



West Heating Plant Disposal

FINAL TRANSPORTATION STUDY



July 2012

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Final

Transportation Study

West Heating Plant Disposal

Washington, DC

July 2012



**U.S. General Services Administration
National Capital Region
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List of Acronyms

ADA	Americans with Disabilities Act
C&O	Chesapeake and Ohio
DC	District of Columbia
DCOP	District of Columbia Office of Planning
DDOT	District Department of Transportation
EA	Environmental Assessment
FAR	Floor Area Ratio
GSA	General Services Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LTR	Left/Thru/Right
NEPA	National Environmental Policy Act
SF	Square Feet
TDM	Travel Demand Management
V/C	Volume to Capacity
WMATA	Washington Metropolitan Area Transit Authority

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1. INTRODUCTION

This report presents the findings of a traffic/transportation impact study prepared as part of the Environmental Assessment (EA) for the proposed disposal of the West Heating Plant parcel by the United States General Services Administration (GSA).

This transportation study is for the purposes of determining under NEPA whether the proposed disposal action is likely to have a significant impact on traffic. The proposed disposal of the West Heating Plant would result in the property being sold at public auction. As the site is not currently zoned, any future developer would likely be required to apply for zoning or undertake a planned unit development approval process. As part of the rezoning process, any future private development of the site would require a traffic impact study according to District Department of Transportation (DDOT) standards and District regulations. Dependent on the actual redevelopment plan for the site a more thorough traffic study, that may include additional intersections, would be warranted. The scope of any future studies to be conducted by the developer is at the discretion of DDOT, as well as requirements for mitigation measures to offset impacts.

The proposed action is for GSA to dispose of approximately 2.08 acres of land, referred to as the West Heating Plant parcel. The property is located at 29th and K Street, NW, Washington, DC (see Figure 1-1). The parcel currently contains a decommissioned heating plant that was previously used to provide steam to Federal buildings in DC. The West Heating Plant parcel has been identified as excess and the disposal of the parcel is needed to eliminate the costs associated with maintenance of the property.

Reuse is not included as part of the proposed action. Nevertheless, to adequately analyze the indirect effects, including traffic/transportation effects, which may potentially result from the proposed disposal, GSA has also identified a reasonably foreseeable development scenario (RFDS) that could occur subsequent to disposal, as shown in Table 1-1. It is important to underscore, however, that the RFDS does not constitute GSA's proposed action of disposal.

The RFDS was made using assumptions that took into consideration site constraints, including buildable area (1.51 acres), zoning regulations, riparian buffer considerations, and cultural resources.

Figure 1-1 West Heating Plant Parcel Location.

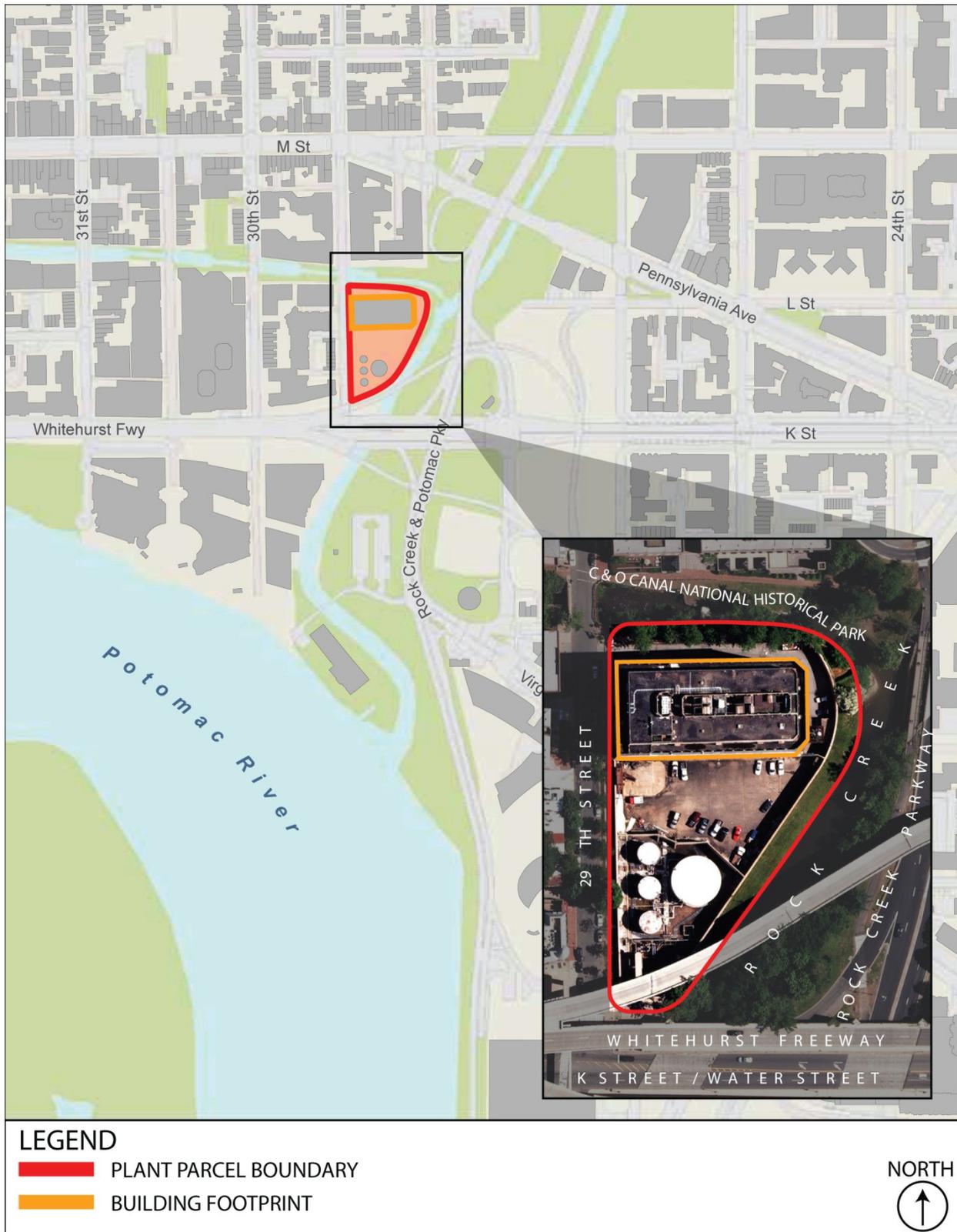


Table 1-1 Reasonable Future Development Scenario.

	Residential		Non Residential				Total
	SF	Units	Total Non-Res	Restaurant	Office	Retail	
			SF	SF	SF	SF	
Total Allowable	181,210	181	181,210				362,419
Existing Building	71,800	72	71,800	36,600	35,200		143,600
Remainder	109,410	109	109,410	0	37,105	72,305	218,819
TOTAL	181,210	181	181,210	36,600	72,305	72,305	362,419

Assumptions:

- Numbers have been rounded.
- Total allowable Gross Square Footage (GFA) = 362,419 (Floor Area Ratio [FAR] 4.0 x 90,605 SF or 2.08 Acres)
- Non-Residential GFA = 181,209.5 Square Feet (SF) (up to 2.0 FAR of total allowable 4.0 FAR)
- Residential GFA = 181,209.5 SF (Remaining 2.0 FAR of allowable Total GFA)
- Residential at 1,000 SF/unit
- Existing building 50 percent residential, 50 percent non-residential.
- Non-residential uses on parcel:
 - Restaurant (36,600 SF) (1st and top floors of existing building).
 - Remainder (144,610 SF) divided evenly between office and retail.
- Residential uses on parcel:
 - Existing building (71,800 SF [72 units]) based on 50 percent of existing building potential SF
 - Remaining 109,410 SF (109 units) on remainder of site.

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2. EXISTING CONDITIONS

The West Heating Plant is located on the corner of 29th Street and K Street, NW in Georgetown, Washington, DC. The western boundary is located along 29th Street, while the southern boundary is located along K Street. The principal roadways serving the site are 29th Street, K Street, Pennsylvania Avenue, and M Street. All access is currently provided by 29th Street. 30th Street is the closest roadway that parallels 29th Street. The District Department of Transportation (DDOT) and GSA agreed to a study area bounded by the four intersections comprising 29th, 30th, K, and M Streets. They are as follows (as shown in Figure 2-1):

- 30th Street at M Street, NW
- 30th Street at K Street, NW
- 29th Street at M Street/ Pennsylvania Avenue, NW
- 29th Street at K Street, NW

2.1. ROADWAY ACCESSIBILITY

29th Street, NW is a two lane roadway with parking allowed on both sides. It is classified by DDOT as a local roadway. 29th Street, NW is a north-south orientated roadway that travels between K Street, NW at the southern end to R Street, NW at the northern end. Currently, the bridge crossing the Chesapeake and Ohio (C&O) Canal is closed for reconstruction and is expected to reopen later this year. This bridge closure has temporarily separated the southern portion of 29th Street, NW from the remainder of the street, which includes the portion of the roadway serving the West Heating Plant. All access to the West Heating Plant site must use K Street, NW to access 29th Street, NW.

K Street, NW is a four lane roadway, with a center turning lane and is classified by DDOT as a principal arterial. K Street, NW is an east-west orientated roadway that connects Georgetown to Mount Vernon Square (Mount Vernon Triangle neighborhood) near the Washington Convention Center and travels under the Whitehurst Freeway through Georgetown.

Pennsylvania Avenue is a six lane roadway, classified as a principal arterial by DDOT. This roadway is orientated northwest-southeast and connects 29th Street, NW with 17th Street, NW (near the White House) by way of Washington Square near George Washington University.

M Street, NW is a four-lane bidirectional roadway, classified by DDOT as a principal arterial west of the 29th Street, NW intersection. It becomes a three lane one-way westbound roadway, classified a minor arterial by DDOT east of the 29th Street, NW intersection.

30th Street, NW is a unidirectional roadway with one-lane, classified by DDOT as a local roadway. This road operates southbound only, providing a connection from M Street, NW to K Street, NW. The bridge carrying 30th Street, NW over the C&O Canal was recently reconstructed.

Other Roadways - In addition to K and M Streets, NW and Pennsylvania Avenue, NW, Rock Creek and Potomac Parkway provides direct connections to 29th Street, NW through ramps intersecting K Street, NW at the 29th Street, NW intersection. This roadway has four lanes and is oriented north-south connecting the Washington Mall to Chevy Chase, Maryland.

2.2. STUDY AREA INTERSECTIONS

30th Street at M Street, NW (Study Area Intersection 1): This intersection is a signalized intersection with a pre-timed signal. The 30th Street, NW southbound approach has one lane that serves all moves. Both M Street, NW approaches have two lanes, a left lane that serves through moves and a right lane that serves right turning and through moves.

29th Street at M Street, at NW (Study Area Intersection 2): This intersection is a signalized intersection with a pre-timed signal. The 29th Street, NW approaches both have one lane that serves all moves. The M Street, NW eastbound approach has two through lanes, one left turning lane and one right turning lane. The M Street, NW westbound approach has two lanes with the left lane that serves left turns and through moves and the right lane that serves right turns and through moves.

30th Street at K Street, NW (Study Area Intersection 3): This intersection is an unsignalized intersection with stop signs posted at all approaches except the 30th, NW Street northbound approach. The 30th Street, NW northbound approach consists of one lane serving all moves. The 30th Street, NW southbound approach has two lanes, the left lane serves left turns and the right lane serves right turn and through moves. The K Street, NW eastbound approach consists of two lanes; the left lane serves through moves and the right lane serves right turning and through moves.

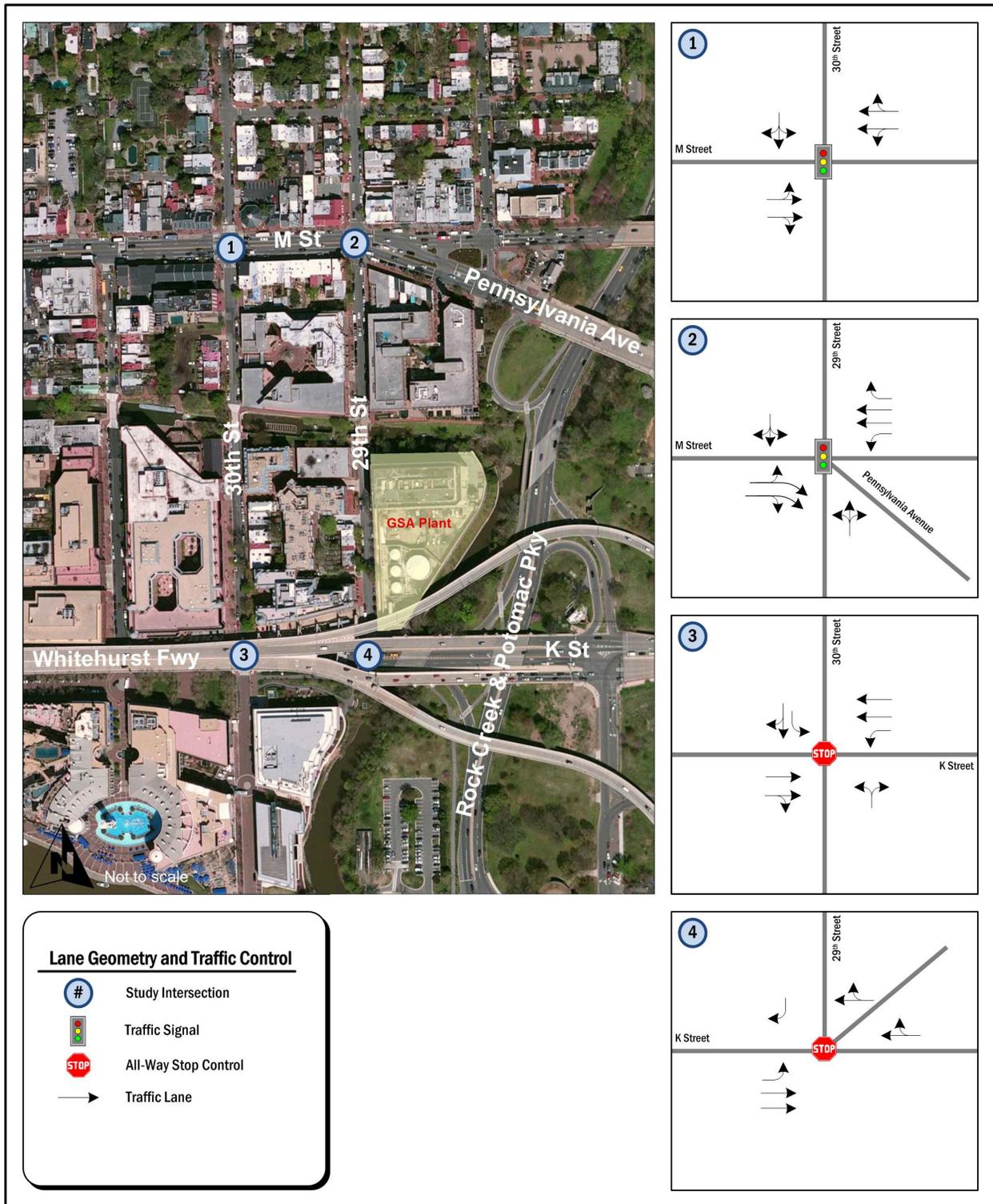
29th Street at K Street, NW (Study Area Intersection 4): This intersection is an unsignalized intersection with stop signs posted at all approaches. The 29th, NW Street approach consists of one lane with only right turns allowed. The K Street, NW eastbound approach consists of two through lanes and a left turning lane. The K Street, NW westbound approach consists of one lane serving through and right turning moves. The ramp from Rock Creek and Potomac Parkway southbound consists of one lane serving through and right turning moves.

Figure 2-1 shows the lane geometry and traffic controls for the study area intersections.

2.3. SITE ACCESS

The West Heating Plant site is only accessible through 29th Street, NW. There are two driveways, an entrance driveway just north of the 29th Street, NW intersection with K Street, NW and the other approximately 500 feet north of the 29th Street, NW intersection with K Street, NW. As discussed above, the bridge carrying 29th Street, NW over the C&O Canal is under construction; therefore, all vehicles must pass through the 29th Street, NW intersection with K Street, NW to access the site until the bridge is reopened later this year.

Figure 2-1 Existing Lane Geometry and Traffic Control.



2.4. TRANSIT

Eight bus routes operating along M and K Streets, NW serve the site. The Washington Metropolitan Area Transportation Authority (WMATA) operates the following linear routes: 31, 32, 36, 38B, D5, and D51. In addition, WMATA operates two Circulator routes, one connecting Georgetown to Dupont Circle and one connecting Georgetown to Union Station. During the morning and evening peak periods, WMATA operates 24 buses per hour along M Street, NW eastbound, 18 buses per hour along M Street, NW westbound, and 6 buses per hour along K Street, NW westbound only.

In addition to scheduled bus service, WMATA operates two subway lines in the vicinity of the West Heating Plant site. The closest Orange and Blue lines stations are located at Foggy Bottom (0.6 mile from the site) and Rosslyn (1.4 miles from the site). The closest Red Line station is Dupont Circle, which is 1.5 miles from the site. All three stations could be reached using the sidewalk network along M Street, NW, Pennsylvania Avenue, NW, and the Francis Scott Key Bridge.

2.5. BICYCLE AND PEDESTRIAN NETWORK

There are five bicycle/pedestrian trails near the West Heating Plant site. The C&O Canal tow path passes closest to the site connecting to 29th Street, NW at the site of the existing bridge construction project. This trail connects to the Rock Creek Trail to the east and Capital Crescent Trail to the west. The Capital Crescent Trail connects Georgetown to Silver Spring, Maryland, following the Potomac River between Georgetown and the Maryland State Line. The Rock Creek Trail connects the Washington Mall to Fernwood Heights, following Rock Creek and Potomac Parkway. Across the Francis Scott Key Bridge in nearby Virginia, the Martha Curtis Trail follows Route 66 between Rosslyn and Shirlington and the Mount Vernon Trail connects Rosslyn to Mount Vernon to the south.

Sidewalks are provided along both sides of 29th, 30th, K, and M Streets, NW, providing a complete pedestrian network. Crosswalks are provided at the 29th Street, NW intersection with K Street, NW along the 29th Street, NW southbound approach and K Street, NW westbound approach. Crosswalks are provided at the 29th Street, NW intersection with M Street, NW, 30th Street, NW intersection with K Street, NW, and 30th Street, NW intersection with M Street, NW at all four approaches. Sidewalks range from 6 feet through upwards of 15 feet in some locations along 29th Street, NW. The minimum American with Disabilities Act (ADA) requirement of three foot clearances occurs along K Street, NW at each post supporting the Whitehurst Freeway. ADA compliant curb cuts are located at each striped crosswalk at all four intersections in the study area, including new recently installed ADA compliant curb cuts along K Street, NW serving the eastbound K Street, NW approach crosswalk. A temporary bridge carrying pedestrians and bicycles is located on the west side of the 29th Street, NW Bridge.

With WMATA scheduled bus service along K and M Streets, NW, pedestrian access to these stops is available following the existing sidewalk network. The closest bus stop is along K Street, NW, near the halfway point between 29th and 30th along the westbound side, served by

the Circulator bus. The next closest stops are along M Street, NW near the intersection of 29th Street, NW.

2.6. PARKING

While there are driveways serving the West Heating Plant site, providing on-site parking for building employees, on street parking is available along 29th Street, NW, M Street, NW, and 30th Street, NW.

- 29th Street, NW between M and K Streets, NW has approximately 40 spaces. North of the bridge (which is still under construction as of June 20, 2012), there are three 2-hour metered spaces on the west side of the street. Parking meter poles (with no heads) are currently in place on the east side of the street; it is anticipated that these spaces will be restored once construction is complete. Private parking is available under Georgetown Place and Four Seasons. South of the bridge, there are 13 2 hour metered spaces on the east side of the street and seven unmetered spaces on the west side of the street, with signs restricting parking to two hours except for Zone 2 permits. There are approximately two parking spaces marked “15 minute hotel loading” on the west side of the street for Georgetown Suites.
- There is no on-street parking on K Street, NW between 29th Street, NW and 30th Street, NW. The driveway entrance to the private parking for Georgetown Suites is located on K Street, NW; the driveway also provides access to a small gravel parking lot that could accommodate approximately twelve vehicles.
- 30th Street, NW between M and K Streets, NW has approximately 40 spaces. South of the bridge, there are four metered spaces on the east side, with an additional 3-4 spaces marked for diplomatic parking (Saudi Arabia) from 7:00 AM to 6:30 PM. There are also approximately 16 to 18 unmetered parking spots, with 2 hour parking limits south of the bridge on the east side of the street. The west side of the street has eight metered spaces, and approximately two unmetered spaces and two diplomatic spaces south of the bridge, plus the Foundry Building parking garage. North of the bridge, the east side includes eight metered spaces plus a three-space section marked loading zone that is restricted from 8:00 AM to 5:00 PM. These three spaces allow two hour parking from 5:00 PM to 10:00 PM Monday through Saturday. There is also a driveway to a private surface lot. The west side of the street north of the bridge has one metered space and approximately 10 unmetered spaces, restricted to two hour parking except for Zone 2 residents.
- M Street, NW has approximately 10 restricted metered spaces between 29th and 30th Street, NW. No stopping is allowed from 7:00 AM to 9:30 AM or from 4:00 PM to 6:30 PM.
- As noted above, a variety of private parking facilities are located near the site, serving residential complexes, restaurants and hotels.

2.7. DATA COLLECTION

Manual turning movement, pedestrian, and bicycle counts were collected on Wednesday, April 12th during the AM peak period (6:30 AM – 9:30 AM) and PM peak period (3:30 PM – 6:30 PM) for the four study area intersections (29th Street at K and M Streets and 30th Street at K and M Streets). In addition, manual turning movement, pedestrian, and bicycle counts were obtained on Saturday April 15th, between 7:00 PM and 10:00 PM to capture the peak weekend. These counts provided a snap shot of the traffic to create the existing vehicle, pedestrian, and bicycle conditions.

Based upon the counts, the AM peak hour occurs between 8:30 AM and 9:30 AM, the PM peak hour occurs between 5:00 PM and 6:00 PM and the Saturday peak hour occurs between 7:00 PM and 8:00 PM. Using the raw traffic counts, all counts were rounded to the nearest five and the volumes between 29th and 30th Streets along K and M Streets were balanced. For example, all vehicles exiting the 29th @ M Street intersection headed westbound arrive at the 30th and M Street intersection westbound approach. In some cases, the number of vehicles exiting one intersection did not match the number arriving at the downstream intersection (i.e., M Street from 29th to 30th Street, K Street from 30th to 29th Street). To adjust for these differences, the higher volume was used to calculate a balanced traffic flow, which will result in a more conservative analysis. Figure 2-2 shows the existing AM and PM weekday peak hour turning movement volumes; Figure 2-3 shows the existing Saturday peak hour turning movement volumes; Figure 2-4 shows the existing AM and PM weekday peak hour pedestrian and bicycle volumes; and Figure 2-5 shows the existing pedestrian and bicycle Saturday peak hour volumes.

Figure 2-2 Existing AM and PM Weekday Peak Hour Turning Movement Volumes.

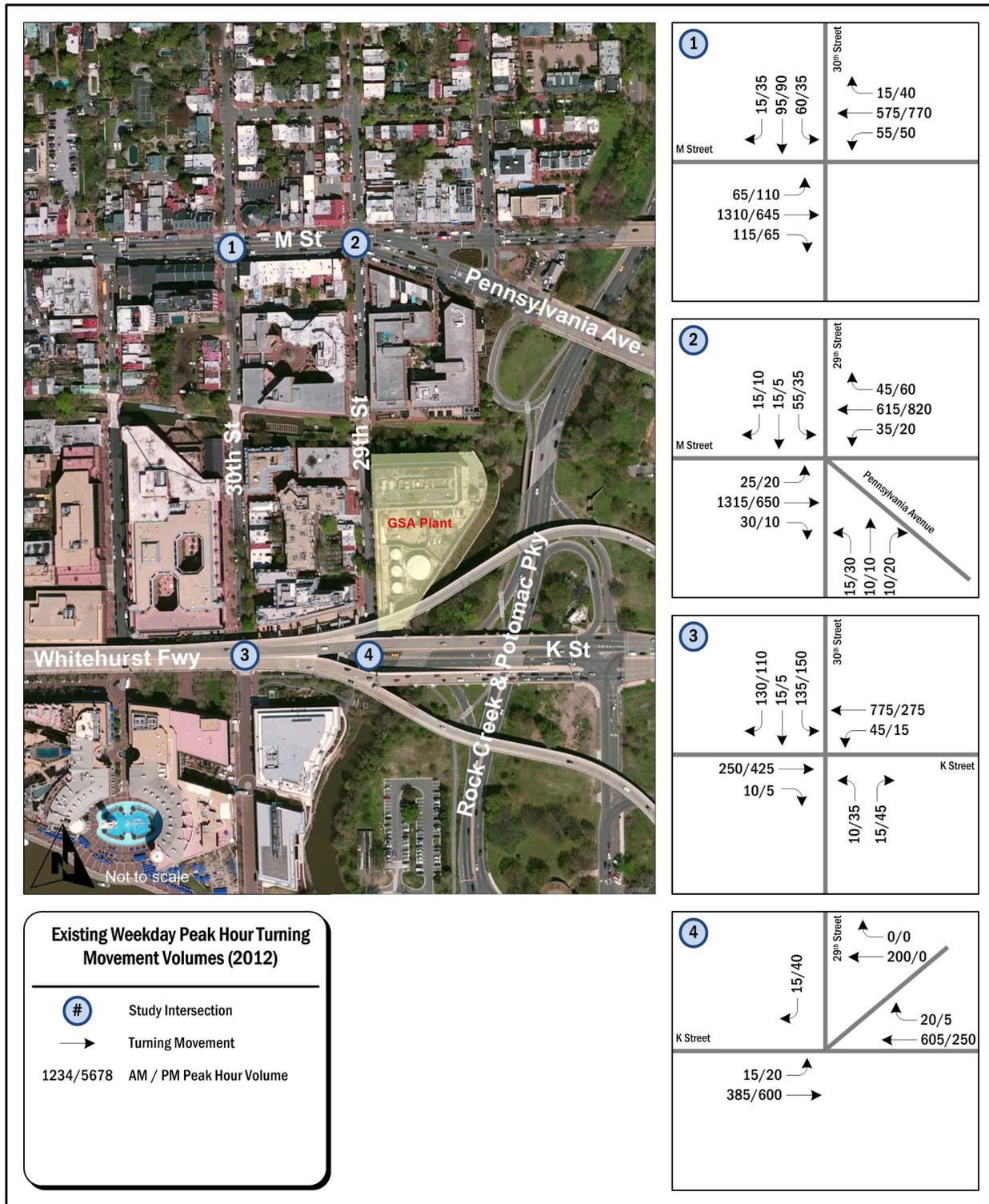


Figure 2-3 Existing Saturday Peak Hour Turning Movement Volumes.

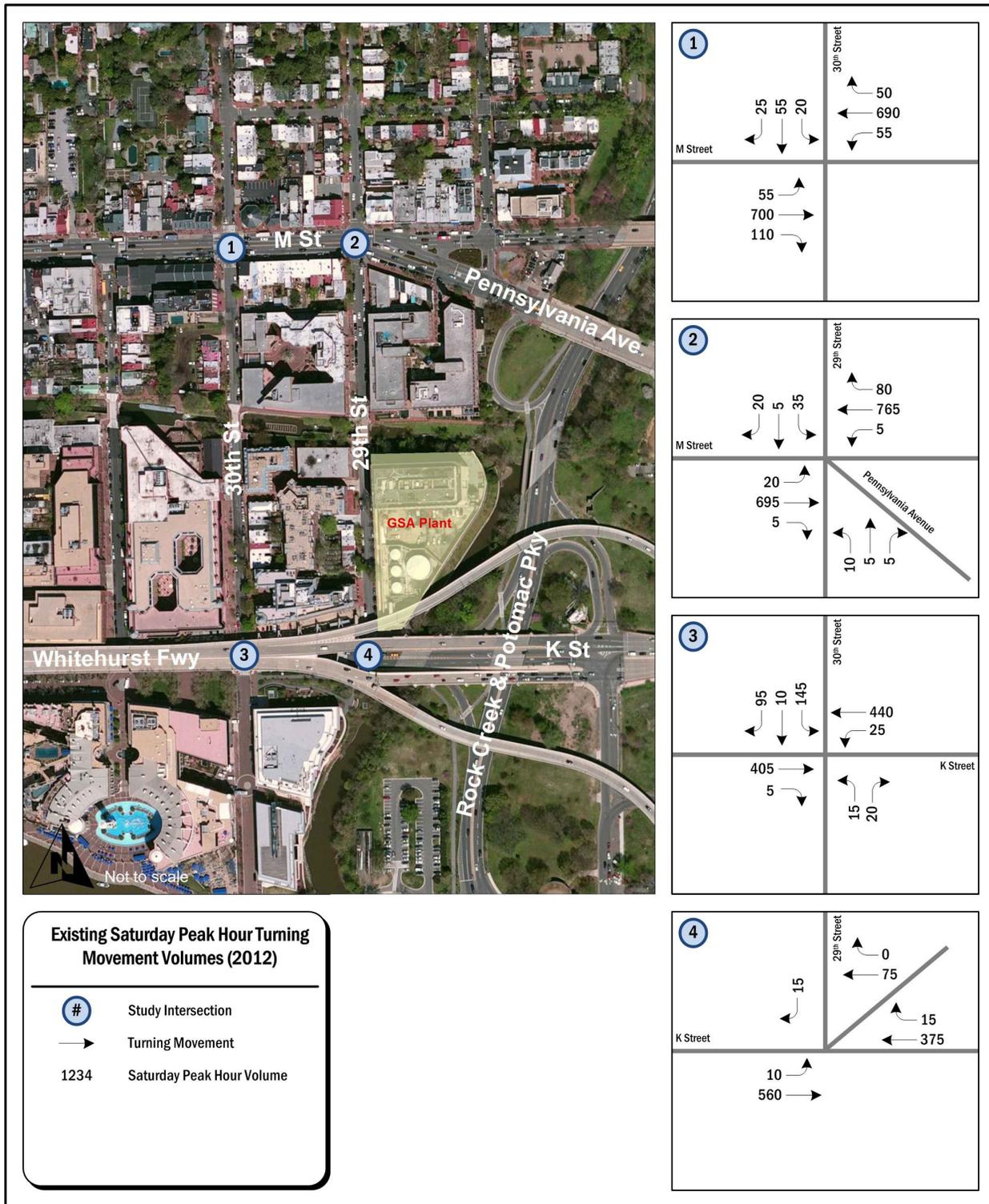


Figure 2-4 Existing AM and PM Weekday Peak Hour Pedestrian and Bicycle Volumes.

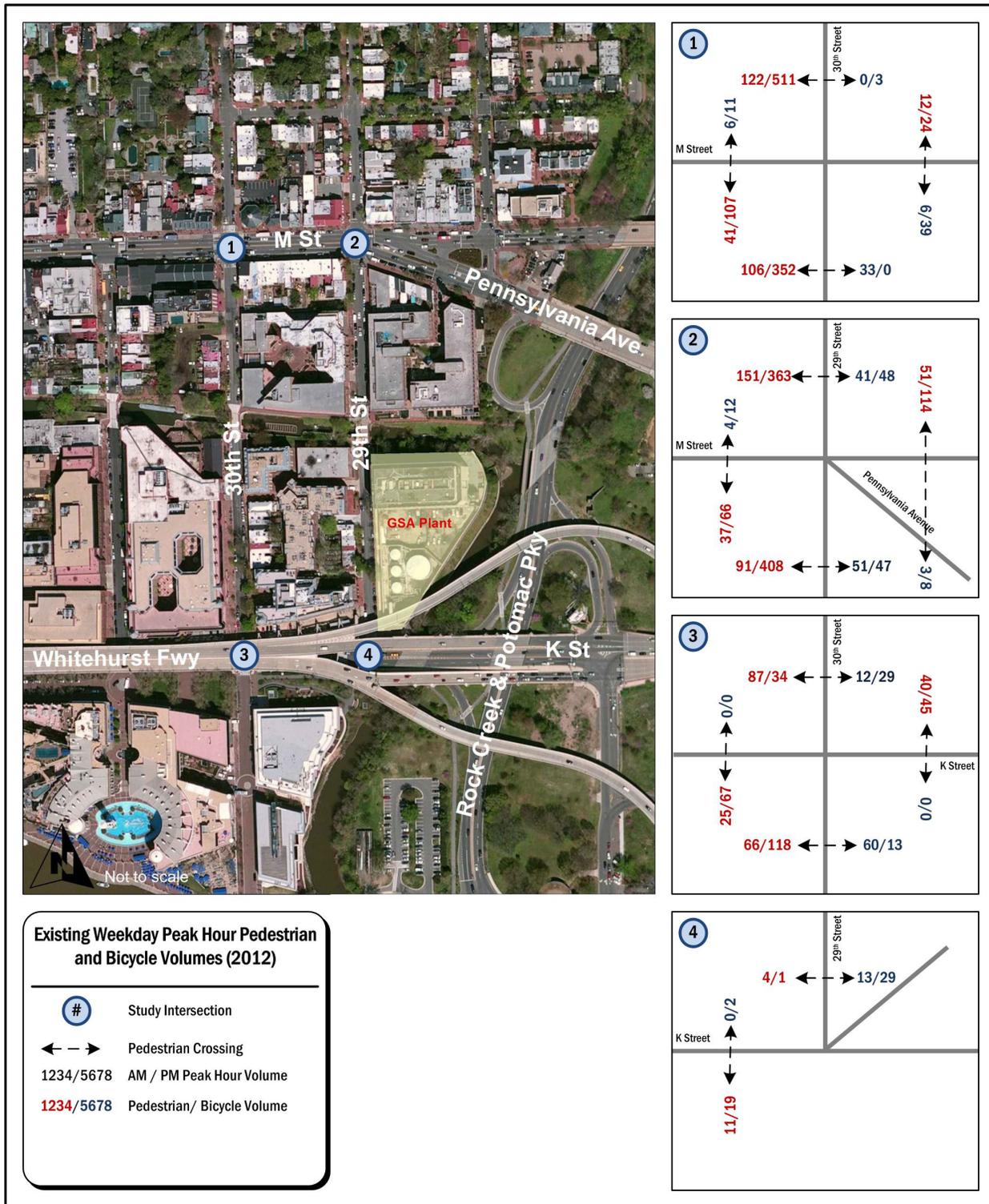
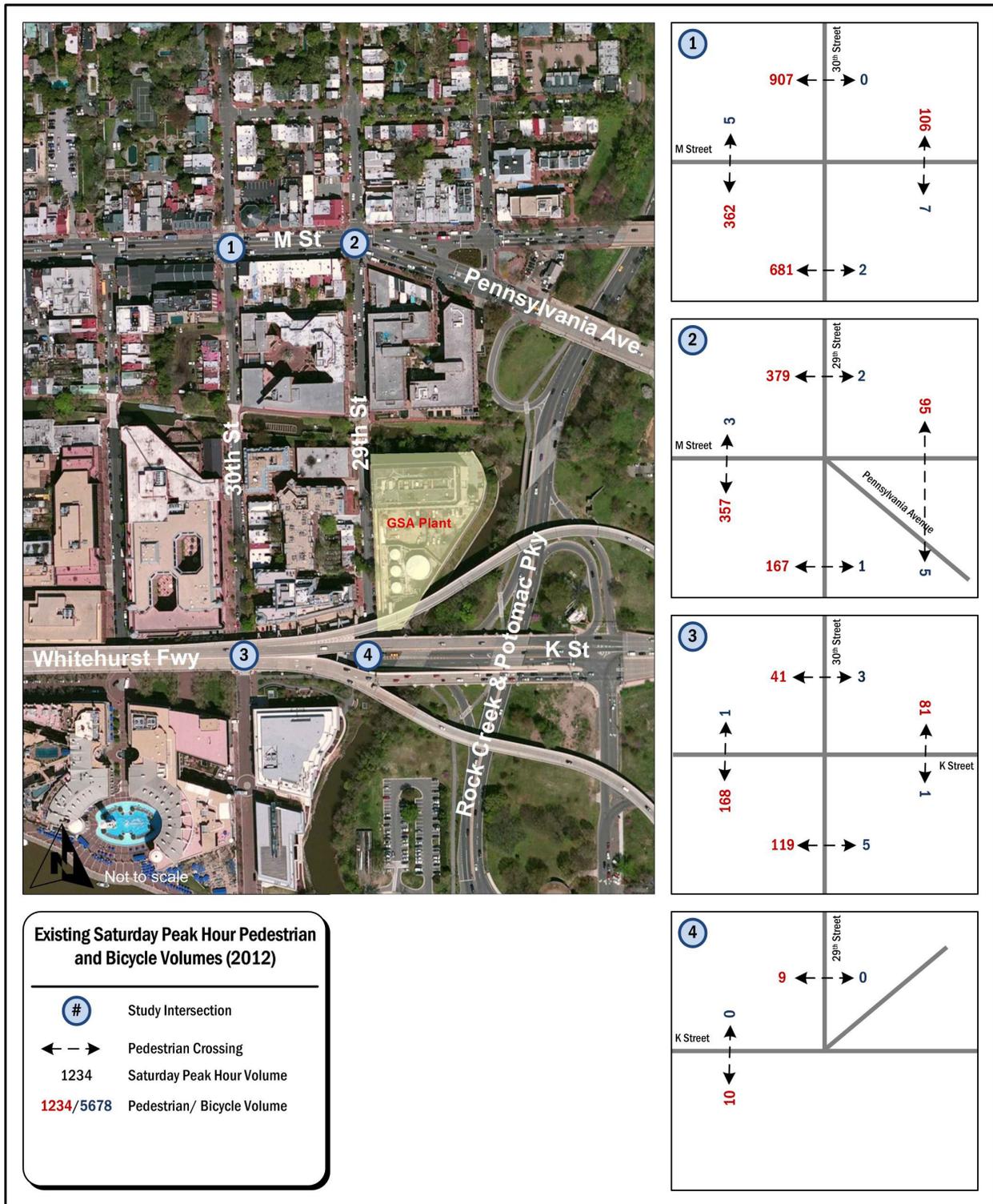


Figure 2-5 Existing Saturday Peak Hour Pedestrian and Bicycle Volumes.



2.8. CAPACITY ANALYSIS

The four intersections were analyzed using the latest version of the Synchro Intersection analysis Software. The four intersections analyzed consisted of two signalized and two unsignalized intersections. The vehicle density (counted volume to maximum capacity ratio), and vehicle delay (seconds per vehicle) were calculated for all four intersections. Based upon the vehicle delay, the level of service (LOS), a performance measure using a letter between A and F, was determined for all approaches. LOS A through D represents stable conditions while LOS E or F represents unstable conditions and delays. All four intersections were analyzed using the 2010 Highway Capacity Manual (HCM).

Based upon the Synchro Traffic Software HCM 2010 signalized intersection analysis, the 30th Street intersection with M Street operates at LOS F during the AM weekday peak hour. As shown in Table 2-1, the M Street eastbound approach has the longest vehicle delay with over four minutes per vehicle, caused by left turning vehicles from M Street to 30th Street northbound restricting through traffic. The M Street westbound left lane approach experiences over a two minute delay per vehicle also caused by left turning vehicles.

During the PM weekday peak hour, the 30th Street intersection with M Street operates at LOS E. The eastbound M Street left lane approach experiences over an eight minute delay, caused by left turning vehicles and the westbound M Street left lane approach experiences over a three minute delay per vehicle also caused by left turning vehicles.

During the Saturday peak hour, the M Street intersection at 30th Street operates at LOS F, with the longest vehicle delay occurring in the M street left lanes (more than 16 minutes westbound), due to the left turning traffic (Table 2-2).

The other signalized intersection, M Street at 29th Street operates at LOS B or better during both weekday peak periods and Saturday peak hour, with all approaches operating at LOS D or better.

Based upon the Synchro Traffic Software HCM 2010 unsignalized intersection analysis, the 30th Street intersection with K Street approaches operate at LOS C or better during the AM weekday peak hour, except for the K Street westbound through movement, which operates at LOS E resulting from a 37 second delay per vehicle. The PM weekday peak hour and Saturday peak hour operate at LOS D or better for all approaches. The 29th Street intersection with K Street operates at LOS C or better during the AM weekday peak hour, except for the K Street westbound through movement, which operates at LOS F resulting from a 65 second delay per vehicle. The PM weekday peak hour operates at LOS C or better and the Saturday peak hour operates at LOS D or better. The Rock Creek Parkway southbound off ramp is closed during the PM peak hour, as Rock Creek Parkway operates in the northbound direction only. Table 2-1 shows the AM and PM peak hour weekday existing intersection analysis.

Table 2-1 AM and PM Peak Hour Weekday Existing Intersection Analysis.

Intersection	Lane Group/ Approach	AM Peak Hour (8:30 - 9:30 a.m.)			PM Peak Hour (5:00 to 6:00 p.m.)		
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS
1 M Street NW/30th Street NW							
Eastbound (M Street)	L	1.03	160.9	F	1.87	488.2	F
Eastbound (M Street)	T	-	242.5	F	-	88.8	F
Eastbound (M Street)	R	1.51	246.4	F	0.83	20.2	C
Westbound (M Street)	L	1.00	149.4	F	1.17	208.3	F
Westbound (M Street)	T	-	23.6	C	-	58.6	E
Westbound (M Street)	R	0.58	8.8	A	1.00	45.5	F
Southbound (30th Street)	LTR	0.71	51.0	D	0.62	42.5	D
Intersection			167.9	F		69.9	E
2 M Street NW/29th Street NW							
Eastbound (M Street)	L	0.76	12.6	B	0.43	8.2	A
Eastbound (M Street)	T	-	13.0	B	-	8.6	A
Eastbound (M Street)	R	0.76	13.4	B	0.44	8.9	A
Westbound (M Street)	L	0.25	25.3	C	0.08	11.6	B
Westbound (M Street)	T	0.28	5.1	A	0.42	7.9	A
Westbound (M Street)	R	0.06	4.1	A	0.15	6.2	A
Northbound (29th Street)	LTR	0.26	36.4	D	0.39	36.0	D
Southbound (29th Street)	LTR	0.59	47.2	D	0.30	34.4	C
Intersection			13.5	B		10.7	B
3 K Street NW/30th Street NW							
Eastbound (K Street)	EB-TR	0.43	17.1	C	0.68	25.1	D
Westbound (K Street)	WB-L	0.12	11.4	B	0.05	11.6	B
Westbound (K Street)	WB-T	0.83	37.1	E	0.37	15.2	C
Northbound (30th Street)	NB-LTR	0.08	12.8	B	0.31	15.0	B
Southbound (30th Street)	SB-L	0.41	17.5	C	0.43	17.6	C
Southbound (30th Street)	SB-TR	0.40	15.1	C	0.28	12.9	B
4 K Street NW/29th Street NW							
Eastbound (K Street)	EB-L	0.04	10.6	B	0.05	9.5	A
Eastbound (K Street)	EB-T	0.45	15.5	C	0.54	15.6	C
Westbound (K Street)	WB-TR	1.30	64.6	F	0.66	20.8	C
Westbound (Rock Creek R	WB-TR	0.47	15.4	C	Ramp Closed		
Southbound (29th Street)	SB-R	0.05	10.3	B	0.12	9.8	A
Notes:							
LOS = Level of Service				Unsignalized intersections do not have an overall vehicle delay or LOS			
V/C Ratio = Volume to Capacity Ratio							
Delay is Measured in Seconds Per Vehicle							
Shaded areas denote intersections with LOS E or F				LTR = left/thru/right lanes			

Table 2-2 Saturday Peak Hour Existing Intersection Analysis.

Intersection	Lane Group/ Approach	Saturday PM Peak Hour (7:00 - 8:00 P.M.)		
		V/C Ratio	Delay (sec)	LOS
1 M Street NW/30th Street NW				
Eastbound (M Street)	L	1.02	161.3	F
Eastbound (M Street)	T	-	41.6	D
Eastbound (M Street)	R	0.95	31.9	C
Westbound (M Street)	L	3.06	1010.8	F
Westbound (M Street)	T	-	230.5	F
Westbound (M Street)	R	0.79	15.0	B
Southbound (30th Street)	LTR	0.51	45.3	D
Intersection			132.6	F
2 M Street NW/29th Street NW				
Eastbound (M Street)	L	0.42	7.7	A
Eastbound (M Street)	T	-	7.9	A
Eastbound (M Street)	R	0.43	8.2	A
Westbound (M Street)	L	0.02	9.9	A
Westbound (M Street)	T	0.44	7.5	A
Westbound (M Street)	R	0.18	6.0	A
Northbound (29th Street)	LTR	0.11	32.7	C
Southbound (29th Street)	LTR	0.46	41.5	D
Intersection			9.7	A
3 K Street NW/30th Street NW				
Eastbound (K Street)	EB-TR	0.68	25.1	D
Westbound (K Street)	WB-L	0.12	11.9	B
Westbound (K Street)	WB-T	0.51	17.9	C
Northbound (30th Street)	NB-LTR	0.15	13.2	B
Southbound (30th Street)	SB-L	0.41	17.3	C
Southbound (30th Street)	SB-TR	0.33	14.0	B
4 K Street NW/29th Street NW				
Eastbound (K Street)	EB-L	0.04	10.0	A
Eastbound (K Street)	EB-T	0.60	18.4	C
Westbound (K Street)	WB-TR	0.83	34.4	D
Westbound (Rock Creek Ramp)	WB-TR	0.20	11.1	B
Southbound (29th Street)	SB-R	0.04	10.0	A
Notes:				
LOS = Level of Service		Unsignalized intersections do not have an overall		
V/C Ratio = Volume to Capacity Ratio		vehicle delay or LOS		
Delay is Measured in Seconds Per Vehicle				
Shaded areas denote intersections with LOS E or F		LTR = left/thru/right lanes		

2.9. QUEUING ANALYSIS

In addition to using the 2010 HCM analysis for signalized and unsignalized intersections, the Synchro Traffic Analysis Software was used to calculate the queue lengths for each approach. The 50th percentile queue length is the queue expected 50 percent of the time or for an average day. The 95th percentile queue length is the queue expected 5 percent of the time or the worst-case scenario. A failing queue length is determined by the 50th percentile queue length because this reflects an average queue scenario. As the available storage for each intersection approach differs, these values reflect whether the existing storage provides enough space for vehicles waiting to pass through the intersection without blocking another lane or another intersection. While failing queues might occur along the same approach as a failing LOS, these values are calculated independent of each other and might result in one approach calculated with a failing LOS, while another approach could be calculated with a failing queue length. The Synchro Traffic Analysis software provides both the 50th and 95th percentile queue lengths for the two signalized intersections, and provides the HCM-based 95th percentile queue lengths for the two unsignalized intersections.

Based upon the Synchro Traffic Software signalized intersection queuing analysis, failing queue lengths occurred during the AM peak period along the eastbound M Street approach to 30th Street. The M Street eastbound approach had a 50th percentile queue length of 23 vehicles per lane and a 95th percentile queue length of 28 vehicles per lane. During the PM peak period, the 50th percentile queue length was not failing; however, the 95th percentile queue length of 16 vehicles per lane exceeded the roadway storage capacity. During the Saturday peak period, the M Street westbound approach had a 95th percentile queue length of 18 vehicles per lane, also exceeding the roadway storage capacity. The approaches at the 29th Street intersection with M Street had all acceptable queue lengths (see Table 2-3).

Based upon the Synchro Traffic Software HCM 2010 unsignalized intersection queuing analysis, all approaches had acceptable queue lengths during the AM, PM, and Saturday peak periods. The Synchro Traffic Software HCM 2010 Unsignalized Intersection queuing analysis reported queue lengths well beyond the observed values for the K Street westbound approaches to both 29th and 30th Streets. Therefore, SimTraffic simulation software was used to calculate the 95th percentile queue lengths, by averaging the results from executing five 60-minute simulation runs. According to SimTraffic results, the queue lengths were acceptable.

Table 2-3 Existing Condition Queuing Lengths.

Intersection	Lane Group/ Approach	AM Peak Hour (8:30 - 9:30 A.M.)		PM Peak Hour (5:00 - 6:00 P.M.)		Saturday Peak Hour (7:00 - 8:00 P.M.)	
		50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
1 M Street NW/30th Street NW							
Eastbound (M Street)	L	574~	714#	217	404#	154	228
Eastbound (M Street)	T	574~	714#	217	404#	154	228
Eastbound (M Street)	R	574~	714#	217	404#	154	228
Westbound (M Street)	L	27	157	222	288	172	459#
Westbound (M Street)	T	27	157	222	288	172	459#
Westbound (M Street)	R	27	157	222	288	172	459#
Southbound (30th Street)	LTR	112	217#	110	205#	67	101
2 M Street NW/29th Street NW							
Eastbound (M Street)	L	105	103	49	71	45	52
Eastbound (M Street)	T	105	103	49	71	45	52
Eastbound (M Street)	R	105	103	49	71	45	52
Westbound (M Street)	L	9	31	6	12	1	5
Westbound (M Street)	T	65	88	128	170	137	145
Westbound (M Street)	R	0	7	0	3	0	4
Northbound (29th Street)	LTR	28	18	44	55	11	18
Southbound (29th Street)	LTR	72	71	34	26	51	67
3 K Street NW/30th Street NW							
Eastbound (K Street)	EB-TR	-	55	-	160	-	155
Westbound (K Street)	WB-L	-	10	-	5	-	10
Westbound (K Street)	WB-T	-	72*	-	45*	-	54*
Northbound (30th Street)	NB-LTR	-	8	-	33	-	13
Southbound (30th Street)	SB-L	-	53	-	58	-	53
Southbound (30th Street)	SB-TR	-	48	-	28	-	38
4 K Street NW/29th Street NW							
Eastbound (K Street)	EB-L	-	3	-	5	-	3
Eastbound (K Street)	EB-T	-	63	-	88	-	113
Westbound (K Street)	WB-TR	-	158*	-	78*	-	82*
Westbound (Rock Creek Ramp)	WB-TR	-	68	Closed		-	20
Southbound (29th Street)	SB-R	-	5	-	10	-	3
Notes:							
~ 50th percentile volume exceeds capacity, queue is theoretically infinite.							
# 95th percentile volume exceeds capacity, queue may be longer.							
* Queue length reported using SimTraffic Software							

2.10. EXISTING TRAFFIC OBSERVATIONS

Along M Street, the two lanes carrying eastbound and westbound traffic could process the traffic in all analyzed time periods; however, the lack of left turning storage lanes required the through traffic to wait until the left turning traffic cleared. As the number of vehicles waiting to make a left turn increased, the delay for all through traffic increased. In addition, it was observed at the M Street intersection with 30th Street that when both the eastbound and westbound approaches had a left turning vehicle, the sight distance for both was blocked, increasing the risk of an incident from a moving vehicle traveling in the opposing M Street right lane.

Along K Street, there were some illegal left turning moves at the 29th Street intersection with K Street. Vehicles were recorded as turning left at the K Street westbound approach onto the Rock Creek Parkway southbound on-ramp, almost requiring a U-turn to complete the move. In addition, vehicles were recorded as turning left from the 29th Street southbound approach onto K Street eastbound or the Rock Creek southbound on-ramp. Visible “no left turn” signs are posted restricting these moves at both approaches. It was also observed that vehicles waited in a queue behind a road closed sign along the Rock Creek Parkway southbound on-ramp, starting 10-15 minutes before 6:30 PM, the time when the ramp opens. This queue backed up into the 29th Street intersection, requiring all K Street through traffic to use the left lane to pass.

3. ANALYSIS OF FUTURE NO-ACTION ALTERNATIVE

Under the No-Action Alternative, GSA would not dispose of the West Heating Plant parcel, and current uses of the site would continue. GSA would continue to maintain the parcel in a caretaker status, and there would not be any future redevelopment of the site. Existing condition data and analysis of existing roadways provide a baseline for evaluating the roadways serving the West Heating Plant parcel and analyzing the No-Action Alternative. Analysis of impacts under the No-Action Alternative assumes background development and growth through the year 2017, which is when the projected future development is expected to occur. To analyze impacts for the No-Action Alternative, roadway improvements and land use change assumptions were determined through 2017. These assumptions directly affect the amount of traffic assigned to the roadway network.

DDOT does not plan any roadway improvements or modifications for the study area intersections (Personal Communication, DDOT, 2012); therefore, only land use changes are included in the No-Action Alternative analysis. The bridge over the C&O Canal will reopen later in 2012; therefore, future scenarios will treat 29th Street, NW between K and M Streets, NW as a through street. Because through traffic volumes between 2007 and 2009 showed insignificant growth, DDOT concurred that an annual growth factor would not be necessary for this study (Personal Communication, DDOT, 2012).

3.1. NO-ACTION ALTERNATIVE TRIP GENERATION

The latest release of the Institute of Transportation Engineers (ITE) Trip Generation Manual was used to determine the trip generation rates for all scenarios. The ITE Trip Generation Manual provides an estimate of the total number of trips generated by proposed land use, broken down into AM weekday, PM weekday, and Saturday peak hour volumes. In addition, directional distributions and pass-by percentages are provided to avoid counting an existing trip (for example, a trip already accounted for in the existing conditions destined for a grocery store that would also stop at a proposed gas station). These rates assume parking is available for all new trips and all trips generated would use a vehicle. To account for a modal split (vehicle/transit) the 2009 WMATA Transit Ridership Trends and Markets report reported a modal split for the study area between 25-50 percent for residential uses and greater than 25 percent for office. To be conservative and consistent, a 75/25 percent vehicle/transit modal split was assumed for this study.

Two nearby developments opening by 2017 would add background vehicle trips to the study area. Both developments are located south of K Street between Thomas Jefferson and 31st Street. One development is replacing 6,000 SF of office space with a quality restaurant and adding a new 10,000 SF ice skating rink and the other is a luxury hotel that comprises 48 suites. To incorporate these background trips, the ITE Trip Generation Manual's office, quality restaurant, ice skating rink, and hotel-all suites were used. Since the hotel-all suites does not provide a Saturday trip rate, the general hotel (ITE code 310) category was used for Saturday.

Based upon the ITE Trip Generation Manual, the total AM peak hour trips would be seven, broken down into two trips entering the site and five trips leaving the site. These trips were reduced from a total of nine to account for a 75/25 percent modal split. The total PM peak hour trips would be 60, broken down into 28 trips entering the sites and 17 trips leaving the sites. These trips were reduced from a total of 80 to account for a 75/25 percent modal split. The Saturday peak hour trips would be 97 trips, broken down into 39 trips entering the site and 36 trips leaving the site. These trips were reduced from a total of 129 to account for a 75/25 percent modal split. The quality restaurant pass-by trips account for 44 percent of the total PM peak hour trips. Tables 3-1 and 3-2 show the trip generation under the No-Action Alternative.

Table 3-1 No-Action Alternative Weekday Peak Hour Trip Generation.

Description/ITE Code	Units	Expected Units	Total Trips	AM Hour	PM Hour	Weekday Distribution of Generated Trips					
						AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
General Office 710*	KSF2	6,000	-14	-7	-7	-6	-1	0	-1	-6	0
Quality Restaurant 931	KSF2	6,000	34	NA	34	NA	NA	NA	13	6	15
Ice Skating Rink 465	KSF2	10,000	18	NA	18	NA	NA	NA	9	9	0
Hotel - All Suites 311	DU	48	29	14	15	8	6	0	7	8	0
TOTAL TRIPS			67	7	60	2	5	0	28	17	15

*General office is being replaced by a quality restaurant

Table 3-2 No-Action Alternative Saturday Peak Hour Trip Generation.

Description/ITE Code	Units	Expected Units	Total Trips	Saturday Distribution of Generated Trips		
				In	Out	Pass-By
General Office* 710	KSF2	6,000	-2	-1	-1	0
Quality Restaurant 931	KSF2	6,000	49	16	11	22
Ice Skating Rink 465	KSF2	10,000	18	8	10	0
Hotel 310 [#]	DU	48	32	16	16	0
TOTAL TRIPS			97	39	36	22

*General office is being replaced by a quality restaurant

Saturday trip rates not provided for hotel-suites, so the general hotel rates were used

3.2. NO-ACTION ALTERNATIVE TRIP DISTRIBUTION

The existing conditions do not cover the 31st Street or Thomas Jefferson Street intersections along K Street; therefore, a hybrid approach was used to distribute the trips. Using the 2004 Coal House Garage Traffic Impact Study, the Thomas Jefferson Street intersection with K Street AM and PM turning movements were used to establish the percentage of vehicles turning right and heading eastbound along K Street, through the 30th and 29th Streets along K Street. The PM turning movements were also used to calculate the Saturday peak hour percentage of vehicles turning right on K Street. The existing condition 30th Street intersection at K Street AM, PM, and Saturday turning movement counts from this study were used to calculate the

traffic flows destined to the two developments headed westbound through 29th and 30th Streets along K Street.

Since the 29th Street Bridge is currently closed for reconstruction, the number of vehicles making a left from 30th Street and then making the next left onto 29th Street was counted. This move represents the number of vehicles that would potentially use 29th Street if the bridge were open. According to the counts obtained, there were zero AM or Saturday peak period vehicles making this move, but there were seven vehicles during the PM peak hour making this move. To account for this, seven trips were removed from the network at 30th Street intersection with M Street headed southbound, 30th Street intersection with K Street headed eastbound, and 29th Street intersection with K Street headed northbound. These were added to the 30th Street intersection with M Street headed eastbound and 29th Street intersection with M Street headed southbound. Figure 3-1 illustrates the No-Action Alternative AM and PM Peak background trip distribution and Figure 3-2 illustrates the No-Action Alternative background Saturday trip distribution.

Figure 3-1 No-Action Alternative AM and PM background Trip Distribution.

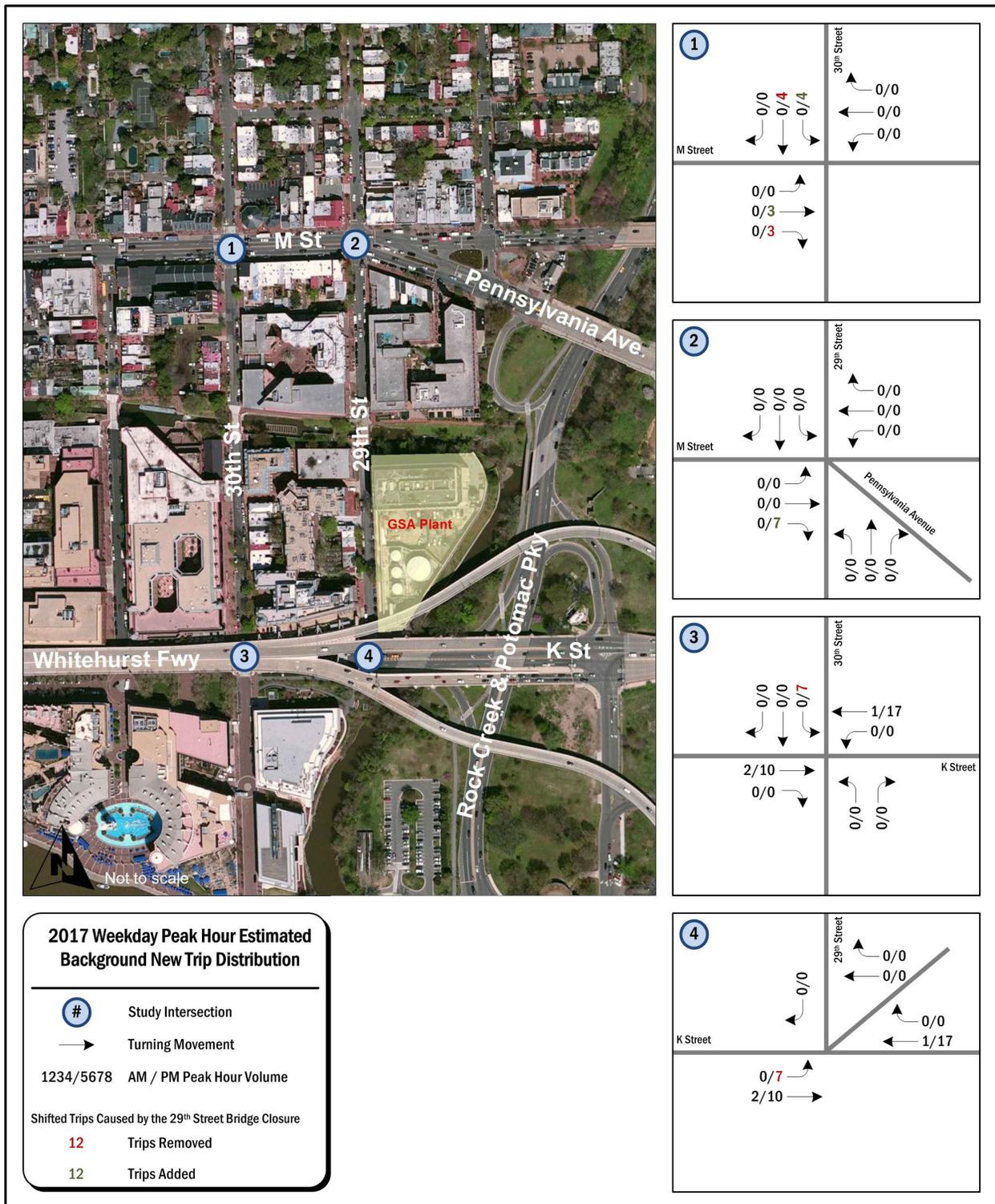
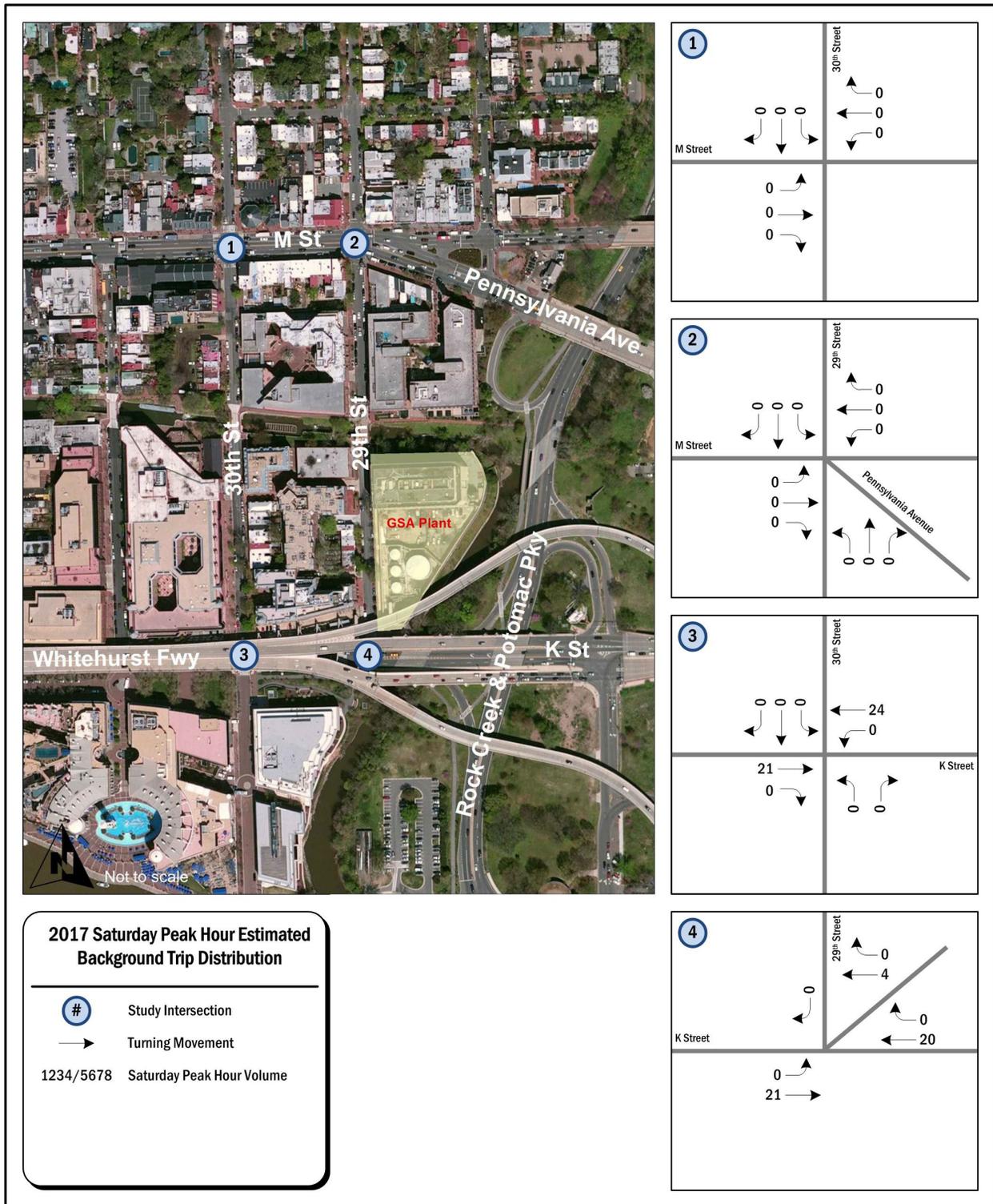


Figure 3-2 No-Action Alternative Saturday Background Trip Distribution.



3.3. NO-ACTION ALTERNATIVE CAPACITY ANALYSIS

Based upon the analysis using the Synchro Traffic Software HCM 2010 signalized intersection analysis, the 30th Street intersection with M Street would operate at an overall LOS F (over a two minute delay per vehicle) during the AM peak hour (See Table 3-3). The longest delay would occur along the eastbound approach, with a three minute delay per vehicle. During the PM peak hour, the 30th Street intersection with M Street would operate with an overall LOS E (over a 65 second delay per vehicle) (See Table 3-4). The longest delay would occur along the eastbound left lane approach with an eight minute delay per vehicle. The 29th Street intersection with M Street would operate at an overall LOS B during both AM and PM peak periods, with just over a 15 second delay per vehicle.

During the Saturday peak hour, the 30th Street intersection with M Street would operate with an overall LOS F, with more than a two minute delay per vehicle (See Table 3-5). The longest delay would occur along the westbound M Street left lane, with more than a 16 minute delay per vehicle. The 29th Street intersection with M Street would operate with an overall LOS A.

Based upon the analysis using the Synchro Traffic Software HCM 2010 unsignalized intersection analysis, the 30th Street intersection with K Street approaches would operate at LOS C or better during the AM weekday peak hour, except for the K Street westbound through movement, which operates at LOS E resulting from a 37 second delay per vehicle. The PM weekday peak hour and Saturday peak hour operates at LOS D or better for all approaches. The 29th Street intersection with K Street operates at LOS C or better during the AM weekday peak hour, except for the K Street westbound through movement, which operates at LOS F resulting from a 65 second delay per vehicle. The PM weekday peak hour operates at LOS C or better and the Saturday peak hour operates at LOS C or better, except the K Street westbound through movement, which would operate at LOS E resulting from a 42 second delay per vehicle. The Rock Creek Parkway southbound off ramp is closed during the PM peak hour, as Rock Creek Parkway operates in the northbound direction only.

Table 3-3 No-Action Alternative and Disposal Alternative AM Peak Hour Intersection Analysis.

AM Weekday Peak Hour								
Intersection	Lane Group/ Approach	Disposal Alternative RFDS			No-Action Alternative			
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	
1	M Street NW/30th Street NW							
	Eastbound (M Street)	L	1.08	178.1	F	1.18	223.7	F
	Eastbound (M Street)	T	-	241.9	F	-	214.6	F
	Eastbound (M Street)	R	1.50	244.9	F	1.43	214.2	F
	Westbound (M Street)	L	1.03	165.3	F	1.14	207.9	F
	Westbound (M Street)	T	-	24.6	C	-	28.7	C
	Westbound (M Street)	R	0.63	9.5	A	0.56	7.7	A
	Southbound (30th Street)	LTR	0.74	56.0	E	0.81	69.4	E
	Intersection			165.5	F		152.6	F
2	M Street NW/29th Street NW							
	Eastbound (M Street)	L	0.81	17.0	B	0.79	15.8	B
	Eastbound (M Street)	T	-	17.6	B	-	16.3	B
	Eastbound (M Street)	R	0.82	18.3	B	0.79	16.7	B
	Westbound (M Street)	L	0.51	48.3	D	0.28	32.1	C
	Westbound (M Street)	T	0.30	6.4	A	0.30	6.4	A
	Westbound (M Street)	R	0.07	5.2	A	0.07	5.2	A
	Northbound (29th Street)	LTR	1.15	137.6	F	0.27	34.6	C
	Southbound (29th Street)	LTR	0.67	51.8	D	0.53	42.7	D
	Intersection			31.8	C		15.7	B
3	K Street NW/30th Street NW							
	Eastbound (K Street)	EB-TR	0.55	21.3	C	0.43	17.3	C
	Westbound (K Street)	WB-L	0.13	11.8	B	0.12	11.4	B
	Westbound (K Street)	WB-T	0.93	54.0	F	0.83	37.3	E
	Northbound (30th Street)	NB-LTR	0.08	13.4	B	0.08	12.8	B
	Southbound (30th Street)	SB-L	0.44	18.8	C	0.42	17.6	C
	Southbound (30th Street)	SB-TR	0.41	16.3	C	0.39	15.1	C
4	K Street NW/29th Street NW							
	Eastbound (K Street)	EB-L	0.19	12.5	B	0.04	10.6	B
	Eastbound (K Street)	EB-T	0.48	16.7	C	0.45	15.6	C
	Westbound (K Street)	WB-TR	1.61	66.7	F	1.30	64.6	F
	Westbound (Rock Creek Ramp)	WB-TR	0.51	17.1	C	0.47	15.4	C
	Southbound (29th Street)	SB-R	0.23	12.5	B	0.05	10.4	B
Notes:								
LOS = Level of Service				Unsignalized intersections do not have an overall				
V/C Ratio = Volume to Capacity Ratio				vehicle delay or LOS				
Delay is Measured in Seconds Per Vehicle								
Shaded areas denote intersections with LOS E or F				LTR = left/thru/right lanes				

Table 3-4 No-Action Alternative and Disposal Alternative PM Peak Hour Intersection Analysis.

PM Weekday Peak Hour								
Intersection	Lane Group/ Approach	Disposal Alternative RFDS			No-Action Alternative			
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	
1	M Street NW/30th Street NW							
	Eastbound (M Street)	L	1.91	506.4	F	1.91	506.4	F
	Eastbound (M Street)	T	-	89.3	F	-	89.8	F
	Eastbound (M Street)	R	0.82	19.4	B	0.80	18.2	B
	Westbound (M Street)	L	1.20	218.7	F	1.20	218.7	F
	Westbound (M Street)	T	-	64.1	E	-	50.1	D
	Westbound (M Street)	R	1.03	51.1	F	0.96	35.0	D
	Southbound (30th Street)	LTR	0.64	44.6	D	0.64	44.4	D
	Intersection			72.8	E		66.5	E
2	M Street NW/29th Street NW							
	Eastbound (M Street)	L	0.45	9.2	A	0.42	8.1	A
	Eastbound (M Street)	T	-	9.7	A	-	8.4	A
	Eastbound (M Street)	R	0.47	10.0	B	0.44	8.7	A
	Westbound (M Street)	L	0.24	15.8	B	0.07	11.3	B
	Westbound (M Street)	T	0.43	8.7	A	0.42	7.7	A
	Westbound (M Street)	R	0.13	6.7	A	0.13	5.9	A
	Northbound (29th Street)	LTR	1.08	116.7	F	0.04	37.2	D
	Southbound (29th Street)	LTR	0.31	33.7	C	0.03	35.3	D
	Intersection			24.8	C		10.6	B
3	K Street NW/30th Street NW							
	Eastbound (K Street)	EB-TR	0.90	51.2	F	0.70	26.5	D
	Westbound (K Street)	WB-L	0.05	12.2	B	0.05	11.6	B
	Westbound (K Street)	WB-T	0.69	20.1	C	0.39	15.7	C
	Northbound (30th Street)	NB-LTR	0.35	17.1	C	0.31	15.2	C
	Southbound (30th Street)	SB-L	0.45	19.9	C	0.42	17.5	C
	Southbound (30th Street)	SB-TR	0.31	14.7	B	0.28	13.1	B
4	K Street NW/29th Street NW							
	Eastbound (K Street)	EB-L	0.27	12.4	B	0.03	9.5	A
	Eastbound (K Street)	EB-T	0.61	18.9	C	0.56	16.2	C
	Westbound (K Street)	WB-TR	0.81	33.3	D	0.70	23.3	C
	Westbound (Rock Creek Ramp)	WB-TR	Ramp Closed			Ramp Closed		
	Southbound (29th Street)	SB-R	0.35	13.1	B	0.12	9.9	A
Notes:								
LOS = Level of Service				Unsignalized intersections do not have an overall				
V/C Ratio = Volume to Capacity Ratio				vehicle delay or LOS				
Delay is Measured in Seconds Per Vehicle								
Shaded areas denote intersections with LOS E or F				LTR = left/thru/right lanes				

Table 3-5 No-Action Alternative and Disposal Alternative Saturday Peak Hour Intersection Analysis.

Saturday Peak Hour								
Intersection	Lane Group/ Approach	Disposal Alternative RFDS			No-Action Alternative			
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	
1	M Street NW/30th Street NW							
	Eastbound (M Street)	L	1.02	161.3	F	1.02	161.3	F
	Eastbound (M Street)	T	-	32.2	C	-	30.0	C
	Eastbound (M Street)	R	0.89	22.1	C	0.86	19.4	B
	Westbound (M Street)	L	3.06	1010.8	F	3.06	1010.8	F
	Westbound (M Street)	T	-	218.0	F	-	228.7	F
	Westbound (M Street)	R	0.80	15.2	B	0.74	12.7	B
	Southbound (30th Street)	LTR	0.50	44.8	D	0.50	44.7	D
	Intersection			123.6	F		126.4	F
2	M Street NW/29th Street NW							
	Eastbound (M Street)	L	0.46	8.2	A	0.41	7.7	A
	Eastbound (M Street)	T	-	8.5	A	-	7.9	A
	Eastbound (M Street)	R	0.48	8.8	A	0.43	8.1	A
	Westbound (M Street)	L	0.12	12.2	B	0.02	13.8	B
	Westbound (M Street)	T	0.44	7.5	A	0.44	7.5	A
	Westbound (M Street)	R	0.16	5.8	A	0.16	5.8	A
	Northbound (29th Street)	LTR	0.85	65.0	E	0.12	32.8	C
	Southbound (29th Street)	LTR	0.58	45.4	D	0.46	41.6	D
	Intersection			15.6	B		9.7	A
3	K Street NW/30th Street NW							
	Eastbound (K Street)	EB-TR	0.86	42.9	E	0.72	28.3	D
	Westbound (K Street)	WB-L	0.12	12.5	B	0.12	12.1	B
	Westbound (K Street)	WB-T	0.65	24.6	C	0.54	19.2	C
	Northbound (30th Street)	NB-LTR	0.16	14.4	B	0.15	13.5	B
	Southbound (30th Street)	SB-L	0.45	19.4	C	0.42	17.8	C
	Southbound (30th Street)	SB-TR	0.36	15.5	C	0.34	14.3	B
4	K Street NW/29th Street NW							
	Eastbound (K Street)	EB-L	0.29	13.4	B	0.04	10.1	B
	Eastbound (K Street)	EB-T	0.69	24.2	C	0.64	20.1	C
	Westbound (K Street)	WB-TR	1.28	67.2	F	0.89	41.9	E
	Westbound (Rock Creek Ramp)	WB-TR	0.25	12.8	B	0.22	11.5	B
	Southbound (29th Street)	SB-R	0.29	13.2	B	0.05	10.2	B
Notes:								
LOS = Level of Service				Unsignalized intersections do not have an overall				
V/C Ratio = Volume to Capacity Ratio				vehicle delay or LOS				
Delay is Measured in Seconds Per Vehicle								
Shaded areas denote intersections with LOS E or F				LTR = left/thru/right lanes				

3.4. NO-ACTION ALTERNATIVE QUEUING ANALYSIS

The results of the No-Action Alternative and Disposal Alternative queuing analysis are discussed below and presented in Tables 3-6, 3-7, and 3-8.

Based upon the Synchro Traffic Software signalized intersection queuing analysis, queue lengths exceeding the roadway storage capacity would occur during the AM peak period along the eastbound M Street approach to 30th Street, NW. The M Street, NW eastbound approach would have a 50th percentile queue length of 23 vehicles per lane and a 95th percentile queue length of 32 vehicles per lane. During the PM peak period, the 50th percentile queue length would not exceed capacity; however, the 95th percentile queue length of 17 vehicles would exceed the storage capacity. During the Saturday peak period, the M Street, NW westbound approach would have a 95th percentile queue length of 19 vehicles per lane, exceeding the storage capacity. The approaches at the 29th Street intersection with M Street, NW would all have acceptable queue lengths for all time periods.

Based upon the Synchro Traffic Software HCM 2010 unsignalized intersection queuing analysis and SimTraffic queuing analysis for the K Street, NW westbound approaches, all approaches at the two unsignalized intersection along K Street, NW would have acceptable queue lengths during all three time periods.

Table 3-6 No-Action Alternative and Disposal Alternative AM Peak Hour Queuing Analysis

Intersection	Lane Group/ Approach	Disposal Alternative RFDS		No-Action Alternative	
		50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
1 M Street NW/30th Street NW					
Eastbound (M Street)	L	613~	754#	587~	797#
Eastbound (M Street)	T	613~	754#	587~	797#
Eastbound (M Street)	R	613~	754#	587~	797#
Westbound (M Street)	L	149	185	93	136
Westbound (M Street)	T	149	185	93	136
Westbound (M Street)	R	149	185	93	136
Southbound (30th Street)	LTR	119	231#	134	262#
2 M Street NW/29th Street NW					
Eastbound (M Street)	L	247	213	451	493
Eastbound (M Street)	T	247	213	451	493
Eastbound (M Street)	R	247	213	451	493
Westbound (M Street)	L	30	113#	11	42
Westbound (M Street)	T	77	105	77	105
Westbound (M Street)	R	0	8	0	8
Northbound (29th Street)	LTR	310~	107	28	18
Southbound (29th Street)	LTR	104~	90	73	71
3 K Street NW/30th Street NW					
Eastbound (K Street)	EB-TR	-	93	-	58
Westbound (K Street)	WB-L	-	10	-	10
Westbound (K Street)	WB-T	-	71*	-	79*
Northbound (30th Street)	NB-LTR	-	8	-	8
Southbound (30th Street)	SB-L	-	58	-	53
Southbound (30th Street)	SB-TR	-	53	-	48
4 K Street NW/29th Street NW					
Eastbound (K Street)	EB-L	-	18	-	3
Eastbound (K Street)	EB-T	-	68	-	63
Westbound (K Street)	WB-TR	-	470*	-	215*
Westbound (Rock Creek Ramp)	WB-TR	-	78	-	68
Southbound (29th Street)	SB-R	-	23	-	5
Notes:					
~ Volume exceeds capacity, queue is theoretically infinite.		* Queue length reported using SimTraffic Software			
# 95th percentile volume exceeds capacity, queue may be longer.					

Table 3-7 No-Action Alternative and Disposal Alternative PM Peak Hour Queuing Analysis

Intersection	Lane Group/ Approach	Disposal Alternative RFDS		No-Action Alternative	
		50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
1 M Street NW/30th Street NW					
Eastbound (M Street)	L	252	442#	229	420#
Eastbound (M Street)	T	252	442#	229	420#
Eastbound (M Street)	R	252	442#	229	420#
Westbound (M Street)	L	284	327	230	298
Westbound (M Street)	T	284	327	230	298
Westbound (M Street)	R	284	327	230	298
Southbound (30th Street)	LTR	116	220#	115	218#
2 M Street NW/29th Street NW					
Eastbound (M Street)	L	45	61	39	52
Eastbound (M Street)	T	45	61	39	52
Eastbound (M Street)	R	45	61	39	52
Westbound (M Street)	L	22	35	6	12
Westbound (M Street)	T	137	182	128	169
Westbound (M Street)	R	0	3	0	3
Northbound (29th Street)	LTR	243~	216#	46	57
Southbound (29th Street)	LTR	51	36	35	26
3 K Street NW/30th Street NW					
Eastbound (K Street)	EB-TR	-	73*	-	70*
Westbound (K Street)	WB-L	-	5	-	5
Westbound (K Street)	WB-T	-	83	-	48
Northbound (30th Street)	NB-LTR	-	40	-	35
Southbound (30th Street)	SB-L	-	63	-	53
Southbound (30th Street)	SB-TR	-	33	-	28
4 K Street NW/29th Street NW					
Eastbound (K Street)	EB-L	-	28	-	3
Eastbound (K Street)	EB-T	-	115	-	95
Westbound (K Street)	WB-TR	-	80*	-	76*
Westbound (Rock Creek Ramp)	WB-TR	Closed		Closed	
Southbound (29th Street)	SB-R	-	40	-	10
Notes:					
~ Volume exceeds capacity, queue is theoretically infinite.			* Queue length reported using SimTraffic Software		
# 95th percentile volume exceeds capacity, queue may be longer.					

Table 3-8 No-Action Alternative and Disposal Alternative Saturday Peak Hour Queuing Analysis

Intersection	Lane Group/ Approach	Disposal Alternative RFDS		No-Action Alternative		
		50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	
1 M Street NW/30th Street NW						
Eastbound (M Street)	L	176	270	163	247	
Eastbound (M Street)	T	176	270	163	247	
Eastbound (M Street)	R	176	270	163	247	
Westbound (M Street)	L	388~	505#	195	472#	
Westbound (M Street)	T	388~	505#	195	472#	
Westbound (M Street)	R	388~	505#	195	472#	
Southbound (30th Street)	LTR	68	102	67	101	
2 M Street NW/29th Street NW						
Eastbound (M Street)	L	52	60	45	52	
Eastbound (M Street)	T	52	60	45	52	
Eastbound (M Street)	R	52	60	45	52	
Westbound (M Street)	L	8	21	1	5	
Westbound (M Street)	T	137	145	137	145	
Westbound (M Street)	R	0	4	0	4	
Northbound (29th Street)	LTR	156~	106	11	18	
Southbound (29th Street)	LTR	88	103	51	67	
3 K Street NW/30th Street NW						
Eastbound (K Street)	EB-TR	-	68*	-	70*	
Westbound (K Street)	WB-L	-	10	-	10	
Westbound (K Street)	WB-T	-	140	-	88	
Northbound (30th Street)	NB-LTR	-	15	-	13	
Southbound (30th Street)	SB-L	-	60	-	55	
Southbound (30th Street)	SB-TR	-	43	-	38	
4 K Street NW/29th Street NW						
Eastbound (K Street)	EB-L	-	30	-	3	
Eastbound (K Street)	EB-T	-	165	-	130	
Westbound (K Street)	WB-TR	-	161*	-	83*	
Westbound (Rock Creek Ramp)	WB-TR	-	25	-	23	
Southbound (29th Street)	SB-R	-	30	-	3	
Notes:						
~		Volume exceeds capacity, queue is theoretically infinite.		* Queue length reported using SimTraffic Software		
#		95th percentile volume exceeds capacity, queue may be longer.				

3.5. PEDESTRIAN, TRANSIT, PARKING IMPACTS

The pedestrian impacts for the No-Action Alternative would be minimal because the increase in traffic along K Street, NW would not impact pedestrians crossing at the intersections, nor impact their access to the surrounding street network. There would not be any loss of on-street parking spaces along 29th Street, NW; however, the attractiveness of the proposed developments or other retail shops along M Street, NW could result in less available parking spaces along 29th and 30th Streets, NW between K and M Streets, NW, and M Street, NW between 29th and 30th Streets, NW. The Circulator bus route might experience some delays along its K Street, NW westbound route as a result of the increased traffic through this corridor.

4. ANALYSIS OF FUTURE CONDITIONS WITH DISPOSAL AND REDEVELOPMENT

The development of the No-Action Alternative and analysis provides a 2017 baseline to compare with the Disposal Alternative. The Disposal Alternative develops trip generation and distributions to assess the roadway operations, with the assumption that future development would occur on the site after disposal has occurred. These impacts are considered indirect impacts of the proposed action (see the EA for additional information).

4.1. DISPOSAL ALTERNATIVE TRIP GENERATION

As discussed in Chapter 1, an RFDS was established within the framework of W-2 zoning to provide the “worst case scenario” for impact analysis purposes. Note that any developer will need to coordinate with the District of Columbia Office of Planning (DCOP) for future zoning, with ample opportunity for public comment. Any developer would also be required to prepare a traffic impact study according to DDOT’s standards and DC regulations. Dependent on the actual redevelopment plan, for the site a more thorough traffic study, which may include additional intersections, may be warranted.

The proposed land use is assumed to consist of 36,600 SF of a restaurant using two floors from the existing building (smaller top floor and bottom floor) and the remainder of the non-residential use divided evenly between office and specialty retail uses. Condos/ townhouses are assumed to use the other 50 percent of the existing building (71,800 SF), plus an additional 109,410 SF on the remainder of the site. This would break down into 72,305 SF of general office, 72,305 SF of specialty retail, and 181 dwelling units of residential condos or townhouses (assuming 1,000 SF per dwelling unit [Personal Communication, DCOP, 2012]).

The ITE Trip Generation Manual was used to calculate the total new trips that would be generated based upon these assumed uses. To be consistent with the development of the No-Action Alternative, a 75/25 percent vehicle/transit modal split was assumed. In addition, the ITE manual did not provide a specialty retail Saturday peak hour rate or pass-by percentage; therefore, the study used the shopping center (ITE code 820) Saturday peak hour rate and shopping center pass-by rate for weekday and Saturday trips to account for an urban retail shopping area attraction.

Based upon the ITE Trip Generation Manual, the total AM peak hour trips would be 515, broken down into 202 trips entering the site, 187 trips leaving the site, and 126 pass-by trips. These trips were reduced from a total of 687 to account for a 75/25 percent modal split. The total PM peak hour trips would be 504, broken down into 182 trips entering the site, 181 trips leaving the site, and 141 pass-by trips. These trips were reduced from a total of 671 to account for a 75/25 percent modal split. The Saturday peak hour trips would be 653 trips, broken down into 239 trips entering the site, 193 trips leaving the site, and 221 pass-by trips. These trips were reduced from a total of 870 to account for a 75/25 percent modal split. The West Heating Plant existing trips

are nominal and therefore, are not included as a reduction in trips. Table 4-1 shows the 2017 Disposal Alternative AM and PM weekday trip generation and Table 4-2 shows the 2017 Disposal Alternative Saturday trip generation.

Table 4-1 2017 Disposal Alternative AM and PM Weekday Trip Generation.

Description/ITE Code	Units	Expected Units	Total Trips	AM Hour	PM Hour	Weekday Distribution of Generated Trips					
						AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
Condo/Townhouse 230	DU	181	142	60	71	10	50	0	48	23	0
General Office 710	KSF2	72,305	160	84	80	74	10	0	14	66	0
Specialty Retail Center 814	KSF2	72,305	518	371	147	118	127	126	43	54	50
Quality Restaurant 931	KSF2	36,600	412	NA	206	NA	NA	NA	77	38	91
TOTAL TRIPS			1,232	515	504	202	187	126	182	181	141

Table 4-2 2017 Disposal Alternative Saturday Trip Generation.

Description/ITE Code	Units	Expected Units	Total Trips	Saturday Distribution of Generated Trips		
				In	Out	Pass-By
Condo/Townhouse 230	DU	181	64	35	29	0
General Office 710	KSF2	72,305	23	12	11	0
Shopping Center* 820	KSF2	72,305	269	93	85	91
Quality Restaurant 931	KSF2	36,600	297	99	68	130
TOTAL TRIPS			653	239	193	221

*Trip rates not available for Saturday peak period; therefore shopping center rates used

4.2. DISPOSAL ALTERNATIVE TRIP DISTRIBUTION

Since the existing condition counts were obtained during a period when the 29th Street Bridge is closed, traffic counts from a previous study at the intersection of 29th and K Street were used to calculate the direction distribution. Based upon the 2004 Coal House Garage Traffic Impact Study, 29th Street had a 71 percent/29 percent northbound/southbound directional split during the AM peak hour and a 61 percent/39 percent northbound/southbound directional split during the PM peak hour. The traffic study used these directional splits for AM and PM weekday distribution models and in addition, used the PM directional split for modeling the Saturday distribution. As there were no recent turning movement volumes at the 29th and M Street intersection and the traffic control for that intersection was different when the 2004 study obtained the counts, the Disposal Alternative trip distribution was calculated from this study's existing volumes. In addition, the study assumed that vehicles destined to or from the West Heating Plant site would not use 30th Street between K and M Street as 29th Street would provide a more direct route. Figure 4-1 illustrates the Disposal Alternative AM and PM estimated weekday new trip distribution; Figure 4-2 illustrates the Disposal Alternative Saturday estimated new trip distribution.

Figure 4-1 2017 Disposal Alternative AM and PM Estimated Weekday New Trip Distribution.

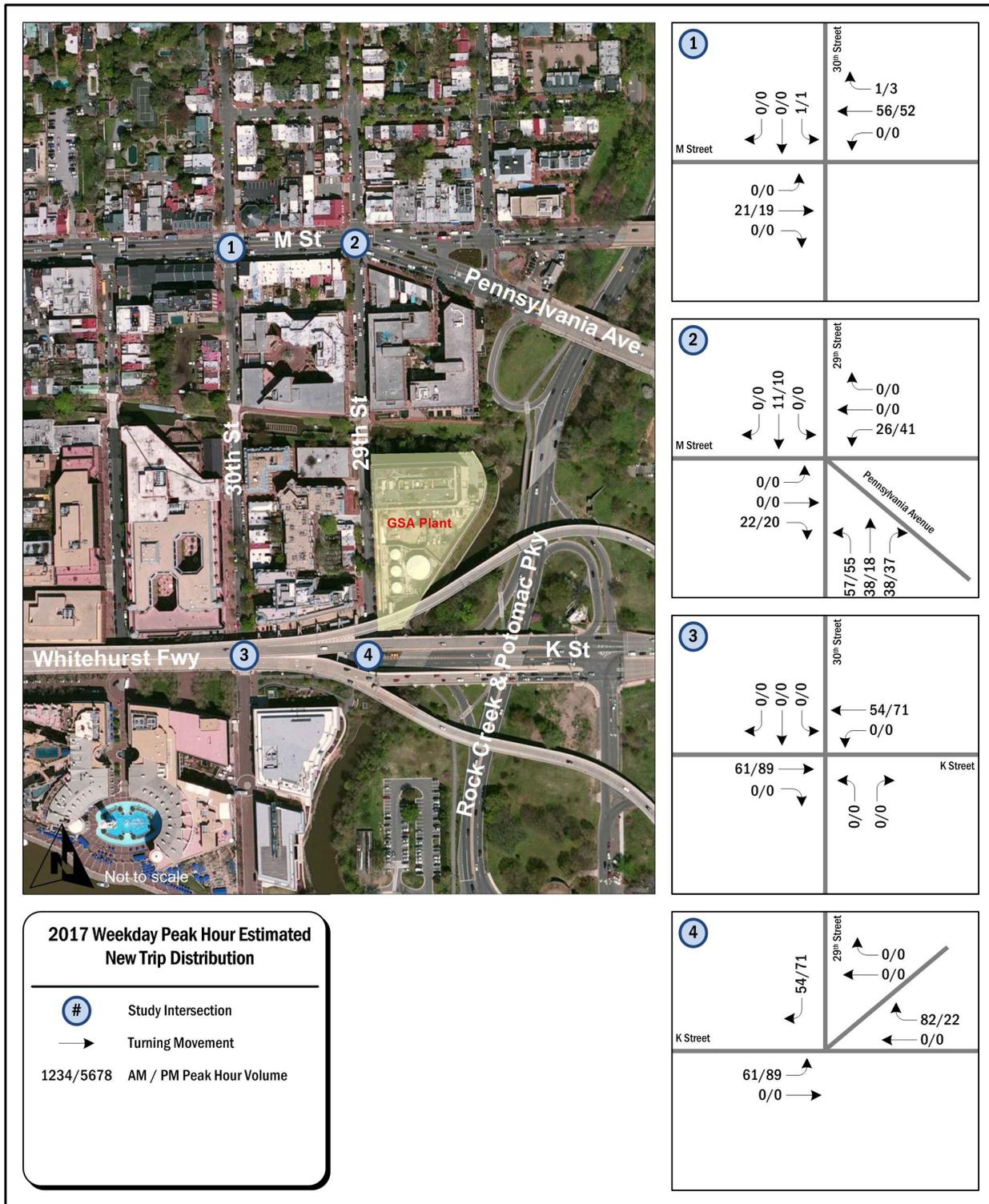
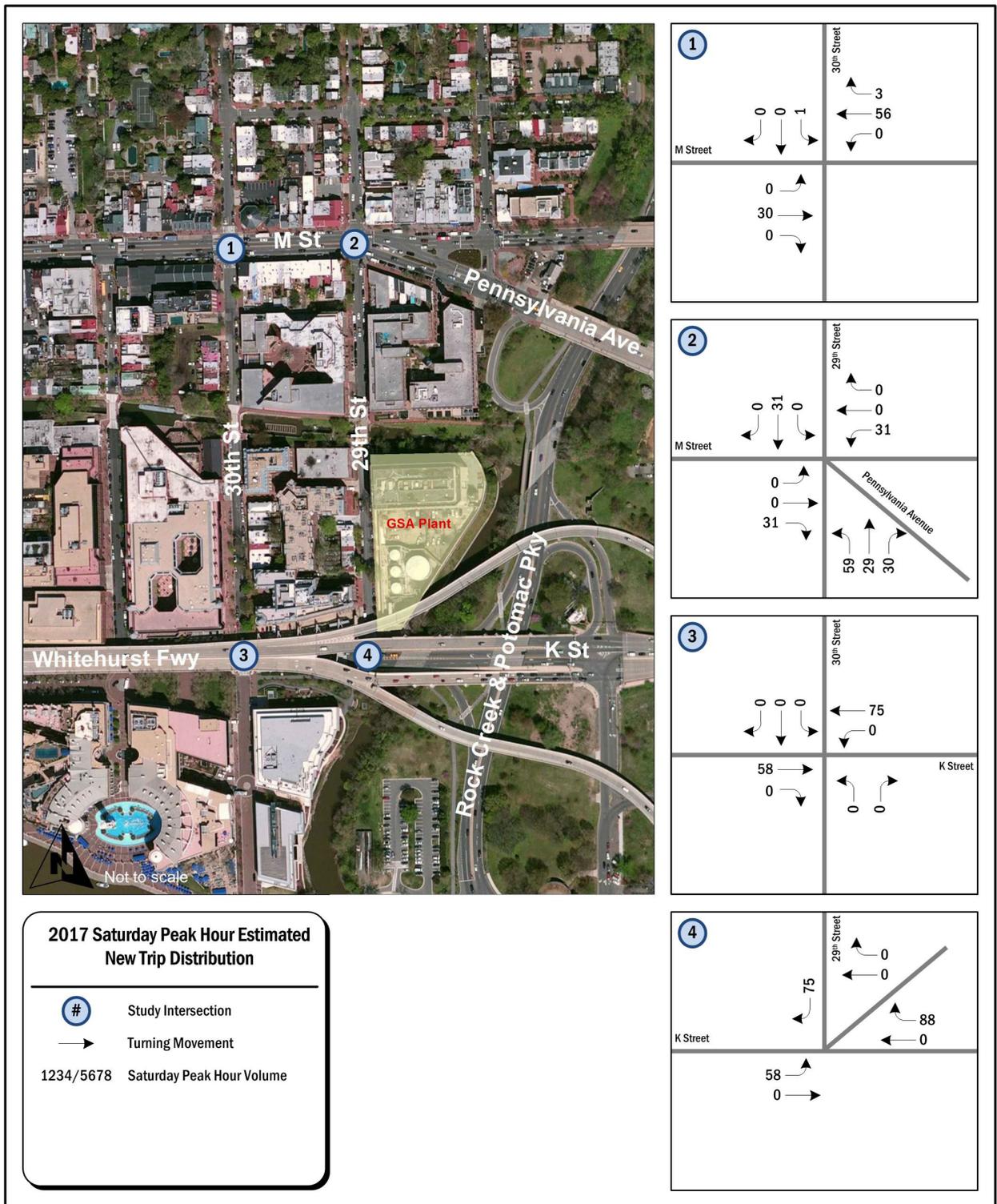


Figure 4-2 2017 Disposal Alternative Saturday Estimated New Trip Distribution.



4.3. 2017 DISPOSAL ALTERNATIVE WITH RFDS CAPACITY ANALYSIS

The results of the No-Action Alternative and Disposal Alternative intersection analysis are discussed below and presented in Tables 3-3, 3-4, and 3-5.

Based upon the analysis using the Synchro Traffic Software HCM 2010 signalized intersection analysis, the 30th Street, NW intersection with M Street, NW would continue to operate at overall LOS F during the AM peak hour for the Disposal Alternative with the RFDS, when compared to the No-Action Alternative. The difference between the No-Action Alternative and Disposal Alternative with the RFDS would be 13 seconds. During the PM peak hour, the intersection would continue to operate at LOS E, with a six second difference between the two Alternatives. During the Saturday peak hour the intersection would continue to operate at LOS F, with a three second difference between the alternatives. Based upon this analysis, the disposal of the West Heating Plant site with the RFDS would have a negligible impact on this intersection with no beneficial or adverse effects.

The 29th Street intersection with M Street would operate at overall LOS C during the AM peak hour for the Disposal Alternative with the RFDS, down from LOS B. The major factor for this change would be in the new vehicle trips added to the 29th Street northbound approach experiencing a two plus minute delay. The difference between the No-Action Alternative and Disposal Alternative with the RFDS would be 16 seconds. During the PM peak hour, the intersection would operate at an overall LOS C, down one LOS letter from the No-Action Alternative (LOS B). The additional vehicle trips added to the 29th Street northbound approach from the West Heating Plant site would be the cause of this LOS change. The difference between the No-Action Alternative and Disposal Alternative with the RFDS would be 14 seconds. The Saturday peak hour would change from LOS A to B, due to the same factor affecting the AM and PM peak hour LOS ratings. Based upon the analysis, the disposal of the West Heating Plant site would have a moderate impact on this intersection; causing a long-term adverse effect of increased vehicular traffic along the 29th Street northbound approach.

Based upon the analysis using the Synchro Traffic Software HCM 2010 unsignalized intersection analysis, the 30th Street intersection with K Street approaches during the AM peak hour would change from LOS E to an F, reflecting the new trips exiting the West Heating Plant site. During the PM peak hour, the eastbound K Street through approach would change from LOS D to F. This LOS change would be the result of new trips headed to the West Heating Plant. During the Saturday peak hour, the K Street eastbound through move would change from LOS D to E, resulting from just under a 15 second increase in vehicle delay caused by the new vehicle trips added for the Disposal Alternative with the RFDS. In addition, the 30th Street southbound approach would change from LOS B to C, due to the one second in vehicle delay difference crossing the LOS threshold between LOS B and C. Based upon the analysis, the disposal of the West Heating Plant would have a moderate impact on this intersection; causing a long-term adverse effect of increased delays along K Street, especially in the eastbound direction during the PM and Saturday peak hour and westbound direction during the AM peak hour.

The 29th Street intersection with K Street would not change between the alternatives during the AM peak hour; however, there would be some changes during the PM peak hour. Specifically, the K Street eastbound left lane approach would change from LOS A to B, the K Street westbound through approach would change from LOS C to D, and the 29th Street southbound approach would change from LOS A to B. The change in these LOS would be the result of new trips to and from the West Heating Plant, causing K Street through moves to stop for longer periods of time to allow the vehicles along 29th Street to enter the intersection. During the Saturday peak hour, the K Street westbound through approach would change from LOS E to F (over a 25 second increase in delay per vehicle difference). All other approaches would continue to have the same LOS for the Disposal Alternative with the RFDS as the No-Action Alternative. Based upon the analysis, the disposal of the West Heating Plant would have a minor impact on this intersection; causing a long-term adverse effect of increased delays for vehicular traffic along K Street, primarily during the Saturday peak hour in the westbound direction.

4.4. QUEUING ANALYSIS

The results of the No-Action Alternative and Disposal Alternative with the RFDS queuing analysis are discussed below and presented in Tables 3-6, 3-7, and 3-8.

Based upon the analysis using the Synchro Traffic Software signalized intersection queuing analysis, the 30th Street intersection with M Street would continue to experience similar queues during the AM and PM peak periods for the Disposal Alternative with the RFDS, when compared to the No-Action Alternative. During the Saturday peak period, the intersection would exceed the roadway storage capacity with the addition of 7 more vehicles in the westbound approach. Based upon this analysis, the disposal of the West Heating Plant site would have a moderate impact on this intersection, causing a long-term adverse effect of increased vehicular traffic along M Street in the westbound direction.

The 29th Street intersection with M Street queues would improve for some approaches and worsen for others. Specifically, the M Street eastbound queues would improve with seven less vehicles per lane during the AM peak period, while the north and southbound approaches would worsen, especially the northbound approach with 11 new vehicles added to the queue. The PM and Saturday peak periods would see longer queues along the 29th Street northbound approach. Based upon the analysis, the disposal of the West Heating Plant site would have a moderate impact on this intersection; causing a long-term adverse effect of increased vehicular queues along the 29th Street northbound approach.

Based upon the analysis using the Synchro Traffic Software HCM 2010 unsignalized intersection queuing analysis, the 30th Street intersection with K Street approaches would continue to have similar queues when comparing the Disposal with the RFDS to the No-Action Alternative, with a maximum of two additional vehicles added to the K Street westbound through approach during the Saturday peak hour. Based upon the analysis, the disposal of the West Heating Plant with the RFDS would have no significant impact on the queuing at this intersection.

The 29th Street intersection with K Street would experience 10 additional vehicles added to the westbound K Street queue between the Alternatives during the AM peak hour. During the PM peak hour, there would be just over a one vehicle difference between the queue lengths, meanwhile, the Saturday peak hour would experience three additional vehicles in the K Street eastbound approach. Based upon the analysis, the disposal of the West Heating Plant with the RFDS would have a minor impact on this intersection; causing a long-term adverse effect of increased queuing along the westbound approach, but not exceeding the roadway storage capacity.

4.5. PEDESTRIAN, TRANSIT, PARKING IMPACTS

The pedestrian impacts for the Disposal Alternative with the RFDS would be minimal as the increase in traffic along K, M, and 29th Streets would not impact pedestrians crossing at the intersections, nor impact their access to the surrounding street network. The loss of parking spaces along 29th Street due to the proposed West Heating Plant redevelopment could impact the number of on-street parking spaces due to potential loading zones, valet zones, or other restricted zones prohibiting parking. The circulator bus routes along K and M Street as well as the other scheduled bus routes along M Street might experience some delays as a result of the increased traffic through the K and M Street corridors.

4.6 SUMMARY

The analysis of existing conditions, the future condition without disposal, and the RFDS, demonstrates that long range impacts for the RFDS are minor to moderate on the intersections that were evaluated. In some cases where intersections are already failing at peak periods, delay increases somewhat. Additional analysis and potential mitigation measures are identified. However, it is emphasized that the current EA is for the disposal of the Heating Plant. The proposed disposal of the West Heating Plant would result in property being sold at public auction. As the site is not currently zoned, any future developer would likely be required to apply for zoning or undertake a planned unit development approval process. As part of the rezoning process, any future private development of the site would require a traffic impact study according to District Department of Transportation (DDOT) standards and District regulations. Dependent on the actual redevelopment plan for the site a more thorough traffic study, that may include additional intersections, would be warranted. The scope of any future studies to be conducted by the developer is at the discretion of DDOT, as well as requirements for mitigation measures to offset impacts.

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5. MITIGATION MEASURES

Each intersection is affected by the new trips that could be added from the RFDS. The 30th Street intersection with M Street would operate at LOS F regardless of whether the West Heating Plant were disposed and RFDS were implemented, however, the queuing would worsen from the development of the site. The 29th Street intersection at M Street would be affected moderately. According to the Synchro Traffic Software, upgrading both traffic signals to operate as fully actuated signals with detectors used to assign the green times to the approaches based upon the demand, the LOS of both intersections would improve, and queues would shorten.

The 30th Street intersection with K Street would be affected moderately and would require a signal warrant analysis to determine if new traffic signals should be installed, based upon the increase of vehicular trips through this intersection. A preliminary analysis in Synchro shows that a new signal would elevate this intersection to LOS A for all time periods. Another consideration would be to remove the stop signs at the 30th Street intersection with K Street; however, the Whitehurst Freeway travels overhead potentially requiring a safety study to determine the potential impacts caused by the sight distances partially blocked by the Whitehurst Freeway columns.

The 29th Street intersection with K Street would be affected in a minor way, with new trips turning between 29th and K streets. The No-Action Alternative would result in a near failing LOS for the K Street westbound approach; therefore, the 25 second increase in delay with the Disposal Alternative with the RFDS does not immediately warrant mitigation. The queues would lengthen, but would not exceed the roadway storage capacity. Future developers will likely be required by DDOT to further study this intersection based upon the actual land use proposed for the West Heating Plant, as well as the changes resulting from the 29th Street Bridge reopening to allow through traffic between K and M Streets.

There is a proposed streetcar along K Street that could shift more new trips to transit beyond the 25 percent already shifted during the trip generation process. This would lower the new trips produced and improve the LOS for all study area intersections, especially the two K Street intersections.

Due to the anticipated impacts and added trips from this “worst case” scenario, the full range of travel demand management (TDM) measures would likely be required from any developer. The TDM measures include required items and potential substitute measures, as noted in Table 5-1, below.

Table 5-1 Example TDM Measures Extracted from TDM Guidelines for All District Development Proposals.

Guide: E Expected TDM Measure e Expected TDM Measure (Option to Substitute) S Potential Substitute/Optional Measure	Proposed requires a variance (or is a Planned Unit Development or Campus Plan) and project generates more than 400 peak hour auto trips.
During construction, maintain or coordinate relocation of any existing bus stops at the developer's expense.	E
Comply with Zoning requirements to provide bicycle parking/storage facilities.	E
Require all parking costs be unbundled from the cost of lease or purchase. Parking costs must be set at no less than the charges of the lowest fee garage, located within ¼ mile.	E
Post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.	E
Identify a project's TDM Leader (for planning, construction, and operations). Provide DDOT/Zoning Enforcement with annual TDM Leader contact updates.	E
Install a Transportation Information Center Display (kiosk) containing printed materials related to local transportation alternatives and maintain a stock of materials at all times.	e
Provide website links to CommuterConnections.com and goDCgo.com on developer and property management websites.	e
At no cost, dedicate spaces in the garage for car sharing services to use with right of first refusal. Locate spaces that are convenient to the garage entrance, available to the members of the car sharing service, twenty-four hours a day, seven days a week, without restrictions (the garage may be gated—members of the service would have access to the spaces via a key pad combination to a pass code system, or other similar device). Count the car sharing spaces towards the project's parking requirements.	e (2 spaces required)
Provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings. Oversee a program to provide carpools and vanpools with a parking subsidy.	e
Provide secured bicycle parking/storage facilities (lockers, bicycle valet parking, etc.)	e

Contribute funding to available, non-exclusive Shuttle Service to Metro or DC Circulator (based on total number of trips generated). Only applies to developments not considered Transit Oriented Developments by DDOT.	e*
Provide an on-site business center to residents with access to copier, fax, and internet services.	e
Provide location for Bikeshare Program Station/Kiosk.	e
Provide Ongoing Funding for on-site Bikeshare Program.	e
Provide each new resident with 1-year subscription to DC Bikesharing program.	e
Provide residents with \$75 mail-in refund on bicycle purchases.	e
Provide SmarTrip cards plus \$100.00 Metro fare media per person, for free, one time, per employee, to each of the tenants' employees and each on-site employee of the property management company and/or building operator.	e (30 year commitment required)
Provide SmarTrip cards plus \$100.00 Metro fare media per person, for free, one time, per resident.	e (30 year commitment required)
Provide a one-time membership fee subsidy in a car sharing program for each residential unit.	e
Locate and furnish an on-site Transit Store free of charge.	e
30 year commitment to operate an on-site Transit Store.	e
Operate a Shuttle service to metro (or other appropriate destinations) specific to the site/development.	e*
Install and maintain new bus stop infrastructure.	e
Construct new Metro Rail stations connection (entrance, escalator, fare array).	e*
* Shuttles and Direct Access to Metro are site specific. DDOT expectations for these measures will be dependent on the practicality of adopting them at a specific location.	
<p>Guide to Users: Use the top row of this table to identify the category which best describes the development proposal, the minimal TDM measures expected are indicated in column below along with others that may be used as substitutes and/or above and beyond the minimum requirements. These expected measures were developed by reviewing TDM programs in other locations both in the greater DC region and nationally. DDOT encourages the adoption of measures above the minimum expected, and reserves the right to require additional measures beyond these minimal expectations as warranted.</p>	

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APPENDIX A: DDOT SCOPING AGREEMENT

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