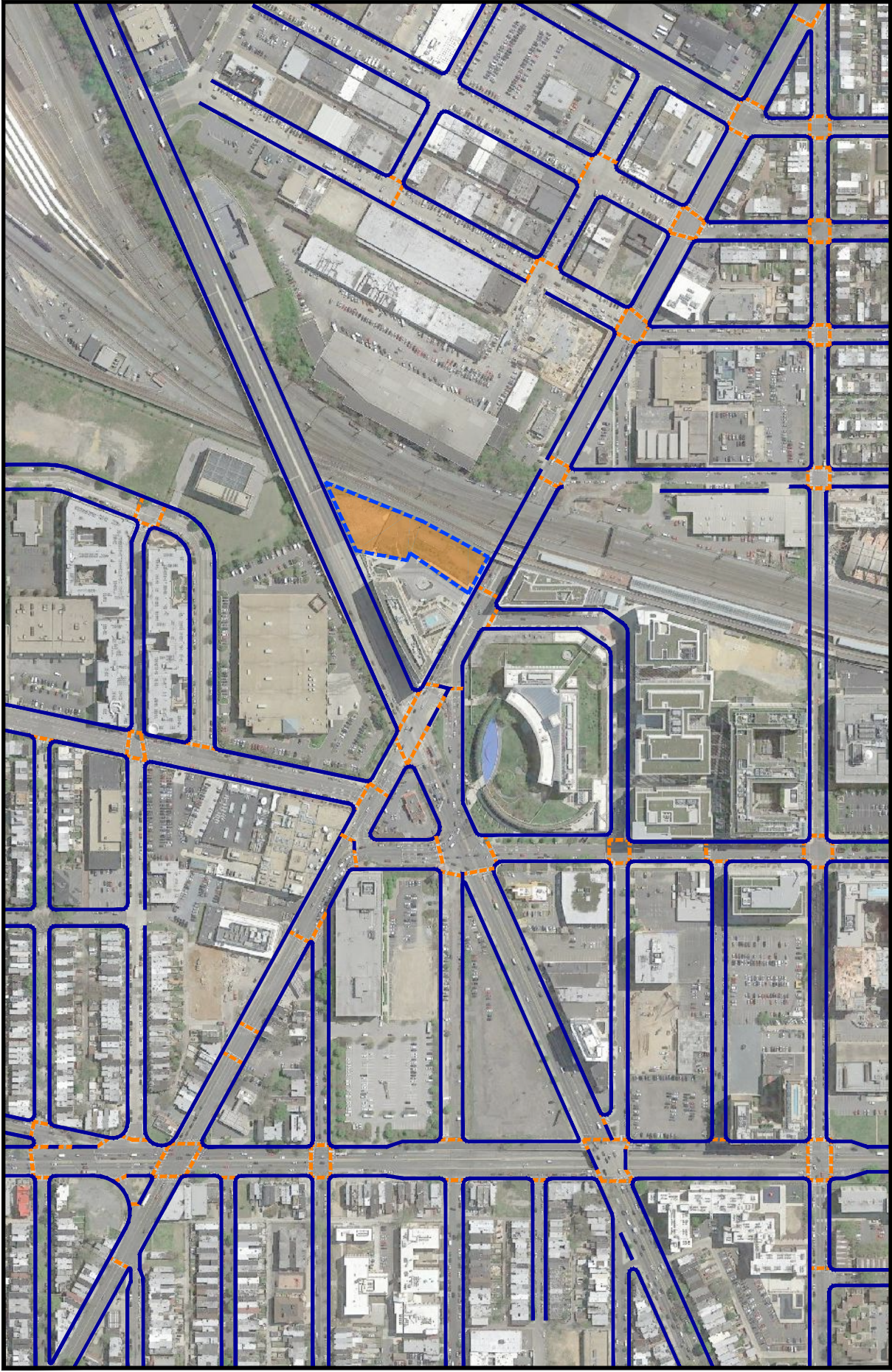


Figure 6
Pedestrian Facilities and Infrastructure
Washington Gateway
Washington, DC

■ SIDEWALK
■ CROSSWALK

▲ NORTH □

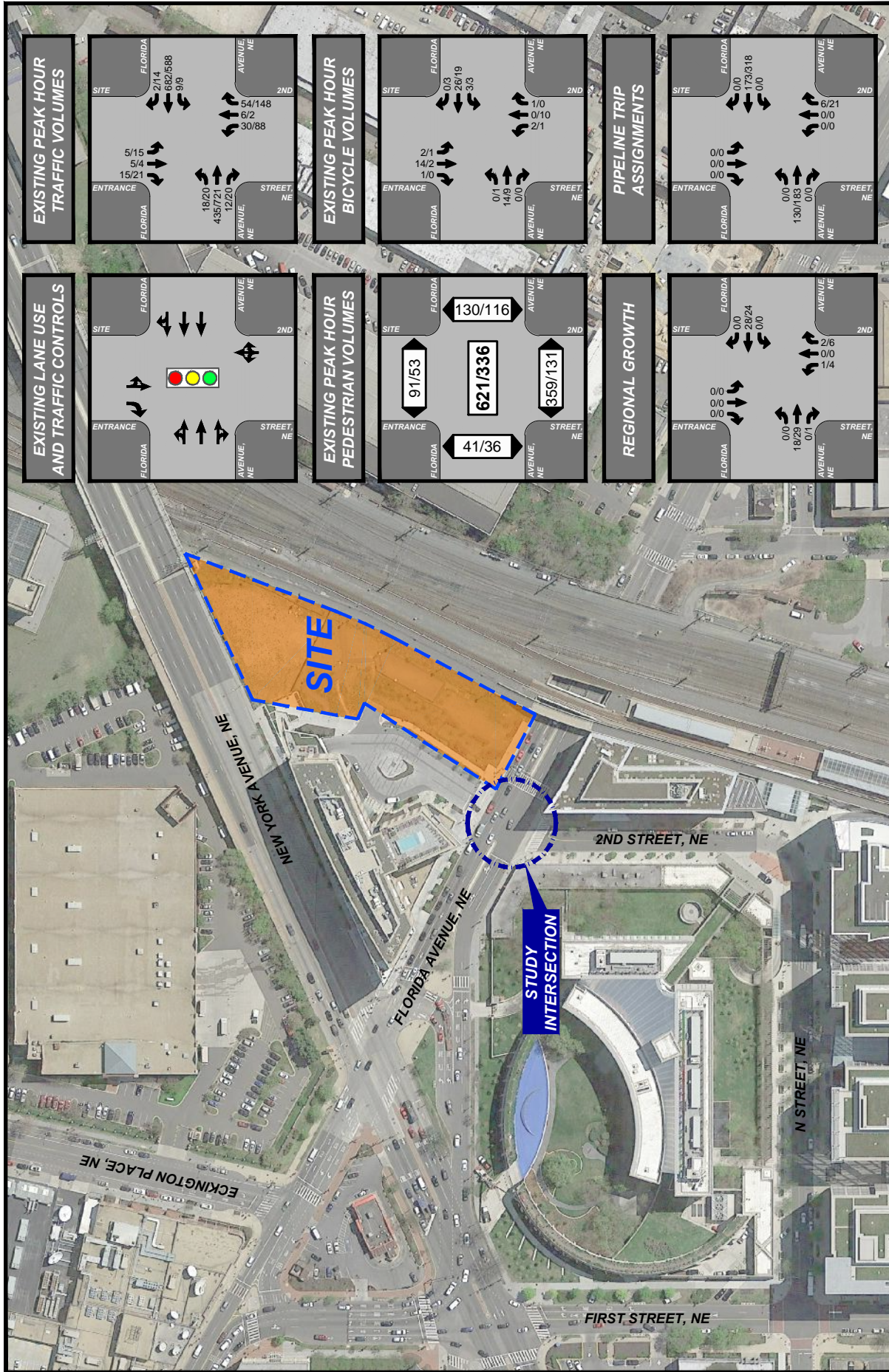


Figure 7
Existing Lane Use, Volumes, Regional Growth, and Pipeline Trips

Washington Gateway
Washington, DC

NORTH
 Represents One Travel Lane
 Signalized Intersection
 Stop Sign
 AM PEAK HOUR
 PM PEAK HOUR
 000 / 000

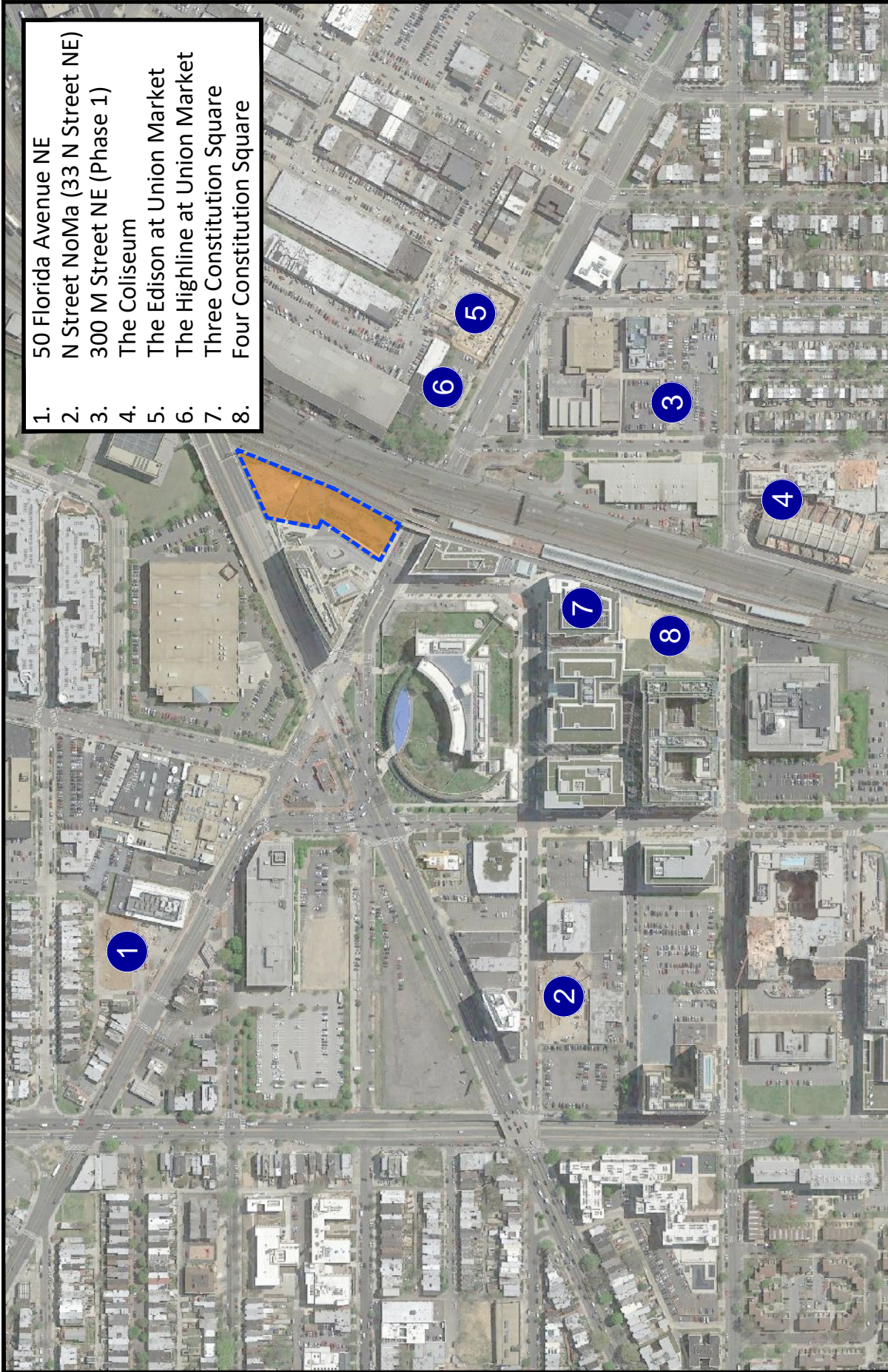


Figure 8
Pipeline Development Locations

Washington Gateway
Washington, DC



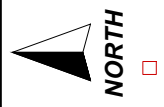
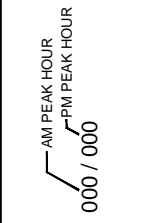
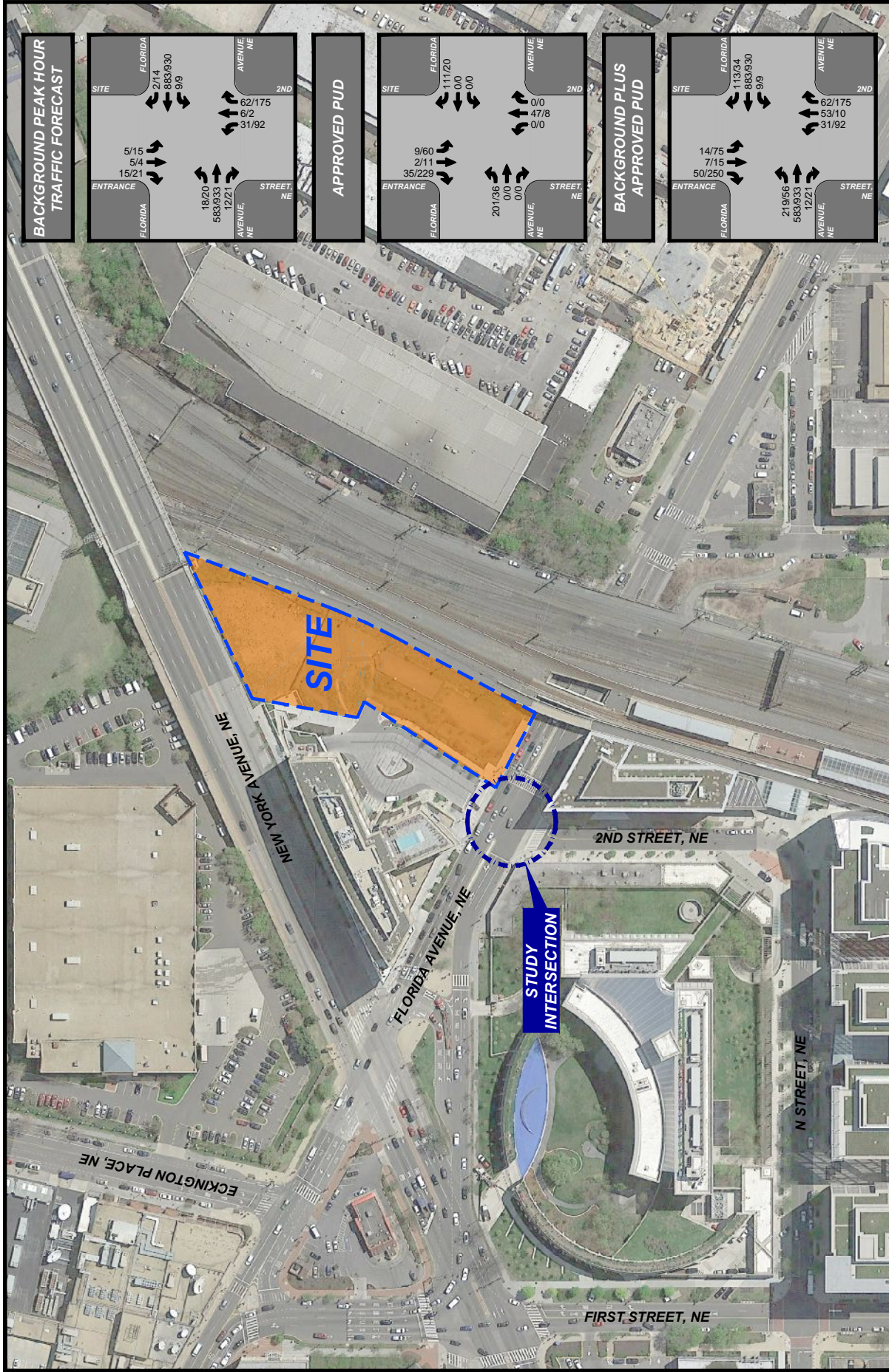


Figure 9
Background Forecasts and Approved PUD Trips
Washington Gateway
Washington, DC

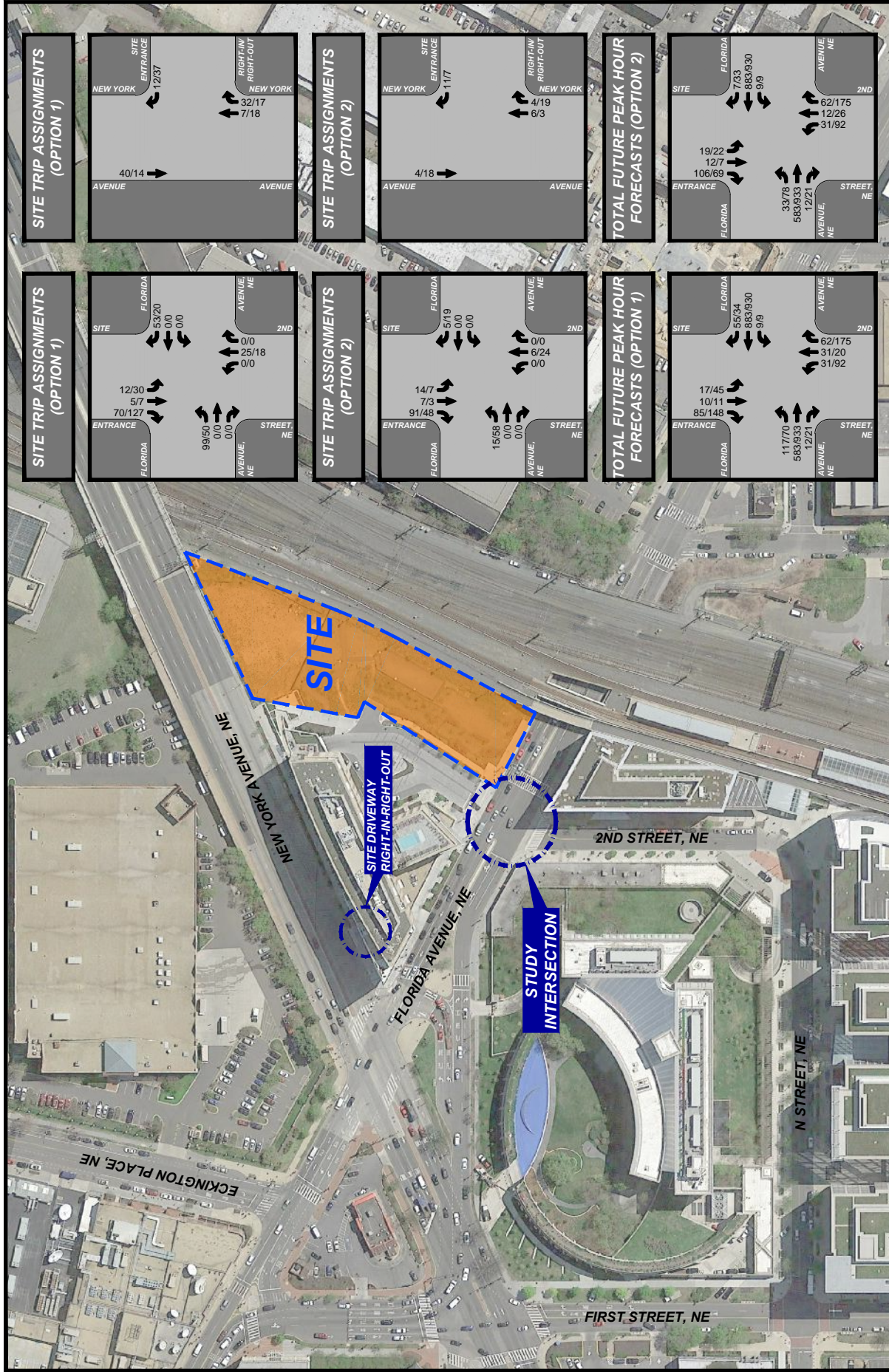
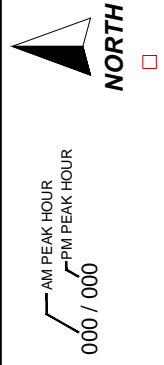


Figure 10
Site Trip Assignments and Total Future Forecasts

Washington Gateway
Washington, DC



Attachment A

Scoping Document

<p>Project Name & Applicant Team: Project Name: Washington Gateway PUD Project Applicant: MRP Residential Matthew Robinson 3050 K Street NW, Suite 125 Washington, DC 20007</p> <p>And</p> <p>Traffic Consultant Wells + Associates Chris Kabatt/Kevin Berger 8730 Georgia Avenue, Suite 200 Silver Spring, MD 20910</p>	
<p>Case Type & No. (PUD, LTR, etc.): PUD 06-14</p>	
<p>Street Address: New York Avenue NE and Florida Avenue NE Washington, DC 20002</p>	
<p>Current Zoning and/or Overlay District: C-3-C</p>	
<p>Date of Filing: Application has not yet been filed</p>	
<p>Estimated Date of Hearing: No hearing date has been designated yet.</p>	
<p>Description of Project: The project is located in Ward 5 on Square 3584 and, specifically, Lots 814, 815, 821, 822, 7000, 7002, 7008, and 7009. The site is located east of the Washington Gateway Phase One development that is located at 100 Florida Avenue NE; south of New York Avenue NE; north of Florida Avenue NE; and west of the Metropolitan Branch Trail, WMATA Metrorail Red Line, and a rail yard.</p> <p>The two project parcels remaining undeveloped are approved for 601,896 SF of office uses. The Applicant (MRP Residential) proposes a Planned Unit Development (PUD) modification which would allow the conversion of the north office building to approximately 372 dwelling units (approximately 339,541 SF) with the south remaining office at 221,691 SF, lowering the density by 40,664 SF. The south office building may also convert to residential but for purposes of this application and scope remains as the approved office.</p>	
<p>General DDOT Comments</p> <ul style="list-style-type: none"> • Please provide a list of PUD transportation-related amenities and when they were delivered or are expected to deliver. • Provide a description and site plan of all on-site transportation improvements (driveway, MBT interim and ultimate conditions, internal pedestrian facilities, etc). Include dimensions and other important design details. 	
<p>1. Strategic Planning Elements (Planning Documents)</p>	
<p>DDOT Comments/Action Items</p>	
<p>Planning Guidelines: The CTR will address how the proposed development considers the primary city-wide</p>	



<p>planning documents, as well as localized studies. See Section 3.1 of the CTR guidelines for more information.</p> <p>Proposed Documents:</p> <ul style="list-style-type: none"> • DDOT Design and Engineering Manual • DDOT Public Realm Design Manual • MoveDC (DC Multimodal Long-Range Transportation Plan) • DC's Transit Future Systems Plan • Florida Avenue Multimodal Transportation Study • The District of Columbia Ward 5 Industrial Land Transformation Study • Transportation Improvement Program (TIP) for the Washington Metropolitan Region • District of Columbia Zoning Regulations • District of Columbia Bicycle Master Plan • District of Columbia Pedestrian Master Plan • Comprehensive Plan 	
2. Roadway Network, Capacity, & Operations	
<p>Vehicle Trip Generation Assumptions</p> <p>Guidelines: Provide preliminary site-generated vehicle trips and mode split assumptions. In addition, provide the assumptions and supporting documentation behind the proposed mode split. See Section 3.2.1 of the CTR guideline for further information.</p> <p>Proposed preliminary mode split and supporting documentation:</p> <p>Peak hour trip generation rates will be established using ITE Trip Generation 9th Edition rates and/or equations.</p> <ul style="list-style-type: none"> • ITE LUC 220 for Residential • ITE LUC 710 for Office • Non-auto mode splits were determined based on the site's proximity to the NoMa-Gallaudet U Metro Station and the WMATA's 2005 Development-Related Ridership Survey. The Ridership Survey indicates that approximately 51 percent of residents would travel via Metrorail and other public transportation modes to/from the site's location, while 40% of the trips generated by the approved office uses would travel by non-automotive transit modes. • A detailed trip generation table is included in Attachment I. <p>The proposed 372 dwelling units and 221,691 SF of office space would generate 209 AM peak hour peak direction trips, compared with the approved 601,896 SF of office space which would generate 425 AM peak hour peak direction trips. During the PM peak hour, the proposed 372 dwelling units and 221,691 SF of office space would generate 201 peak direction trips, compared with the 375 peak direction trips generated by the 601,896 SF of office space. The proposed uses would result in fewer than 25 new vehicle trips in the peak direction during the AM and PM peak hours. Further, the proposed conversion</p>	<p>DDOT Comments/Action Items</p>



	<p>of the north office tower to residential would result in fewer total AM and PM peak hour trips.</p>
<p>Vehicle Site Access</p> <p>Guidelines: If vehicle access is needed, at a minimum the CTR will provide the locations of access point(s) and desired access controls (full, right-in/right-out, etc.). See Section 3.2.2 of the CTR guidelines for any further requirements.</p> <p>Access Location(s):</p> <p>Public access to Washington Gateway Two would be provided by way of the full-movement intersection of Florida Avenue NE/2nd Street NE and an existing right-in/right-out driveway on New York Avenue NE that serves Washington Gateway One. An underground parking garage presently serves the Washington Gateway One building and would connect to the eastern portion of the garage serving Washington Gateway Two. Loading would be provided from the courtyard that is accessible from the Florida Avenue NE/2nd Street NE intersection.</p> <p>Access Control:</p> <p>The intersection of Florida Avenue/2nd Street NE is signalized; the right-in/right-out access on New York Avenue NE is unsignalized.</p> <p>Existing curb cuts utilized:</p> <p>Access to site from the entrance opposite to 2nd Street NE at the Florida Avenue NE intersection. Right-in/right-out entrance along eastbound New York Avenue NE also to be utilized.</p> <p>Existing curb cuts abandoned: None</p> <p>Proposed curb cuts: No additional curb cuts along the public roadway network proposed at this time.</p> <p>Curb cut width and radii: Curb cut widths and radii will be provided on the plans submitted with the application.</p>	
<p>CTR Triggers for further vehicle analysis (for sections below)</p> <p>Guidelines: See Section 3.2.3 of the CTR guidelines to determine if a more comprehensive vehicle analysis is required. If so, completion of the remainder of the <i>Roadway Network, Capacity & Operations</i> section of the scoping form is required.</p> <p>Development Scenarios</p> <p>Guidelines: See Section 3.2.4 of the CTR guidelines for discussion of the required development scenarios.</p> <p>Proposed Development Scenarios:</p> <p>Not triggered. The proposed uses would result in fewer than 25 new vehicle trips in the peak direction</p>	



	<p>during the AM and PM peak hours.</p>
<p><u>Vehicle Study Area</u></p>	<p>Guidelines: See Section 3.2.5 of the CTR guidelines for discussion of the study area. Proposed Study Area intersections, including access points (attach figure at end of Scoping Form as needed):</p>
<p><u>Data Collection and Hours of Analysis</u></p>	<p>Guidelines: See Section 3.2.6 of the CTR guidelines for discussion of the required data collection and hours of analysis. Proposed turning movement count intersections:</p>
<p><u>Roadway Improvements</u></p>	<p>Guidelines: The study will account for approved and funded roadway improvement projects within the study area that are expected to begin before the proposal's horizon year. See Section 3.2.8 of the CTR guidelines. Proposed roadway improvements:</p>
<p><u>Background Developments</u></p>	<p>Guidelines: The study will account for vehicle trips generated by developments in the study area that have an origin/destination within the study area. See Section 3.2.8 of the CTR guidelines. Proposed background development:</p>
<p><u>Background Growth</u></p>	<p>Guidelines: The study will account for annual growth or decrease in through traffic on minor and principal arterials that pass through the proposed study area. See Section 3.2.9 of the CTR guidelines. Proposed annual background growth:</p>
<p><u>Site Trip Distribution & Assignment</u></p>	<p>Guidelines: Trips generated by the site will be distributed throughout the study area network. See Section 3.2.10 of the CTR guidelines for information in trip distribution and assignment. Proposed site distribution and assignment (attach figures, as needed, at end of Scoping Form):</p>



<p><u>Analysis Methodology</u> Guidelines: Capacity analyses are typically performed using Highway Capacity Manual (HCM) methodologies or a similar industry recognized software. See Section 3.2.11 of the CTR guidelines. Proposed analysis methodology:</p>	<p>Please provide an analysis of the 2nd Street/Florida Avenue/Site Driveway intersection to reflect the change in development program. While total trips may be expected to decrease, traffic patterns associated with residential uses are different than those of office users. Please study LOS and 50th & 95th percentile queuing at this intersection during the AM and PM peak periods.</p>
<p><u>Vehicle Trip Mitigation</u> Guidelines: Proposed mitigation of vehicle impacts, if needed, must not add significant delay to other travel modes. Standard non-urban mitigation often includes geometric re-design which may not fit DDOT's practice of balancing safety and capacity across multiple transportation modes. See Section 3.2.12 of the CTR guidelines. For informational purposes only. Mitigation will be documented in the final CTR. No information is required in the scoping form.</p>	
<p>3. Bicycle and Pedestrian Facilities <u>CTR Triggers for Bike and Pedestrian Mode Share</u> Guidelines: A CTR is required to include some level of analysis of the bike and pedestrian network at a minimum, based on several potential factors. See Section 3.3.1 of the CTR guidelines to determine if a more comprehensive analysis is required. If so, complete the remainder of the <i>Bicycle & Pedestrian Facilities</i> section of this scoping form.</p>	<p>DDOT Comments/Action Items</p>
<p><u>CTR Bike and Pedestrian Study Area</u> Guidelines: See Section 3.3.2 of the CTR guidelines to determine bike and pedestrian study areas. Proposed bike and pedestrian study area: <u>A map depicting a one-quarter mile walk shed and bike shed to and from the site will be developed for the CTR.</u> <u>Data Collection and Analysis of Bike and Pedestrian Network and Facilities</u> Guidelines: See Section 3.3.3 of the CTR guidelines for data collection requirements and analysis for bike and pedestrian modes. Proposed bike and pedestrian network and facilities analysis: A discussion of the existing and proposed pedestrian and bicycle facilities in the immediate vicinity of the proposed development will be provided. The proposed New York Avenue Rail-with-Trail project will be discussed in the CTR. Additional relevant information from the Pedestrian Master Plan and Bicycle Master Plan also will be included.</p>	<p>Provide a full description of the revised MBT connection including vertical circulation, layout of the space, hours of operation, etc. If the ultimate MBT connection is not built concurrently with Phase 2, an interim MBT connection in the Phase</p>



<p>3 building footprint is needed.</p> <p>Please set up a meeting with DDOT's bike ped team and development review team to review the interim and ultimate MBT connection and any changes to the MBT.</p> <p>Describe existing and proposed bike facilities/signage/other treatments to connection cyclists from the MBT connection to Florida Avenue.</p> <p>Explore adding the western crosswalk at the 2nd Street/Florida Avenue intersection.</p>	<p>Mitigation for Bike and Pedestrian Network</p> <p>Guidelines: If deficiencies have been documented in the study area's pedestrian or bike facilities that would preclude the proposed mode split, then mitigation of these deficiencies is required. See Section 3.3.4 of the CTR guidelines for mitigation requirements of the bike and pedestrian network.</p> <p>For informational purposes only. Mitigation will be documented in the final CTR. No information is required in the scoping form.</p>
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DDOT Comments/Action Items	
	<p>4. Transit Service</p> <p>CTR Triggers for Transit Mode Share</p> <p>Guidelines: A CTR is required to include some level of analysis of the transit network, based on several potential factors. See Section 3.4.1 of the CTR guidelines to determine the minimum analysis requirements and if a more comprehensive transit analysis is required. If so, completion of the remainder of the <i>Transit Service</i> section of this scoping form is required.</p> <p>CTR Transit Study Area</p> <p>Guidelines: If further analysis of the transit network is triggered, see Section 3.4.2 of the CTR guidelines for determining the requisite study area.</p> <p>Proposed transit study area:</p> <p>The NoMa-Gallaudet U Metro station is located approximately 1/8 mile to the south of the subject site. The NoMa-Gallaudet U station provides direct access to the Red Line. Passengers may transfer to the Yellow and Green Lines at either the Gallery Place-Chinatown or Fort Totten stations or transfer to the Blue, Orange, and Silver Lines at the Metro Center station. Metrobus stops along Florida Avenue NE provide passengers access to routes 90, 92, 93, and X3.</p> <p>Analysis of Transit Network</p>



<p>Guidelines: Analysis of the transit network will incorporate both a quantitative and qualitative review. See Section 3.4.3 of the CTR guidelines for further information.</p> <p>Proposed transit analysis: A discussion of the existing transit facilities—including bus stops and routes, Metrorail Stations, carsharing locations, and Capital Bikeshare locations—in the immediate site vicinity will be provided. Peak hour headways of bus service will be provided. Walking paths to the NoMa-Gallaudet U Metro station and nearest bus stops will be exhibited.</p>	
<p><u>Transit Trip Mitigation</u> Guidelines: Proposed mitigation of transit impact may be needed, given certain impacts to the network. See Section 3.4.4 of the CTR guidelines for more information.</p> <p>For informational purposes only. Mitigation will be documented in the final CTR. No information is required in the scoping form.</p>	
5. Site Access and Loading	
<p>Guidelines: At a minimum, the Applicant is required to show site access for vehicles, pedestrians and bicyclists. In addition, DDOT has additional policies for site access and loading as they relate to public space. See Section 3.5 of the CTR guidelines for additional information regarding these policies.</p> <p>Freight/Delivery The study will identify existing and proposed commercial vehicle access to the site. See Section 3.5.1 of the CTR guidelines.</p> <p>Motorcoach For developments that will generate significant tourist activity (hotels, museums, etc.) the study will discuss the site plan's accommodation of motorcoach access. See Section 3.5.2 of the CTR guidelines.</p> <p>Proposed loading analysis: Loading requirements outlined in the District of Columbia Municipal Regulations (DCMR) are summarized below.</p> <p><u>Loading Requirements</u> <u>Residential</u></p> <ul style="list-style-type: none"> • One 55-foot loading berth • One 200 SF loading platform • One 20-foot service/delivery space <p>The proposed north tower development will provide one 55-foot loading berth.</p>	<p>Provide site access and circulation diagrams for all modes.</p>



Autoturns will be provided showing trucks entering and exiting the site.	<p>6. Parking</p> <p>Guidelines: Minimum requirements exist for documenting parking needs and constraints, regardless of development size. Further requirements may be needed for larger developments. See Section 3.6 of the CTR guidelines.</p> <p>Proposed parking analysis: Parking requirements outlined in the DCMR are summarized below.</p> <p>C-3-C District: <u>372 Residential Units</u></p> <ul style="list-style-type: none"> • One vehicular parking space for every 4 dwelling units • 93 spaces required • 186 spaces proposed <p><u>South Tower Office (221,691 SF)</u></p> <ul style="list-style-type: none"> • 1 space per 1,800 SF • 123 spaces required • 123 spaces proposed <p>The proposed development will provide 309 vehicular parking spaces for the north and south towers.</p> <p>District law requires one bicycle parking space per three residential units. Therefore, 124 bicycle spaces would be required for the residential component. The proposed north tower development will provide 124 bicycle parking spaces.</p> <p>7. Transportation Demand Management Triggers for a TDM Plan</p> <p>Guidelines: All developments are encouraged to produce TDM plans, regardless of size. See Section 3.7 of the CTR guidelines.</p> <p>Proposed TDM Plan: Transportation Demand Management (TDM) strategies and incentives for encouraging alternative modes of transportation will be identified.</p> <p>8. Performance Monitoring & Measurement</p> <p>Guidelines: Development of a certain size may need to incorporate a performance monitoring element as a condition of zoning approval. See Section 3.8 of the CTR guidelines for more information.</p> <p>For informational purposes only. Requirements for performance monitoring will be coordinated with the DDOT case manager.</p>
	Provide a complete description of the proposed parking changes. Indicate parking ratios for Phases 2/3 and the development as a whole.



<p>9. Safety</p> <p>Guidelines: The CTR will demonstrate that the site will not create or exacerbate existing issues for all modes of travel. See Section 3.9 of the CTR guidelines for further information.</p> <p>Proposed safety analysis: Crash data for the study intersections for the most recent three years of data available will be requested from DDOT. Crash rates at each study intersection will be broken down by crash type for any intersections with a crash rate over 1.0 per MEV. Any pedestrian/bike related accidents will also be noted in the study. The project team will provide the sight distance evaluation for all the unsignalized site entrances.</p>	
<p>10. Streetscape/Public Realm</p> <p>Guidelines: DDOT expects new developments to rehabilitate streetscape infrastructure between the curb and property lines. The applicant must work closely with DDOT and OP to ensure that design of the public realm meets current standards. See Section 3.10 of the CTR guidelines for direction on streetscape rehabilitation.</p> <p>These guidelines are provided to inform that public realm design standards may alter an Applicant's intended use of public space.</p>	<p>Continue discussions with DDOT and PEPCO regarding additional vault needs and placement.</p> <p>DDOT does not support additional vaults in the sidewalk with adequate buffering. In addition, the stairway landing at the top of New York Avenue should be reviewed particularly closely so that the stairway landing does not occur on top of a vault. Confirm with Pepco the need for additional vaults. Vault locations consistent with DDOT's policy on vault location must be fully explored.</p>

Information/Data Requests (List requested data from DDOT after each field below:

- District planning documents: N/A
- Local planning documents, including small area plans: N/A
- Information on programmed and/or funded roadway improvements in study area: N/A
- Studies for background developments in study area: N/A
- Signal Timings: N/A



- **Crash:** Crash data for the study intersections for the most recent three years of data available are requested from DDOT.

Proposed Scheduled:

Submit Scoping Document: [May 24, 2016](#)

DDOT comments on Scoping Document:

Transportation Consultant/Applicant responses to comments: [Unknown at this time](#)

Submission of Report to DDOT: [Unknown at this time](#)

Zoning Commission or BZA Hearing Date: [Unknown at this time](#)

Attach any Figures, Tables, and Appendices here:

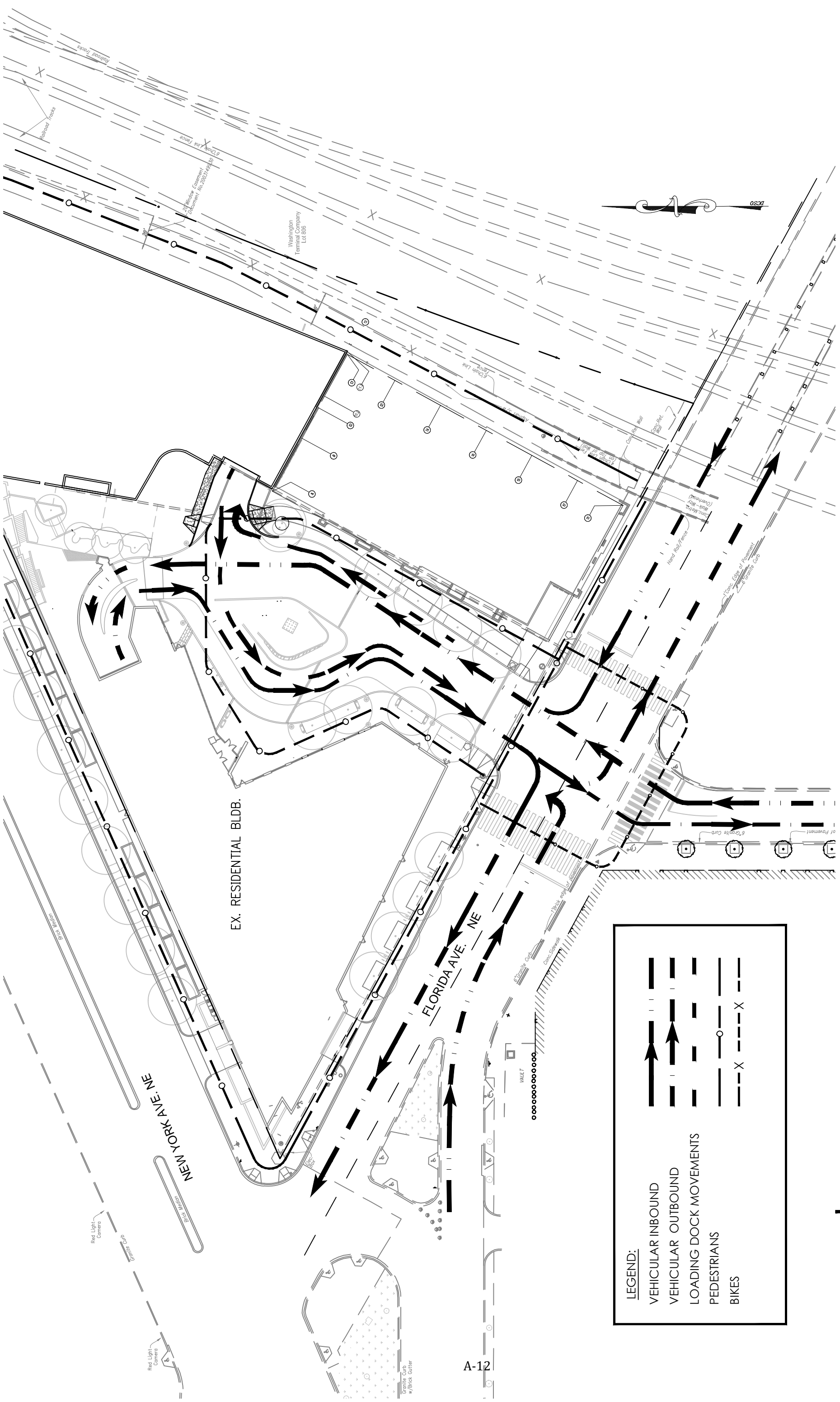


Attachment I
Washington Gateway PUD
Site Trip Generation

Development/Land Use	ITE Code	Size	Unit	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Approved Use									
Office	710	601,896 40%	SF	708 <u>(283)</u> 425	96 <u>(38)</u> 58	804 <u>(321)</u> 483	128 <u>(51)</u> 77	625 <u>(250)</u> 375	753 <u>(301)</u> 452
<i>Transit Mode Share Reduction</i> Office Vehicle Trips									
Proposed Use									
Residential (Apartments)	220	372 51%	DU's	37 <u>(19)</u> 18	149 <u>(76)</u> 73	186 <u>(95)</u> 91	144 <u>(73)</u> 71	78 <u>(40)</u> 38	222 <u>(113)</u> 109
<i>Transit Mode Share Reduction</i> Residential Vehicle Trips									
Office	710	221,691 40%	SF	319 <u>(128)</u> 191	43 <u>(17)</u> 26	362 <u>(145)</u> 217	56 <u>(22)</u> 34	271 <u>(108)</u> 163	327 <u>(130)</u> 197
<i>Transit Mode Share Reduction</i> Office Vehicle Trips									
Total Proposed Vehicle Trips				209	99	308	105	201	306
				(216)	41	(175)	28	(174)	(146)
					(216)			(174)	

Notes:

1. Number of trips generated estimated using Institute of Transportation Engineers (ITE), Trip Generation, Ninth Edition.
2. Transit mode share reductions were estimated based on regression equations used in the 2005 Development-Related Ridership Survey Final Report by the Washington Metropolitan Area Transit Authority, March 2006; and the proximity to the NoMA-Gallaudet U Metro Station.



LEGEND:

- VEHICULAR INBOUND (thick solid line with arrow)
- VEHICULAR OUTBOUND (thick dashed line with arrow)
- LOADING DOCK MOVEMENTS (dashed line)
- PEDESTRIANS (thin solid line with circle)
- BIKES (thin dashed line with X)

MRP | REALTY

Washington Gateway | Washington, DC

Phase 2 | Circulation Plan

April 15, 2016 | **C-010**



Attachment B

Vehicle, Pedestrian, and Bicycle Count Data

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

Time Period		Southbound Driveway					Westbound Florida Avenue - NE					Northbound 2nd Street NE					Eastbound Florida Avenue - NE					North & South	East & West	Total																								
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF																											
PROJECT: Washington Gateway II																						DATE: 6/14/2016					SOUTHBOUND ROAD: Driveway																					
W+A JOB NO: 6816																						DAY: Tuesday					NORTHBOUND ROAD: 2nd Street NE																					
INTERSECTION: Florida Ave. & 2nd Street																						WEATHER: clear					WESTBOUND ROAD: Florida Avenue - NE																					
LOCATION: Washington, DC																						COUNTED BY: Gina & Boddie					EASTBOUND ROAD: Florida Avenue - NE																					
																						INPUT BY: agan																										
AM 15 Minute Volumes																																																
7:00 AM - 7:15 AM	1	2	0	3		3	159	1	163		1	1	4	6		2	67	5	74		9	237	246																									
7:15 AM - 7:30 AM	2	5	0	7		4	166	3	173		1	1	9	11		5	76	7	88		18	261	279																									
7:30 AM - 7:45 AM	8	2	1	11		3	154	1	158		11	0	9	20		4	89	7	100		31	258	289																									
7:45 AM - 8:00 AM	4	1	1	6		4	156	0	160		5	3	7	15		1	100	7	108		21	268	289																									
8:00 AM - 8:15 AM	4	1	1	6		2	156	0	158		14	2	10	26		3	117	6	126		32	284	316																									
8:15 AM - 8:30 AM	3	0	0	3		0	185	1	186		12	2	9	23		4	109	3	116		26	302	328																									
8:30 AM - 8:45 AM	6	1	1	8		0	176	4	180		18	3	5	26		4	111	4	119		34	299	333																									
8:45 AM - 9:00 AM	3	1	2	6		0	146	4	150		8	0	8	16		2	117	5	124		22	274	296																									
9:00 AM - 9:15 AM	3	3	2	8		2	175	0	177		16	1	8	25		2	98	6	106		33	283	316																									
9:15 AM - 9:30 AM	2	0	0	2		0	166	0	166		8	3	14	25		2	110	2	114		27	280	307																									
9:30 AM - 9:45 AM	7	1	0	8		2	147	2	151		13	7	12	32		5	85	5	95		40	246	286																									
9:45 AM - 10:00 AM	8	3	0	11		1	158	0	159		13	1	13	27		0	109	2	111		38	270	308																									
Total	51	20	8	79		21	1944	16	1981		120	24	108	252		34	1188	59	1281		331	3262	3593																									
AM One Hour Volumes																																																
7:00 AM - 8:00 AM	15	10	2	27	0.61	14	635	5	654	0.95	18	5	29	52	0.65	12	332	26	370	0.86	79	1024	1103																									
7:15 AM - 8:15 AM	18	9	3	30	0.68	13	632	4	649	0.94	31	6	35	72	0.69	13	382	27	422	0.84	102	1071	1173																									
7:30 AM - 8:30 AM	19	4	3	26	0.59	9	651	2	662	0.89	42	7	35	84	0.81	12	415	23	450	0.89	110	1112	1222																									
7:45 AM - 8:45 AM	17	3	3	23	0.72	6	673	5	684	0.92	49	10	31	90	0.87	12	437	20	469	0.93	113	1153	1266																									
8:00 AM - 9:00 AM	16	3	4	23	0.72	2	663	9	674	0.91	52	7	32	91	0.88	13	454	18	485	0.96	114	1159	1273																									
8:15 AM - 9:15 AM	15	5	5	25	0.78	2	682	9	693	0.93	54	6	30	90	0.87	12	435	18	465	0.94	115	1158	1273																									
8:30 AM - 9:30 AM	14	5	5	24	0.75	2	663	8	673	0.93	50	7	35	92	0.88	10	436	17	463	0.93	116	1136	1252																									
8:45 AM - 9:45 AM	15	5	4	24	0.75	4	634	6	644	0.91	45	11	42	98	0.77	11	410	18	439	0.89	122	1083	1205																									
9:00 AM - 10:00 AM	20	7	2	29	0.66	5	646	2	653	0.92	50	12	47	109	0.85	9	402	15	426	0.93	138	1079	1217																									
Total	76	12	42	130		51	1706	37	1794		318	13	247	578		66	1958	67	2091		708	3885	4593																									
PM 15 Minute Volumes																																																
4:00 PM - 4:15 PM	9	0	5	14		3	155	0	158		26	0	31	57		7	183	7	197		71	355	426																									
4:15 PM - 4:30 PM	8	1	1	10		5	148	2	155		32	0	21	53		5	161	6	172		63	327	390																									
4:30 PM - 4:45 PM	5	0	7	12		2	146	0	148		43	1	23	67		7	176	6	189		79	337	416																									
4:45 PM - 5:00 PM	5	1	4	10		4	149	0	153		42	0	23	65		6	153	2	161		75	314	389																									
5:00 PM - 5:15 PM	5	2	3	10		4	157	2	163		36	1	21	58		5	191	5	201		68	364	432																									
5:15 PM - 5:30 PM	6	1	1	8		4	136	7	147		27	0	21	48		2	201	7	210		56	357	413																									
5:30 PM - 5:45 PM	3	0	7	10		22	129	10	161		18	1	13	32		3	196	5	204		42	365	407																									
5:45 PM - 6:00 PM	9	1	5	15		2	146	1	149		28	2	23	53		5	172	3	180		68	329	397																									
6:00 PM - 6:15 PM	4	1	4	9		3	127	11	141		21	3	22	46		8	168	6	182		55	323	378																									
6:15 PM - 6:30 PM	11	5	3	19		2	141	2	145		17	2	9	28		7	136	9	152		47	297	344																									
6:30 PM - 6:45 PM	8	0	1	9		0	131	1	132		16	0	22	38		6	117	5	128		47	260	307																									
6:45 PM - 7:00 PM	3	0	1	4		0	141	1	142		12	3	18	33		5	104	6	115		37	257	294																									
Total	76	12	42	130		51	1706	37	1794		318	13	247	578		66	1958	67	2091		708	3885	4593																									
PM One Hour Volumes																																																
4:00 PM - 5:00 PM	27	2	17	46	0.82	14	598	2	614	0.97	143	1	98	242	0.90	25	673	21	719	0.91	288	1333	1621																									
4:15 PM - 5:15 PM	23	4	15	42	0.88	15	600	4	619	0.95	153	2	88	243	0.91	23	681	19	723	0.90	285	1342	1627																									
4:30 PM - 5:30 PM	21	4	15	40	0.83	14	588	9	611	0.94	148	2	88	238	0.89	20	721	20	761	0.91	278	1372	1650																									
4:45 PM - 5:45 PM	19	4	15	38	0.95	34	571	19	624	0.96	123	2	78	203	0.78	16	741	19	776	0.92	241	1400	1641																									
5:00 PM - 6:00 PM	23	4	16	43	0.72	32	568	20	620	0.95	109	4	78	191	0.82	15	760	20	795	0.95	234	1415	1649																									
5:15 PM - 6:15 PM	22	3	17	42	0.70	31	538	29	598	0.93	94	6	79	179	0.84	18	737	21	776	0.92	221	1374	1595																									
5:30 PM - 6:30 PM	27	7	19	53	0.70	29	543	24	596	0.93	84	8	67	159	0.75	23	672	23	718	0.88	212	1314	1526																									
5:45 PM - 6:45 PM	32	7	13	52	0.68	7	545	15	567	0.95	82	7	76	165	0.78	26	593	23	642	0.88	217	1209	1426																									
6:00 PM - 7:00 PM	26	6	9	41	0.54	5	540	15	560	0.97	66	8	71	145	0.79	26	525	26	577	0.79	186	1137	1323																									

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

<p>PROJECT: Washington Gateway II W+A JOB NO: 6816 INTERSECTION: Florida Ave. & 2nd Street LOCATION: Washington, DC DATE: 6/14/2016 DAY: Tuesday WEATHER: clear COUNTED BY: Gina INPUTED BY: agan</p>	<p style="text-align: center;">Florida Avenue - NE Driveway Florida Avenue - NE 2nd Street NE North</p>
--	---

Time Period	Movement								1 + 2	3 + 4	5 + 6	7 + 8	Total
	1	2	3	4	5	6	7	8					
AM 15 Minute Volumes													
7:00 AM - 7:15 AM	6	7	7	20	11	2							
7:15 AM - 7:30 AM	3	5	4	19	15	20							
7:30 AM - 7:45 AM	5	5	3	18	13	23							
7:45 AM - 8:00 AM	4	3	6	21	11	21							
8:00 AM - 8:15 AM	5	9	4	27	17	49	1	2					
8:15 AM - 8:30 AM	10	24	8	37	20	88	3	8					
8:30 AM - 8:45 AM	3	17	2	28	23	81	4	11					
8:45 AM - 9:00 AM		15	2	19	20	60		6					
9:00 AM - 9:15 AM	5	17	6	28	18	49	1	8					
9:15 AM - 9:30 AM	1	8	7	13	11	34		3					
9:30 AM - 9:45 AM	14	13	13	14	22	53		4					
9:45 AM - 10:00 AM	2	9	7	15	7	19	1	2					
Total	58	132	69	259	188	499	10	67					
AM One Hour Volumes													
7:00 AM - 8:00 AM	18	20	20	78	50	66	0	23	38	98	116	23	275
7:15 AM - 8:15 AM	17	22	17	85	56	113	1	19	39	102	169	20	330
7:30 AM - 8:30 AM	24	41	21	103	61	181	4	22	65	124	242	26	457
7:45 AM - 8:45 AM	22	53	20	113	71	239	8	27	75	133	310	35	553
8:00 AM - 9:00 AM	18	65	16	111	80	278	8	27	83	127	358	35	603
8:15 AM - 9:15 AM	18	73	18	112	81	278	8	33	91	130	359	41	621
8:30 AM - 9:30 AM	9	57	17	88	72	224	5	28	66	105	296	33	500
8:45 AM - 9:45 AM	20	53	28	74	71	196	1	21	73	102	267	22	464
9:00 AM - 10:00 AM	22	47	33	70	58	155	2	17	69	103	213	19	404
PM 15 Minute Volumes													
4:00 PM - 4:15 PM	7	5	18	1	10	8	5	2					
4:15 PM - 4:30 PM	10	5	15	6	17	12	1						
4:30 PM - 4:45 PM	1	5	13	17	19	11	20						
4:45 PM - 5:00 PM	4	4	15	3	10		3	1					
5:00 PM - 5:15 PM	13	4	24	9	17	32	2						
5:15 PM - 5:30 PM	20	2	31	4	21	21	9	1					
5:30 PM - 5:45 PM	30	6	57	14	15	10	10	1					
5:45 PM - 6:00 PM	18	8	35	19	10	16	3	4					
6:00 PM - 6:15 PM	14	10	37	8	24	22	3	3					
6:15 PM - 6:30 PM	9	17	27	18	16	14	10	2					
6:30 PM - 6:45 PM	12	6	43	8	15	8	2						
6:45 PM - 7:00 PM	16	15	33	17	13	13	6						
Total	154	87	348	124	187	167	74	14					
PM One Hour Volumes													
4:00 PM - 5:00 PM	22	19	61	27	56	31	29	3	41	88	87	32	248
4:15 PM - 5:15 PM	28	18	67	35	63	55	26	1	46	102	118	27	293
4:30 PM - 5:30 PM	38	15	83	33	67	64	34	2	53	116	131	36	336
4:45 PM - 5:45 PM	67	16	127	30	63	63	24	3	83	157	126	27	393
5:00 PM - 6:00 PM	81	20	147	46	63	79	24	6	101	193	142	30	466
5:15 PM - 6:15 PM	82	26	160	45	70	69	25	9	108	205	139	34	486
5:30 PM - 6:30 PM	71	41	156	59	65	62	26	10	112	215	127	36	490
5:45 PM - 6:45 PM	53	41	142	53	65	60	18	9	94	195	125	27	441
6:00 PM - 7:00 PM	51	48	140	51	68	57	21	5	99	191	125	26	441

Attachment C

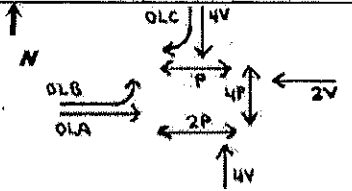
DDOT Signal Timings

233

Rev - 06/19/2012

FLORIDA AVENUE AND 2ND STREET, N.E.

1



DEPARTMENT OF TRANSPORTATION
WASHINGTON, D.C.
TRANSPORTATION OPERATIONS
ADMINISTRATION

ACISA ID 3457 TS- 1776-B
ISNUM 1607 S- 2317A

C + 0 + F = 1 <F + PHASE + INTVL>	PHASE TIMING BANK								PREEMPT TIMING	
	PHASE								< F/1 + E + row >	
INTERVAL	1	2	3	4	5	6	7	8		
WALK	0	4	4	4	7				EVA DELAY	2
FLASH DW	1	1	10	10	16				EVA CLEAR	3
MIN. GREEN	2	7	10	7	7				EVB DELAY	4
TYPE 3 LIMIT	3								EVB CLEAR	5
ADD/VEH	4								EVC DELAY	6
VEH EXTENSION	5	1	1	1	3				EVC CLEAR	7
MAX GAP	6	1	1	1	3				EVD DELAY	8
MIN GAP	7	1	1	1	3				EVD CLEAR	9
MAXIMUM	8	65	45	45	35				BUS PRIORITY PARAMETERS	
MAXIMUM 2	9								< F/1 + A + row >	
ADVANCE / DELAY WALK	A								BUS DELAY	D
PREEMPT PED. CLEARANCE	B								MAX EARLY GREEN	E
CONDITIONAL SERVICE MINIMUM	C								MAX GREEN EXTN	F
REDUCE EVERY	D								Min Grn Bef PE Forceoff	
YELLOW	E	4	4	4	4				MAX PREEMPT TIME	
RED CLEAR	F	1	1	1	1				Min Time Blwn Same PE	

C + 0 + E = 28		OVERLAP CONFIG			
FUNCTION	OLA	OLB	OLC	OLD	
SET 1 (Overlapped Phases)	1,2,3	1,3	1,3		
NEG V		2	2		
NEG P					
GREEN EXTENSION					
YELLOW EXTENSION	4	4	4		
RED EXTENSION	1	0.5	0.5		

COORDINATION FUNCTIONS	PHASE								NOTES
FUNCTION	1	2	3	4	5	6	7	8	
LAG PHASES (Check by phases)									
SYNC PHASES (Check by phases)	x								

C+0+C=1; C + <PLAN> + <FEATURE>		COORDINATION TIMING PLAN								
FEATURE		1	2	3	4	5	6	7	8	9
CYCLE TIME	0	100	150	150	100	100	120	120		
FORCE OFF 1	1	74	123	117	74	75	75	84	88	
FORCE OFF 2	2	0	0	0	0	0	0	0	0	
FORCE OFF 3	3	30	41	32	28	30	30	30	30	
FORCE OFF 4	4	59	70	61	57	59	59	58	59	
FORCE OFF 5	5									
FORCE OFF 6	6									
FORCE OFF 7	7									
FORCE OFF 8	8	59	70	61	57	59	59	57	59	
OFFSET A	A	60	108	58	61	95	13	88	29	
END PERMISSIVE 1	D	5	5	5	5	5	5	5	5	
PRETIMED (Check by co-ord plan)		1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	
MAX RECALL (Check by co-ord plan)										
PERM 1 VEH (Check by co-ord plan)		4	4	4	4	4	4	4	4	
PERM 1 PED (Check by co-ord plan)		4	4	4	4	4	4	4	4	

C + 0 + E = 125		CONFIG DATA PHASE							
FEATURE		1	2	3	4	5	6	7	8
OVERLAP FL YEL	9								
EM VEH A	A								
EM VEH B	B								
EM VEH C	C								
EM VEH D	D								

C + 0 + E = 126		CONFIG DATA PHASE							
FEATURE		1	2	3	4	5	6	7	8
PED 2P	5	X	X	X					
PED 6P	6		X						
PED 4P	7				X				
PED 8P	8								
FLASH YELLOW	9		X					X	
LOW PRIORITY A	A								
LOW PRIORITY B	B								
LOW PRIORITY C	C								
LOW PRIORITY D	D								
RESTRICT	E								
EXTRA 2 BITS	F								

EVENT	TIME	PLAN	OFFSET	DAY OF WEEK	NOTES
EVENT 0	0:00	1	A	1234567	
EVENT 1	5:30	5	A	23456	
EVENT 2	10:00	4	A	23456	
EVENT 3	14:30	6	A	23456	
EVENT 4	19:00	1	A	23456	
EVENT 5	10:00	4	A	7	
EVENT 6	19:00	1	A	7	

C + 0 + F = 1		PHASE FUNCTIONS							
F + F + FEATURE		1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X				
RED LOCK	1								
YELLOW LOCK	2								
VEH RECALL	3								
PED RECALL	4		X						
REST IN WALK	5								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9	X	X	X					
SOFT RECALL	A								
MAX 2	B								
COND SERVICE	C								
EXT CONT. CALL	D								
YELLOW START UP	E								
FIRST PHASE GRN	F		X					X	

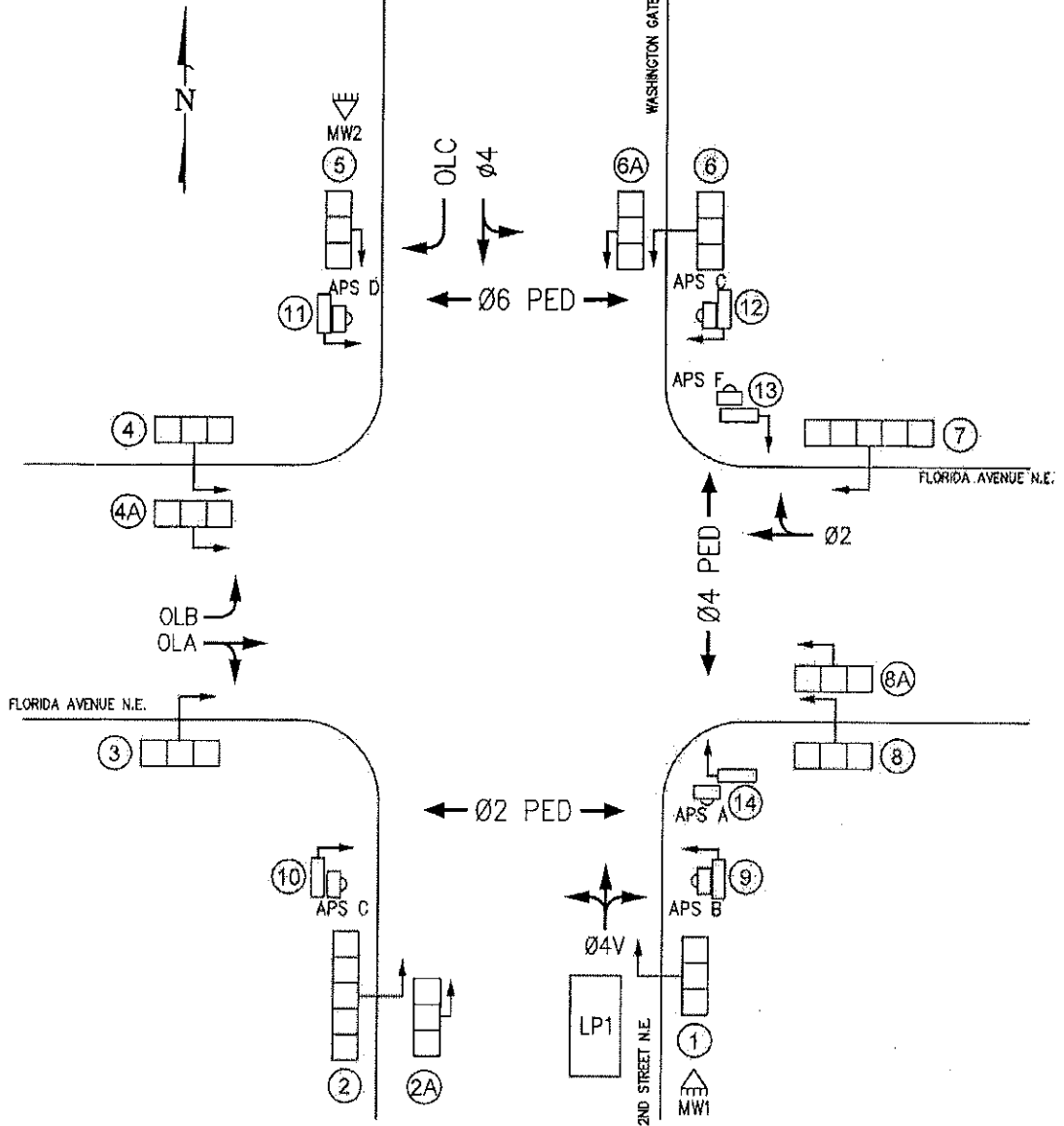
C + 0 + F = 2		PHASE FUNCTIONS							
F + F + FEATURE		1	2	3	4	5	6	7	8
GREEN FLASH									
FLASH WALK									
ADVANCED WALK									
DELAYED WALK									

NOTES:
SET THE COUNTDOWN SIGNALS TO BEGIN WITH FDW INTERVALS. USE MC-1 FIRMWARE.

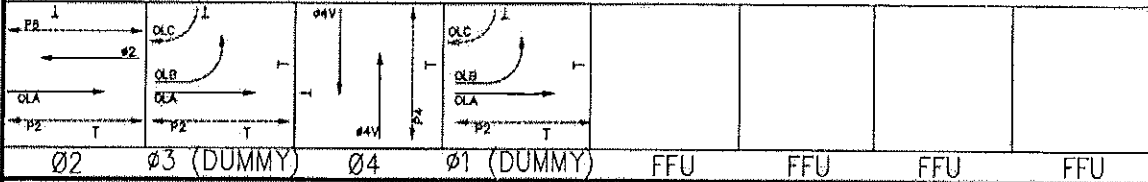
PREPARED BY:
WELLS & ASSOCIATES
WORKSHOP ORDER NO: **8-07-14-29**
APPROVED BY:
William W. M. Quirk 7/29/2014
DATE INSTALLED:
INSTALLED BY:

SIGNAL HEAD NO. 2A, 4A, 6A AND 8A ARE MOUNTED ON 8 FOOT LONG MAST ARMS

PHASE ASSIGNMENTS



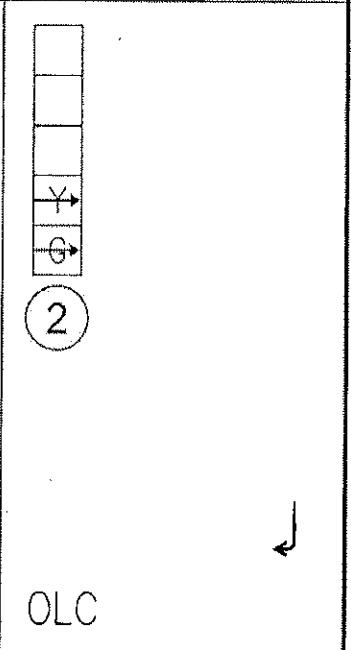
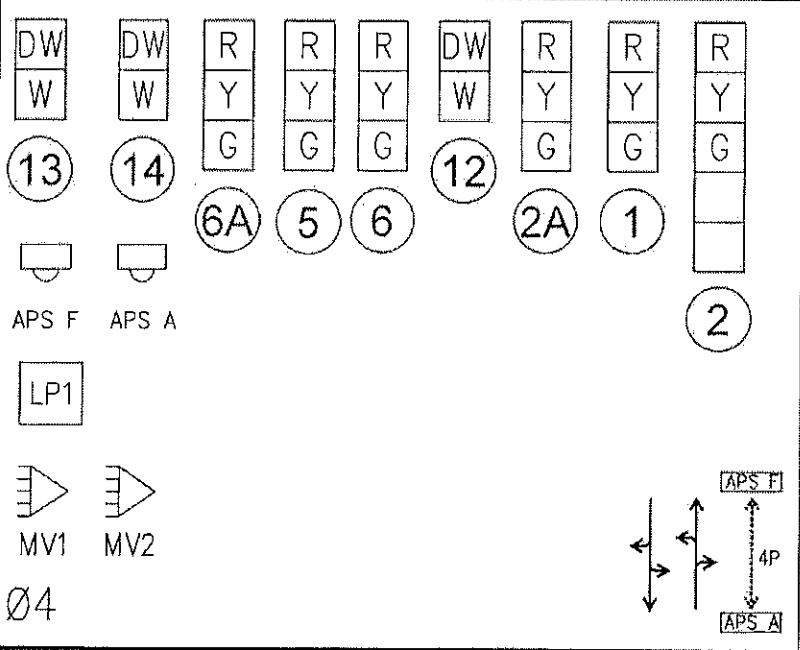
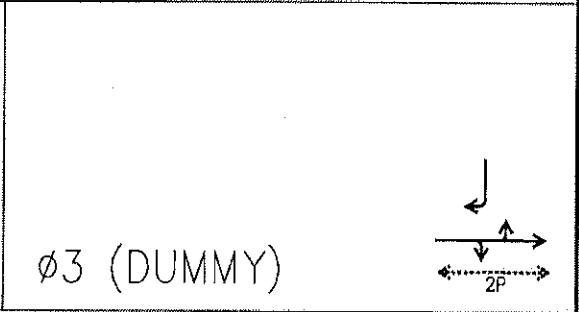
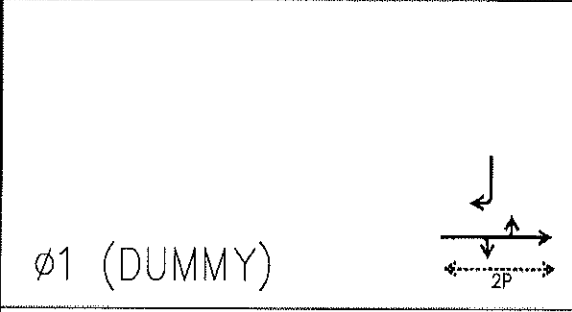
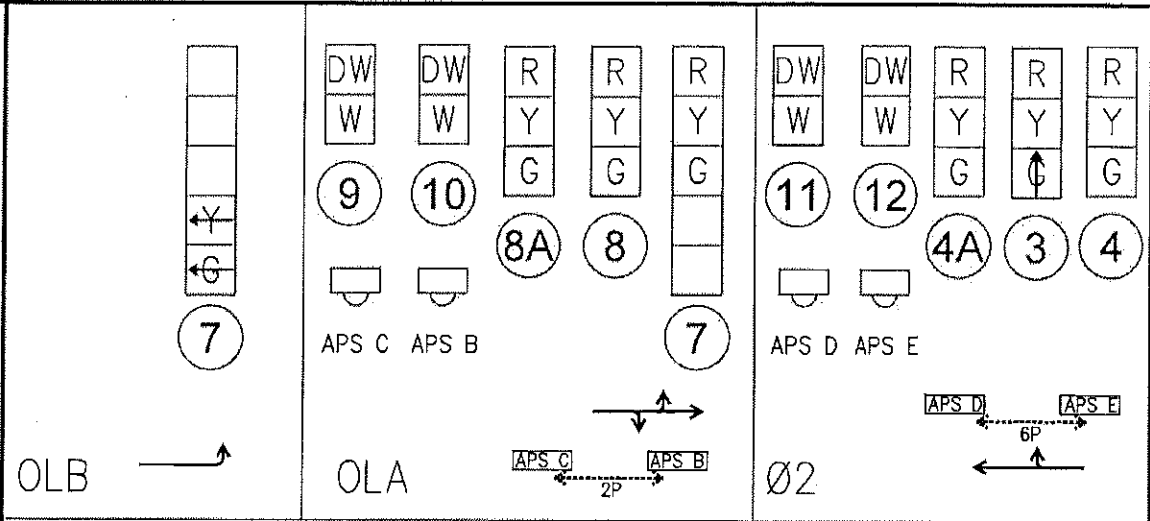
PHASING DIAGRAM



TRAFFIC SIGNAL OPERATION
2ND STREET AND FLORIDA AVENUE N.E.

D.C. DEPARTMENT OF TRANSPORTATION TRAFFIC SERVICES ADMINISTRATION		SUBMITTED: <u>WELLS & ASSOCIATES</u>	T.S. 1776-B
CHECKED BY: LES	DATE: 07/28/14	RECOMMENDED:	SHEET
DRAWN BY: JCP	DATE: 07/28/14	APPROVED: <u>William W. M. Smith 7/29/2014</u>	1 OF 4
IN SERVICE:	DATE:	CHIEF, SIGNAL DESIGN BRANCH DIVISION CHIEF	

SIGNAL HEAD NO. 2A, 4A, 6A AND 8A ARE MOUNTED ON 8 FOOT LONG MAST ARMS



TRAFFIC SIGNAL OPERATION
2ND STREET AND FLORIDA AVENUE N.E.

D.C. DEPARTMENT OF TRANSPORTATION
TRAFFIC SERVICES ADMINISTRATION

CHECKED BY: LES DATE: 07/29/14
DRAWN BY: JCP DATE: 07/29/14
IN SERVICE: DATE:

SUBMITTED: _____

RECOMMENDED: _____
CHIEF, SIGNAL DESIGN BRANCH

APPROVED: _____
DIVISION CHIEF

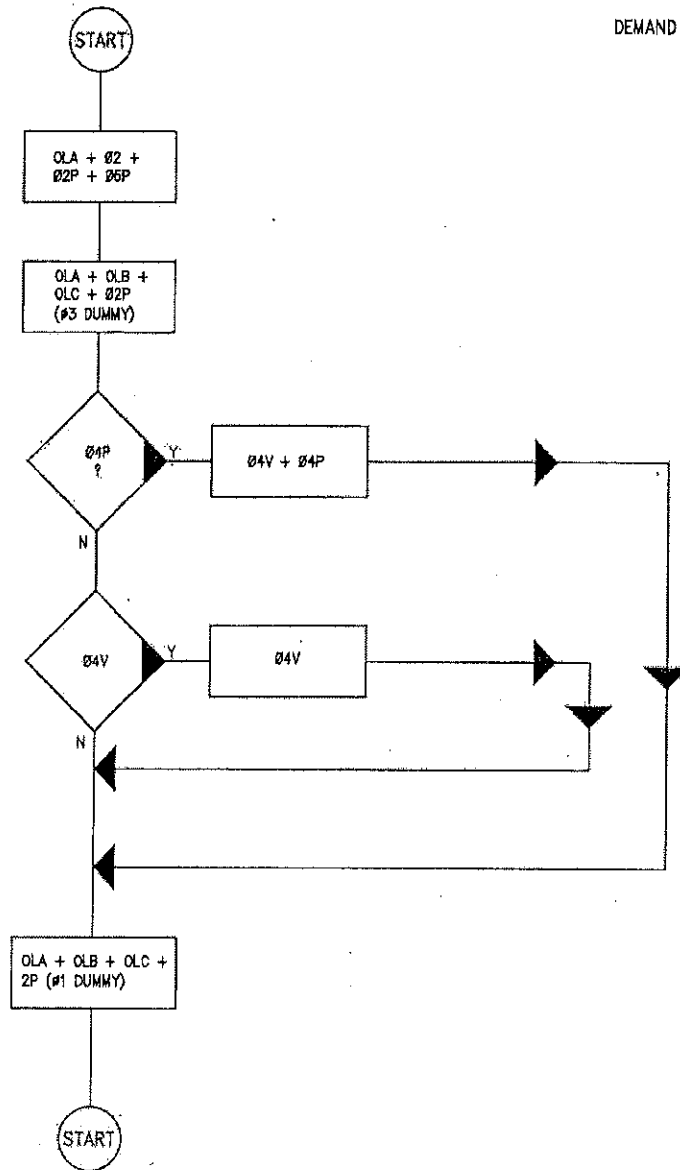
T.S.
1776-B
SHEET
2 OF 4

SIGNAL HEAD NO. 2A, 4A, 6A AND 8A ARE MOUNTED ON 8 FOOT LONG MAST ARMS

PHASE SEQUENCE

RECALL 02V + 02P
06V + 06P
05V

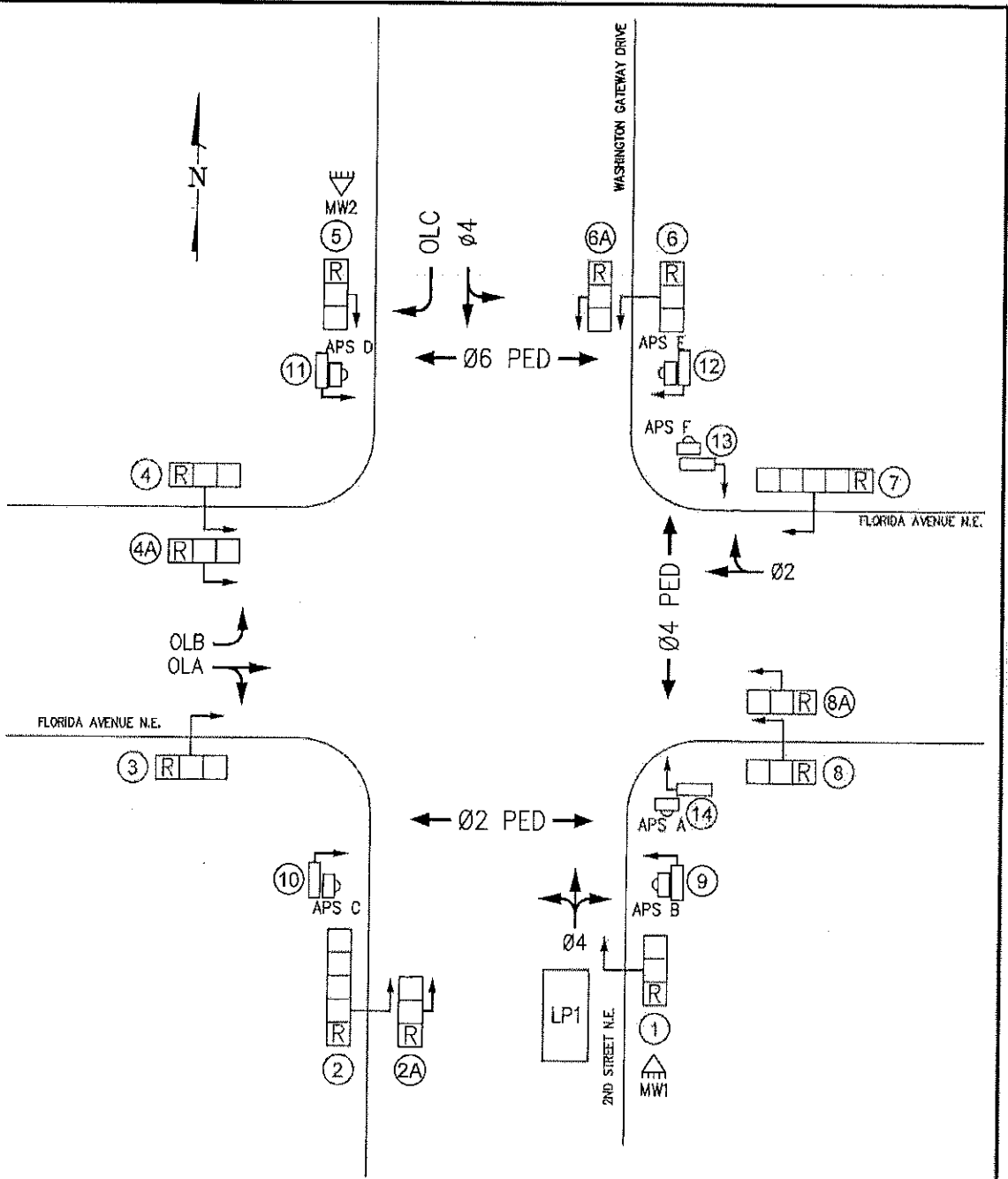
DEMAND 04V
04P



TRAFFIC SIGNAL OPERATION 2ND STREET AND FLORIDA AVENUE N.E.

D.C. DEPARTMENT OF TRANSPORTATION TRAFFIC SERVICES ADMINISTRATION		SUBMITTED: _____	T.S.
CHECKED BY: LES	DATE: 07/29/14	RECOMMENDED: _____	1776-B
DRAWN BY: JCP	DATE: 07/29/14	CHIEF, SIGNAL DESIGN BRANCH	SHEET
IN SERVICE:	DATE:	APPROVED: _____	3 OF 4
		DIVISION CHIEF	

SIGNAL HEAD NO. 2A, 4A, 6A AND 8A ARE MOUNTED ON 8 FOOT LONG MAST ARMS



FLASH

SIGNAL OPERATES ON COLOR 24 HOURS PER DAY;
FLASH FOR EMERGENCY USE ONLY

TRAFFIC SIGNAL OPERATION
2ND STREET AND FLORIDA AVENUE N.E.

D.C. DEPARTMENT OF TRANSPORTATION TRAFFIC SERVICES ADMINISTRATION		SUBMITTED: _____	T.S.
CHECKED BY: LES	DATE: 07/29/14	RECOMMENDED: _____	1776-B
DRAWN BY: JCP	DATE: 07/29/14	CHIEF SIGNAL DESIGN BRANCH	SHEET
IN SERVICE:	DATE:	APPROVED: _____	4 OF 4
		DIVISION CHIEF	

Attachment D

Levels of Service Descriptions

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Table 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

Attachment E

Existing Conditions Levels of Service and Queues

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	495	745	103	12	19
v/c Ratio	0.19	0.97	0.48	0.07	0.02
Control Delay	4.3	66.9	23.9	33.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	66.9	23.9	33.1	4.9
Queue Length 50th (ft)	18	187	25	7	3
Queue Length 95th (ft)	52	#268	64	18	8
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2653	766	327	320	813
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.97	0.31	0.04	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	18	435	12	9	682	2	30	6	54	5	5	15
Future Volume (vph)	18	435	12	9	682	2	30	6	54	5	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.98			1.00			0.89			1.00	0.95
Flpb, ped/bikes		1.00			1.00			0.98			0.93	1.00
Frt		1.00			1.00			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.98	1.00
Satd. Flow (prot)		4037			4123			1291			1484	1312
Flt Permitted		0.92			0.93			0.89			0.88	1.00
Satd. Flow (perm)		3714			3834			1167			1336	1312
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	19	463	13	10	733	2	34	7	62	6	6	19
RTOR Reduction (vph)	0	2	0	0	0	0	0	54	0	0	0	0
Lane Group Flow (vph)	0	493	0	0	745	0	0	49	0	0	12	19
Confl. Peds. (#/hr)	91		359	359			91	41		130	130	
Confl. Bikes (#/hr)			14				26					
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		67.6			19.0			12.4			12.4	61.0
Effective Green, g (s)		67.6			19.0			12.4			12.4	61.0
Actuated g/C Ratio		0.68			0.19			0.12			0.12	0.61
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2572			728			144			165	931
v/s Ratio Prot		0.04										0.01
v/s Ratio Perm		c0.09			c0.19			c0.04			0.01	0.00
v/c Ratio		0.19			1.02			0.34			0.07	0.02
Uniform Delay, d1		6.0			40.5			40.0			38.7	7.7
Progression Factor		1.00			1.01			1.00			1.00	1.00
Incremental Delay, d2		0.2			38.9			1.4			0.2	0.0
Delay (s)		6.2			79.7			41.4			38.9	7.7
Level of Service		A			E			D			D	A
Approach Delay (s)		6.2			79.7			41.4			19.8	
Approach LOS		A			E			D			B	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Existing AM
 Wells + Associates

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	836	651	267	23	25
v/c Ratio	0.36	0.86	0.89	0.10	0.03
Control Delay	7.4	44.7	57.7	31.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	44.7	57.7	31.1	5.0
Queue Length 50th (ft)	74	150	116	11	4
Queue Length 95th (ft)	94	#213	#246	30	11
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2293	757	333	266	766
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.86	0.80	0.09	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔			↔↔↔			↔			↔	↔
Traffic Volume (vph)	20	721	20	9	588	14	88	2	148	15	4	21
Future Volume (vph)	20	721	20	9	588	14	88	2	148	15	4	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.99			0.90			1.00	0.92
Flpb, ped/bikes		1.00			1.00			0.98			0.94	1.00
Frt		1.00			1.00			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.96	1.00
Satd. Flow (prot)		4068			4102			1289			1475	1276
Flt Permitted		0.93			0.92			0.87			0.73	1.00
Satd. Flow (perm)		3771			3773			1140			1115	1276
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	22	792	22	10	626	15	99	2	166	18	5	25
RTOR Reduction (vph)	0	2	0	0	2	0	0	62	0	0	0	0
Lane Group Flow (vph)	0	834	0	0	649	0	0	205	0	0	23	25
Confl. Peds. (#/hr)	53		131	131		53	36		116	116		36
Confl. Bikes (#/hr)			9			19			10			2
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		59.1			20.0			20.9			20.9	60.0
Effective Green, g (s)		59.1			20.0			20.9			20.9	60.0
Actuated g/C Ratio		0.59			0.20			0.21			0.21	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2288			754			238			233	893
v/s Ratio Prot		0.07										0.01
v/s Ratio Perm		c0.14			c0.17			c0.18			0.02	0.01
v/c Ratio		0.36			0.86			0.86			0.10	0.03
Uniform Delay, d1		10.7			38.6			38.2			31.9	8.1
Progression Factor		1.00			0.83			1.00			1.00	1.00
Incremental Delay, d2		0.5			12.0			26.0			0.2	0.0
Delay (s)		11.1			44.1			64.1			32.1	8.1
Level of Service		B			D			E			C	A
Approach Delay (s)		11.1			44.1			64.1			19.6	
Approach LOS		B			D			E			B	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Existing PM
 Wells + Associates

Attachment F

Background Conditions Levels of Service and Queues

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	667	972	108	10	16
v/c Ratio	0.26	1.27	0.49	0.05	0.02
Control Delay	4.9	164.8	23.4	32.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	164.8	23.4	32.7	4.9
Queue Length 50th (ft)	26	-287	25	6	3
Queue Length 95th (ft)	71	#375	69	19	9
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2542	768	332	319	781
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	1.27	0.33	0.03	0.02

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	18	583	12	9	883	2	31	6	62	5	5	15
Future Volume (vph)	18	583	12	9	883	2	31	6	62	5	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00			0.89			1.00	0.94
Flpb, ped/bikes		1.00			1.00			0.98			0.93	1.00
Frt		1.00			1.00			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.98	1.00
Satd. Flow (prot)		4068			4132			1285			1485	1303
Flt Permitted		0.92			0.93			0.90			0.88	1.00
Satd. Flow (perm)		3735			3840			1173			1333	1303
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	634	13	10	960	2	34	7	67	5	5	16
RTOR Reduction (vph)	0	2	0	0	0	0	0	58	0	0	0	0
Lane Group Flow (vph)	0	665	0	0	972	0	0	50	0	0	10	16
Confl. Peds. (#/hr)	91		359	359		91	41		130	130		41
Confl. Bikes (#/hr)			14			26						14
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		66.2			20.0			13.8			13.8	60.0
Effective Green, g (s)		66.2			20.0			13.8			13.8	60.0
Actuated g/C Ratio		0.66			0.20			0.14			0.14	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2539			768			161			183	912
v/s Ratio Prot		0.05										0.01
v/s Ratio Perm		c0.12			c0.25			c0.04			0.01	0.00
v/c Ratio		0.26			1.27			0.31			0.05	0.02
Uniform Delay, d1		6.9			40.0			38.8			37.4	8.1
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.3			129.8			1.1			0.1	0.0
Delay (s)		7.2			169.8			39.9			37.6	8.1
Level of Service		A			F			D			D	A
Approach Delay (s)		7.2			169.8			39.9			19.4	
Approach LOS		A			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	98.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	1059	1036	292	20	23
v/c Ratio	0.47	1.36	0.93	0.08	0.03
Control Delay	9.2	204.3	65.1	30.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	204.3	65.1	30.5	5.0
Queue Length 50th (ft)	101	~322	139	10	4
Queue Length 95th (ft)	126	#413	#297	30	11
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2231	761	330	272	760
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	1.36	0.88	0.07	0.03

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔			↔↔↔			↔			↔	↔
Traffic Volume (vph)	20	933	21	9	930	14	92	2	175	15	4	21
Future Volume (vph)	20	933	21	9	930	14	92	2	175	15	4	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00			0.89			1.00	0.92
Flpb, ped/bikes		1.00			1.00			0.98			0.94	1.00
Frt		1.00			1.00			0.91			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.96	1.00
Satd. Flow (prot)		4085			4121			1281			1477	1268
Flt Permitted		0.92			0.92			0.88			0.74	1.00
Satd. Flow (perm)		3768			3799			1144			1136	1268
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1014	23	10	1011	15	100	2	190	16	4	23
RTOR Reduction (vph)	0	2	0	0	2	0	0	57	0	0	0	0
Lane Group Flow (vph)	0	1057	0	0	1034	0	0	235	0	0	20	23
Confl. Peds. (#/hr)	53		131	131		53	36		116	116		36
Confl. Bikes (#/hr)			9			19			10			2
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		57.5			20.0			22.5			22.5	60.0
Effective Green, g (s)		57.5			20.0			22.5			22.5	60.0
Actuated g/C Ratio		0.58			0.20			0.22			0.22	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2230			759			257			255	887
v/s Ratio Prot		0.09										0.01
v/s Ratio Perm		c0.18			c0.27			c0.21			0.02	0.01
v/c Ratio		0.47			1.36			0.92			0.08	0.03
Uniform Delay, d1		12.4			40.0			37.8			30.6	8.1
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.7			171.7			34.3			0.1	0.0
Delay (s)		13.1			211.7			72.1			30.7	8.1
Level of Service		B			F			E			C	A
Approach Delay (s)		13.1			211.7			72.1			18.6	
Approach LOS		B			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	105.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	885	1093	159	23	54
v/c Ratio	0.45	1.48	0.67	0.12	0.07
Control Delay	7.5	254.6	43.2	33.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	254.6	43.2	33.7	5.2
Queue Length 50th (ft)	54	~353	77	13	9
Queue Length 95th (ft)	98	#444	134	33	21
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	1961	738	339	293	773
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	1.48	0.47	0.08	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	219	583	12	9	883	113	31	53	62	14	7	50
Future Volume (vph)	219	583	12	9	883	113	31	53	62	14	7	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.96			0.92			1.00	0.93
Flpb, ped/bikes		0.99			1.00			0.99			0.93	1.00
Frt		1.00			0.98			0.94			1.00	0.85
Flt Protected		0.99			1.00			0.99			0.97	1.00
Satd. Flow (prot)		3996			3901			1390			1461	1289
Flt Permitted		0.65			0.93			0.93			0.81	1.00
Satd. Flow (perm)		2639			3614			1306			1226	1289
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	238	634	13	10	960	123	34	58	67	15	8	54
RTOR Reduction (vph)	0	1	0	0	16	0	0	29	0	0	0	0
Lane Group Flow (vph)	0	884	0	0	1077	0	0	130	0	0	23	54
Confl. Peds. (#/hr)	91		359	359		91	41		130	130		41
Confl. Bikes (#/hr)			14			26						14
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		63.9			20.0			16.1			16.1	60.0
Effective Green, g (s)		63.9			20.0			16.1			16.1	60.0
Actuated g/C Ratio		0.64			0.20			0.16			0.16	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		1957			722			210			197	902
v/s Ratio Prot		0.09										0.03
v/s Ratio Perm		c0.20			c0.30			c0.10			0.02	0.02
v/c Ratio		0.45			1.49			0.62			0.12	0.06
Uniform Delay, d1		9.2			40.0			39.1			35.9	8.3
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.8			228.6			5.6			0.3	0.0
Delay (s)		9.9			268.6			44.7			36.1	8.3
Level of Service		A			F			D			D	A
Approach Delay (s)		9.9			268.6			44.7			16.6	
Approach LOS		A			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	140.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	1098	1058	301	98	272
v/c Ratio	0.53	1.40	0.95	0.58	0.36
Control Delay	10.3	219.5	68.2	49.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	219.5	68.2	49.1	7.4
Queue Length 50th (ft)	106	~333	143	55	57
Queue Length 95th (ft)	132	#425	#309	113	91
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2077	757	328	176	759
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	1.40	0.92	0.56	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



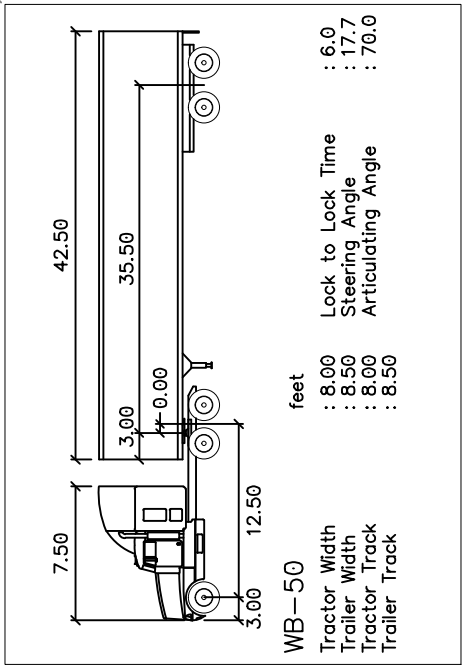
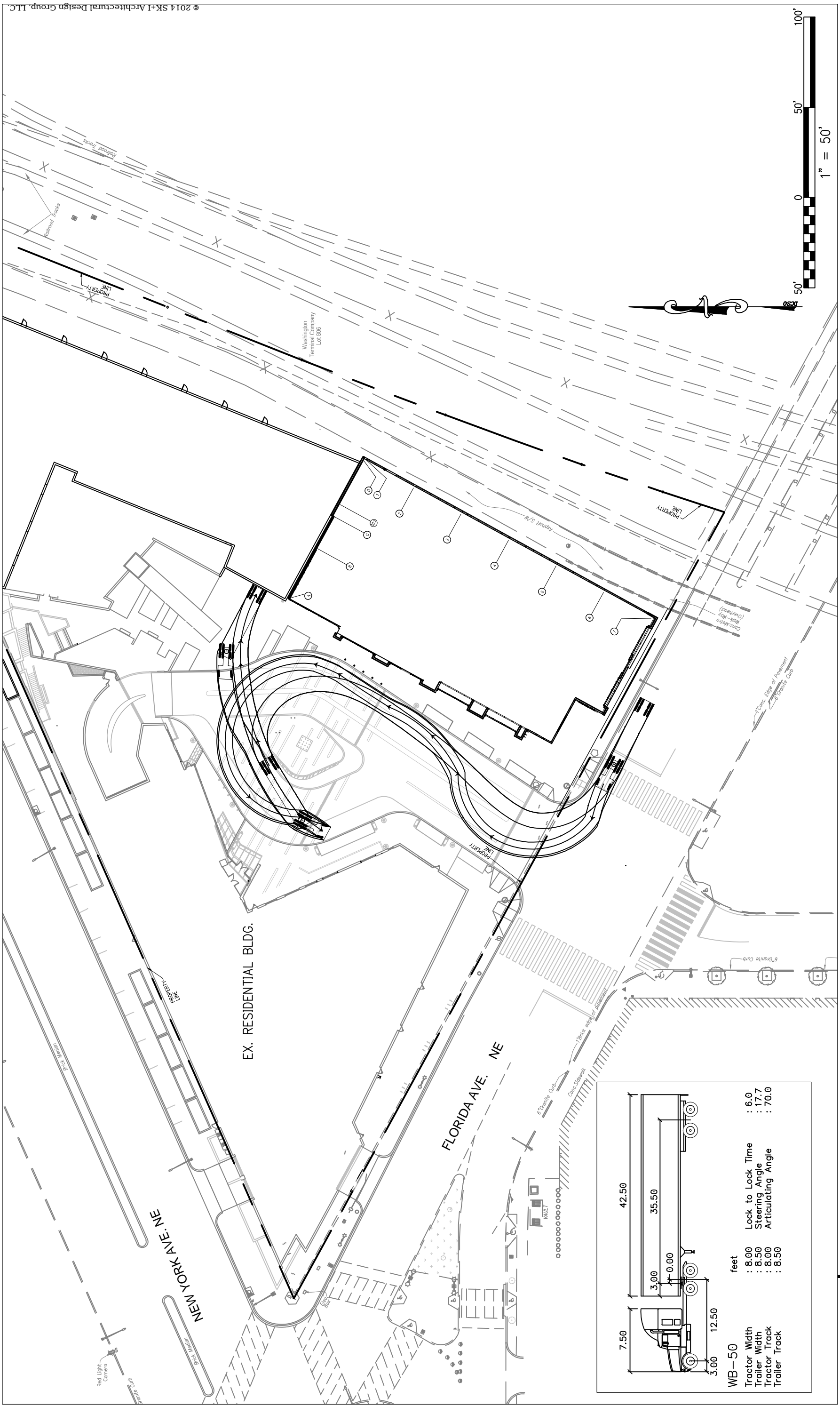
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔			↔↔↔			↔			↔	↔
Traffic Volume (vph)	56	933	21	9	930	34	92	10	175	75	15	250
Future Volume (vph)	56	933	21	9	930	34	92	10	175	75	15	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.99			0.89			1.00	0.91
Flpb, ped/bikes		1.00			1.00			0.99			0.94	1.00
Frt		1.00			0.99			0.91			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.96	1.00
Satd. Flow (prot)		4075			4089			1293			1472	1265
Flt Permitted		0.83			0.92			0.85			0.48	1.00
Satd. Flow (perm)		3399			3767			1118			735	1265
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	1014	23	10	1011	37	100	11	190	82	16	272
RTOR Reduction (vph)	0	2	0	0	4	0	0	61	0	0	0	0
Lane Group Flow (vph)	0	1096	0	0	1054	0	0	240	0	0	98	272
Confl. Peds. (#/hr)	53		131	131		53	36		116	116		36
Confl. Bikes (#/hr)			9			19			10			2
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		57.0			20.0			23.0			23.0	60.0
Effective Green, g (s)		57.0			20.0			23.0			23.0	60.0
Actuated g/C Ratio		0.57			0.20			0.23			0.23	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2072			753			257			169	885
v/s Ratio Prot		0.11										0.11
v/s Ratio Perm		c0.20			c0.28			c0.21			0.13	0.10
v/c Ratio		0.53			1.40			0.93			0.58	0.31
Uniform Delay, d1		13.2			40.0			37.8			34.2	9.8
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.0			187.9			38.5			4.8	0.2
Delay (s)		14.2			227.9			76.2			39.0	10.0
Level of Service		B			F			E			D	B
Approach Delay (s)		14.2			227.9			76.2			17.7	
Approach LOS		B			F			E			B	

Intersection Summary

HCM 2000 Control Delay	101.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Attachment G

Truck Maneuver Diagrams



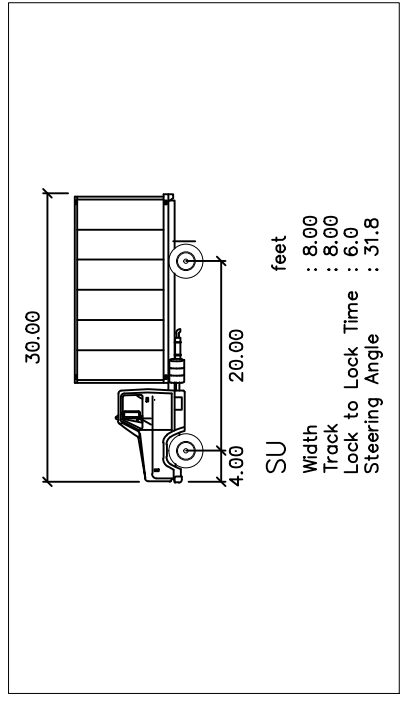
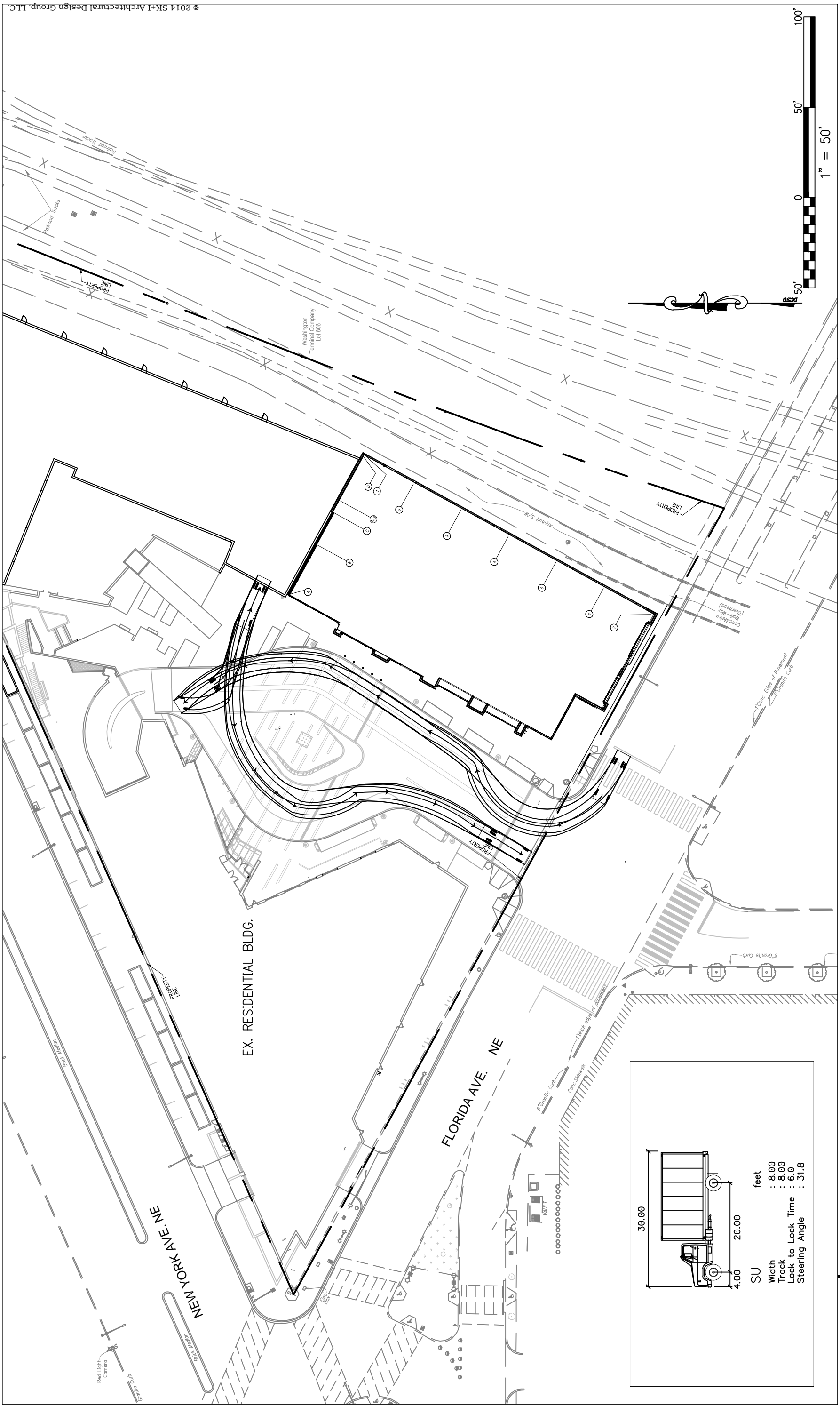
MRP | REALTY

Washington Gateway | Washington, DC

July 18, 2016 | **C-601A**

Truck Turning Plan WB-50





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Washington Gateway | Washington, DC

July 18, 2016 | **C-601B**

Truck Turning Plan SU



Attachment H

Total Future Conditions Levels of Service and Queues

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	774	1030	135	29	92
v/c Ratio	0.37	1.37	0.59	0.16	0.12
Control Delay	6.3	208.4	34.8	35.3	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	208.4	34.8	35.3	5.5
Queue Length 50th (ft)	39	~320	54	17	16
Queue Length 95th (ft)	84	#411	105	39	32
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2078	751	335	294	777
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	1.37	0.40	0.10	0.12

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	117	583	12	9	883	55	31	31	62	17	10	85
Future Volume (vph)	117	583	12	9	883	55	31	31	62	17	10	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.98			0.91			1.00	0.94
Flpb, ped/bikes		0.99			1.00			0.99			0.92	1.00
Frt		1.00			0.99			0.93			1.00	0.85
Flt Protected		0.99			1.00			0.99			0.97	1.00
Satd. Flow (prot)		4024			4014			1350			1461	1296
Flt Permitted		0.70			0.93			0.91			0.82	1.00
Satd. Flow (perm)		2824			3725			1250			1229	1296
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	634	13	10	960	60	34	34	67	18	11	92
RTOR Reduction (vph)	0	1	0	0	7	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	773	0	0	1023	0	0	95	0	0	29	92
Confl. Peds. (#/hr)	91		359	359		91	41		130	130		41
Confl. Bikes (#/hr)			14			26						14
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		65.0			20.0			15.0			15.0	60.0
Effective Green, g (s)		65.0			20.0			15.0			15.0	60.0
Actuated g/C Ratio		0.65			0.20			0.15			0.15	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2075			745			187			184	907
v/s Ratio Prot		0.07										0.05
v/s Ratio Perm		c0.17			c0.27			c0.08			0.02	0.03
v/c Ratio		0.37			1.37			0.51			0.16	0.10
Uniform Delay, d1		8.1			40.0			39.1			37.0	8.5
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.5			176.3			2.2			0.4	0.0
Delay (s)		8.6			216.3			41.3			37.4	8.6
Level of Service		A			F			D			D	A
Approach Delay (s)		8.6			216.3			41.3			15.5	
Approach LOS		A			F			D			B	

Intersection Summary

HCM 2000 Control Delay	115.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Total Future AM (Option 1)
Wells + Associates

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	1113	1058	312	61	161
v/c Ratio	0.55	1.40	0.96	0.30	0.21
Control Delay	10.8	219.5	71.0	36.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	219.5	71.0	36.1	6.1
Queue Length 50th (ft)	108	~334	155	32	30
Queue Length 95th (ft)	135	#425	#325	70	53
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2014	757	332	206	758
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	1.40	0.94	0.30	0.21

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	70	933	21	9	930	34	92	20	175	45	11	148
Future Volume (vph)	70	933	21	9	930	34	92	20	175	45	11	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.99			0.90			1.00	0.91
Flpb, ped/bikes		1.00			1.00			0.99			0.95	1.00
Frt		1.00			0.99			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.96	1.00
Satd. Flow (prot)		4072			4089			1303			1481	1263
Flt Permitted		0.80			0.92			0.87			0.56	1.00
Satd. Flow (perm)		3265			3765			1151			862	1263
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1014	23	10	1011	37	100	22	190	49	12	161
RTOR Reduction (vph)	0	2	0	0	4	0	0	57	0	0	0	0
Lane Group Flow (vph)	0	1111	0	0	1054	0	0	255	0	0	61	161
Confl. Peds. (#/hr)	53		131	131		53	36		116	116		36
Confl. Bikes (#/hr)			9			19			10			2
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		56.6			20.0			23.4			23.4	60.0
Effective Green, g (s)		56.6			20.0			23.4			23.4	60.0
Actuated g/C Ratio		0.57			0.20			0.23			0.23	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2009			753			269			201	884
v/s Ratio Prot		0.11										0.07
v/s Ratio Perm		c0.20			c0.28			c0.22			0.07	0.06
v/c Ratio		0.55			1.40			0.95			0.30	0.18
Uniform Delay, d1		13.7			40.0			37.7			31.6	9.0
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.1			187.9			40.7			0.9	0.1
Delay (s)		14.8			227.9			78.4			32.4	9.1
Level of Service		B			F			E			C	A
Approach Delay (s)		14.8			227.9			78.4			15.5	
Approach LOS		B			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	105.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Total Future PM (Option 1)
 Wells + Associates

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	683	978	114	34	115
v/c Ratio	0.28	1.28	0.51	0.20	0.15
Control Delay	5.0	169.3	24.9	37.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	169.3	24.9	37.2	5.7
Queue Length 50th (ft)	28	-292	29	21	21
Queue Length 95th (ft)	72	#382	74	44	39
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	2456	766	335	292	780
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	1.28	0.34	0.12	0.15

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	33	583	12	9	883	7	31	12	62	19	12	106
Future Volume (vph)	33	583	12	9	883	7	31	12	62	19	12	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00			0.90			1.00	0.94
Flpb, ped/bikes		1.00			1.00			0.98			0.92	1.00
Frt		1.00			1.00			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.99			0.97	1.00
Satd. Flow (prot)		4059			4119			1303			1454	1302
Flt Permitted		0.88			0.93			0.90			0.82	1.00
Satd. Flow (perm)		3561			3827			1184			1222	1302
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	634	13	10	960	8	34	13	67	21	13	115
RTOR Reduction (vph)	0	1	0	0	1	0	0	58	0	0	0	0
Lane Group Flow (vph)	0	682	0	0	977	0	0	56	0	0	34	115
Confl. Peds. (#/hr)	91		359	359		91	41		130	130		41
Confl. Bikes (#/hr)			14			26						14
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		66.1			20.0			13.9			13.9	60.0
Effective Green, g (s)		66.1			20.0			13.9			13.9	60.0
Actuated g/C Ratio		0.66			0.20			0.14			0.14	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		2453			765			164			169	911
v/s Ratio Prot		0.06										0.06
v/s Ratio Perm		c0.13			c0.26			c0.05			0.03	0.03
v/c Ratio		0.28			1.28			0.34			0.20	0.13
Uniform Delay, d1		7.0			40.0			38.9			38.1	8.7
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.3			134.9			1.3			0.6	0.1
Delay (s)		7.3			174.9			40.2			38.7	8.7
Level of Service		A			F			D			D	A
Approach Delay (s)		7.3			174.9			40.2			15.6	
Approach LOS		A			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	95.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Total Future AM (Option 2)
Wells + Associates

Queues

1: 2nd Street NE/Driveway & Florida Avenue NE



Lane Group	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	1122	1057	318	32	75
v/c Ratio	0.57	1.40	0.97	0.13	0.10
Control Delay	11.2	218.9	72.6	31.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	218.9	72.6	31.5	5.4
Queue Length 50th (ft)	109	~333	161	16	13
Queue Length 95th (ft)	136	#424	#337	42	27
Internal Link Dist (ft)	43	411	141	46	
Turn Bay Length (ft)					
Base Capacity (vph)	1979	757	334	253	757
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	1.40	0.95	0.13	0.10

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
 1: 2nd Street NE/Driveway & Florida Avenue NE

Washington Gateway Two PUD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑			↑↓			↑	↑
Traffic Volume (vph)	78	933	21	9	930	33	92	26	175	22	7	69
Future Volume (vph)	78	933	21	9	930	33	92	26	175	22	7	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.91			0.91			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.99			0.90			1.00	0.91
Flpb, ped/bikes		1.00			1.00			0.99			0.95	1.00
Frt		1.00			0.99			0.92			1.00	0.85
Flt Protected		1.00			1.00			0.98			0.96	1.00
Satd. Flow (prot)		4070			4091			1308			1491	1262
Flt Permitted		0.78			0.92			0.88			0.68	1.00
Satd. Flow (perm)		3192			3766			1172			1057	1262
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	1014	23	10	1011	36	100	28	190	24	8	75
RTOR Reduction (vph)	0	2	0	0	4	0	0	53	0	0	0	0
Lane Group Flow (vph)	0	1120	0	0	1053	0	0	265	0	0	32	75
Confl. Peds. (#/hr)	53		131	131		53	36		116	116		36
Confl. Bikes (#/hr)			9			19			10			2
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	1 3	2			2			4			4	1 3
Permitted Phases	2	1 2 3		2			4			4		4
Actuated Green, G (s)		56.4			20.0			23.6			23.6	60.0
Effective Green, g (s)		56.4			20.0			23.6			23.6	60.0
Actuated g/C Ratio		0.56			0.20			0.24			0.24	0.60
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		1.0			1.0			3.0			3.0	
Lane Grp Cap (vph)		1975			753			276			249	883
v/s Ratio Prot		0.11										0.03
v/s Ratio Perm		c0.21			c0.28			c0.23			0.03	0.03
v/c Ratio		0.57			1.40			0.96			0.13	0.08
Uniform Delay, d1		14.0			40.0			37.7			30.1	8.4
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.2			187.3			42.4			0.2	0.0
Delay (s)		15.2			227.3			80.1			30.3	8.5
Level of Service		B			F			F			C	A
Approach Delay (s)		15.2			227.3			80.1			15.0	
Approach LOS		B			F			F			B	

Intersection Summary			
HCM 2000 Control Delay	109.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Total Future PM (Option 2)
 Wells + Associates