

**2013 H STREET NW
TRANSPORTATION IMPACT STUDY
WASHINGTON, D.C.**

Prepared on behalf of:
The HSC Foundation

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Section I INTRODUCTION

Overview

The HSC Foundation, herein referred to as the Applicant, has submitted an application to the District of Columbia Zoning Commission to rezone 2013 H Street NW from R-5-D to C-3-C. The site is located within the George Washington University (GWU) campus, in Square 101, Lot 874, in the northwest section of Washington, D.C. The site location map is shown on Figure I-1.

The proposed site currently is improved by a three-story-plus-basement masonry townhouse with an accessory two-story masonry carriage house/garage at its rear. The main building has a footprint of approximately 1,262 square feet (SF), with approximately 4,483 SF of building floor area. The garage occupies a footprint of approximately 871 SF and a gross floor area of 1,742 SF. The total gross floor area is approximately 6,225 SF. The main building and carriage house currently are used as an office; however, only approximately 1,500 SF was occupied at the time of this study.

The proposed rezoning to C-3-C would facilitate the use of the property for office purposes and would allow for increased density more compatible with the surrounding University office and institutional buildings in Squares 101 and 102. As shown on the proposed concept plan (see Figure I-2), the Applicant is proposing to construct an addition to the existing building which would result in a total of approximately 29,801 SF of office space in seven stories.

To determine the impact of the proposed rezoning on the local transportation system, the Applicant has commissioned this transportation impact study. For the purposes of this study, full build-out of the office space was assumed to occur by 2010.

Study Area

The study area was selected based on those intersections that potentially could be affected by the proposed development and was agreed to by District Department of Transportation (DDOT) staff. As a result, the 20th Street/H Street, 21st Street/H Street, Pennsylvania Avenue/20th Street, and Pennsylvania Avenue/Eye Street intersections were selected for detailed analysis.

This report presents an analysis of existing transportation conditions and 2010 conditions, without and with the proposed development. The purpose of this transportation impact study is to determine the impact of the proposed development on the surrounding roadway network.

Tasks undertaken in this study included the following:

1. Review of development plan prepared by Group Goetz Architects.
2. A scoping meeting with DDOT staff regarding the traffic study scope and methodologies on May 28, 2008.
3. A field reconnaissance of existing roadway and intersection geometrics, traffic controls, and speed limits.
4. Vehicular turning movement counts, pedestrian counts and bicycle counts at the study intersections during the AM and PM peak periods.
5. Analysis of existing and projected levels of service at the study intersections, without and with the proposed development.
6. Estimation of the number of AM and PM peak hour trips that would be generated by the proposed office development.

7. Identification of traffic operations and/or road improvements, if any, required to adequately accommodate future traffic forecasts with the proposed development.

The conclusions and recommendations of this study are as follows:

1. The 2013 H Street NW site is proposed to be rezoned from R-5-D to C-3-C so that additional multi-tenant office space could be constructed on the site resulting in a total gross floor area of approximately 29,801 SF.
2. With the existing bicycle and pedestrian systems, the SmartBike and Zipcar systems, and the Metrorail, Metrobus and various commuter bus systems available in the site vicinity, alternate forms of transportation are prevalent in the study area.
3. Under the existing conditions, the majority of the lane groups at the study intersections operate at acceptable (i.e., LOS D or better) levels of service. However, the northbound approach at the Pennsylvania Avenue/20th Street intersection and the eastbound (Eye Street) approach at the Pennsylvania Avenue/Eye Street intersection operate near or at capacity in the AM and PM peak hours.
4. Under the 2010 conditions without the proposed development, which includes regional traffic growth and several other planned developments in the area, levels of service at the study intersections are expected to generally remain consistent with existing conditions with only a few minor drops in levels of service.
5. With transit ridership on the rise in the Washington, D.C. area, the proposed office development is anticipated to realize a 45 percent reduction in site trips due to transit usage and an additional 10 percent reduction in site trips from pedestrian/bicycle usage.
6. With the overall 55 percent reduction in site trips from non-auto forms of transportation, the proposed office development at 2013 H Street NW is anticipated to generate 32 AM peak hour vehicle trips and 51 PM peak hour vehicle trips.
7. According to the District of Columbia Municipal Regulations, 16 on-site parking spaces would be required for the proposed office development; however, the Applicant is requesting a variance to this requirement and, as such, no on-site parking is proposed. Employees at 2013 H Street NW are anticipated to utilize two nearby public parking garages. Visitors to 2013 H Street NW are anticipated to either utilize the nearby public parking garages or on-street, metered parking.
8. Traffic generated by the proposed office development would account for approximately ½ percent to 2.9 percent of all AM and PM peak hour traffic at the study intersections under 2010 conditions with the 2013 H Street NW development.
9. The proposed development would have no discernable impact on the traffic operations at the study intersections under 2010 conditions with the 2013 H Street NW development.

Section 2 BACKGROUND INFORMATION

Land Use

The subject site is located in Ward 2, which is located in the northwest quadrant of the District, along H Street between 20th Street and 21st Street.

The site currently is zoned R-5-D (Residence District), which permits matter-of-right development of medium/high density residential uses, including single-family dwellings, flats and apartment buildings to a maximum lot occupancy of 75 percent, a maximum floor area ratio (FAR) of 3.5 and a maximum height of 90 feet.

The site currently is improved by a three-story-plus-basement masonry townhouse with an accessory two-story masonry carriage house/garage at its rear. The main building has a footprint of approximately 1,262 SF, with approximately 4,483 SF of building floor area. The garage occupies a footprint of approximately 871 SF and a gross floor area of 1,742 SF. The total gross floor area is approximately 6,225 SF. The main building and carriage house currently are used as an office; however, only approximately 1,500 SF was occupied at the time of this study. Additionally, only four employees currently work in the 1,500 SF of occupied office space.

The area immediately to the west of the site is zoned R-5-D while the areas immediately to the east and north are zoned C-3-C.

Roadway Network

The existing lane use and traffic control for the study intersections are depicted in Figure 2-1. A description of each of the roadways in the study area follows:

H Street is a two-way, two-lane, undivided collector roadway that provides one travel lane in each direction in the site vicinity. The average daily traffic (ADT) volume on H Street ranges from 2,400 to 3,600 vehicles per day (vpd) in the site vicinity.¹ The intersections of H Street/20th Street and H Street/21st Street are controlled by traffic signals. Sidewalks are present along both sides of H Street in the vicinity of the site.

20th Street is a one-way northbound minor arterial with three travel lanes during the AM peak period and two travel lanes and one parking lane during the PM peak period. The ADT on 20th Street ranges from 12,000 to 14,700 vpd in the site vicinity.² Sidewalks are found along both sides of 20th Street in the study area.

21st Street is a one-way southbound collector with two travel lanes and one parking lane during the peak periods. The ADT on 21st Street ranges from 5,900 to 6,500 vpd in the site vicinity.³ Sidewalks are found along both sides of 21st Street in the study area.

Pennsylvania Avenue is a two-way, six-lane principal arterial. Pennsylvania Avenue carries an ADT of 23,200 vpd. The Pennsylvania Avenue/Eye Street intersection is stop controlled on the eastbound approach while the Pennsylvania Avenue/20th Street intersection is signalized.

Eye Street is a two-way, two-lane street, except between 21st Street and Pennsylvania Avenue where it is one-way eastbound. The ADT volume varies from 1,000 vpd on the one-way portion to 3,700 vpd on the two-way portion on the GWU campus.⁴

Bicycle Network

Currently, no designated bicycle lanes or routes exist within the study area. Bicyclists must share the roads with vehicular and pedestrian traffic. According to the District of Columbia Bicycle Master Plan,⁵ under the existing condition of bicyclists sharing the road, the bicycle level of service (BLOS) on 20th Street, 21st Street and Pennsylvania Avenue currently is a BLOS D while H Street operates with a BLOS E. Also according to the Bicycle Master Plan,⁶ which also reports the number of bicycle accidents that occurred between 2000 and 2002, no accidents were reported at the two H Street intersections; however, four to five accidents were reported at the 20th Street/Eye Street/Pennsylvania Avenue intersection over the two year study period.⁷

According to the Bicycle Master Plan,⁸ bicycle lanes are recommended on Pennsylvania Avenue and on 21st Street (see Figure 2-2). A letter from Mr. Jim Sebastian, the DDOT Bicycle and Pedestrian Program Manager, dated July 28, 2006 provides additional details regarding the proposed bicycle lane on 21st Street. Specifically, this letter indicates that the parking restrictions would be switched from the west side of 21st Street to the east side of 21st Street. With the narrowing of the two travel lanes on 21st Street from 11 feet to 10 feet, this would allow for a seven foot parking lane on the west side and a five foot bicycle lane. The detailed sketches from this letter have been provided in Appendix A.

According to DDOT, there are no specific plans for the bicycle lane on Pennsylvania Avenue, even though it is recommended in the Bicycle Master Plan,⁹ because currently it does not have any funding.

SmartBike DC

SmartBike is an automated bicycle rental or bicycle sharing system now available in the Washington, D.C. area. Approximately 120 bicycles are available at 10 locations in the greater downtown D.C. area. One of the SmartBike docking stations is located in the northwest corner of the 23rd Street/Eye Street intersection at the Foggy Bottom-GWU Metrorail Station, which is approximately 0.3 miles from the 2013 H Street NW site.

To utilize a SmartBike, a membership must first be purchased online or over the phone (annual membership subscription is \$40) and then a membership card is utilized to release a bicycle from the docking station. The bicycle must be returned to any of the 10 docking stations in the City within three hours. The SmartBike system provides a new way of discovering and moving around the city while enhancing the city's public transportation system.

Zipcar

Similar to SmartBike, Zipcar is an automated car rental or car sharing system in the Washington, D.C. area. Zipcar users must fill out an application online and then would receive a Zipcard, which enables them to reserve Zipcars at any of the locations. Users pay either an hourly or daily rental fee to utilize the car for their reserved time slot. Cars must be returned to the same designated parking space at which it was picked up. Three Zipcars are located in the GWU parking lot adjacent to the 2013 H Street NW site. Additionally, several other Zipcar spaces are located in the site vicinity as shown on Figure 2-3.

Recent Increases in Transit Use

According to a recent Washington Post article dated June 3, 2008, Americans across the country are turning to public transit because of increasing gas prices. Nationwide, public transit use (streetcars, trolleys and other light rail) has increased an astounding 10.3 percent in the first quarter of the year. Even more significant, transit ridership increased in many areas despite increases in fares, Washington, D.C. being one such area. WMATA experienced its largest ridership increase in history this April (compared to the same time last year), which equated to a 4.3 percent increase.

Metrorail

The subject site is located approximately 0.3 miles walking distance from the Foggy Bottom-GWU Metrorail Station, 0.45 miles walking distance from the Farragut West Metrorail Station, and 0.55 miles walking distance from the Farragut North Metrorail Station, which are shown on Figure 2-4.

The Foggy Bottom-GWU Metrorail Station, which is the closest to the subject site, is located on the northwest quadrant of the 23rd Street/Eye Street intersection.

This station was used by nearly 41,000 passengers on an average weekday in 2002, according to the WMATA passenger surveys that are summarized in Table 2-1.

Table 2-1
Foggy Bottom-GWU Metrorail Station Passenger Boardings and Alightings

Time of Day	Boardings	Alightings	Total
AM Peak	2,007	9,326	11,333
AM Off Peak	4,219	5,278	9,497
PM Peak	10,725	3,440	14,165
PM Off Peak	4,906	1,021	5,927
Total	21,857	19,065	40,922

A large majority of passengers (85 to 87 percent) walk to and from the station; very few drive or are driven to the station, as shown in Table 2-2.

Table 2-2
Foggy Bottom-GWU Metrorail Station Passenger Access and Egress Modes

Mode	Access		Egress	
	Number	Percent	Number	Percent
Metrobus	761	3.5	533	2.8
Other Bus	1,271	5.8	1,120	5.9
Park & Ride	360	1.6	216	1.1
Carpool	19	0.1	24	0.1
Kiss & Ride	362	1.7	145	0.8
Bike	13	0.1	5	0.0
Walk	18,673	85.4	16,666	87.4
Taxi	57	0.3	43	0.2
Unknown	339	1.6	313	1.6
Total	21,855	100	19,065	100

Metrobus System

The area also is served by several Metrobus routes, as shown on Figure 2-5, although no Metrobus stops are located at the study intersections. The Pennsylvania Avenue Line (Metrobus Routes 30, 32, 34, 35, 36), the North Capitol Street Line (Metrobus Route 80), the 16th Street-Potomac Park Line (Metrobus Route S1), the Columbia Pike-Farragut Square Line (Metrobus Route 16Y), the Lee Highway-Farragut Square Line (Metrobus Route 3Y), and the Mt. Vernon Express Line (Metrobus Route 11Y) provide service in the site vicinity.

Metrobus Routes 30, 32, 34, 35 and 36 provide weekday and weekend service to the Friendship Heights, Tenleytown - AU, Archives - Navy Memorial - Penn Quarter, Eastern Market, Potomac Avenue, Naylor Avenue, and Southern Avenue Metrorail Stations.

Metrobus Route 80 provides weekday and weekend service to the Fort Totten, Brookland - CUA, Gallery Pl - Chinatown, McPherson Square, and Farragut North and West Metrorail Stations.

Metrobus Route S1 provides weekday service to the Farragut North and Farragut West Metrorail Stations.

Metrobus Routes 16Y and 3Y provide weekday service to the Farragut North, Farragut West and McPherson Square Metrorail Stations.

Metrobus Route 11Y provides weekday service however it does not provide service to any Metrorail Stations.

Although no stops are located at the study intersections, several bus stops are located within the site vicinity (less than 0.2 mile walkable distance). These include stops at the 19th Street/H Street intersection, the 20th Street/Eye Street intersection, the 18th Street/Pennsylvania Avenue intersection, and the 21st Street/ Pennsylvania Street intersection. Table 2-3 displays these four bus stops and the bus routes that stop at each.

Table 2-3
Metrobus Routes at Nearby Bus Stops

METROBUS ROUTE		30, 32, 34, 35, 36	80	S1	16Y	3Y	11Y
BUS STOP LOCATION	19 th Street/H Street		X	X	X	X	
	20 th Street/Eye Street	X					
	18 th Street/ Pennsylvania Avenue		X				X
	21 st Street/ Pennsylvania Street	X					

Metrobus 30s Line Study

WMATA, in partnership with DDOT, recently studied various ways of improving bus service along Metrobus Routes 30, 32, 34, 35 and 36, otherwise known as the 30s Line. The culmination of their work was presented in a study entitled Metrobus 30s Line Study – Final Summary report, February 2008. This report calls for the restructuring of the 30s Line to address performance-related issues, scheduling adherence, bus bunching, traffic congestion, delays, passenger crowding, detours and incident response.¹⁰

The new plan would: (1) maintain local bus service along existing Routes 32 and 36 from the Southern Avenue and Naylor Road Metrorail Stations to the Friendship Heights Metrorail Station; (2) establish a new Route M5 to operate over the current 34 line between the Naylor Road and Eastern Market Metrorail Stations; (3) establish a new Route 31 to operate over the current 30-36 routes between the Friendship Heights and Foggy Bottom-GWU Stations; (4) establish a new limited-stop Route 37 to operate between the Friendship Heights and Archives-Navy Memorial-Penn Quarter Metrorail Stations via Wisconsin and Massachusetts Avenues; (5) establish a new limited-stop Route 39 to operate between the Naylor Road and Foggy Bottom-GWU Metrorail Stations via Southern Avenue Pennsylvania Avenues; and (6) discontinue Routes 30, 34 and 35.¹¹

The new service plan is anticipated to be in place by the end of June; however, at the time of this report, it was not yet implemented.

Commuter Buses

Several commuter bus services also are available in the site vicinity including:

- **MTA (Maryland Transit Authority)** Bus Routes 902, 904, 905 have stops on 19th Street between Pennsylvania Avenue and H Street (0.15 miles from site) and at the Pennsylvania Avenue/20th Street intersection (0.1 miles from site). Route 902 provides service as far as St. Leonard and Prince Frederick in Calvert County, Maryland. Route 904 provides service as far as North Beach in Calvert County, Maryland and Pindell in Anne Arundel County, Maryland. Finally, Route 905 provides service as far as Waldorf in Charles County, Maryland and California and Charlotte Hall in St. Mary's County, Maryland.
- The **Loudoun County Commuter Buses** provide service to/from Purcellville, Hamilton, Leesburg, the Dulles North Transit Center and Dulles South. Each route has a morning stop at the 18th Street/G Street intersection (0.3 miles from site) and an evening stop at the 19th Street/H Street intersection (0.1 miles from site). Figure 2-6 displays the Loudoun County bus routes in the site vicinity.

- **OmniRide** is the Potomac and Rappahannock Transportation Commission's (PRTC) commuter bus service, which provides service to/from locations throughout Prince William County along the I-95 corridor and Manassas and Gainesville areas along the I-66 corridor to greater downtown Washington, D.C. Specifically, each of the OmniRide routes stop at the 19th Street/H Street intersection, which is approximately 0.1 miles from the site.
- The **DC Circulator**, which provides connectivity throughout the central areas of Washington, D.C., has one route with stops in the site vicinity. The Georgetown-Union Station Route stops at the 20th Street/K Street intersection (0.25 miles from site) and the Pennsylvania Avenue/21st Street intersection (0.2 miles from site). Figure 2-7 displays the DC Circulator routes.

Section 3 EXISTING CONDITIONS ANALYSIS

Traffic Volumes

Vehicular turning movement counts, pedestrian counts and bicycle counts were conducted at the H Street/20th Street and H Street/21st Street intersections on Tuesday, April 22, 2008 from 7:00 AM to 10:00 AM and from 4:00 PM to 7:00 PM.

The common AM peak hour occurred from 8:30 AM to 9:30 AM and the common PM peak hour occurred from 5:30 PM to 6:30 PM.

As requested by DDOT during the scoping process, vehicular turning movement counts, pedestrian counts and bicycle counts were conducted at the Pennsylvania Avenue/20th Street and Pennsylvania Avenue/Eye Street intersections on Tuesday, June 3, 2008 from 7:00 AM to 10:00 AM and from 4:00 PM to 7:00 PM.

Because the June 3, 2008 counts were performed after GWU's spring session ended, the June 3, 2008 counts for the Pennsylvania Avenue/20th Street intersection were compared to counts performed at this intersection on September 21, 2005. This comparison showed that the newer counts were significantly lower than the counts performed in 2005 with GWU in session. Therefore, at the two Pennsylvania Avenue intersections, the June 3, 2008 peak hour traffic volumes were factored by 10 percent in the AM and 20 percent in the PM to account for GWU traffic.

Existing peak hour traffic volumes are summarized on Figure 3-1. Pedestrian peak hour volumes are summarized on Figure 3-2 and bicycle peak hour volumes are summarized on Figure 3-3. Traffic count data, including the September 21, 2005 traffic count, are included in Appendix B.

Operational Analysis

Capacity/level of service (LOS) analyses were conducted at the study intersections based on the existing lane use and traffic control shown on Figure 2-1, existing vehicular traffic volumes shown on Figure 3-1, existing pedestrian volumes shown on Figure 3-2, existing bicycle volumes shown on Figure 3-3 and existing DDOT traffic signal timings provided in Appendix C.

Synchro software (Version 6, Build 614) was used to evaluate levels of service at the study intersections during the AM and PM 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 for the signalized intersections were taken from the Highway Capacity Manual 2000¹² (HCM) reports generated by Synchro.

The Synchro results are presented in Appendix D and summarized in Table 3-1. Level of service descriptions are provided in Appendix E.

As shown in Table 3-1, the H Street/20th Street and H Street/21st Street intersections currently operate at acceptable levels of service (i.e. LOS D or better). At the Pennsylvania Avenue/20th Street intersection, the northbound (20th Street) approach currently operates near or at capacity during both the AM and PM peak hours. Likewise, at the Pennsylvania Avenue/Eye Street intersection, the eastbound (Eye Street) approach currently operates near or at capacity during the AM and PM peak hours.

Table 3-1
Existing Levels of Service

Lane Group	AM Peak	PM Peak
1. H Street/20th Street		
EBLT	D (38.3)	B (17.2)
WBTR	C (26.3)	B (15.8)
NBLTR	B (13.9)	C (20.7)
OVERALL	B (17.6)	B (19.7)
2. H Street/21st Street		
EBTR	B (13.3)	C (23.8)
WBLT	A (6.5)	B (10.8)
SBLTR	B (11.4)	B (15.3)
OVERALL	B (11.6)	B (16.4)
3. Pennsylvania Avenue/20th Street		
EBLT	C (23.6)	B (17.9)
WBTR	B (11.9)	B (10.9)
NBLTR	F (234.4)	E (56.3)
OVERALL	F (118.3)	C (30.3)
4. Pennsylvania Avenue/Eye Street		
EBL	E [36.7]	E [37.2]
EBR	F [234.8]	E [42.4]
(x.x) = signalized intersection control delay in sec/veh [x.x] = unsignalized intersection control delay in sec/veh		

Section 4 FUTURE BACKGROUND CONDITIONS ANALYSIS

Traffic Volumes

Future background traffic forecasts were developed as the sum of: (1) existing traffic counts, (2) background traffic growth, and (3) traffic that will be generated by developments (i.e., pipeline developments) that have been proposed and/or approved but have not yet been built or occupied at the time the counts were taken.

In order to account for regional traffic growth outside the immediate site vicinity, a one (1) percent growth rate, compounded annually, was applied to the existing traffic volumes. The resulting volumes are shown on Figure 4-1.

In addition to this growth rate, four pipeline developments were included in the future traffic forecasts. The location of the pipeline developments are shown on Figure 4-2. The number of trips that would be generated by the various planned developments either was taken from previously conducted traffic impact studies or was estimated based on the Institute of Transportation Engineers (ITE) Trip Generation manual and appropriate trip reductions. Details regarding the pipeline developments are provided in Appendix F.

Square 54, which is located on the GWU Foggy Bottom campus near Washington Circle in Northwest Washington, D.C., is a planned re-development of vacant land that would consist of 333 apartments, 454,000 SF of office space, a 45,000 SF grocery store and 39,000 SF of retail space.

According to the Square 54 Transportation Impact Study performed by Wells + Associates, LLC in May 2006, it was assumed that 60 percent of all office trips, 63 percent of all residential trips, and 60 percent of all retail and grocery store trips would be made on foot, by Metrorail or Metrobus, or by some means of transportation other than automobile. Based on these non-auto reductions, the proposed re-development of Square 54 would generate a total of 396 AM peak hour vehicle trips and 627 PM peak hour vehicle trips at project build-out and full occupancy.

GWU and DC Public Schools recently filed a joint Planned Unit Development (PUD) application for **Square 80**, which is bound by 21st and 22nd Streets and F and G Streets in Northwest Washington, D.C. As part of the PUD application, Square 80 would be improved to include a new 474-student dormitory for GWU students and an expansion to the School Without Walls (SWW) for additional classroom areas for up to 100 students.

According to the Square 80 Transportation Impact Study performed by Wells + Associates, LLC in October 2006, the SWW addition would generate 25 new AM peak hour vehicle-trips and six new PM peak hour vehicle-trips. Additionally, because the driveway to SWW's parking would be relocated, existing site trips were rerouted as part of the study. Also according to the Square 80 TIS, the new GW dormitory would generate 29 AM peak hour vehicle trips and 30 PM peak hour vehicle trips. Trip generation for both uses was based on site specific rates.

The Allstate Hotel Partnership proposes to raze an existing six-story parking garage and develop a 147-room hotel (**Courtyard by Marriott**) on Lot 25 in Square 122 of Northwest Washington, D.C. The property, 515 20th Street, NW, is located on the east side of 20th Street, between E and F Streets. According to the Allstate Hotel Partnership Transportation Impact Study performed by Wells + Associates, LLC in February 2006, the new hotel would generate 40 AM peak hour vehicle trips and 65 PM peak hour vehicle trips. Additionally, because the hotel would displace the site trips to and from the existing parking garage, these site trips (110 AM trips and 101 PM trips) were rerouted to other parking structures in the vicinity of the site.

A renovation of the existing 710,000 SF **GSA Headquarters**, located at 1800 F Street, along with a 105,000 SF addition of office space is planned to be completed by the second quarter of 2010. Therefore, the number of trips associated with the 105,000 SF addition was estimated based on ITE's Trip Generation manual.¹³ Land Use Code 710, General Office, was used with the square footage as the independent variable. Additionally, a 40 percent non-auto mode split was assumed for the GSA Headquarters addition. Accordingly, the addition would generate 117 AM peak hour vehicle trips and 118 PM peak hour vehicle trips. These vehicle trips then were distributed to the roadway network based on existing travel patterns and the site location.

The combined peak hour trip assignments for the four pipeline developments are depicted on Figure 4-3. The background peak hour traffic forecasts were established from a composite of the existing traffic volumes with regional growth shown on Figure 4-1 and the pipeline traffic volumes shown on Figure 4-3. The background peak hour traffic forecasts are shown on Figure 4-4.

Operational Analysis

Capacity/level of service (LOS) analyses were conducted at the study intersections based on the existing lane use and traffic control shown on Figure 2-1, future background traffic forecasts shown on Figure 4-4, and existing traffic signal timings (shown in Appendix C).

Synchro software (Version 6, Build 614) was used to evaluate levels of service at the study intersections during the AM and PM peak hours. The levels of service were taken from the Highway Capacity Manual 2000¹⁴ (HCM) reports generated by Synchro.

The Synchro results are presented in Appendix G and summarized in Table 4-1.

Table 4-1
2010 Future Background Levels of Service

Lane Group	AM Peak	PM Peak
1. H Street/20th Street		
EBLT	D (39.2)	B (17.1)
WBTR	C (26.6)	B (15.8)
NBLTR	B (14.6)	C (21.5)
OVERALL	B (18.1)	C (20.3)
2. H Street/21st Street		
EBTR	B (13.4)	C (24.7)
WBLT	A (7.1)	B (11.7)
SBLTR	B (12.2)	C (27.2)
OVERALL	B (12.1)	C (25.3)
3. Pennsylvania Avenue/20th Street		
EBLT	C (25.2)	B (19.1)
WBTR	B (11.9)	B (10.9)
NBLTR	F (268.0)	E (67.3)
OVERALL	F (135.3)	C (34.5)
4. Pennsylvania Avenue/Eye Street		
EBL	E [39.8]	E [43.9]
EBR	F [263.4]	E [48.1]
(x.x) = signalized intersection control delay in sec/veh		
[x.x] = unsignalized intersection control delay in sec/veh		

Under 2010 conditions without the proposed development, levels of service at the study intersections are expected to generally remain consistent with existing conditions with only a few minor drops in levels of service, as shown in Table 4-1.

Queue Analysis

A queue analysis was conducted at the study intersections under background conditions using Synchro. The 95th percentile queues have been tabulated in Table 4-2. Queuing reports are included in Appendix H.

Table 4-2
2010 Background Queue Analysis¹

Lane Group	Available Storage Length ²	2010 Background Conditions	
		AM	PM
H Street NW/20 th Street NW			
EBLT	435	225	83
WBTR	335	59	36
NBLTR	390	268	221
H Street NW/21 st Street NW			
EBTR	555	84	156
WBLT	435	20	44
SBLTR	330	79	276
Pennsylvania Avenue NW/20 th Street NW			
EBT	470	389	281
WBTR	370	30	38
NBLTR	320	893	468
Pennsylvania Avenue NW/Eye Street NW			
NBL	315	4	10
NBR	315	296	90

¹ All queues and available storage lengths are in feet.

² Available storage lengths measured to nearest major intersection.

With the exception of the northbound (20th Street) approach at Pennsylvania Avenue, each of the queues is projected to be less than the available storage. The northbound (20th Street) queue at Pennsylvania Avenue is projected to block the H Street intersection during both the AM and PM peak hours under background conditions without the proposed development.

Section 5 SITE ANALYSIS

Overview

The proposed development would consist of an office building approximately 29,801 SF in size housing multiple tenants, including the HSC Foundation.

No parking is proposed on-site. Employees of the office building are anticipated to park in one of two nearby public parking garages.

Trip Generation Analysis

The number of trips anticipated to be generated by the proposed 29,801 SF office building was estimated based on ITE's Trip Generation.¹⁵ Land Use Code 710, General Office Building was used with the square footage as the independent variable.

The proposed office building is projected to generate an estimated 71 total AM peak hour trips and 112 total PM peak hour trips, as shown in Table 5-1.

A portion of the trips generated by the proposed development would be made via non-auto modes of transportation. The percentage of site-generated trips that would utilize public transportation is dependent on the proximity of the site to public transportation service.

According to WMATA's 2005 Ridership Survey, the transit mode share for office developments is related to the distance from the development to the nearest transit station. Based on the Ridership Survey, the non-auto mode split for the subject site was estimated to be 45 percent. Additionally, an estimated 10 percent of the trips were assumed to be made on foot or by bicycle.

Table 5-1
Site Trip Generation

Land Use	AM Peak			PM Peak			ADT
	In	Out	Total	In	Out	Total	
29,801 SF General Office Building							
Total Trips	62	9	71	19	93	112	525
Transit Mode Split (45%)	28	4	32	8	42	50	236
Ped/Bike Mode Split (10%)	6	1	7	2	9	11	53
Vehicle Trips	28	4	32	9	42	51	236

The HSC Foundation currently has a written transportation policy for employees of its existing facilities to encourage employees to utilize public transportation. The policy is summarized below:

- Encourage employees to use public transportation to and from work;
- Encourage employees to enroll in the Commuter Connection program. Employees who enroll in the program have pre-taxed funds deducted from their pay and downloaded to a SmarTrip Metro card for Metro transportation. This program also applies to any public transportation venue;
- A company shuttle currently is being utilized to and from Metro stations that are not a short walking distance. Currently, there are shuttle stops at the Brookland Metro Station, Fort Totten Metro Station, The HSC Foundation, and the HSC Pediatric Center.;

Additional TDM strategies which could be implemented to accomplish the overall 55 percent non-auto trip reduction may include, but would not necessarily be limited to:

- Provide bicycle parking and shower and changing facilities for office employees;

- Provide website hotlinks to goDCgo.com on developer and property management websites;
- Designate a member of building management as a point of contact who is responsible for coordinating and implementing TDM obligations (such as assisting employees in enrolling in Commuter Connections); and
- Distribute alternative transportation information and brochures via lobby kiosks, welcome packets, and bulletin boards.

Based on the proximity to Metrorail Stations and the implementation of certain TDM strategies, non-auto trips are projected to account for 39 AM peak hour trips and 61 PM peak hour trips, as shown in Table 5-1.

Taking into account the non-auto mode share, the proposed development would generate an estimated 32 AM peak hour vehicular trips and 51 PM peak hour vehicular trips, as shown on Table 5-1.

Site Trip Distribution

The distribution of peak hour trips generated by the proposed development was based on existing traffic patterns in the study area, the location of the two nearby public parking garages and the premise that commuters will select routes that minimize travel time.

For inbound vehicle trips, an estimated 31 percent of the site-generated traffic would approach the two public parking garages from the northwest on Pennsylvania Avenue. An estimated five percent of site trips would approach the garages from the southeast on Pennsylvania Avenue. Approximately 33 percent of the inbound site trips would approach the garages from the south on 20th Street and approximately 22 percent of the inbound site trips would approach the garages from the north on 21st Street. Finally, approximately four percent of inbound site trips would approach the garages from the west on H Street and approximately five percent of inbound site trips would approach from the east on H Street.

For outbound vehicle trips, an estimated 64 percent of site-generated traffic would leave the two garages to the northwest on Pennsylvania Avenue with 33 percent continuing down 21st Street. Approximately 26 percent of the outbound site trips would exit the garages to the north on 20th Street while the remaining 10 percent of outbound site trips would exit to the southeast on Pennsylvania Avenue.

Figure 5-1 displays the inbound and outbound distributions to and from the two public parking garages in the site vicinity.

Site Traffic Assignments

The site-generated traffic volumes were assigned to the public roadway network according to the directional distribution described above. For purposes of this analysis, all vehicle site trips were routed to the two public parking garages even though a small number of visitor site trips would utilize on-street parking. The resulting site traffic assignments are shown on Figure 5-2.

Parking Requirements

According to the District of Columbia Municipal Regulations (DCMR),¹⁶ one (1) parking space is required in the C-3-C zoning district for each additional 1,800 SF of gross floor area in excess of 2,000 SF. Accordingly, a total of 16 parking spaces would be required for the 2013 H Street NW office development. However, the Applicant is requesting a variance for this requirement as no parking spaces are proposed on the site.

In lieu of on-site parking, employees of the office building would park in one of two nearby garages. The first is located on 20th Street between H Street and Pennsylvania Avenue (less than 0.1 miles walking distance from the site) and the second is located on Pennsylvania Avenue between 20th and 19th Streets (less than 0.2 miles walking distance from the site). Both garages offer monthly passes and daily parking.

Visitors either would park in one of the nearby public parking garages or would utilize on-street, metered parking in the site vicinity.

Section 6 TOTAL FUTURE CONDITIONS ANALYSIS

Traffic Volumes

The background traffic forecasts shown on Figure 4-4 were combined with the site trip assignments shown on Figure 5-2 to yield the 2010 total future traffic forecasts shown on Figure 6-1.

Proportional Impact Analysis

Traffic generated by the proposed development would account for approximately 1/2 percent to 2.9 percent of all 2010 AM and PM total future peak hour traffic at the study intersections, as summarized in Table 6-1.

Table 6-1
Proportional Impact Analysis

Intersection	AM Peak	PM Peak
H Street/20 th Street	< 1%	< 1%
H Street/21 st Street	1.1%	1.1%
Pennsylvania Avenue/20 th Street	< 1%	1.7%
Pennsylvania Avenue/Eye Street	< 1%	2.9%

Operational Analysis

Capacity/level of service (LOS) analyses were conducted at the study intersections based on the existing lane use and traffic control shown on Figure 2-1, total future traffic forecasts shown on Figure 6-1, and existing traffic signal timings (shown in Appendix C).

Synchro software (Version 6, Build 614) was used to evaluate levels of service at the study intersections during the AM and PM peak hours. The levels of service were taken from the Highway Capacity Manual 2000¹⁷ (HCM) reports generated by Synchro.

The Synchro results are presented in Appendix I and summarized in Table 6-2.

Table 6-2
2010 Total Future Levels of Service

Lane Group	AM Peak	PM Peak
1. H Street/20th Street		
EBLT	D (41.8)	B (17.3)
WBTR	C (26.8)	B (15.8)
NBLTR	B (14.6)	C (21.5)
OVERALL	B (18.5)	C (20.4)
2. H Street/21st Street		
EBTR	B (13.5)	C (24.7)
WBLT	A (7.0)	B (11.7)
SBLTR	B (12.4)	C (29.6)
OVERALL	B (12.2)	C (27.1)
3. Pennsylvania Avenue/20th Street		
EBLT	C (25.4)	B (19.2)
WBTR	B (11.9)	B (11.0)
NBLTR	F (271.9)	E (75.7)
OVERALL	F (137.1)	D (37.5)
4. Pennsylvania Avenue/Eye Street		
EBL	E [40.4]	E [44.9]
EBR	F [266.0]	E [48.3]
(x.x) = signalized intersection control delay in sec/veh [x.x] = unsignalized intersection control delay in sec/veh		

As shown in Table 6-2, the proposed office development would have no discernable impact on intersection levels of service under 2010 conditions with the 2013 H Street NW development. Levels of service would remain consistent with background conditions.

Queue Analysis

A queue analysis was conducted at the study intersections, under total future conditions using Synchro. The 95th percentile queues have been tabulated in Table 6-2. Queuing reports are included in Appendix J.

Table 6-3
2010 Total Future Queue Analysis¹

Lane Group	Available Storage Length ²	2010 Total Future Conditions	
		AM	PM
H Street NW/20th Street NW			
EBLT	435	241	84
WBTR	335	61	37
NBLTR	390	271	223
H Street NW/21st Street NW			
EBTR	555	85	156
WBLT	435	19	44
SBLTR	330	82	283
Pennsylvania Avenue NW/20th Street NW			
EBT	470	393	282
WBTR	370	30	41
NBLTR	320	897	485
Pennsylvania Avenue NW/Eye Street NW			
NBL	315	4	10
NBR	315	297	91

¹ All queues and available storage lengths are in feet.

² Available storage lengths measured to nearest major intersection.

As shown in Table 6-2, queues would remain consistent with 2010 conditions without the proposed development. That is, each of the queues would be within one car length of the queues projected under background conditions.

Section 7 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

1. The 2013 H Street NW site is proposed to be rezoned from R-5-D to C-3-C so that additional multi-tenant office space could be constructed on the site resulting in a total gross floor area of approximately 29,801 SF.
2. With the existing bicycle and pedestrian systems, the SmartBike and Zipcar systems, and the Metrorail, Metrobus and various commuter bus systems available in the site vicinity, alternate forms of transportation are prevalent in the study area.
3. Under the existing conditions, the majority of the lane groups at the study intersections operate at acceptable (i.e., LOS D or better) levels of service. However, the northbound approach at the Pennsylvania Avenue/20th Street intersection and the eastbound (Eye Street) approach at the Pennsylvania Avenue/Eye Street intersection operate near or at capacity in the AM and PM peak hours.
4. Under the 2010 conditions without the proposed development, which includes regional traffic growth and several other planned developments in the area, levels of service at the study intersections are expected to generally remain consistent with existing conditions with only a few minor drops in levels of service.
5. With transit ridership on the rise in the Washington, D.C. area, the proposed office development is anticipated to realize a 45 percent reduction in site trips due to transit usage and an additional 10 percent reduction in site trips from pedestrian/bicycle usage.
6. With the overall 55 percent reduction in site trips from non-auto forms of transportation, the proposed office development at 2013 H Street NW is anticipated to generate 32 AM peak hour vehicle trips and 51 PM peak hour vehicle trips.
7. According to the District of Columbia Municipal Regulations, 16 on-site parking spaces would be required for the proposed office development; however, the Applicant is requesting a variance to this requirement and, as such, no on-site parking is proposed. Employees at 2013 H Street NW are anticipated to utilize two nearby public parking garages. Visitors to 2013 H Street NW are anticipated to either utilize the nearby public parking garages or on-street, metered parking.
8. Traffic generated by the proposed office development would account for approximately ½ percent to 2.9 percent of all AM and PM peak hour traffic at the study intersections under 2010 conditions with the 2013 H Street NW development.
9. The proposed development would have no discernable impact on the traffic operations at the study intersections under 2010 conditions with the 2013 H Street NW development.

REFERENCES

- ¹ 2002 Traffic Volumes, District Department of Transportation, Traffic Services Administration, Washington, D.C., http://ddot.dc.gov/ddot/frames.asp?doc=/ddot/lib/ddot/information/maps/2002_downtown.pdf.
- ² 2002 Traffic Volumes, District Department of Transportation, Traffic Services Administration, Washington, D.C., http://ddot.dc.gov/ddot/frames.asp?doc=/ddot/lib/ddot/information/maps/2002_downtown.pdf.
- ³ 2002 Traffic Volumes, District Department of Transportation, Traffic Services Administration, Washington, D.C., http://ddot.dc.gov/ddot/frames.asp?doc=/ddot/lib/ddot/information/maps/2002_downtown.pdf.
- ⁴ 2002 Traffic Volumes, District Department of Transportation, Traffic Services Administration, Washington, D.C., http://ddot.dc.gov/ddot/frames.asp?doc=/ddot/lib/ddot/information/maps/2002_downtown.pdf.
- ⁵ District Department of Transportation, District of Columbia Bicycle Master Plan, April 2005.
- ⁶ District Department of Transportation, District of Columbia Bicycle Master Plan, April 2005.
- ⁷ District Department of Transportation, District of Columbia Bicycle Master Plan, April 2005.
- ⁸ District Department of Transportation, District of Columbia Bicycle Master Plan, April 2005.
- ⁹ District Department of Transportation, District of Columbia Bicycle Master Plan, April 2005.
- ¹⁰ WMATA Press Release, Metro's Board of Directors Gives Preliminary Approval to Restructuring Metrobus 30s Line, May 8, 2008.
- ¹¹ WMATA Press Release, Metro's Board of Directors Gives Preliminary Approval to Restructuring Metrobus 30s Line, May 8, 2008.
- ¹² Highway Capacity Manual, Transportation Research Board, Washington D.C., 2000.
- ¹³ Trip Generation, 7th Edition, Institute of Transportation Engineers, Washington, D.C., 2003.
- ¹⁴ Highway Capacity Manual, Transportation Research Board, Washington D.C., 2000.
- ¹⁵ Trip Generation, 7th Edition, Institute of Transportation Engineers, Washington, D.C., 2003.
- ¹⁶ District of Columbia Municipal Regulations, Title 11-Zoning, Section 2101.1, 2001 Edition.
- ¹⁷ Highway Capacity Manual, Transportation Research Board, Washington D.C., 2000.

FIGURES

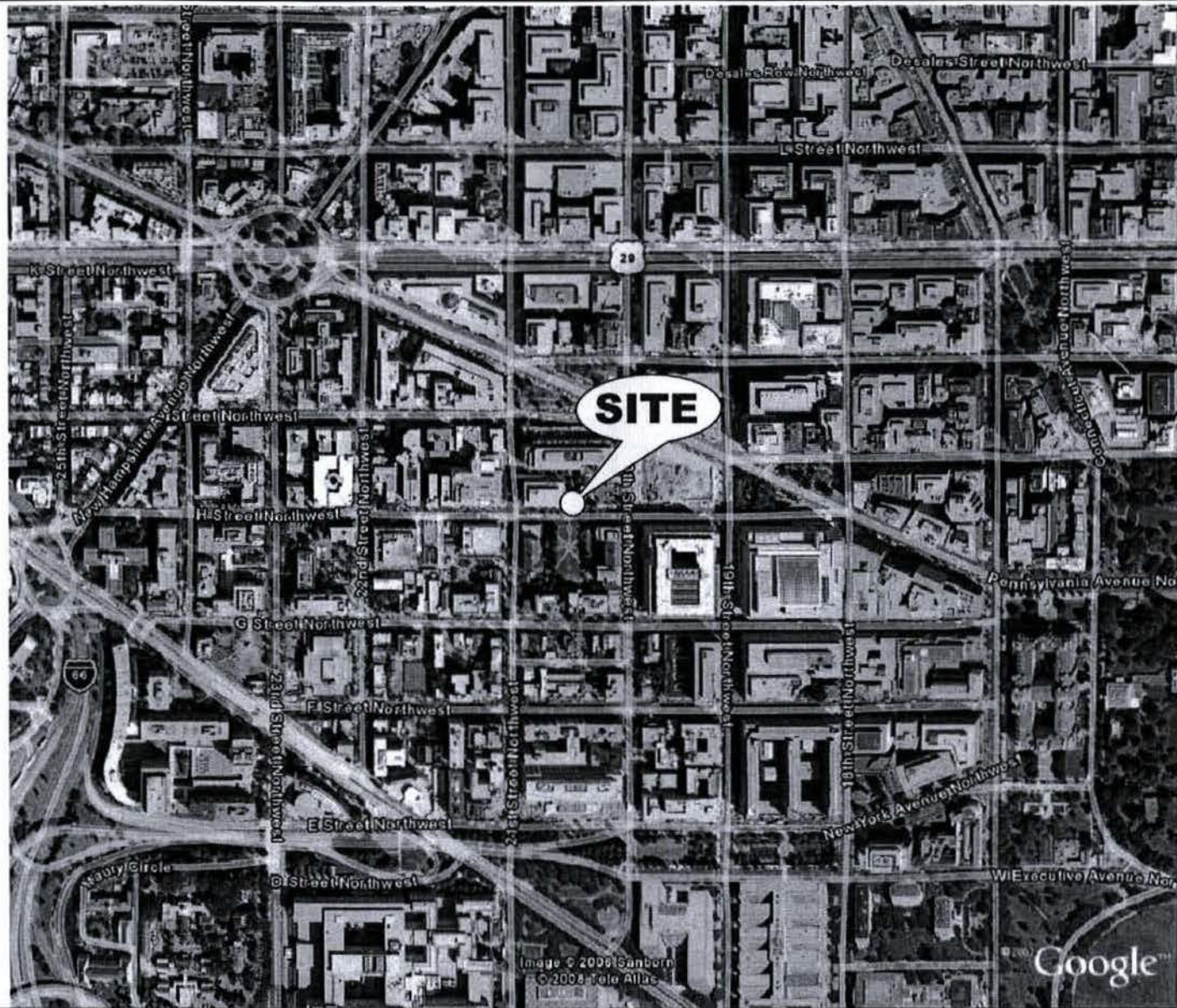


Figure 1-1
Site Location Map



Plan by Group Goetz Architects



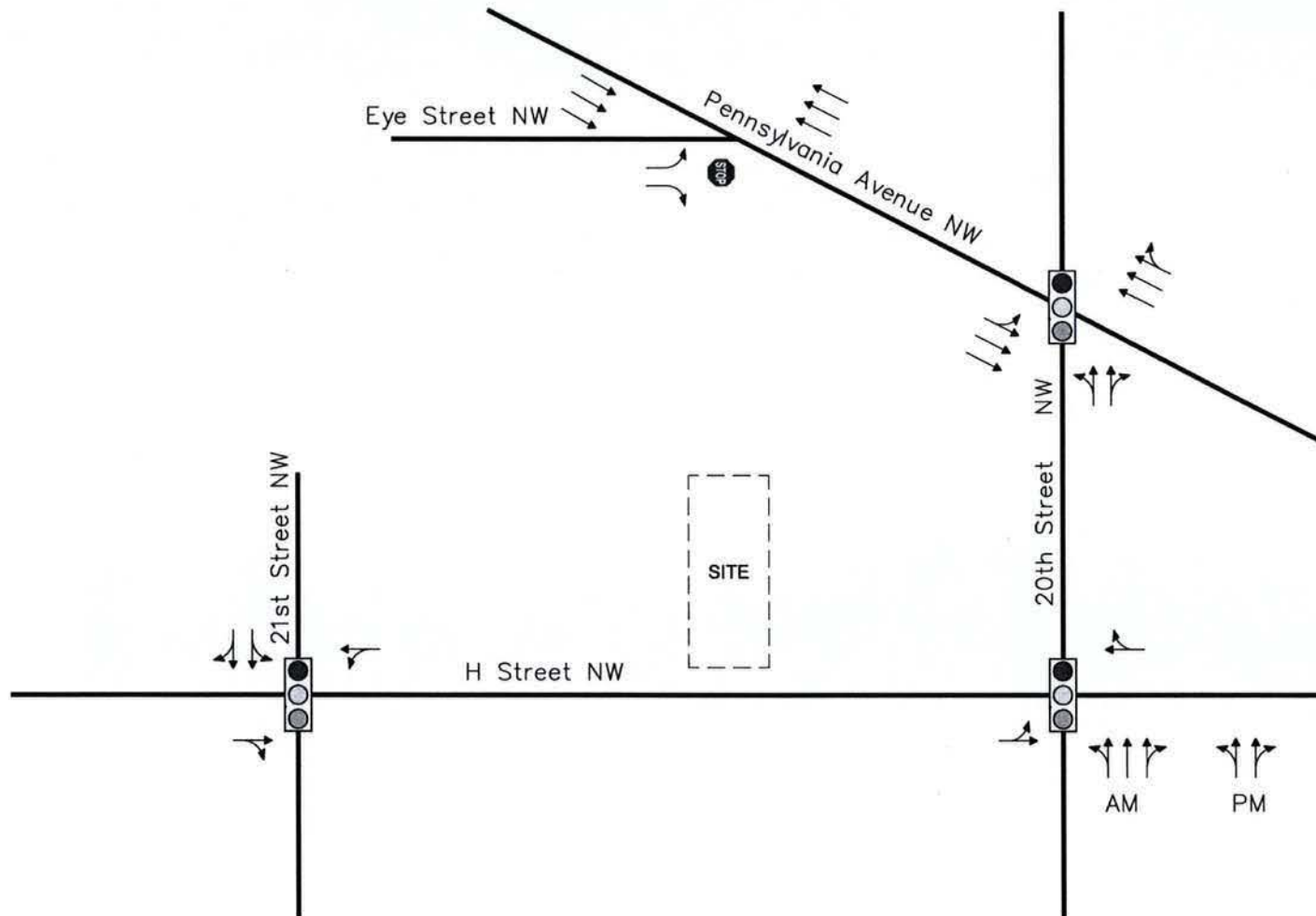


Figure 2-1
Existing Lane Use and Traffic Control

- ← Represents One Travel Lane
- ⬢ Signalized Intersection
- Stop Sign



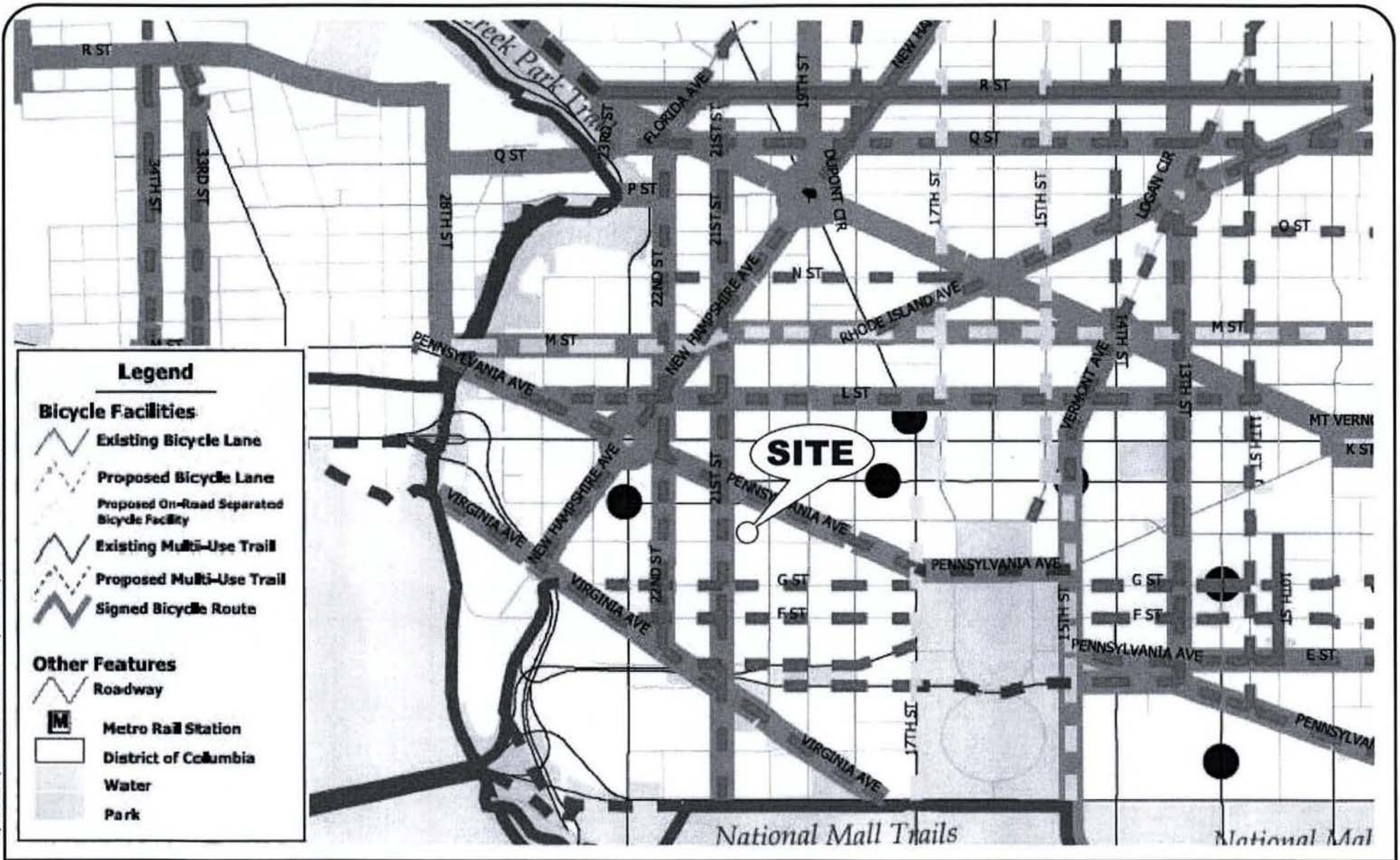


Figure 2-2
Proposed Bicycle Facilities



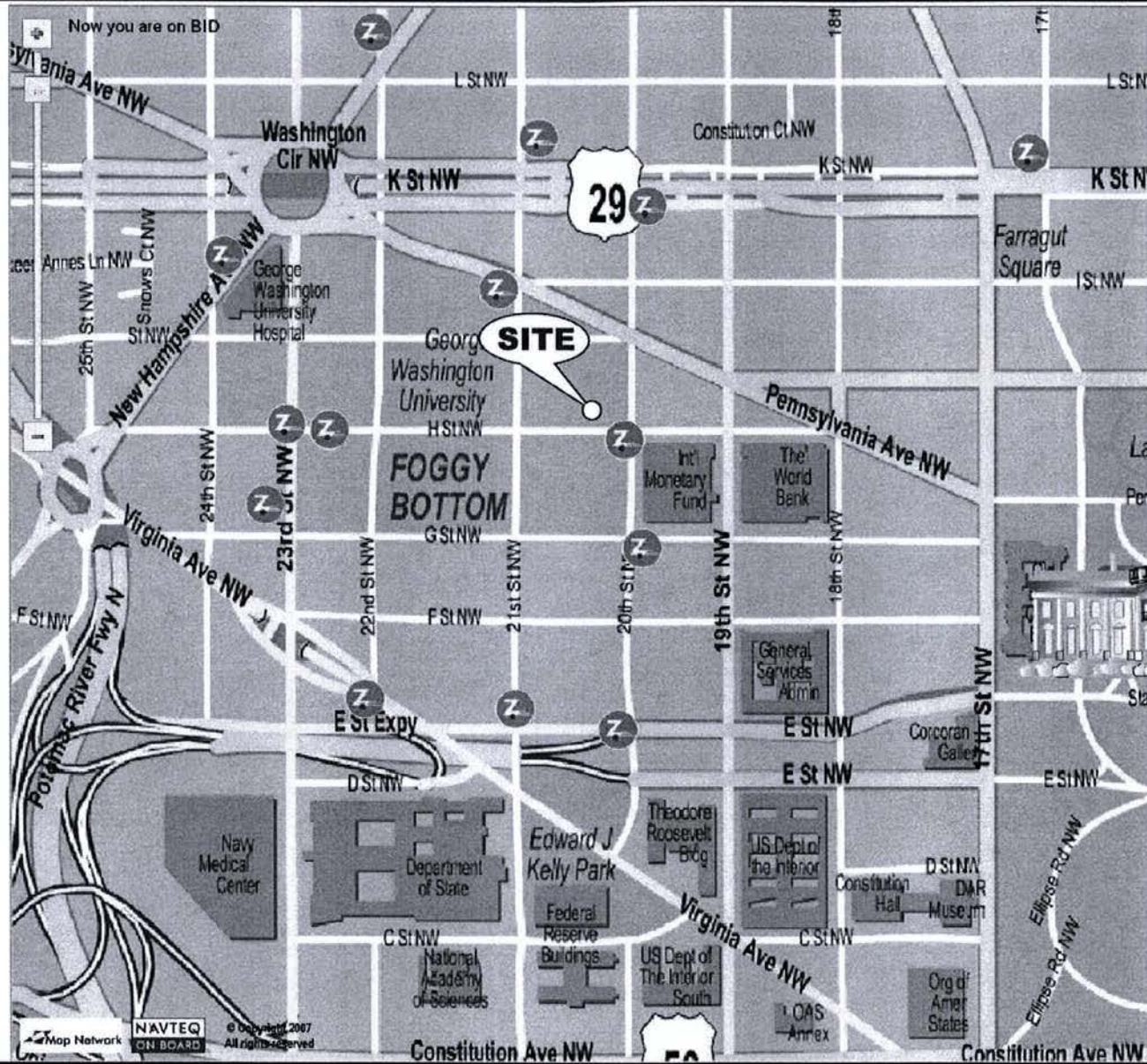


Figure 2-3
Zipcar Locations

Z = Zipcar Location



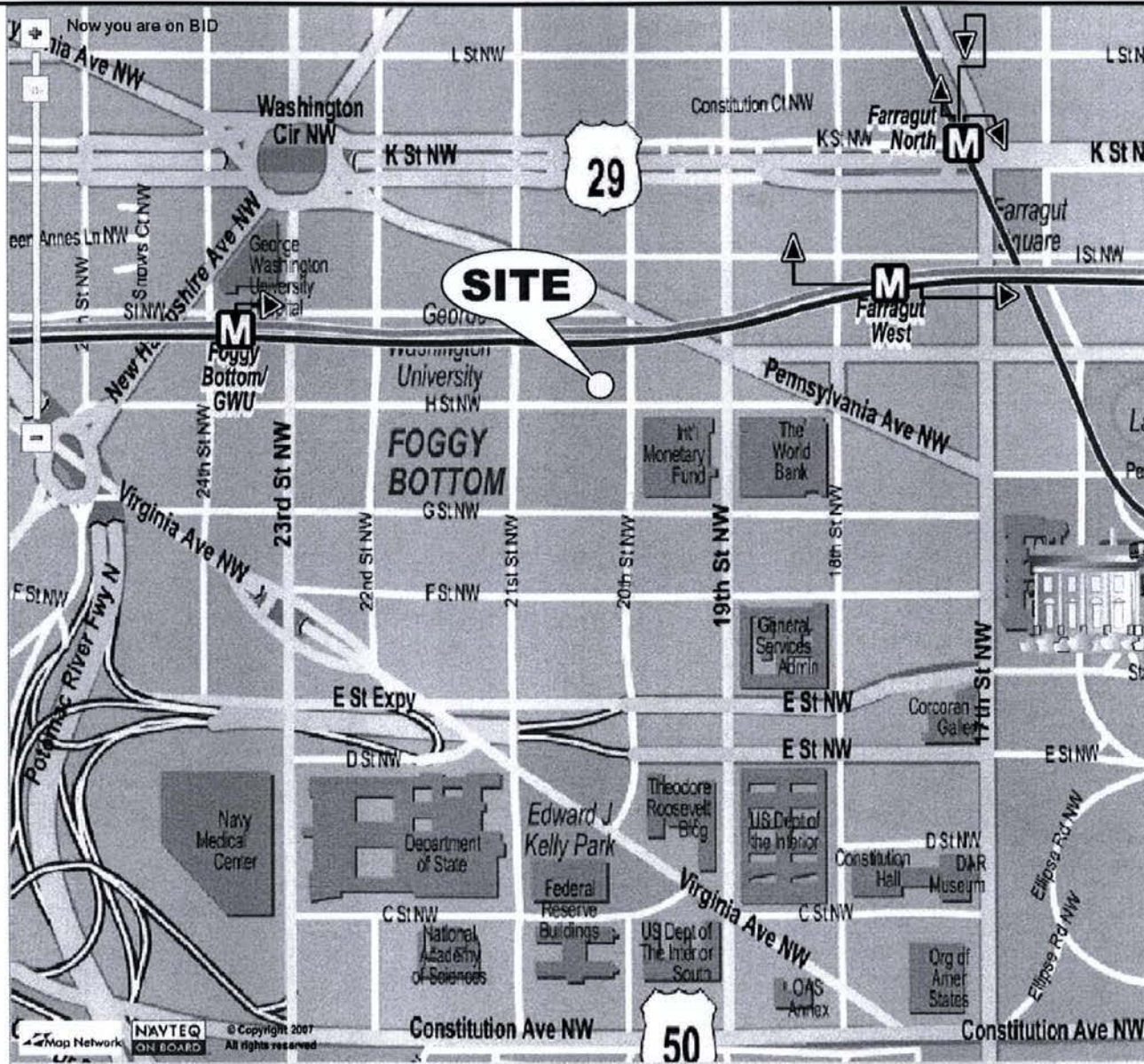
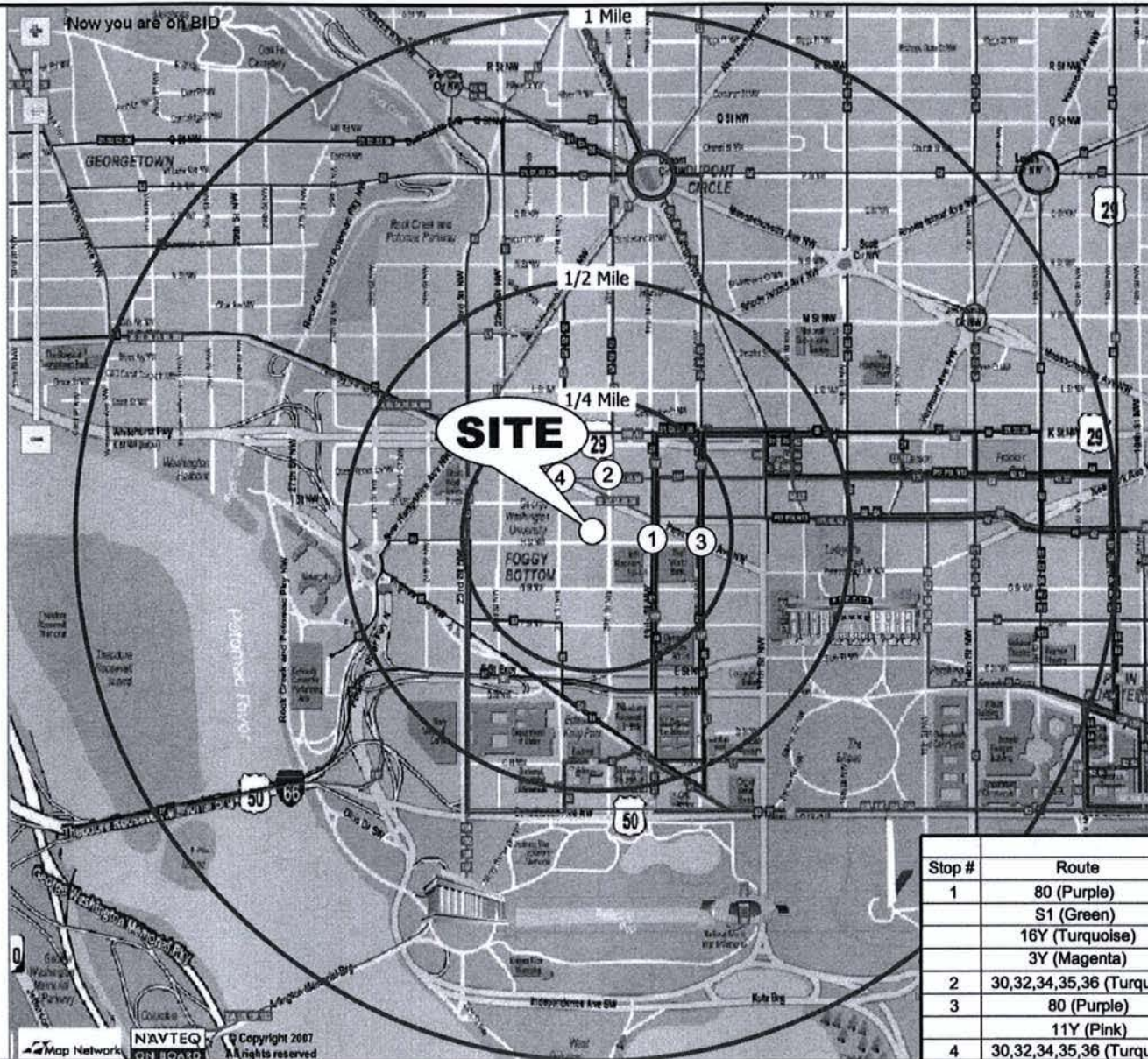


Figure 2-4
Metrorail Station Locations

M = Metrorail Station





Stop #	Route	Bus Trips		
		Weekly	Saturday	Sunday
1	80 (Purple)	76	45	37
	S1 (Green)	24	0	0
	16Y (Turquoise)	14	0	0
	3Y (Magenta)	5	0	0
2	30,32,34,35,36 (Turquoise)	62	0	0
3	80 (Purple)	68	44	35
	11Y (Pink)	4	0	0
4	30,32,34,35,36 (Turquoise)	310	0	0

Figure 2-5
Metrobus Routes



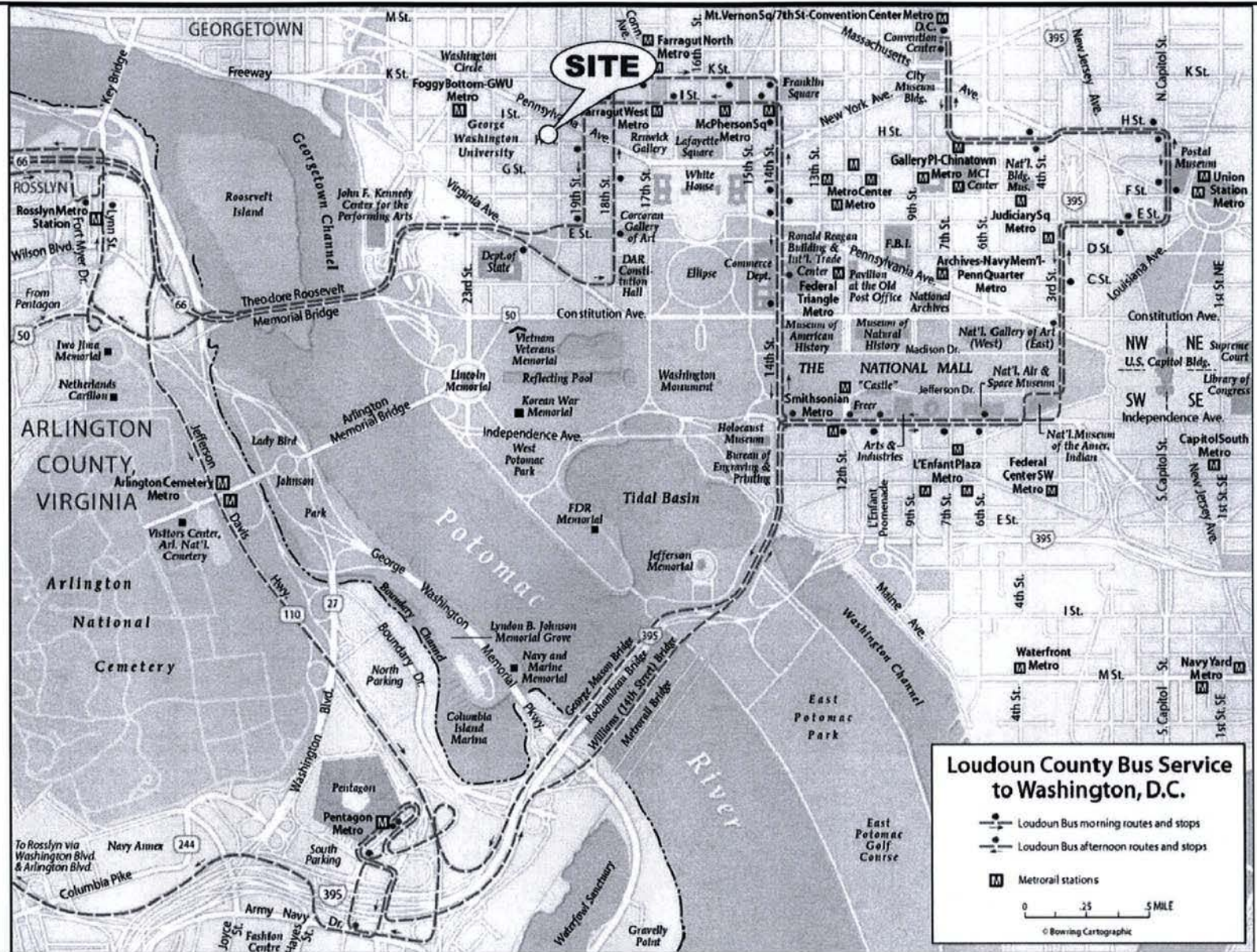


Figure 2-6
Loudoun County Commuter Bus Routes

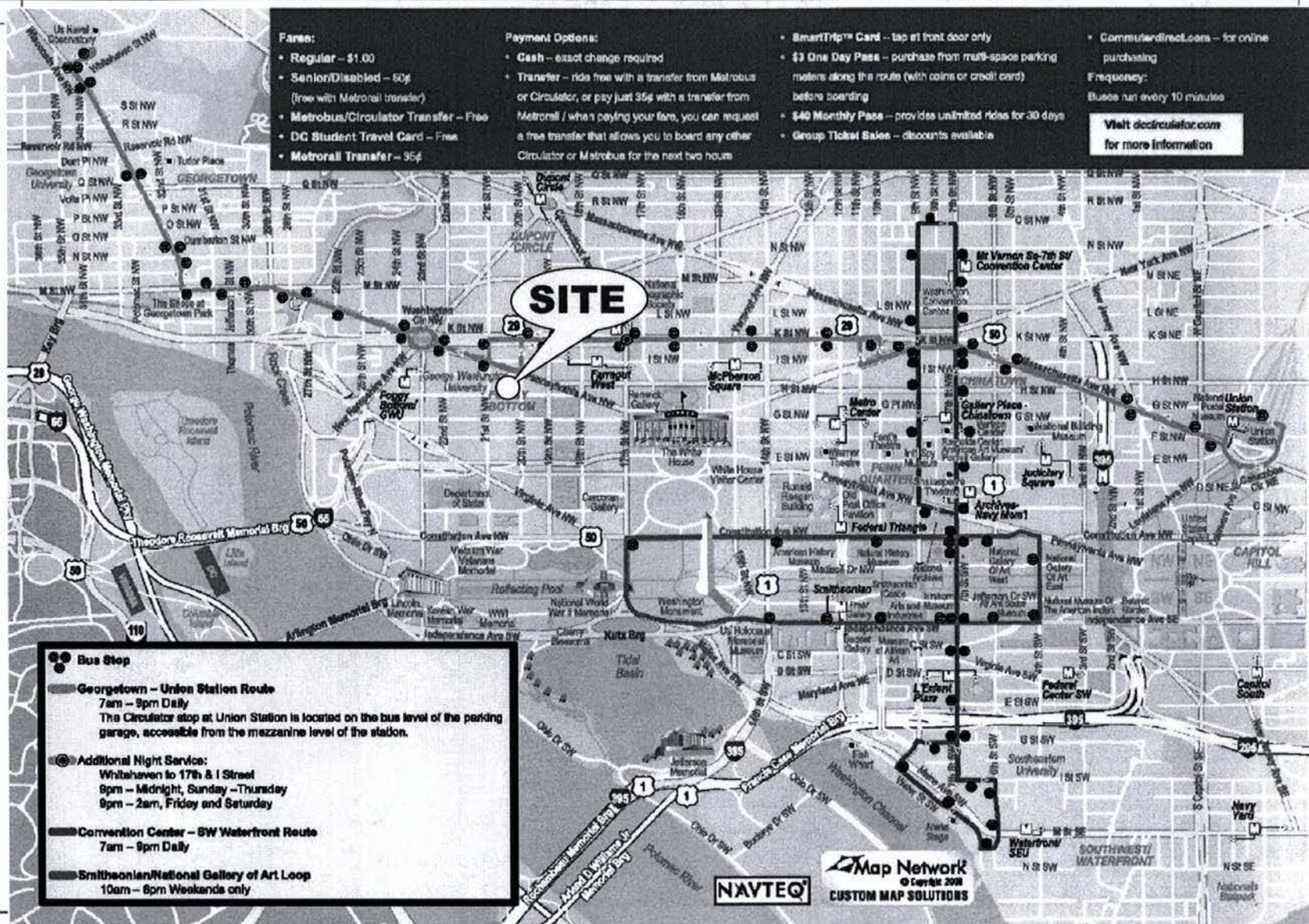


Figure 2-7
DC Circulator Bus Routes



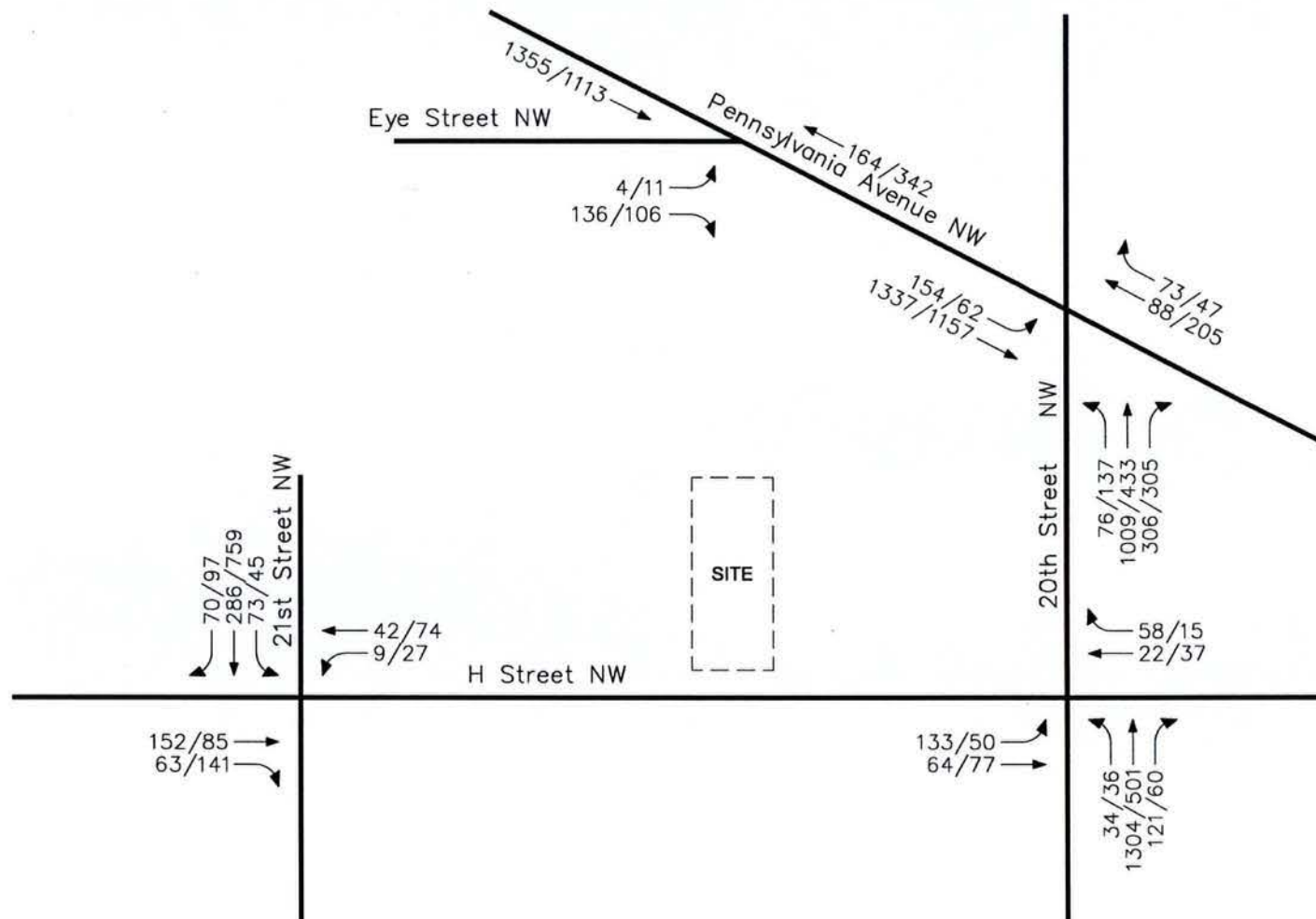


Figure 3-1
Existing Peak Hour Vehicle Traffic Volumes

AM PEAK HOUR
PM PEAK HOUR
000/000



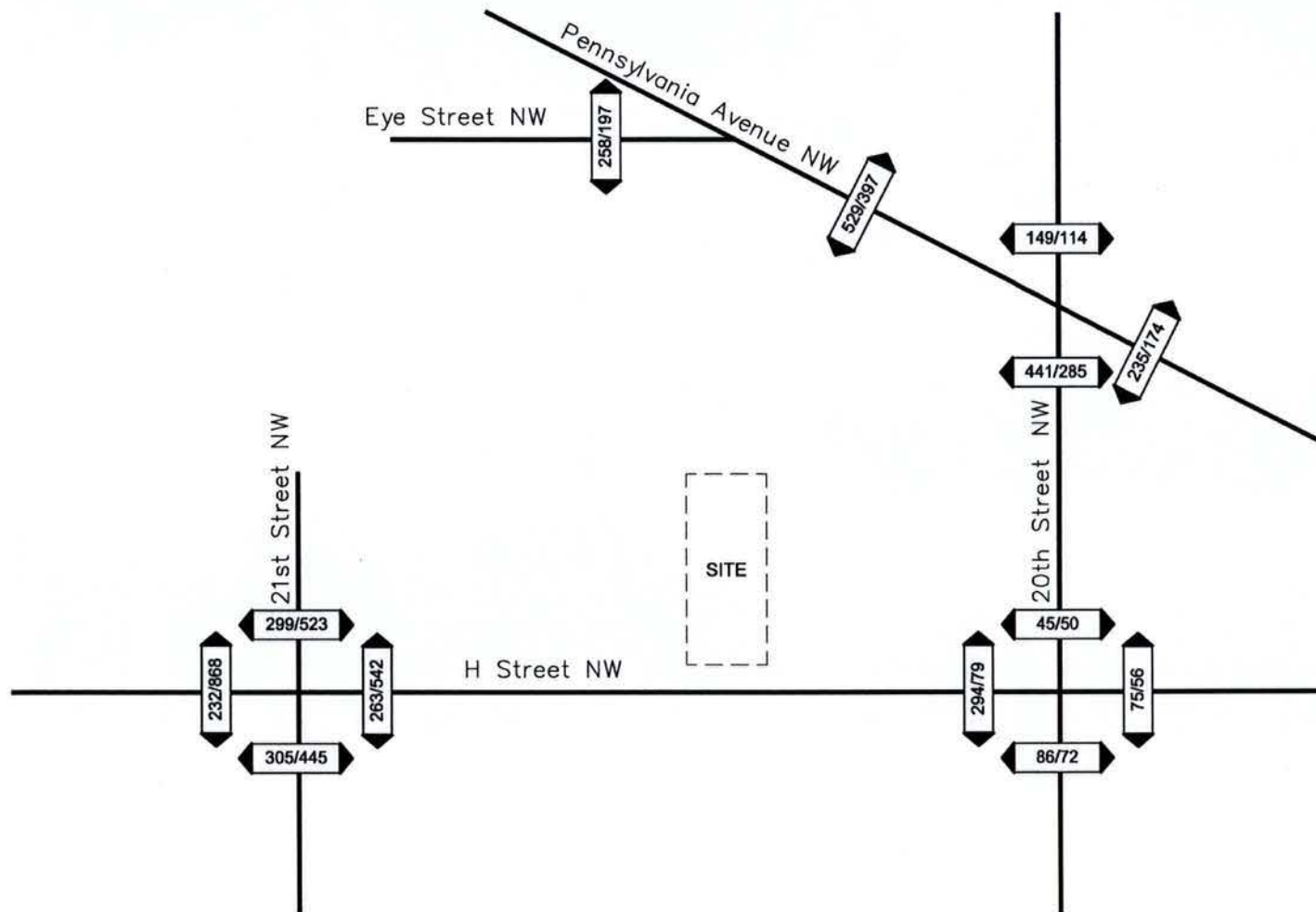


Figure 3-2
Existing Peak Hour Pedestrian Volumes



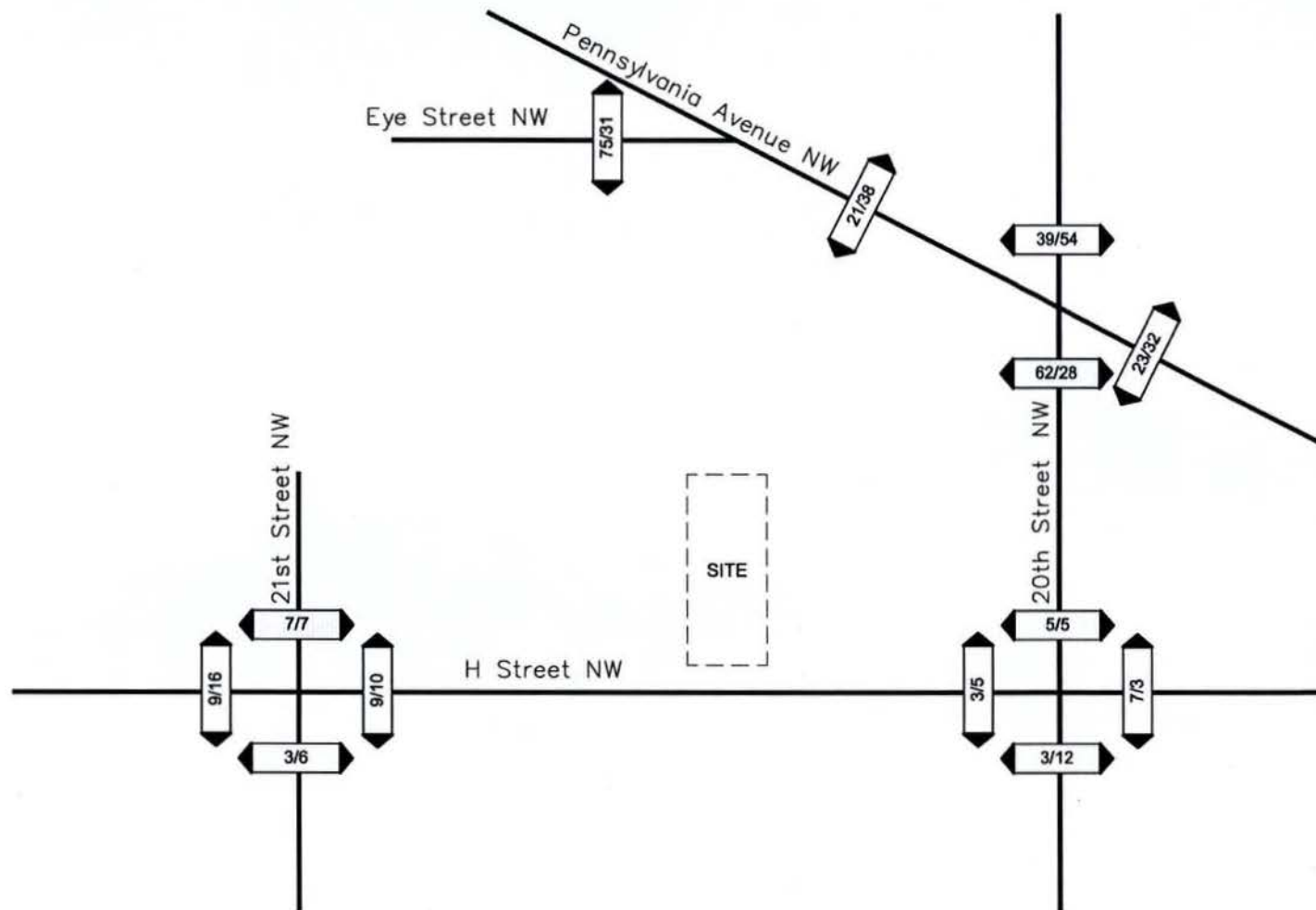


Figure 3-3
Existing Peak Hour Bicycle Volumes



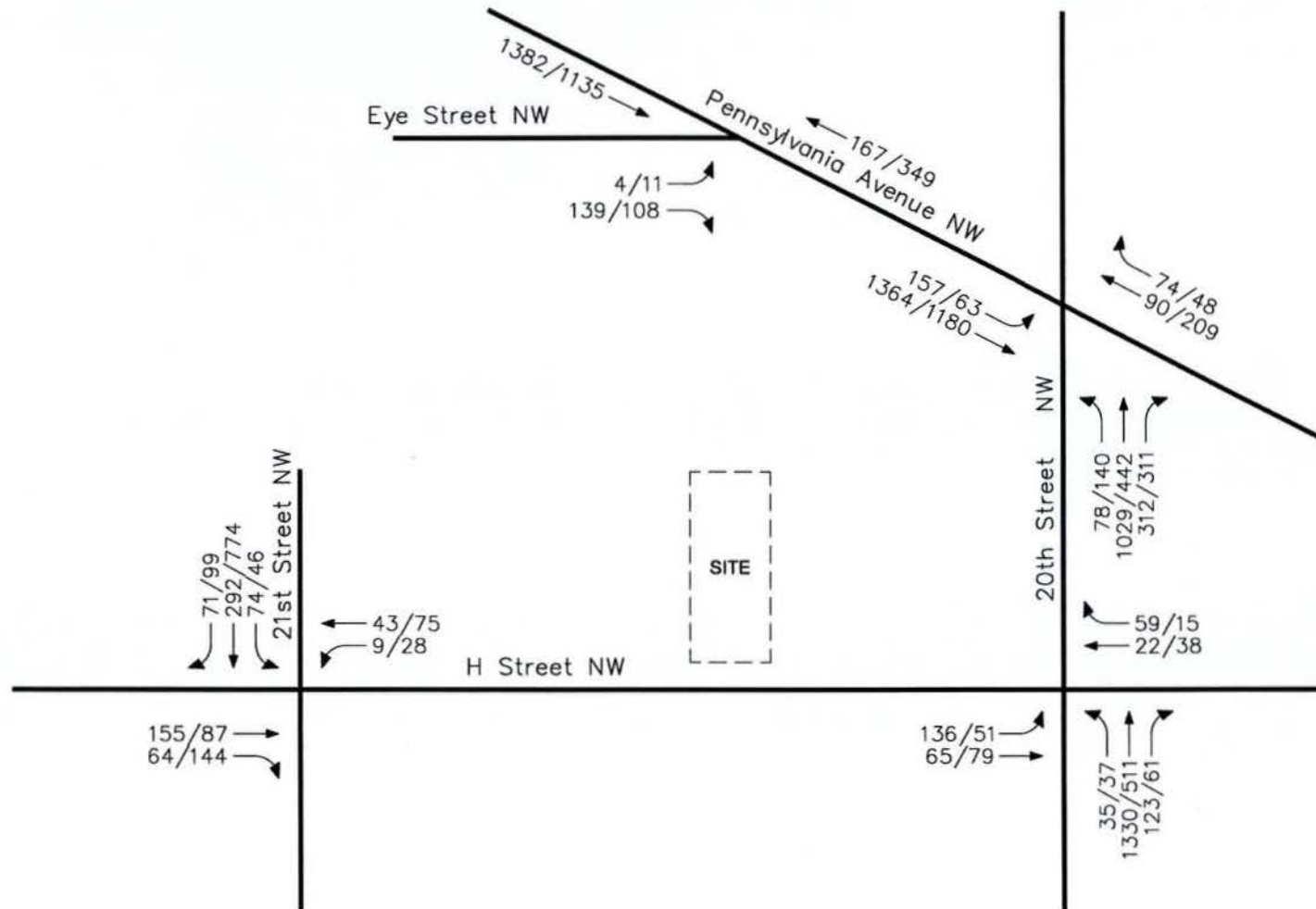


Figure 4-1
2010 Peak Hour Traffic Forecasts with Regional Growth

AM PEAK HOUR
PM PEAK HOUR
000/000



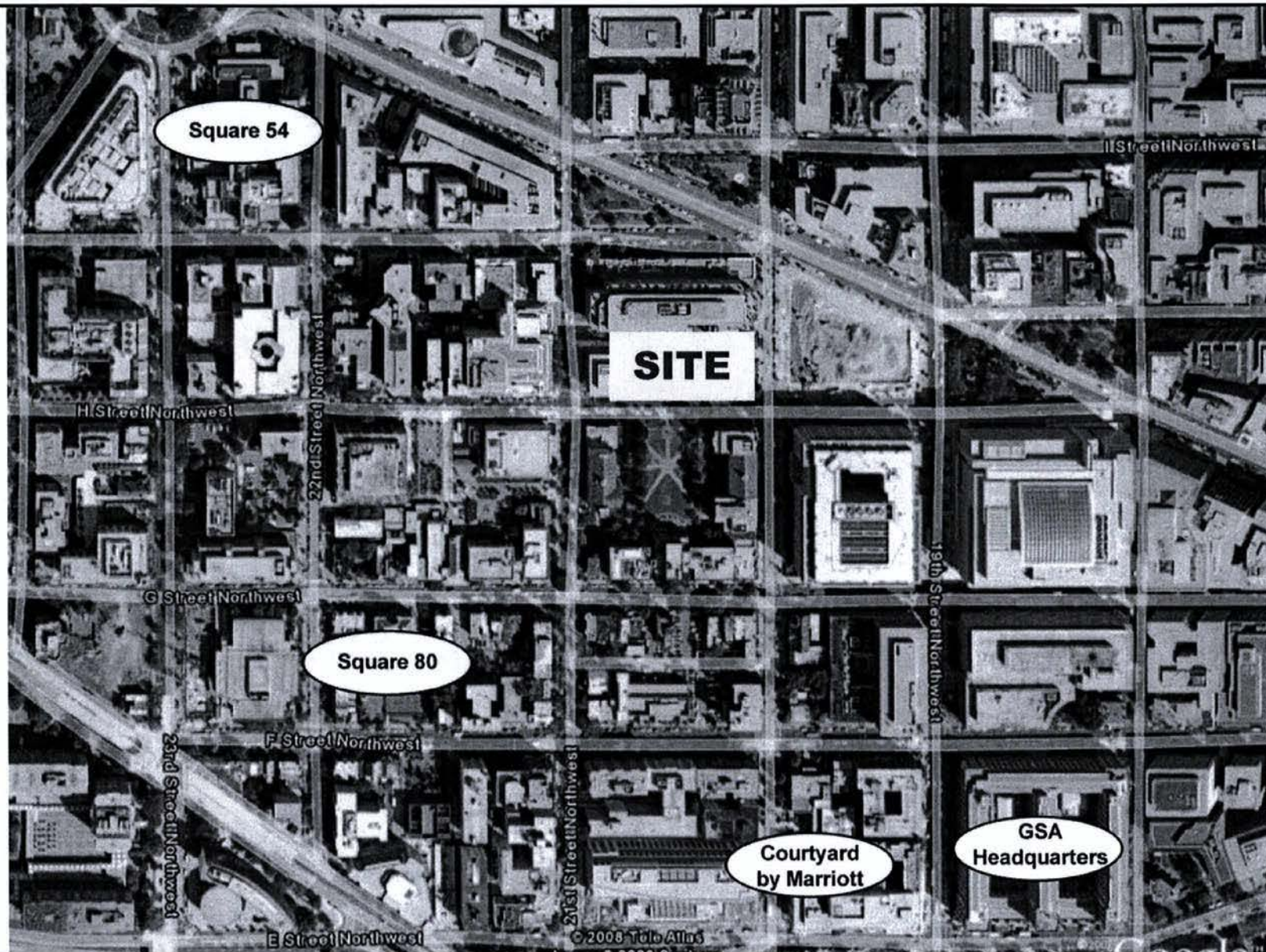


Figure 4-2
Location of Pipeline Developments



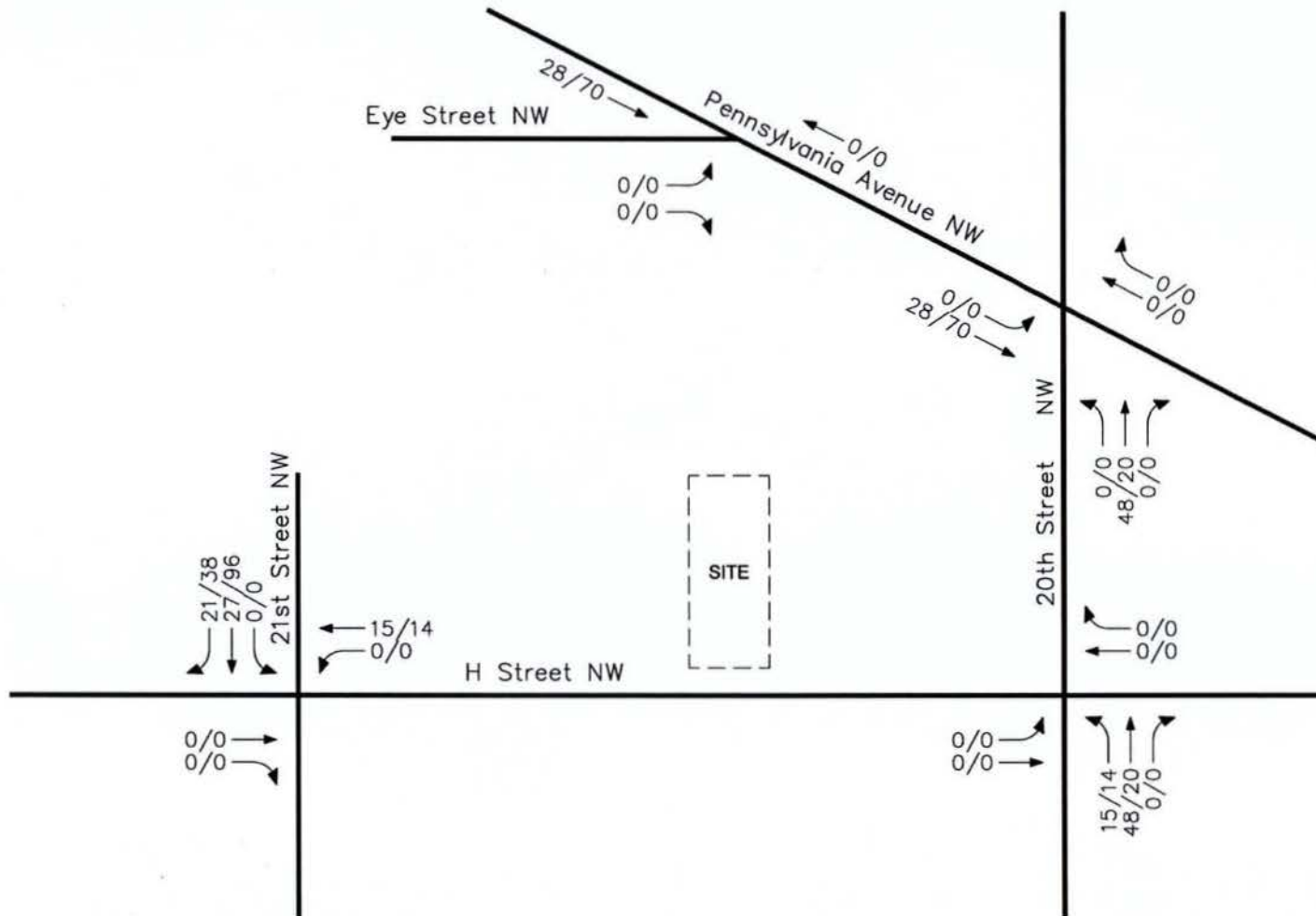


Figure 4-3
Peak Hour Site Trips for Pipeline Developments

AM PEAK HOUR
PM PEAK HOUR
000/000



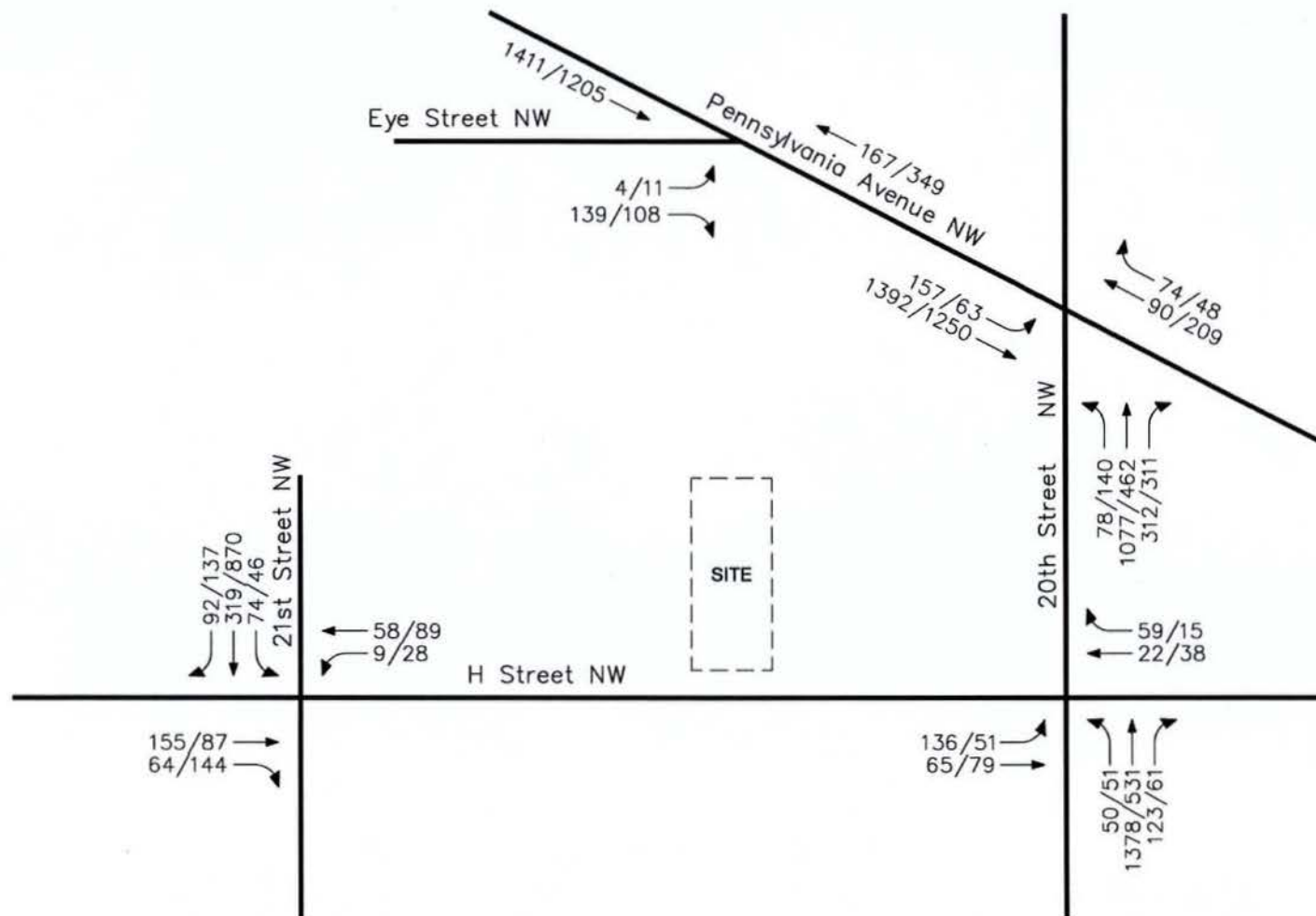


Figure 4-4
2010 Background Peak Hour Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
000/000



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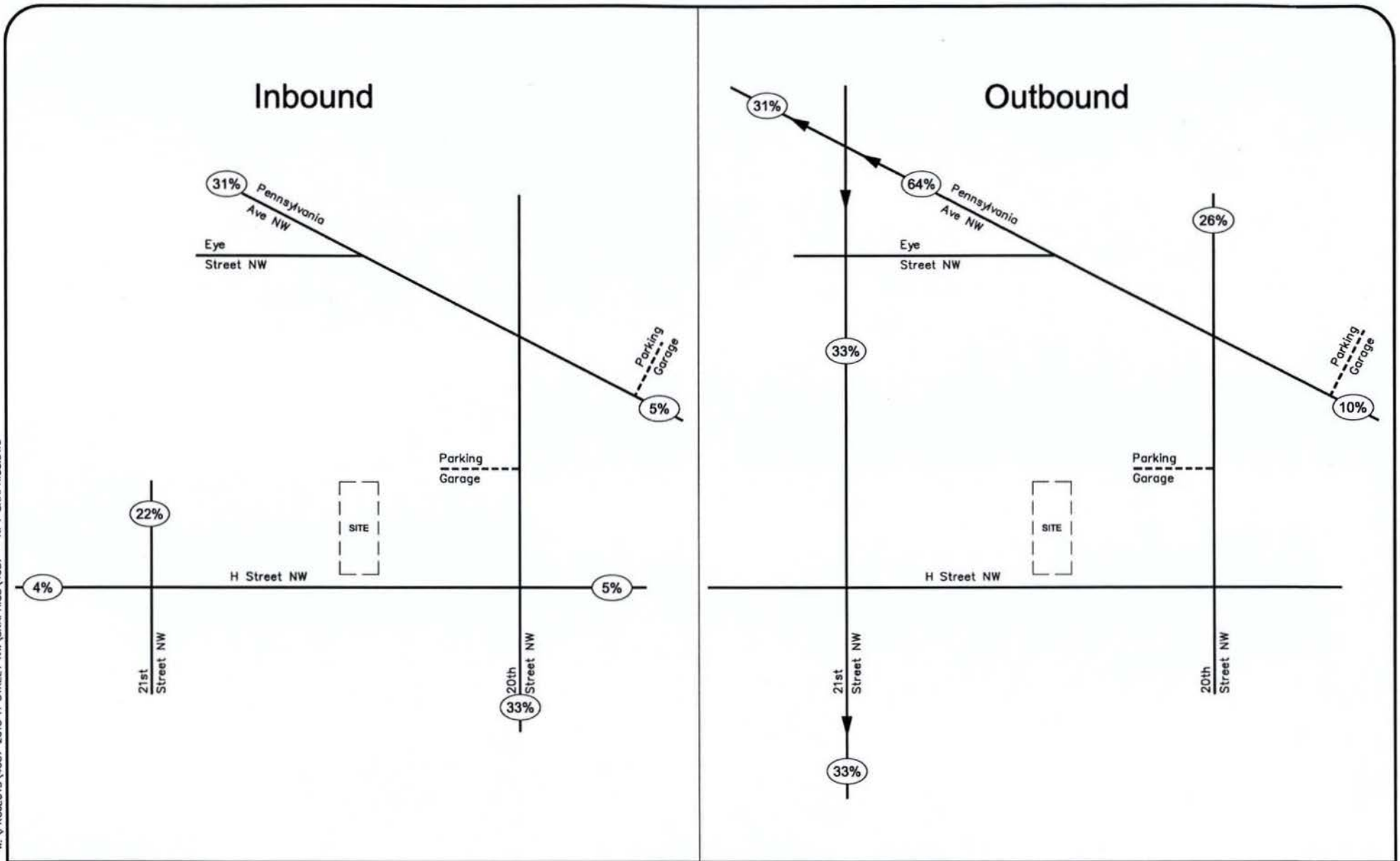


Figure 5-1
2013 H Street NW Peak Hour Site Trip Distributions

(XX%) AM and PM Peak Hour Site Trip Distribution



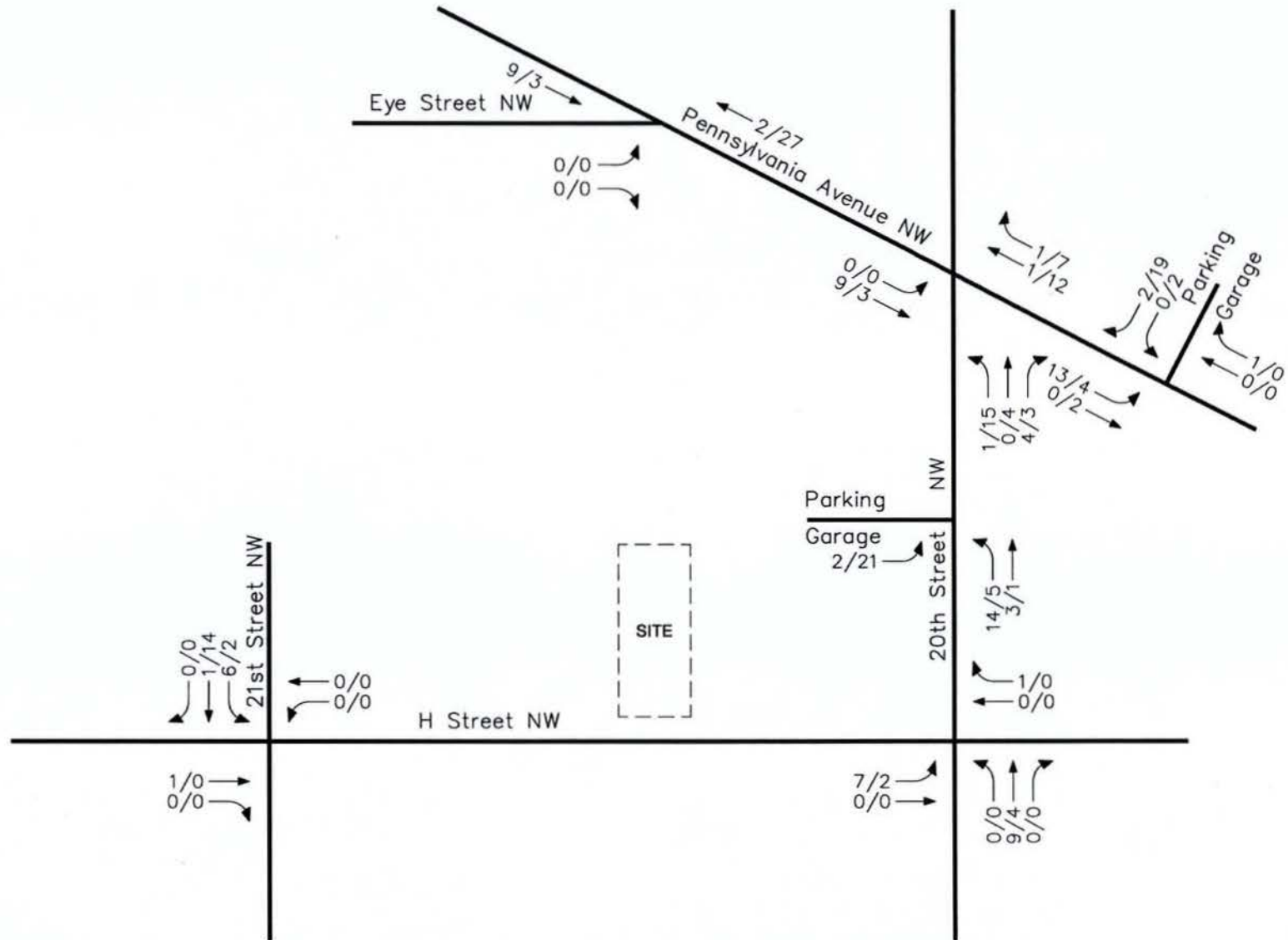


Figure 5-2
2013 H Street NW Peak Hour Site Trip Assignment

AM PEAK HOUR
PM PEAK HOUR
000/000



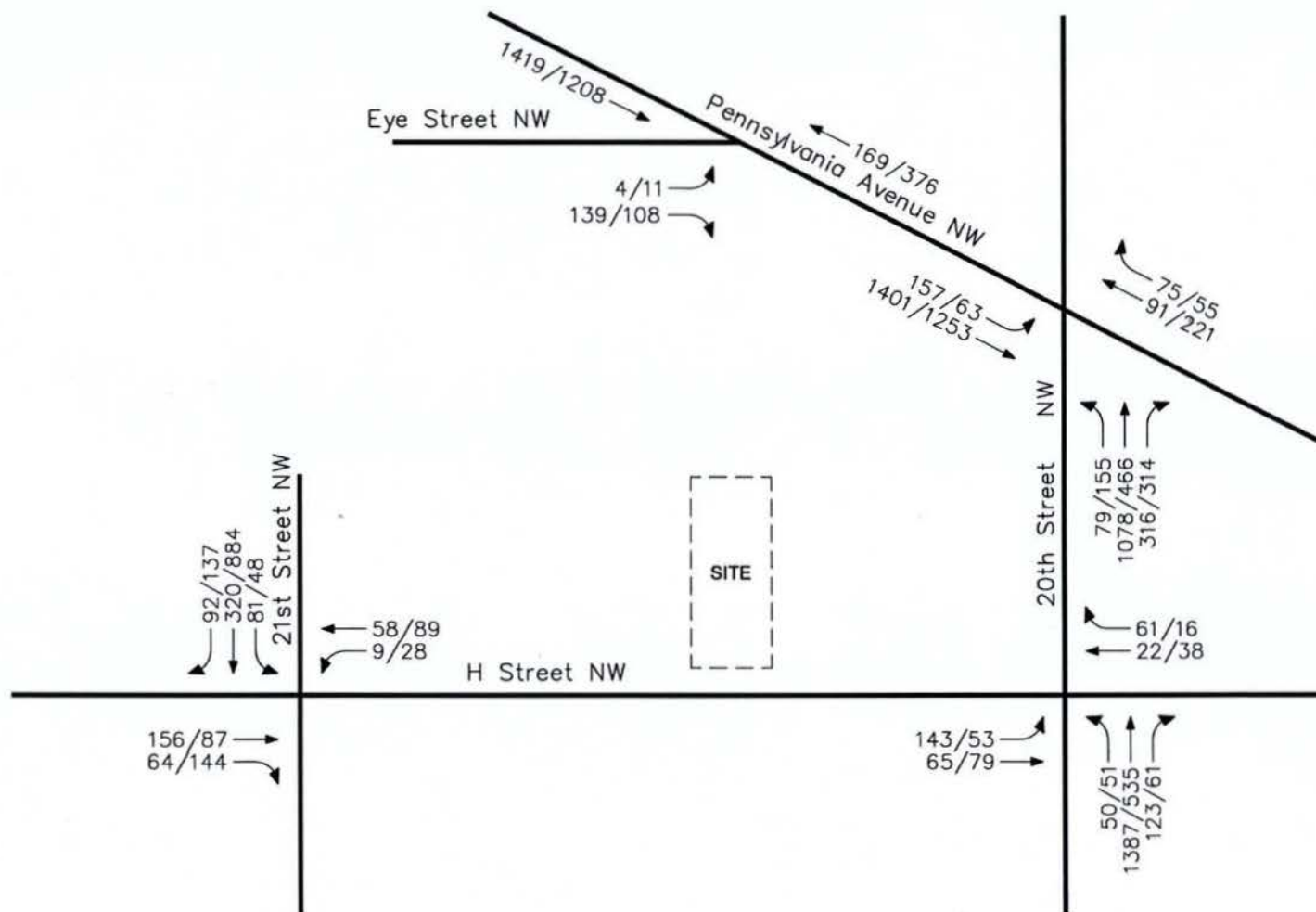


Figure 6-1
2010 Total Future Peak Hour Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
000/000

