THE GEORGE WASHINGTON UNIVERSITY SCHOOL OF PUBLIC HEALTH AND HEALTH SERVICES TRANSPORTATION IMPACT STUDY WASHINGTON, D.C.

Submitted on behalf of: The George Washington University

> Prepared by: Wells + Associates, Inc.

> > March 2011

TABLE OF CONTENTS

<u>PAGE</u>

Section I	
NTRODUCTION	I
Overview	I
Site Location	I
Proposed Redevelopment	I
Study Scope	2
Overview	2
Study Area	2
Śtudy Objectives	2
Conclusions and Recommendations	2
	4
	4
	4
PUBLIC TRANSPORTATION FACILITIES AND SERVICES	5
Metrorail	5
Table 2-1: Foggy Bottom-GW Metrorail Station Passenger Boardings and Alightings	5
Table 2-2: Foggy Bottom-GW Metrorail Station Passenger Access Modes	5
Bus Service	5
Table 2-3: Metorail – Number of Bus Trips	6
GW CAMPUS TRANSPORTATION	7
Pedestrian Accommodations	8
Pedestrian Accommodations at Signalized Intersections	8
Pedestrian Accommodations at Unsignalized Intersections	8
Pedestrian Master Plan	8
BICYCLES ACCOMMODATIONS	. 9
Bicycle Master Plan	. 9
Table 2-4: Existing Bicycle Levels of Service	. 9
Campus Bicycle Inventory	. 9
Bike Sharing	. 9
ZIPCAR	. 9
Parking	10
Table 2-6: Existing Off-Street Parking Inventory	10

Section 3

EXISTING CONDITIONS ANALYSIS	11
Existing Transportation Demand Measures (TDM)	. 11
Transportation Management Coordinator	. 11
Public Transportation Pass	, 11
GW Parking Facility Permits	, 11
On-Campus Parking Pre-Tax Deduction Program	. 12
Off-Campus Parking Pre-Tax Deduction Program	. 12
Attendant/Valet Parking	.12
Carpool Programs	. 12
Car Sharing	. 12
Shuttle Bus Service Plan	.12
Technology Initiatives	. 12
Web-based Transit Purchases	. 12
Parking Management During On-Site Construction	. 12
Truck Management Plan	. 13
-	

TABLE OF CONTENTS (CONTINUED)

<u>PAGE</u>

GW TRANSPORTATION CHARACTERISTICS	
Table 3-1: Summary of Respondents Foggy Bottom Campus	
Mode Choice	
Carpooling Characteristics	
Table 3-2: Mode Split Summary Foggy Bottom Campus	
Parking Location	
Table 3-3: Parking Location Summary Foggy Bottom Campus	
Traffic Volumes	
Operational Analysis	15
Table 3-4: Existing Levels of Service	
Section 4	
FUTURE BACKGROUND CONDITIONS	17
Traffic Volumes	
Regional Growth	
Pipeline Development	
	10

PLANNED IMPROVEMENTS	18
OPERATIONAL ANALYSIS	18
Table 4-1: 2020 Background Levels of Service	19

Section 5 SITE ANA

<u>SITE ANALYSIS</u>	20
Overview	
CURB CUTS	
Site Access	
LOADING	
Parking	
BICYCLE REQUIREMENTS	
Trip Generation, Distribution, and Assignment	
Overview	
Reassigned Traffic to Square 54 Garage	
Traffic Associated with Increase in Faculty/Staff	
PROPOSED TDM MEASURES FOR THE SEC	
Bicycle Accommodations	
Truck Management Plan	
Section 6	
TOTAL FUTURE CONDITIONS	24
TOTAL FUTURE TRAFFIC FORECASTS	

Section 7 CONCLUSIONS AND RECOMMENDATIONS	26
Table 6-2: Total Future Levels of Service	25
OPERATIONAL ANALYSIS	
Table 6-1: Proportional Impact Analysis	
Prodortional Impact Analysis	
TOTAL FUTURE TRAFFIC FORECASTS	

REFERENCES	28



LIST OF FIGURES

FIGURE T	<u>ITLE</u>
----------	-------------

- I-I Site Location
- I-2 Site Plan
- I-3 Location of Existing School of Public Health and Health Services Facilities
- I-4A Truck Loading Movement Southbound
- I-4B Truck Loading Movement Northbound
- I-5 Pedestrian Entrances
- 2-1 Lane Use and Traffic Control
- 2-2 Functional Classification Map
- 2-3 Public Transportation Services
- 2-4A Existing Vern Express Route Monday Through Friday (All Times Except 6 AM to 10 AM)
- 2-4B Existing Vern Express Route Monday Through Friday (6 AM to 10 AM)
- 2-5 Proposed Vern Express Route Monday Through Friday (All Times Except 6 AM to 10 AM)
- 2-6 Existing Colonial Express Routes
- 2-7 Pedestrian Crossings at the 24th Street/K Street (EB) Intersection
- 2-8 Pedestrian Crossings at the New Hampshire Avenue/Washington Circle Intersection and K Street (EB) Washington Circle Intersection
- 2-9 Pedestrian Crossing at the K Street (EB)/Washington Circle Intersection
- 2-10 Pedestrian Crossing at the 24th Street/New Hampshire Avenue Intersection
- 2-11 Pedestrian Activity
- 2-12 Bicycle Levels of Service
- 2-13 Capital Bikeshare Locations
- 2-14 Proposed Bicycle Parking
- 2-15 Zipcar Locations
- 3-1 Baseline Peak Hour Vehicular Traffic Volumes
- 3-2 Existing Peak Hour Pedestrian Volumes
- 4-1 2020 Peak Hour Traffic Forecasts with Regional Growth
- 4-2 Pipeline Development Traffic Assignments
- 4-3 2020 Future Background Peak Hour Traffic Forecasts
- 5-1A Removal of Existing Site Trips
- 5-1B Site Trip Assignment Square 54 Garage
- 5-1C Site Trip Assignment Increases in Faculty and Staff
- 5-1D Combined Site Trip Assignment All Components
- 5-2 Preferred Truck Routes
- 6-1 2020 Total Future Peak Hour Traffic Forecasts



The George Washington University School of Public Health and Health Services Transportation Impact Study Washington, D.C.

LIST OF APPENDICES

<u>APPENDIX</u> <u>TITLE</u>

- Traffic Count Data А
- В
- DDOT Traffic Signal Timings Level of Service Descriptions Existing Capacity Analyses Pipeline Developments С
- D
- Е
- F 2020 Background Capacity Analyses
- G Truck Diagrams
- 2020 Total Future Capacity Analyses н



Section I

OVERVIEW

This report presents a Transportation Impact Study (TIS) of the proposed redevelopment of Square 39 on the Foggy Bottom Campus of The George Washington University (GW or the University), in Washington, D.C. The study was conducted in support of a Second-Stage Planned Unit Development (PUD) application for the proposed redevelopment.

Site Location

Square 39 is located in Ward 2 and is bounded by K Street on the north, Washington Circle on the East, New Hampshire Avenue on the southeast, and 24th Street on the west, as shown on Figure 1-1.

Proposed Redevelopment

On February 5, 2007, the Zoning Commission of the District of Columbia approved two applications by George Washington University. The first application was for special exception approval of a new Campus Plan; the second application sought review and first-stage approval of a PUD and related amendments to the Zoning Map of the District of Columbia applicable to University-owned properties within the campus boundaries. The order was adopted on March 12, 2007 and became final and effective on October 26, 2007.

The approved Campus Plan identified Square 39 as one of the potential redevelopment sites on campus. The University is now moving forward with the Second-Stage PUD application for the Square 39 redevelopment.

The site currently is occupied by the three-story Warwick building, which houses the various clinical, academic, administrative, and medical programs of the School of Medicine and Health Sciences and the GW Hospital and a 24-space faculty/staff surface parking lot. Both of these facilities are proposed to be razed to accommodate the new School of Public Health and Health Services (SPHHS). The proposed SPHHS will consist of approximately 115,542 square feet (SF) of gross floor area (GFA). No parking is proposed in conjunction with the SPHHS. Figure 1-2 shows the proposed site plan. The uses currently housed in the Warwick building will be relocated to nearby Ross Hall or the George Washington University Hospital or leased space in the nearby Golden Triangle/K Street business corridor.

The new SPHHS will partially consolidate educational departments and administrative functions currently housed in Ross Hall; Building K; 2021, 2121, and 2175 K Street; 2100 Pennsylvania Avenue; and 2100 M Street. Figure 1-3 shows the locations of these buildings with respect to the new SPHHS. Due to the close proximity of the existing facilities to the proposed site, the redevelopment is not expected to substantially alter traffic patterns in the area. That is, faculty, staff, students, and visitors of the new building are not expected to alter their mode of transportation, nor are they anticipated to substantially alter their route.

The programming of the proposed SPHHS contemplates an additional 30 faculty and staff upon build out of the new facility.

Construction of the new facility is anticipated to begin in January 2012 with anticipated completion by the end of 2013. The new facility is expected to be occupied by late 2013 or early 2014.

Upon completion of the redevelopment, the number of curb cuts on the entire square will be reduced from two to one. The curb cut on New Hampshire Avenue that currently provides access to the surface parking lot will be removed. A single curb cut on 24th Street will provide access to the loading docks, as shown on Figures I-4A and I-4B. The 24-foot wide curb cut will be located a few feet north of the existing curb cut.

Truck sweep diagrams depicting trucks turning into and out of the loading area are shown on Figures I-5A through I-5H.



The main pedestrian access to the SPHHS is proposed on New Hampshire Avenue. Emergency exits will be provided via two additional doors on New Hampshire Avenue and a door on K Street. The service entrance is proposed on 24th Street. Figure 1-5 shows the locations of these pedestrian entrances.

STUDY SCOPE

Overview

The University retained Wells + Associates to evaluate the multi-modal transportation impacts of redeveloping Square 39.

Study Area

The study area was selected based on those intersections that potentially could be affected by the proposed redevelopment. The following intersections were selected for detailed analysis:

- I. 24th Street/Pennsylvania Avenue,
- 2. 24th Street/K Street Westbound,
- 3. 24th Street/K Street Eastbound,
- 4. 24th Street/New Hampshire Avenue,
- 5. New Hampshire Avenue/I Street,
- 6. 24th Street/I Street,
- 7. 23rd Street/Washington Circle,
- 8. New Hampshire Avenue/Washington Circle,
- 9. Pennsylvania Avenue/K Street/Washington Circle, and
- 10. New Hampshire Avenue/Existing Driveway.

Study Objectives

The objectives of this study were to:

- I. Evaluate existing traffic conditions,
- 2. Identify off-street parking impacts,
- 3. Identify on-street parking impacts on the blocks immediately surrounding Square 39,
- 4. Identify existing mode choices,
- 5. Project future traffic volumes without and with the proposed SPHHS,
- 6. Evaluate the effectiveness of the existing Transportation Management Plan and recommend changes, as necessary,
- Analyze and recommend improvements to manage truck service and delivery activity, and
- 8. Recommend transportation improvements to promote the safe and efficient flow of vehicular and pedestrian traffic on campus.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

- 1. Square 39 is well served by a high-quality multimodal transportation system that includes: a connected network of arterial, collector, and local streets; a connected network of sidewalks, paths, and open spaces; the nearby Foggy Bottom-GWU Metrorail station; multiple regional bus lines; shuttle buses; and bicycle facilities.
- 2. The 24 parking spaces located on Square 39 would be removed as part of the proposed SPHHS; however, GW will maintain a minimum of 2,800 parking spaces through the year 2020 in compliance with the GW Campus Plan Order.

- 3. In conjunction with construction of the proposed SPHHS, the number of curb cuts around the perimeter of Square 39 would be reduced from two to one, which will reduce pedestrian/vehicle conflicts. Additionally, there will be a net gain of one on-street parking space due to the reduction in the number of curb cuts around the perimeter of the site.
- 4. The proposed loading area on 24th Street would safely and adequately accommodate single-unit trucks up to 30 feet in length (SU-30) and trash trucks turning into and out of the driveway to and from the north and south on 24th Street.
- 5. An extensive truck management plan has been developed to accommodate the anticipated loading operations of the SPHHS and to minimize the impact of the building's truck operations.
- 6. The proposed development plan will provide approximately 74 bicycle parking spaces (including 20 covered spaces) outside of the facility. The University has conducted a campuswide inventory of bicycle parking. The University provides spaces for nearly 500 bicycles in several surface bicycle racks and secure interior building racks spread throughout campus.
- 7. GW currently has an extensive Transportation Management Plan that promotes safe and efficient traffic operations within the Campus, encourages alternate modes of transportation, and maximizes the use of the on- and off-street parking facilities to efficiently serve the Campus parking demands. The TMP also prohibits freshmen and sophomores from bringing vehicles to the Campus except in special circumstances.
- 8. As a result of GW's aggressive Transportation Management Plan, the GW community widely uses alternative modes of transportation. Specifically, 67 percent of faculty and staff at the Foggy Bottom Campus commute via a carpool or non-auto mode of transportation. Of the students who commute to campus, 79 percent do so via a carpool or non-auto mode of transportation.

- 9. In accordance with GW's TMP, the proposed SPPHS will encourage alternate modes of transportation by providing bicycle accommodations and by providing shower and changing facilities on-site for those who choose to walk, bike, or jog to the facility.
- Currently, the 24th Street/Pennsylvania Avenue intersection and the Pennsylvania Avenue/ Washington Circle intersection have one or more lane groups that operate at capacity. The remaining intersections currently operate with acceptable levels of service (i.e., LOS "D" or better).
- 11. Under future conditions without the proposed redevelopment, the 24th Street/Pennsylvania Avenue and Pennsylvania Avenue/Washington Circle intersections would continue to have one or more lane groups that would operate at capacity. The remaining study intersections would continue to operate acceptably, that is, with all lane groups operating at a LOS "D" or better.
- 12. The proposed redevelopment would alter the traffic volumes at each of study intersections minimally. Specifically, at many of the study intersections the volume is expected to decrease and at the remaining study intersections the volume is expected to increase by less than $\frac{1}{2}$ percent.
- 13. The proposed redevelopment will have a negligible impact on the traffic operations in the study area.

WA WELLS + ASSOCIATES

Section 2 BACKGROUND INFORMATION

EXISTING LAND USE

The subject site was zoned R-5-E (General Residence District) as part of the First-Stage PUD that applies to the Foggy Bottom Campus. The site currently is occupied by the three-story Warwick building, which houses the GW Universal Health Services Radiation Oncology Center, and a 24-space faculty/staff surface parking lot.

The R-5-E district is designed to accommodate medium-high density development of general residential uses, including single-family dwellings, flats, and apartment buildings, to a maximum FAR of 6.0 for apartments and hotels, and 5.0 for other structures. The R-5 zoning districts, in general, permit the construction of institutional and semi-public buildings that are compatible with adjoining residential uses and that are excluded from the more restrictive residence districts.¹

The area surrounding the site is comprised of educational, retail, and residential uses. Redevelopment of Square 54, located two blocks to the east, is underway. This mixed-use development, consisting of office, residential, and retail uses, will be completed this year.

The Foggy Bottom-GWU Metro Station is located at the northwest corner of the 23^{rd} Street/I Street intersection.

PUBLIC ROADWAY NETWORK

Square 39 is located within a connected network of arterial, collector, and local streets. Existing intersection lane use and traffic control at the study intersections are shown on Figure 2-1.

The north-south streets through campus (21st, 22nd, 23rd, and 24th Streets) and Pennsylvania Avenue, New Hampshire Avenue, and Washington Circle primarily serve through commuter traffic. The east-west streets through campus (F, G, H, and I Streets) are more diverse and primarily serve local traffic.

Pennsylvania Avenue is classified by DDOT as a principal arterial,² as shown on Figure 2-2, with a posted speed limit of 25 miles per hour (mph). Pennsylvania Avenue carries an average daily traffic (ADT) volume of 21,000 vehicles per day (vpd).³ Automobiles, public buses, private shuttle buses, bicyclists, and vehicles parked along the curb share this two-way, six-lane street. Pedestrians utilize sidewalks that are located along both sides of the roadway.

New Hampshire Avenue is a two-way, two-lane collector roadway⁴ in the study area. New Hampshire Avenue carries an ADT volume ranging from 5,200 to 8,600 vpd⁵ in the study area. Vehicles park along both sides of New Hampshire Avenue while automobiles, buses, and bicyclists share the two travel lanes.

Washington Circle is classified by DDOT as a principal arterial.⁶ The mainline of K Street passes beneath the Circle. Frontage roads on both sides of K Street intersect the Circle at-grade. All streets except the K Street frontage roads intersect the Circle at signalized junctions. The cross-section of the circle varies from two to four lanes. The posted speed limit of the circle is 25 mph. No parking is permitted within the Circle in the study area.

24th Street is a two-way, two-lane collector street⁷ with parking intermittently permitted on both sides of the street. The posted speed limit is 25 mph. The ADT on 24th Street is 5,900 vpd⁸ within the study area. Sidewalks are present along both sides of 24th Street.

K Street operates as a one-way pair with the mainline passing under Washington Circle. At K Street's intersections with 24th Street, two travel lanes are present on the eastbound and westbound approaches. K Street is classified as a principal arterial⁹ and carries approximately 32,000 vpd¹⁰ in the site vicinity.

I Street is a two-way, two-lane street classified as a local roadway¹¹ in the vicinity of the site. I Street, between 23^{rd} and 24^{th} Streets, is a pedestrian mall, closed to vehicular traffic. The posted speed limit on I Street is 25 mph.



PUBLIC TRANSPORTATION FACILITIES AND SERVICES

GW is served by both Metrobus and Metrorail, as shown on Figure 2-3.

Metrorail

The Foggy Bottom-GWU Metrorail Station is located on the northwest quadrant of the 23rd Street/ I Street intersection, approximately one block from the subject site. This station is the eighth busiest station in the Metrorail system, with an average weekday ridership of nearly 41,000 passengers (based on 2006 data).¹² The peak hour boardings and alightings at the Foggy Bottom-GWU Metro station are summarized in Table 2-1.

Table 2-1

Foggy Bottom-GW Metrorail Station Passenger Boardings and Alightings

Time of Day	Boardings	Alightings	Total
AM Peak Hour	910	4,220	5,130
PM Peak Hour	3,666	I,307	4,973

The majority of passengers (74 to 89 percent) walk to and from the station; less than 10 percent drive or are driven to the station, as shown in Table 2-2.¹³

Table 2-2

Foggy Bottom-GW Metrotail Station Passenger Access Modes

Mada	Per	cent
Mue	AM Peak	PM Peak
Metrobus	13.3	2.8
Other Bus	1.7	6.7
Park & Ride	3.3	1.0
Carpool	1.0	0.0
Kiss & Ride	6.6	0.9
Bike	0.0	0.0
Walk	74.1	88.6
Taxi	0.0	0.0
Total	100	100

Bus Service

WMATA and the DC Circulator currently provide public bus service convenient to the proposed SPHHS. Specifically, bus stops are located on the northeast and southwest corners of the 24th Street/Pennsylvania Avenue intersection.

WMATA's Wisconsin Avenue (Route 31), Pennsylvania Avenue (Routes 32 and 36), Ballston -Farragut Square (Route 38B), and MacArthur Boulevard - Georgetown (Route D5) provide service to the 24th Street/Pennsylvania Avenue intersection bus stops. On these lines, a total of 263 bus-trips on a typical weekday, 150 bus-trips on a typical Saturday, and 127 bus-trips on a typical Sunday are operated, as shown in Table 2-3.

The DC Circulator's Georgetown - Union Station Line also provides service at the 24th Street/ Pennsylvania Avenue intersection bus stops. Service is provided on Sunday through Thursday from 7:00 AM to midnight and on Friday and Saturday from 7:00 AM to 2:00 AM.

The Kennedy Center Shuttle provides service from the Kennedy Center to the Foggy Bottom-GWU Metrorail station. The shuttle is free and departs every 15 minutes from 9:45 AM to midnight on Monday through Friday, from 10:00 AM to midnight on Saturdays, and from noon to midnight on Sundays. On federal holidays the shuttle operates from 4:00 PM to midnight.



LINE			Ŭ		ICE			Ü			
NAME	NUMBER	DIRECTION		WEEKDAY SERV			SATURDAY SERV			SUNDAY SERVIO	
			AM	PM	After Midnight	AM	PM	After Midnight	AM	PM	After Midnight
Wisconsin Avenue	31	NB	18	31	-	11	24	I	9	17	-
v isconsin / wende	51	SB	19	32	-	12	24	-	10	16	-
	32	EB	-	8	-	-	-	-	-	-	-
Poppsylvania Avonuo	52	WB	9	-	-	-	-	-	-	-	-
	24	EB	-	6	-	-	-	-	-	-	-
	20	WB	4	-	-	-	-	-	-	-	-
Polleton Forregut Square	200	EB	24	35	3	12	24	3	13	24	I
Ballston - Fail agut Square	200	WB	22	35	3	13	23	3	12	25	-
MacArthur Boulevard -		EB	7	-	-	-	-	-	-	-	-
Georgetown	05	WB	-	7	-	-	I	-	-	ŀ	-
Totals			103	154	6	48	95	7	44	82	I
				263			150			127	

Table 2-3 Metrobus Service – Number of Bus Trips



GW CAMPUS TRANSPORTATION

The University provides four forms of inter-campus transportation: the Vern Express, the Colonial Express, the Virginia Science and Technology Campus Shuttle, and the University Police Department (UPD) 4Ride Escort Service.

The Vern Express is a free bus service that provides transportation for students, faculty/staff, and visitors between the Foggy Bottom and Mount Vernon campuses. The three-mile trip between the two campuses takes between 10 and 13 minutes during non-rush hours. During the academic year, the Vern Express runs 24 hours a day, seven days a week, providing an easy and efficient link between the campuses. During the summer and semester breaks, the Vern Express provides more limited service.

On weekdays during the academic year, the Vern Express operates at headways of five to ten minutes between 7:00 AM and 9:00 PM, and at 15 to 30 minute headways at all other times of day. On weekends during the academic year, the Vern Express operates with headways ranging from 15 to 30 minutes.

During the 2008-2009 academic year, ridership on the Vern Express was 650,137 passengers, which is a increase in ridership of approximately two percent when compared to the 2007-2008 academic year.

The Vern Express routes are shown on Figures 2-4A and 2-4B. Stops are located on the Foggy Bottom Campus at the following locations:

- I. 2025 E Street, NW (Red Cross Building);
- 2. 22nd Street and G Street;
- 3. H Street east of 23rd Street and in front of Fulbright Hall (primary location);[†] and
- 4. 2601 Virginia Avenue in front of the Hall on Virginia Avenue (across from the Watergate), except on weekdays between 6:00 AM and 10:00 AM.

The H Street stop is proposed to be relocated one block south in conjunction with the construction of GW's new Science and Engineering Complex (SEC). As such, the Vern Express route is proposed to be shifted from H Street to G Street, as shown on Figure 2-5.

Colonial Express is a shuttle bus service that operates on two routes shown on Figure 2-6. The northern route operates as a clockwise loop with stops at Marvin Center, The Aston residence hall, 19th Street at L Street, Connecticut Avenue at L Street, and 20th Street at I Street.

The southern route also serves five stops at the following locations: Marvin Center, Thurston Hall, Health and Wellness Center, the HOVA residence hall, and Columbia Plaza.

Both routes operate between 7:00 PM and approximately 3:00 AM. The northern route generally has headways of 23 minutes while the southern route has headways ranging from 19 minutes to 49 minutes.

GW Virginia Science and Technology Campus Shuttle runs between the Virginia Science and Technology Campus and the Foggy Bottom Campus. A second shuttle provided by Virginia Regional Transit also is available between the Virginia Science and Technology Campus and the West Falls Church Metro Station. Both shuttle services are free for GW faculty, staff, and students.

Service between the Virginia Science and Technology Campus and the Foggy Bottom Campus is provided between 8:35 AM and 11:00 PM, Monday through Thursday. Friday service is provided between 8:35 AM and 10:00 PM. The first shuttle departs the Virginia Science and Technology Campus at 8:35 AM. The first shuttle departs the Foggy Bottom Campus at 9:45 AM. The shuttle makes five stops daily (Monday through Friday) at the Foggy Bottom Campus. The stop is located at the intersection of 21st and 1 Streets in front of the Marvin Center.

Saturday service is limited to three trips between the campuses.

[†] Except on weekdays between 6:00 AM and 10:00 AM, during which time the primary location is at 21st Street and H Street adjacent to Marvin Center.



The University Police Department (UPD) 4Ride Escort Service is offered by the UPD to enhance safety and peace of mind for members of the GW community after dark. UPD Escort vans are in operation between 7:00 PM and 6:00 AM. During all other hours, escorts are provided by UPD officers on foot or in patrol cars. Escorts are provided from on-campus to on-campus, on-campus to select off-campus locations, and select off-campus locations to on-campus locations.

PEDESTRIAN ACCOMMODATIONS

In the vicinity of the proposed development, sidewalks are present along both sides of New Hampshire Avenue, 24th Street, K Street, and Washington Circle.

Pedestrian Accommodations at Signalized Intersections

At the 24th Street/K Street (EB) intersection, pedestrian signal heads are not provided on any approach. Marked crosswalks are present on the east, west, and south legs of the intersection but not on the north leg. Two accessible ramps are located on the southwest corner of the intersection. A single accessible ramp is located on the northwest corner to accommodate disabled persons crossing the K Street frontage road, and a single accessible ramp is located on the southeast corner to accommodate disabled persons crossing 24th Street. No accessible ramps are located on the northeast corner of the intersection. Photographs of the pedestrian crossings at the 24th Street/K Street (EB) intersection are shown in Figure 2-7.

At the New Hampshire Avenue/Washington Circle intersection, crosswalks are provided for pedestrians crossing New Hampshire Avenue and for pedestrians crossing the Circle to/from a small island in the center of New Hampshire Avenue, as shown in Figure 2-8. Pedestrian signals are provided for all marked crossings; however, count down heads are not provided. Accessible ramps are provided for the New Hampshire Avenue crossing. A depressed curb is provided along Washington Circle for pedestrians crossing the Circle.

Pedestrian Accommodations at Unsignalized Intersections

At the K Street (EB)/Washington Circle intersection a single crosswalk is provided for pedestrians crossing the K Street leg of the intersection. Accessible ramps are located on either side of the crosswalk, as shown on Figure 2-9.

At the 24th Street/New Hampshire Avenue intersection, crosswalks are present on all four approaches. Two accessible ramps are located on each corner of the intersection except for the southwest corner. At this location, an accessible ramp is present only for the New Hampshire Avenue crossing. Photographs of the pedestrian crossings at the 24th Street/New Hampshire Avenue intersection are shown in Figure 2-10.

Pedestrian Master Plan

The District of Columbia Pedestrian Master Plan strives to make Washington, DC safer and more walkable by improving sidewalks, roadway crossings, and the quality of the pedestrian environment as well as by ensuring that the District's policies and procedures support walking.¹⁴ The plan provides an overview of existing pedestrian conditions, recommends new pedestrian projects and programs, establishes performance measures, and provides a plan for implementation through 2018.

The Plan estimates areas of pedestrian activity and deficiency. Within the site vicinity, the majority of Washington Circle is designated as an area of high pedestrian activity and deficiency. Twenty-third Street and portions of Pennsylvania Avenue and Washington Circle contain moderate to high pedestrian activity and pedestrian deficiency.

The Plan provides pedestrian crash data for the years 2000 through 2006. Within the site vicinity, one pedestrian crash has occurred at the I Street/23rd Street intersection. Two to four pedestrian crashes have occurred at each of the following intersections:

- 24th Street/New Hampshire Avenue,
- 24th Street/I Street,
- New Hampshire Avenue/I Street, and
- Pennsylvania Avenue/Washington Circle.



Figure 2-11 summarizes the pedestrian activity and crashes in the study area.

As part of the Plan, eight priority corridors (one in each ward) were identified based on areas of heavy pedestrian traffic and deficient walking conditions. The priority corridor in Ward 2 is New York Avenue, from 15th Street, NW to Penn Street, NE.

BICYCLES ACCOMMODATIONS

Bicycle Master Plan

The District of Columbia Bicycle Master Plan¹⁵ seeks to create a more bicycle-friendly city by establishing high quality bicycle facilities and programs that are safe and convenient.

Under the existing condition where bicyclists share the road with vehicles, the bicycle levels of service (BLOS) in the site vicinity are presented in the Plan and have been replicated on Figure 2-12 and in Table 2-4.

Table 2-4

Existing Bicyc	le Levels	of Service
----------------	-----------	------------

Roadway	Bicycle LOS
23 rd Street	D
24 th Street	D
New Hampshire Avenue	D
Pennsylvania Avenue	D
Washington Circle	D
K Street	E

According to the Plan, a bike lane is proposed on New Hampshire Avenue and Pennsylvania Avenue in the vicinity of the site.¹⁶

Campus Bicycle Inventory

GW has conducted a campus-wide inventory of all University-owned bicycle racks. The University provides spaces for nearly 500 bicycles in several surface bicycle racks and secure interior building racks spread throughout campus.

Bike Sharing

Capital Bikeshare is an automated bicycle rental or bicycle sharing system in the Washington, DC area. The District and Arlington County teamed up to launch a new bike share program that includes over 110 stations with 1,100 bicycles.

Membership is required to use Capital Bikeshare. Daily, monthly, and annual memberships are available for fees of \$5, \$25, and \$75, respectively. The first 30-minutes of use are free; users are then charged a usage fee for each additional 30-minute period. Bicycles can be returned to any station with an available dock.

Currently, the closest bikeshare station to the proposed SPHHS is located approximately four blocks south and east, at the 21st Street/I Street intersection. This station has 27 docks. A former SmartBike station currently is located at the Foggy Bottom-GWU Metro Station, approximately one block south of the subject site. This station is expected to be converted to the Capital Bikeshare program. A map depicting the locations of these bikeshare stations is shown on Figure 2-13.

Additionally, 74 bicycle spaces (including 20 covered spaces) will be provided on site, near the main entrance along New Hampshire Avenue, as shown on Figure 2-14.

ZIPCAR

Zipcar is an automated car rental or car sharing system in the Washington, DC area. Zipcar users must fill out an application online and then 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.

One Zipcar currently is located on the subject site in the existing surface parking lot. This space will need to be relocated in conjunction with the proposed redevelopment. Ten additional Zipcars are located within approximately three to four blocks of the subject site. Nineteen Zipcars are located on the Foggy Bottom Campus. The locations of Zipcars in the area are shown on Figure 2-15.

PARKING

Currently, 21 parking lots and garages are located on the Foggy Bottom Campus. These parking facilities house 3,104 self-parked (striped) spaces (3,751 spaces including valet capacity), as shown in Table 2-6. In accordance with the Campus Plan, the University is required to maintain a minimum of 2,800 off-street parking spaces.

Approximately 945 parking spaces (1,123 including valet capacity) will be displaced permanently as a result of the redevelopment of Square 55 (i.e., 1,252 self-parked spaces in the UPG plus 20 spaces in Lot 2 minus 328 self-parked spaces in new SEC garage or, including valet spaces, 1,482 spaces in the UPG plus 20 spaces in Lot 2 minus 379 spaces in the new SEC garage). Another 24 spaces will be lost permanently with the redevelopment of Square 39. The majority of those spaces will be relocated to other parking facilities on campus. Specifically, 362 new parking spaces (462 including valet capacity) will be designated for GW use in the Square 54 garage in the spring of 2011.

Additionally, a net increase of 357 spaces in the new Law Learning Center (LLC) garage (392 self-garage spaces plus 58 interim valet spaces minus 93 spaces currently on Square 103) will come on-line in the spring of 2012. Upon completion of LLC and SEC, the University will have approximately 3,306 total spaces (including valet), more than exceeding the required minimum of 2,800 off-street parking spaces.

Table 2-6 Existing Off-Street Parking Inventory

Lot#	Name	Number of Spaces		
LUL #			Valet	Total
2	JBKO [†]	20	0	20
3	Lot 3	13	36	49
4	Academic Center	226	60	286
5	Elliot School	198	59	257
6	New Hall	59	0	59
7	Ambulatory Care Center	110	0	110
9	Media/Public Affairs	64	0	64
10	Warwick Lot	24	0	24
12	Lot 12	23	0	23
14	Ross Hall	139	48	187
15	Old Main	63	0	63
16	Funger Hall	218	46	264
17	Ivory Tower	90	0	90
18	South Hall	180	0	180
20	Dakota	60	0	60
21	Health & Wellness	112	0	112
UPG	University Parking Garage	1,252	230	1,482
MC	Marvin Center	170	144	314
	Rear of Westend	9	0	9
	Riverside Towers	5	0	5
	TOTAL	3,055	603	3,658
[†] Though attendant-parked, these 20 spaces are counted as self- parked spaces since they are not tandem spaces.				

Section 3 EXISTING CONDITIONS ANALYSIS

EXISTING TRANSPORTATION DEMAND MEASURES (TDM)

The GW Transportation Management Plan (TMP) was created as a comprehensive plan that promotes safe and efficient traffic operations within the campus, encourages alternate modes of transportation, and maximizes the use of the on- and off-street parking facilities to efficiently serve the campus parking demands. The campus-wide plan currently consists of the following measures:

- I. Transportation Management Coordinator,
- 2. Public Transportation Pass,
- 3. GW Parking Facility Permits,
- 4. On-Campus Parking Pre-Tax Deductions,
- 5. Off-Campus Parking Pre-Tax Deductions,
- 6. Attendant Parking,
- 7. Carpool Programs,
- 8. Shuttle Bus Service Plan,
- 9. Car Sharing,
- 10. Technology Initiatives,
- 11. Web-based Transit Purchases,
- 12. Parking Management During On-Site Construction, and
- 13. Truck Management Program.

Transportation Management Coordinator

In accordance with the approved Campus Plan, the University designated a Transportation Management Coordinator in the fall of 2006. The Transportation Management Coordinator is responsible for implementing and monitoring the TMP, including:

- Advising undergraduate students, faculty and staff of the various TMP initiatives through student and faculty/staff orientation programs;
- Marketing and promoting TMP initiatives through printed materials and online resources;

- Working with students, faculty and staff to evaluate appropriate locations for bike racks and lockers (including evaluation of bike storage facilities in connection with future University development projects) to encourage more members of the GW community to bike to campus; and
- Working with appropriate University offices to promote public transportation for special events on campus.

In the spring of 2010, the University combined the responsibilities for transportation and parking initiatives to allow for a comprehensive approach to campus transportation matters.

Public Transportation Pass

The Foggy Bottom campus is served by the Foggy Bottom – GWU Metrorail station, conveniently located within the Campus, and numerous Metrobus lines. GW offers a pre-tax transportation benefits program to University employees (regular full-time and part-time) to promote the use of public transportation. This program (SmartBenefits) allows employees to purchase a SmarTrip Card, which can be used on Metrorail, Metrobus, and on MARC or VRE commuter trains.

GW also introduces all new students to the WMATA public transportation program during their orientation.

GW Parking Facility Permits

Parking permits are issued to students, faculty, staff, residents, and physicians who drive and park oncampus. The permits are sold with monthly contracts or on an occasional/daily parking basis and are assigned to a specific parking facility. Freshmen and sophomores are not permitted to bring cars to campus.

Visitors are required to pay hourly rate fees, but do not need to purchase a permit.



Discounted daily parking rates are offered to encourage faculty, staff, and students who do drive to park in University garages. Parking fees can be paid conveniently by payroll deduction or via funds deposited to the GWorld card.

On-Campus Parking Pre-Tax Deduction Program

A pre-tax deduction for on-campus parking fees is offered to all regular GW employees.

Off-Campus Parking Pre-Tax Deduction Program

This program allows employees who pay for parking at a Metro station or at a commercial parking facility to participate in a pre-tax parking program.

Attendant/Valet Parking

When class attendance is high or when special events occur on campus, attendant/valet parking is available at specific parking facilities to provide additional parking spaces. Attendant/valet parking also will be used as needed during the redevelopment of Square 39 and other sites to ensure that the minimum parking requirement is met.

Carpool Programs

Carpooling is encouraged at GW through the Carpool Program, which allows employees to park any car registered in their carpool group in one group-shared parking space in any parking facility. The University is enrolled in "NuRide," a ride sharing program that encourages and rewards carpooling. Registered riders earn reward points that can be redeemed for gift cards, discounts, and event tickets.

Car Sharing

The University actively promotes Zipcar at University fairs and events. Since 2007, GW affiliated Zipcar memberships have increased by more than 50 percent (including students, faculty, staff, and alumni). Since then, the University has worked closely with Zipcar to increase the number of Zipcars on campus. Currently, 19 Zipcars are located on the Foggy Bottom Campus.

Shuttle Bus Service Plan

To alleviate the need for private automobile use oncampus and between campuses, GW provides four forms of campus transportation: the Colonial Express Shuttle, the Vern Express Shuttle, the Virginia Science and Technology Campus Shuttle and the University Police Department (UPD) Escort Service.

Technology Initiatives

The University promotes the use of video conferencing, podcasts, online library resources, the <u>Bb@GW</u> on-line course management system (based on the Blackboard Learning SystemTM), and administrative document management systems to reduce the need for physical movement to and between the Foggy Bottom and other GW campuses.

The University's website also provides links to Commuter Connections and other transportation resources.

Web-based Transit Purchases

In accordance with the Campus Plan approval, GW now provides a link from its website to Metro pass sales information where members of the University community can purchase transit fare media, including SmarTrip fare cards online. Additionally, SmarTrip fare cards are available for purchase in the GW Bookstore.

Parking Management During On-Site Construction

The University has a parking management plan in place to ensure that campus parking demands are adequately met during construction. Specifically, 362 (462 including valet capacity) GW designated spaces in the Square 54 garage will come on-line prior to demolishing the 24-space lot that currently is located on Square 39. Additionally, the University plans to lease interim spaces at the Kennedy Center and additional spaces in the Square 54 garage during construction of the SEC and Square 103 redevelopments.



While leased parking at the Kennedy Center is in place, users who choose not to walk can ride the Kennedy Center shuttle during its hours of operation. GW will provide a shuttle to transport people from the Kennedy Center to the Foggy Bottom Campus when the Kennedy Center shuttle is not in operation.

Truck Management Plan

The University currently has a truck management plan in place with the goal of reducing the impact of GW delivery trucks on the campus roadways. Preferred truck routes were developed in conjunction with DDOT to identify the main roadways that delivery vehicles should use to access the GW loading facilities, while discouraging the use of smaller and narrower neighborhood streets. GW is committed to developing specific truck management plans for new developments on campus.

GW TRANSPORTATION CHARACTERISTICS

A University-wide transportation survey was conducted during the spring semester of 2010 in order to identify the existing travel behaviors of the GW community and to assess the effectiveness of its Transportation Management Plan. The survey was distributed electronically to 800 faculty, 1,300 staff, and 6,000 students at the Foggy Bottom, Mount Vernon, and Virginia Science and Technology Campuses. The number of respondents from the Foggy Bottom Campus is presented in Table 3-1.

Table 3-1 Summary of Respondents Foggy Bottom Campus

Type of Response	Number of Responses	
Faculty	294	
Staff	536	
Students	854	
Total	1,684	
Numerous respondents provided only partially complete surveys. The numbers reflected in this table include both complete and partially complete surveys.		

Mode Choice

Based on the survey data, an estimated 51 percent of Foggy Bottom students live on campus. The remaining 49 percent commute to campus. Faculty, staff, and students who commute to campus were asked about their mode of transportation to campus. These data are summarized in Table 3-2.

As shown in Table 3-2, 29 percent of the faculty and staff drive alone. Eight percent carpool and 12 percent walk, jog, or bike to campus. The majority of the faculty and staff, 47 percent, commute via some form of public transportation.

The mode split of students commuting to the Foggy Bottom Campus is summarized in Table 3-2. Just 17 percent of students who commute drive alone to campus while three percent carpool. The majority of commuter students, 76 percent, commute to campus via a non-auto mode of transportation (i.e., rail, bus, walk/jog, or bike).

Carpooling Characteristics

The average vehicle occupancy for those who travel by automobile was determined based on the number of persons in each respondent's carpool. The carpooling data for faculty/staff and students also are summarized in Table 3-2.

Based on the data, the average vehicle occupancy for faculty and staff is 1.25 persons per vehicle. Based on the student commuter data, the average vehicle occupancy for commuter students is 1.17 persons per vehicle. Table 3-2 Mode Split Summary Foggy Bottom Campus

Mode	Facult	y/Staff	Stue Comn	dent nuters
	Number	Percent	Number	Percent
Auto				
Drove Alone	242	2 9 %	139	17%
Motorcycle	I	0%	2	0%
2 person Carpool	56	7%	18	2%
3 person Carpool	7	١%	5	۱%
4-6 person Carpool	2	0%	0	0%
7+ person Carpool	0	0%	0	0%
Sub-total	308	37%	164	20%
Non-auto				
Commuter Rail	309	37%	431	53%
Light Rail	21	3%	8	۱%
Public Bus	53	6%	65	8%
Private Bus	8	١%	4	۱%
Walk/Jog	84	10%	63	8%
Bicycle	17	2%	39	5%
Other	26	3%	28	3%
Sub-total	518	62%	638	79%
No Response	4	١%	9	١%
Total	830	100%	811	100%

Parking Location

Faculty, staff, and students affiliated with the Foggy Bottom Campus were asked to indicate their parking location. Table 3-3 summarizes the responses. As shown, 83 percent of faculty/staff who drive to campus and 44 percent of students who drive to campus park in a GW lot or garage.

Table 3-3 Parking Location Summary Foggy Bottom Campus

	Facult	y/Staff	Stud	lents
Location	Number	Percent	Number	Percent
GW Facility	239	83%	97	44%
Private Facility	24	8%	21	9 %
Street	25	9 %	103	47% †
Total	288	100%	221	100%
[†] The percentage of students parking on-street shown in based on the number of students who drive; the number of total students who park on-street is 4.6%.				

TRAFFIC VOLUMES

Turning movement counts and pedestrian counts were conducted at each of the study intersections on Tuesday, November 9, 2010 from 7:00 to 10:00 AM and from 4:00 to 7:00 PM.

Based on the data collected, a common AM peak hour and a common PM peak hour were selected for the study area. The common AM peak hour occurred from 8:30 to 9:30 AM and the common PM peak hour occurred from 5:00 to 6:00 PM.

Existing traffic volumes at the study intersections were adjusted slightly to balance with adjacent intersections with some allowance for driveways or roadways located between the intersections.

Baseline vehicular peak hour traffic volumes are summarized on Figure 3-1. Existing peak hour pedestrian volumes are summarized on Figure 3-2. Traffic count data are included in Appendix A.

OPERATIONAL ANALYSIS

Capacity/level of service (LOS) analyses were conducted based on the existing lane use and traffic control shown on Figure 2-1, existing vehicular traffic volumes shown on Figure 3-1, the existing pedestrian volumes shown on Figure 3-2, and existing DDOT traffic signal timings, which are included in Appendix B.

Synchro software (Version 7, Build 773) was used to evaluate levels of service at each of 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 were taken from the <u>Highway</u> <u>Capacity Manual 2000¹⁷</u> (HCM) reports generated by Synchro. Levels of service descriptions are included in Appendix C.

The Synchro results are presented in Appendix D and summarized in Table 3-4.

Table 3-4 Existing Levels of Service

INTERSECTION		ΔΜ ΡΕΔΚ	ΡΜ Ρελκ	
Direction Lane Group				
I: 24 th Street/Pennsylvania Avenue				
EB	LTR	E (56.0)	E (63.2)	
WB	LTR	B (10.6)	A (9.5)	
NB	LTR	B (15.4)	B (12.7)	
SB	LTR	E (57.2)	E (71.4)	
Overa		D (39.6)	D (43.8)	
2: 24 th	Street/K S	Street WB		
WB	LTR	A (0.1)	B (19.1)	
NB	LT	B (17.0)	B (15.3)	
S P	Т	A (9.7)	A (4.0)	
30	R	A (5.8)	A (2.1)	
Overa	11	B (11.6)	B (13.7)	
3: 24 th Street/K Street EB				
EB	LTR	B (19.7)	B (15.1)	
NB	TR	C (31.2)	C (24.8)	
SB	LT	A (1.5)	A (6.7)	
Overa	all C (21.0) B (13.3)		B (13.3)	
4: 24 th	Street/Ne	w Hampshire	Avenue	
NB	LTR	B [12.0]	B [11.2]	
SB	LTR	B [10.6]	C [16.6]	
NEB	LTR	B [13.8]	B [12.2]	
SWB	LTR	B [11.4]	C [17.9]	
5: New	[,] Hampshi	re Avenue/I St	treet	
EB	LTR	A [8.4]	A [8.8]	
WB	LTR	A [8.5]	A [9.0]	
NEB	LTR	B [10.2]	A [9.2]	
SWB	LTR	A [9.2]	C [15.4]	
6: 24 th	Street/I St	treet		
EB	LR	A [7.6]	A [7.4]	
NB	LT	A [8.7]	A [8.1]	
SB	TR	A [7.9]	A [8.2]	
[23.3] = unsignalized intersection control delay in veh/sec (23.3) = signalized intersection control delay in veh/sec				



Table 3-4 (continued) Existing Levels of Service

INTERSECTION					
Direction Lane Group		AITTEAK			
7: 23 rd	7: 23 rd Street/Washington Circle				
EB	TR	A (0.2)	A (0.3)		
	R	A (1.5)	A (0.1)		
NB	R	A (4.8)	A (4.6)		
Overa		A (1.4)	A (I.I)		
8: New	Hampshi	re Ave./Wash	ington Circle		
SB	L	B (12.1)	A (6.2)		
5	R	A (6.6)	A (8.9)		
NEB	R	C (21.9)	B (13.7)		
Overall		B (12.8)	A (7.4)		
9a: Pennsylvania Avenue/K Street WB			eet WB		
WB	Т	B (17.4)	B (15.6)		
SEB	Т	A (4.2)	A (7.2)		
Overall		A (6.1)	B (11.3)		
9b: Per	nnsylvania	Avenue/Wash	nington Circle		
SEB	R	F [167.7]	C [19.5]		
9c: K S	treet EB/	Washington C	ircle		
EB	R	C [20.0]	C [19.7]		
10: Ne	w Hampsl	hire Ave./Exist	ing Driveway		
SEB	LR	B [13.1]	B [14.2]		
NWB	LTR	C [15.2]	B [10.5]		
NEB	LT	A [0.1]	A [0.2]		
SWB	TR	A [0.0]	A [0.0]		
[23.3] = ur (23.3) = sig	[23.3] = unsignalized intersection control delay in veh/sec(23.3) = signalized intersection control delay in veh/sec				

As shown in Table 3-4, of the study intersections, only the 24th Street/Pennsylvania Avenue intersection and the Pennsylvania Avenue/ Washington Circle intersection have one or more lane groups that operate at capacity. The remaining intersections currently operate with acceptable levels of service (i.e., LOS "D" or better).

Section 4 FUTURE BACKGROUND CONDITIONS

TRAFFIC VOLUMES

In order to forecast 2020 background traffic volumes in the study area without the proposed redevelopment, several factors were taken into consideration:

- Increases in traffic associated with growth outside the immediate site vicinity (regional growth) and
- Increases in traffic associated with planned or approved but not yet constructed developments in the study area (pipeline developments).

Regional Growth

In order to account for regional traffic growth outside the immediate site vicinity, a growth rate of $\frac{1}{2}$ percent per year, compounded annually over 10 years (2010 to 2020), was applied to the baseline traffic volumes shown on Figure 3-1. The resulting volumes are shown on Figure 4-1.

Pipeline Developments

In addition to the proposed development, two other developments planned in and around the study area were considered as part of the background traffic growth.

Square 54

On May 14, 2007, the District of Columbia Zoning Commission approved a PUD and Zoning Map amendment for Square 54, located two blocks east of the proposed SPHHS site. The approval rezoned Square 54 from R-D-5 to C-3-C, which allowed construction of a mixed-use development which will consist of approximately 335 residential units, approximately 436,000 S.F. of office space, and approximately 84,000 S.F. of retail space (including a 37,000 S.F. grocery store). The proposed development will include approximately 1,026 parking spaces, of which 362 (462 including valet capacity) will be designated for use by GW. Access to the garage is proposed via a new driveway on 22^{nd} Street.

The project is under construction and will be complete this spring.

Traffic associated with the redevelopment of Square 54 was taken from the <u>Square 54 Transportation</u> <u>Impact Study</u>.¹⁸ The Square 54 site assignments are included in Appendix E.

Square 55

Like Square 39, Square 55 also was identified as a potential area of redevelopment under the approved Campus Plan. GW recently submitted the Second-Stage PUD application for redevelopment of Square 55.

Square 55 is bounded by I Street on the north, H Street on the south, 22nd Street on the east, and 23rd Street on the west. GW proposes to raze the existing 1,252-space (1,482-space with valet capacity) University Parking Garage (UPG), the existing 20-space Lot 2 surface parking lot, and the adjacent Physical Sciences Building (Building K), which are located on Square 55, and construct a new Science and Engineering Complex (SEC) in their place. The existing Fulbright, Jacqueline Bouvier Kennedy Onassis (JBKO), and Munson Residence Halls will be retained.

The new SEC will include 377,036 SF of GFA on eight levels above-grade. Two below-grade programmed levels plus 328 parking spaces (379 spaces including valet capacity) on four levels belowgrade also are proposed.

The departments that will occupy the SEC currently are located in 12 buildings throughout GW's Foggy Bottom Campus and leased space.



Construction of the proposed SEC is anticipated to begin in the spring of 2011 and be completed by the end of 2014. Occupancy of the new building is anticipated in January 2015.

The programming of the proposed SEC contemplates an additional 69 faculty and staff for the various science and engineering departments.

Traffic associated with the increase in faculty and staff for the new SEC was estimated based on traffic projections from The George Washington University Foggy Bottom Campus Plan: 2006-2025 Transportation Impact Study.¹⁹ Specifically, the Campus Plan contemplated an increase of 1,198 students and 1,000 faculty and staff. Corresponding increases in vehicular traffic associated with these increases were estimated across the Campus. In order to estimate the vehicular traffic increases associated with additional faculty and staff related to the new SEC, a portion of the Campus Plan forecasts were used based on the ratio of SEC faculty and staff to the faculty and staff used in the Campus Plan. The site assignments for the SEC are included in Appendix E.

The traffic associated with both of the pipeline developments is shown on Figure 4-2.

Background 2020 traffic forecasts were developed by combining the 2020 forecasts with regional growth (shown on Figure 4-1) with the pipeline traffic volumes (shown on Figure 4-2). The resulting 2020 background peak hour traffic forecasts are shown on Figure 4-3.

PLANNED IMPROVEMENTS

A review of the Transportation Improvement Program (TIP) for the Washington Metropolitan Region prepared by the National Capitol Region Transportation Research Board indicates the following transportation improvements in the area by 2020:

• K Street, N.W. Priority Busway – Reconstruction of K Street, N.W. between Mount Vernon Triangle and Washington Circle to provide an exclusive transit way in the median with anticipated completion in 2017;

- District-wide Bicycle and Pedestrian Management Program – Improvements to increase the safety and convenience of bicycle and pedestrian travel, such as installing bicycle racks, installing bicycle lanes on existing streets, upgrading signage and lighting, and improving the pedestrian experience in the City;
- Roadway Construction City-wide Reconstruction of streets with poor pavement condition, including New Hampshire Avenue from Dupont Circle to H Street, N.W.; and
- East Entrance Foggy Bottom Undertake a study to evaluate the feasibility of constructing an additional entrance on the east side of the Foggy Bottom-GWU Metrorail station. According to the TIP, the study is slated to be complete in 2012; however, a study was completed by WMATA in 2007.

None of these improvements would impact the analysis of the study intersections; therefore, the existing lane use and traffic control shown in Figure 2-1 would be applicable for future conditions.

OPERATIONAL ANALYSIS

Capacity/level of service analyses were conducted at the study intersections based on the 2020 background traffic forecasts shown on Figure 4-3, the existing lane use and traffic control shown on Figure 2-1, and existing DDOT traffic signal timings provided in Appendix B.

The Synchro level of service results for the 2020 background conditions without the proposed Square 39 redevelopment are presented in Appendix F and summarized in Table 4-1.

As shown in Table 4-1, the 24th Street/Pennsylvania Avenue and Pennsylvania Avenue/Washington Circle intersections, which operate with one or more lane groups at capacity under existing conditions, would continue to have one or more lane groups that would operate at capacity under the 2020 background conditions. The remaining study intersections would continue to operate acceptably, that is, with all lane groups operating at a LOS "D" or better.



Table	4-1
2020	Background Levels of Service

INTERSECTION		ΔΜ Ρελκ	ΡΜ Ρελκ	
Direction	Lane Group			
I: 24 th Street/Pennsylvania Avenue				
EB	LTR	F (82.4)	F (92.1)	
WB	LTR	B (10.7)	A (9.9)	
NB	LTR	B (16.7)	B (13.4)	
SB	LTR	E (66.4)	F (80.7)	
Overa	II	D (54.9)	E (57.1)	
2: 24 th	Street/K S	Street WB		
WB	LTR	A (0.1)	C (20.0)	
NB	LT	B (17.0)	B (15.6)	
CD	Т	B (10.3)	A (3.6)	
30	R	A (6.1)	A (1.8)	
Overa	II	B (11.6)	B (14.4)	
3: 24 th	Street/K S	Street EB		
EB	LTR	C (20.7)	B (15.5)	
NB	TR	C (32.2)	C (25.0)	
SB	LT	A (1.5)	A (7.1)	
Overa	II	С (21.9) В (13.8)		
4: 24 th	Street/Ne	w Hampshire	Avenue	
NB	LTR	B [12.9]	B [12.0]	
SB	LTR	B [11.2]	C [19.5]	
NEB	LTR	C [15.7]	B [13.5]	
SWB	LTR	B [12.0]	C [21.1]	
5: New	/ Hampshi	re Avenue/I St	treet	
EB	LTR	A [8.6]	A [8.9]	
WB	LTR	A [8.6]	A [9.2]	
NEB	LTR	B [10.8]	A [9.6]	
SWB	LTR	A [9.4]	C [17.0]	
6: 24 th	Street/I St	treet		
EB	LR	A [7.6]	A [7.4]	
NB	LT	A [8.9]	A [8.2]	
SB	TR	A [7.9]	A [8.3]	
[23.3] = unsignalized intersection control delay in veh/sec (23.3) = signalized intersection control delay in veh/sec				

Table 4-1 (continued) 2020 Background Levels of Service

INTERSECTION			
Direction Lane Group		AITTEAK	I I'II EAN
7: 23 rd	Street/Wa	ashington Circ	le
EB	TR	A (0.2)	A (0.3)
	R	A (2.4)	A (0.4)
NB	R	A (4.9)	A (4.7)
Overa		A (1.5)	A (I.I)
8: New	[,] Hampshi	re Ave./Wash	ington Circle
SB	L	B (14.1)	A (6.9)
5	R	A (6.7)	A (9.1)
NEB	R	C (23.2)	B (14.3)
Overall		B (14.6)	A (7.9)
9a: Pennsylvania Avenue/K Street WB			eet WB
WB	Т	B (17.5)	B (16.3)
SEB	Т	A (4.6)	A (8.0)
Overall		A (6.5)	B (12.0)
9b: Per	nnsylvania	Avenue/Wash	nington Circle
SEB	R	F [263.1]	C [24.6]
9c: K S	treet EB/	Washington C	ircle
EB	R	D [27.3]	C [23.8]
10: Ne	w Hampsl	hire Ave./Exist	ing Driveway
SEB	LR	B [13.5]	B [14.8]
NWB	LTR	C [15.9]	B [10.7]
NEB	LT	A [0.1]	A [0.2]
SWB	TR	A [0.0]	A [0.0]
[23.3] = unsignalized intersection control delay in veh/sec(23.3) = signalized intersection control delay in veh/sec			

Section 5 SITE ANALYSIS

OVERVIEW

Currently, GW's public health and human services educational departments and administrative offices occupy space in seven buildings throughout the Foggy Bottom Campus. The proposed SPHHS will allow for the consolidation of these departments and offices at one location, the Square 39 site. Due to the close proximity of the existing facilities to the proposed site, the redevelopment is not expected to substantially alter traffic patterns in the area. That is, faculty, staff, students, and visitors of the new building are not expected to alter their mode of transportation, nor are they anticipated to substantially alter their route.

The Square 39 site currently is occupied by the three-story Warwick building, which houses the various clinical, academic, administrative, and medical programs of the School of Medicine and Health Sciences and the GW Hospital and a 24-space faculty/staff surface parking lot. Both of these facilities are proposed to be razed to accommodate the new SPHHS. The uses currently housed in the Warwick building will be relocated to nearby Ross Hall or the George Washington University Hospital or leased space in the nearby Golden Triangle/K Street business corridor.

The proposed SPHHS will consist of approximately 115,542 square feet (SF) of gross floor area (GFA). No parking is proposed in conjunction with the SPHHS. The programming of the proposed SPHHS contemplates an additional 30 faculty and staff upon build out of the new facility.

Construction of the new facility is anticipated to begin in January 2012 with anticipated completion by the end of 2013. The new facility is expected to be occupied by late 2013 or early 2014.

CURB CUTS

Upon completion of the redevelopment, the number of curb cuts on the entire square will be reduced from two to one. The curb cut on New Hampshire Avenue that currently provides access to the surface parking lot will be removed. A single curb cut on 24th Street will provide access to the loading docks. The 24-foot wide curb cut will be located a few feet north of the existing curb cut.

SITE ACCESS

Vehicular access to the proposed SPHHS will be limited to only delivery and service vehicles since no parking is proposed on the site.

The main pedestrian access to the SPHHS is proposed on New Hampshire Avenue. Emergency exits will be provided via two additional doors on New Hampshire Avenue and a door on K Street. The service entrance is proposed on 24th Street.

LOADING

The loading area for the new SPHHS would be accessed via the proposed curb cut on 24^{th} Street. Two 30-foot loading berths are proposed for the new SPHHS, one of which is for trash removal.

Delivery trucks will access the loading area by backing in from 24^{th} Street; they then would leave front first. Trash trucks would enter the loading area front first and exit by backing onto 24^{th} Street. The truck turning diagrams for both 30-foot single unit trucks and trash trucks are included in Appendix G.

All vendors, suppliers, and service providers will be instructed that deliveries will not be permitted between 7:00 and 9:00 AM and between 5:00 and 7:00 PM, Monday through Friday. Certain deliveries cannot be controlled, however (including but not limited to FedEx and UPS).



The George Washington University School of Public Health and Health Services Transportation Impact Study Square 39 – Washington, D.C.

PARKING

As previously stated, in accordance with the approved Campus Plan, GW is required to maintain a minimum of 2,800 off-street parking spaces on its Foggy Bottom Campus.

Approximately 24 spaces will be lost permanently with the redevelopment of Square 39. Another 945 parking spaces (1,123 including valet capacity) will be displaced permanently as a result of the redevelopment of Square 55 (i.e., 1,252 self-parked spaces in the UPG plus 20 spaces in Lot 2 minus 328 self-parked spaces in new SEC garage or, including valet spaces, 1,482 spaces in the UPG plus 20 spaces in Lot 2 minus 379 spaces in the new SEC garage). The majority of those spaces will be relocated to other parking facilities on campus. Specifically, 362 new parking spaces (462 including valet capacity) will be designated for GW use in the Square 54 garage in the spring of 2011.

Additionally, a net increase of 357 spaces in the new Law Learning Center (LLC) garage (392 self-garage spaces plus 58 interim valet spaces minus 93 spaces currently on Square 103) will come on-line in the spring of 2012. Upon completion of LLC and SEC, the University will have approximately 3,306 total spaces (including valet), more than exceeding the required minimum of 2,800 off-street parking spaces.

Finally, since the number of curb cuts around the perimeter of the Square 39 site would be reduced from two to one with the proposed SPHHS, there will be a net gain of one on-street parking space around the perimeter of the site.

BICYCLE REQUIREMENTS

According to the District of Columbia Municipal Regulations (DCMR),²⁰ the number of bicycle parking spaces provided shall be at least equal to five percent of the number of automobile parking spaces provided. Since no automobile parking spaces are being provided, no bicycle parking spaces would be required for the proposed SPHHS.

Although not required, the new SPHHS would include approximately 74 bicycle parking spaces (including 20 covered spaces) outside, conveniently located near main entrance along New Hampshire Avenue.



TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

Overview

Vehicular traffic generated by the proposed redevelopment will be comprised of two components:

- The traffic currently parking in the Square 39 surface lot that would be displaced and would park on Square 54 in the future and
- 2. The additional trips that will be generated by approximately 30 additional faculty members.

Reassigned Traffic to Square 54 Garage

Existing traffic currently using the 24 parking spaces on Square 39 were removed from the roadway network based on the existing traffic volumes entering and exiting each of the driveways during the peak hours and on the existing traffic patterns in the study area. The removal of the existing trips associated with the Square 39 surface lot are shown on Figure 5-1A.

These trips, which were assumed to park in the Square 54 garage under future conditions, then were added back to the roadway network based the location of the Square 54 driveway on 22^{nd} Street, as shown on Figure 5-1B.

Traffic Associated with Increase in Faculty/Staff

Traffic associated with the increase in faculty and staff for the new SPHHS was estimated based on traffic projections from <u>The George Washington</u> <u>University Foggy Bottom Campus Plan: 2006-2025</u> <u>Transportation Impact Study.²¹</u>

Specifically, the Campus Plan contemplated an increase of 1,000 faculty and staff. Corresponding increases in vehicular traffic associated with these increase were estimated across the Campus. In order to estimate the vehicular traffic increases associated with new faculty and staff related to the new SPHHS, a portion of the Campus Plan forecasts were used based on the ratio of SPHHS faculty and staff to the faculty and staff used in the Campus Plan.



The site trips associated with the increase in faculty and staff are shown on Figure 5-1C. The combined site trips for all components are summarized in Figure 5-1D.

PROPOSED TDM MEASURES FOR THE SPHHS

As part of the campus-wide TMP, the SPHHS will employ several specific TDMs to encourage alternate modes of transportation, manage loading and delivery operations, and to generally promote safe and efficient traffic operations in and around the site.

Bicycle Accommodations

As previously mentioned, approximately 74 bicycle parking spaces (including 20 covered spaces) will be conveniently located outside of the SPHHS proximate to the main building entrance.

Shower and changing facilities will be available in the SPHHS for those who chose to bicycle, walk, or jog.

Truck Management Plan

GW is committed to operating in a manner that is sensitive to the surrounding community. The purpose of the truck management plan is to promote safe and efficient travel for all users (e.g., cars, trucks, and pedestrians) by conducting its loading and delivery operations to avoid adverse impacts on campus and the surrounding community.

<u>Truck Route Designation</u> – The preferred truck routes shown on Figure 5-2 have been identified for trucks coming to and from the SPHHS. All deliveries and trash disposal services will be directed to use the preferred truck routes. <u>Operation of Trucks</u> - Trucks must obey all traffic control devices including signs, markings, and signals. Trucks must yield to pedestrians upon entering and exiting the loading area. Truck idling will not be permitted on the premises.

<u>Hours of operation</u> - All tenants, vendors, suppliers, and service providers will be instructed that deliveries and trash disposal services will not be permitted between 7:00 and 9:00 AM and between 5:00 and 7:00 PM, Monday through Friday. Certain deliveries cannot be controlled, however (including but not limited to FedEx and UPS).

<u>Enforcement</u> - GW shall require its vendors and service providers (not including commercial delivery services such as FedEx, UPS, etc.) to conform to the provisions of this truck management plan through a contract provision or similar mechanism.



Section 6 TOTAL FUTURE CONDITIONS

TOTAL FUTURE TRAFFIC FORECASTS

Total future traffic forecasts with the proposed development were determined by combining the 2020 background traffic forecasts shown in Figure 4-3 with the site traffic volumes shown on Figure 5-1D to yield the 2020 total future traffic forecasts shown on Figure 6-1.

Proportional Impact Analysis

In order to determine the amount of traffic on the surrounding roadways that will be attributable to the proposed redevelopment, a proportional impact assessment was conducted. That is, the total future traffic volumes were compared to the background traffic volumes to determine the impact of adding the site trips to the study intersections. Table 6-1 displays the results of the proportional impact analysis.

Table 6-1 Proportional Impact Analysis

	AM	PM
Intersection	Peak	Peak
I: 24 th Street/	0.04%	0.04%
Pennsylvania Avenue	0.04%	0.04%
2: 24 th Street/	0.02%	0.06%
K Street WB	0.02/6	0.00%
3: 24 th Street/	0.06%	0.09%
K Street EB	0.0078	0.07/8
4: 24 th Street/	-0 42%	-0.22%
New Hampshire Avenue	-0.1270	-0.2270
5: New Hampshire Avenue/	-0 35%	-0.25%
l Street	0.5570	0.2370
6: 24 th Street/I Street	-0.44%	-0.09%
7: 23 rd Street/	0.03%	019%
Washington Circle	-0.0378	0.17/0
8: New Hampshire Avenue/	0.05%	0.04%
Washington Circle	0.0378	0.01/6
9a: Pennsylvania Avenue/	0.06%	001%
K Street WB	0.0078	0.0178
9b: Pennsylvania Avenue/	0.25%	0.27%
Washington Circle	0.2378	0.2770
9c: K Street EB/	0.20%	0.24%
Washington Circle	0.20/0	0.27/0

As shown in Table 6-1, the change in peak hour traffic volumes between the 2020 background conditions and the 2020 total future conditions is negligible.

Site impacts of five percent or less are low and generally reflect negligible effects on traffic operations and delays. Site impacts between five and 15 percent generally are considered moderate and minor effects on traffic operations and delays could be expected. Site impacts of more than 15 percent generally are considered significant.²²

OPERATIONAL ANALYSIS

A future conditions capacity analysis, with the SPHHS, was performed at the study intersections utilizing 2020 projected total future traffic forecasts shown on Figure 6-1, the lane use and traffic controls shown on Figure 2-1, and existing DDOT traffic signal timings included in Appendix B.

The analysis is summarized in Table 6-2 and the results are included in Appendix H.

As shown in Table 6-2, levels of service and delays with the proposed SPHHS would be consistent with background conditions.

Levels of service were not reported for the 24th Street loading access since the SPHHS's truck management plan will not permit deliveries during the AM and PM peak periods; therefore, no vehicles should be using this driveway during the AM and PM peak hours.



Table 6-2 Total Future Levels of Service

INTERSECTION			ΡΜ Ρελκ		
Direction	Lane Group	APTTEAK	I I'II EAR		
1: 24 th	I: 24 th Street/Pennsylvania Avenue				
EB	LTR	F (82.4)	F (92.1)		
WB	LTR	A (10.7)	A (9.9)		
NB	LTR	B (16.7)	B (13.4)		
SB	LTR	E (66.4)	F (80.7)		
Overa	11	D (54.9)	E (57.1)		
2: 24 th	Street/K S	Street WB			
WB	LTR	A (0.1)	C (20.0)		
NB	LT	B (17.0)	B (15.5)		
CD	Т	B (10.3)	A (3.6)		
30	R	A (6.1)	A (1.8)		
Overa	II	B (11.6)	B (14.4)		
3: 24 th Street/K Street EB					
EB	LTR	C (20.7)	B (15.5)		
NB	TR	C (32.2)	C (25.1)		
SB	LT	A (1.5)	A (7.1)		
Overa	II	С (21.9) В (13.8)			
4: 24 th	Street/Ne	w Hampshire	Avenue		
NB	LTR	B [12.8]	B [12.0]		
SB	LTR	B [11.2]	C [19.4]		
NEB	LTR	C [15.6]	B [13.4]		
SWB	LTR	B [12.0]	C [21.1]		
5: New	/ Hampshi	re Avenue/I S	treet		
EB	LTR	A [8.6]	A [8.9]		
WB	LTR	A [8.6]	A [9.2]		
NEB	LTR	B [10.8]	A [9.5]		
SWB	LTR	A [9.4]	C [17.0]		
6: 24 th	Street/I St	treet			
EB	LR	A [7.6]	A [7.4]		
NB	LT	A [8.8]	A [8.2]		
SB	TR	A [7.9] A [8.3]			
[23.3] = unsignalized intersection control delay in veh/sec(23.3) = signalized intersection control delay in veh/sec					

Table 6-2 (continued) Total Future Levels of Service

INTERSECTION		ΔΜ Ρελκ	ΡΜ Ρελκ
Direction	Lane Group		
7: 23 rd Street/Washington Circle			
EB	TR	A (0.2)	A (0.3)
	R	A (2.4)	A (0.4)
NB	R	A (4.9)	A (4.7)
Overall		A (1.5)	A (I.I)
8: New Hampshire Ave./Washington Circle			
SB	L	B (14.1)	A (6.9)
	R	A (6.7)	A (9.1)
NEB	R	C (23.1)	B (14.3)
Overall		B (14.6)	A (7.9)
9a: Pennsylvania Avenue/K Street WB			
WB	Т	B (17.5)	B (16.3)
SEB	Т	A (4.6)	A (8.0)
Overall		A (6.5)	B (12.0)
9b: Pennsylvania Avenue/Washington Circle			
SEB	R	F [264.7]	C [24.8]
9c: K Street EB/Washington Circle			
EB	R	D [27.5]	C [23.9]
[23.3] = unsignalized intersection control delay in veh/sec(23.3) = signalized intersection control delay in veh/sec			

The George Washington University School of Public Health and Health Services Transportation Impact Study Square 39 – Washington, D.C.

Section 7 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

- Square 39 is well served by a high-quality multi-modal transportation system that includes: a connected network of arterial, collector, and local streets; a connected network of sidewalks, paths, and open spaces; the nearby Foggy Bottom-GWU Metrorail station; multiple regional bus lines; shuttle buses; and bicycle facilities.
- 2. The 24 parking spaces located on Square 39 would be removed as part of the proposed SPHHS; however, GW will maintain a minimum of 2,800 parking spaces through the year 2020 in compliance with the GW Campus Plan Order.
- 3. In conjunction with construction of the proposed SPHHS, the number of curb cuts around the perimeter of Square 39 would be reduced from two to one, which will reduce pedestrian/vehicle conflicts. Additionally, there will be a net gain of one on-street parking space due to the reduction in the number of curb cuts around the perimeter of the site.
- 4. The proposed loading area on 24th Street would safely and adequately accommodate single-unit trucks up to 30 feet in length (SU-30) and trash trucks turning into and out of the driveway to and from the north and south on 24th Street.
- 5. An extensive truck management plan has been developed to accommodate the anticipated loading operations of the SPHHS and to minimize the impact of the building's truck operations.

- 6. The proposed development plan will provide approximately 74 bicycle parking spaces (including 20 covered spaces) outside of the facility. The University has conducted a campus-wide inventory of bicycle parking. The University provides spaces for nearly 500 bicycles in several surface bicycle racks and secure interior building racks spread throughout campus.
- 7. GW currently has extensive an Transportation Management Plan that promotes safe and efficient traffic operations within the Campus, encourages alternate modes of transportation, and maximizes the use of the on- and off-street parking facilities to efficiently serve the Campus parking demands. The TMP also prohibits freshmen and sophomores from bringing vehicles to the Campus except in special circumstances.
- 8. As a result of GW's aggressive Transportation Management Plan, the GW community widely uses alternative modes of transportation. Specifically, 67 percent of faculty and staff at the Foggy Bottom Campus commute via a carpool or nonauto mode of transportation. Of the students who commute to campus, 79 percent do so via a carpool or non-auto mode of transportation.
- 9. In accordance with GW's TMP, the proposed SPPHS will encourage alternate modes of transportation by providing bicycle accommodations and by providing shower and changing facilities on-site for those who choose to walk, bike, or jog to the facility.



The George Washington University School of Public Health and Health Services Transportation Impact Study Square 39 – Washington, D.C.

- 10. Currently, the 24th Street/Pennsylvania Avenue intersection and the Pennsylvania Avenue/ Washington Circle intersection have one or more lane groups that operate at capacity. The remaining intersections currently operate with acceptable levels of service (i.e., LOS "D" or better).
- 11. Under future conditions without the proposed redevelopment, the 24th Street/Pennsylvania Avenue and Pennsylvania Avenue/Washington Circle intersections would continue to have one or more lane groups that would operate at capacity. The remaining study intersections would continue to operate acceptably, that is, with all lane groups operating at a LOS "D" or better.
- 12. The proposed redevelopment would alter the traffic volumes at each of study intersections minimally. Specifically, at many of the study intersections the volume is expected to decrease and at the remaining study intersections the volume is expected to increase by less than ¹/₂ percent.
- The proposed redevelopment will have a negligible impact on the traffic operations in the study area.

REFERENCES

- ¹ District of Columbia Municipal Regulations, Title 11-Zoning, Section 350, October 20, 2000.
- ² Functional Classification Map, District Department of Transportation, August 22, 2006 [http://ddot.dc.gov/DC/DDOT/About+DDOT/Maps/Functional+Classification+Map].
- ³ Traffic Volume Map, District Department of Transportation, 2008, [http://mocrs.dc.gov/DC/DDOT/About+DDOT/Maps/Traffic+Volume+Map+2008].
- ⁴ Functional Classification Map, District Department of Transportation, August 22, 2006, [http://ddot.dc.gov/DC/DDOT/About+DDOT/Maps/Functional+Classification+Map].
- ⁵ Traffic Volume Map, District Department of Transportation, 2008, [http://mocrs.dc.gov/DC/DDOT/About+DDOT/Maps/Traffic+Volume+Map+2008].
- ⁶ Functional Classification Map, District Department of Transportation, August 22, 2006, [http://ddot.dc.gov/DC/DDOT/About+DDOT/Maps/Functional+Classification+Map].
- 7 Ibid.
- 8 Traffic Volume Map, District Department of Transportation, 2008, [http://mocrs.dc.gov/DC/DDOT/About+DDOT/Maps/Traffic+Volume+Map+2008].
- ⁹ Functional Classification Map, District Department of Transportation, August 22, 2006, [http://ddot.dc.gov/DC/DDOT/About+DDOT/Maps/Functional+Classification+Map].
- ¹⁰ Traffic Volume Map, District Department of Transportation, 2008, [http://mocrs.dc.gov/DC/DDOT/About+DDOT/Maps/Traffic+Volume+Map+2008].
- ¹¹ Functional Classification Map, District Department of Transportation, August 22, 2006, [http://ddot.dc.gov/DC/DDOT/About+DDOT/Maps/Functional+Classification+Map].
- ¹² Foggy Bottom-GWU Station Second Entrance Demand Analysis, Final Report, Washington Metropolitan Area Transit Authority, March I, 2007.
- 13 Ibid.
- ¹⁴ District Department of Transportation, <u>District of Columbia Pedestrian Master Plan</u>, May 2008, [http:// www. dc.gov/DC/DDOT/On+Your+Street/Bicycles+and+Pedestrians/Pedestrians/Pedestrian+Master+Plan].
- ¹⁵ District Department of Transportation, <u>District of Columbia Bicycle Master Plan</u>, April 2005.
- ¹⁶ Ibid.
- ¹⁷ <u>Highway Capacity Manual</u>, Transportation Research Board, Washington DC, 2000.
- ¹⁸ Square 54 Transportation Impact Study, Wells + Associates, LLC, Revised October 2006.
- ¹⁹ The George Washington University Foggy Bottom Campus Plan: 2006-2025 Transportation Impact Study, Wells + Associates, LLC, Second Revision November 2006.
- ²⁰ District of Columbia Municipal Regulations, Title 11-Zoning, Section 2119.2, July 8, 2005.
- ²¹ <u>The George Washington University Foggy Bottom Campus Plan: 2006-2025 Transportation Impact Study</u>, Wells + Associates, LLC, Second Revision November 2006.
- ²² Connecticut Avenue Transportation Study Draft Final Report, DMJM+Harris, Inc., June 2003.

W:\Projects\4335 Square 39 - GW School of Public Health\Documents\Square 39 TIS.doc



The George Washington University School of Public Health and Health Services Transportation Impact Study Washington, D.C.

FIGURES





Figure I-I Site Location Map



George Washington University— School of Public Health and Health Services Washington, DC





Source: Payette Associates Inc.

Figure 1-2 Site Plan


Figure 1-3 Location of Existing School of Public Health and Health Services Facilities







Source: Payette Associates Inc.

Figure I-4A Truck Loading Movement– Northbound



Source: Payette Associates Inc.

	Truck
Figure 1-4B	Truck
Truck Loading Movement – Southbound	Parkir



S



SOL

The George Washington University – School of Public Health and Health Services Washington, DC



SS





Wells + Associates, Inc.

JCS



JCS





JCS







The George Washington University — School of Public Health and Health Services Washington, DC







Figure 2-2 Functional Classification Map





WA WELLS + ASSOCIATES



Figure 2-3 Public Transportation Services







North

 Bus Stops

 1. 2025 E Street (In Front of Red Cross Building)

 2. 22nd and G Streets

 3. 23rd and H Streets (In Front of Fulbright Hall)

 4. 2601 Virginia Avenue (Hall on Virginia Avenue)

Figure 2–4A Existing Vern Express Route Monday Through Friday (All Times Except 6 AM to 10 AM)



Figure 2–4B Existing Vern Express Route Monday Through Friday (6 AM to 10 AM)



North





North

 Bus Stops

 1. 2025 E Street (In Front of Red Cross Building)

 2. 22nd and G Streets

 3. 23rd and H Streets (In Front of Fulbright Hall)

 4. 2601 Virginia Avenue (Hall on Virginia Avenue)

Figure 2–5 Proposed Vern Express Route Monday Through Friday (All Times Except 6 AM to 10 AM)





NORTHERN ROUTE

MARVIN CENTER/GELMAN @ MC H ST.
 ASTON
 CORNER OF 19TH & L ST
 CORNER OF CONNECTICUT & L ST
 CORNER OF 20TH & EYE ST

SOUTHERN ROUTE

1) MARVIN CENTER/GELMAN @ MC H ST.

- 2) THURSTON HALL
- **3) HEALTH AND WELLNESS CENTER**

4) HOVA

5) COLUMBIA PLAZA @ CENTER DRIVEWAY

Source: http://gwired.gwu.edu/upd/

Figure 2-6 Existing Colonial Express Routes







24th Street & K Street (EB) South Leg



24th Street & K Street (EB) East Leg 24th Street & K Street (EB) West Leg

Source: http://maps.google.com

Figure 2-7 Pedestrian Crossing at the 24th Street/K Street (EB) Intersection





New Hampshire Avenue & Washington Circle Washington Circle Leg New Hampshire Avenue & Washington Circle New Hampshire Leg



K Street & Washington Circle K Street (EB) Leg

Source: http://maps.google.com

Figure 2-8 Pedestrian Crossing at the New Hampshire Avenue/Washington Circle Intersection and K Street (EB) Washington Circle Intersection





K Street & Washington Circle K Street (WB) Leg

K Street & Washington Circle Pennsylvania Avenue Leg



K Street & Washington Circle Washington Circle Leg

Source: http://maps.google.com

Figure 2-9 Pedestrian Crossing at the K Street (EB)/Washington Circle Intersection





24th Street & New Hampshire Avenue North Leg 24th Street & New Hampshire Avenue South Leg



24th Street & New Hampshire Avenue East Leg 24th Street & New Hampshire Avenue West Leg

Source: http://maps.google.com

Figure 2-10 Pedestrian Crossing at the 24th Street/New Hampshire Avenue Intersection





Source: DC Pedestrian Master Plan

Figure 2-11 Pedestrian Activity



1 Pedestrian Injury
 2-4 Pedestrian Injuries
 High Pedestrian Activity and High Pedestrian Deficiency

Low Pedestrian Activity and High Pedestrian Deficiency

North







Source: DC Bicycle Master Plan

Figure 2-12 Bicycle Levels of Service Bicycle LOS A Bicycle LOS B Bicycle LOS C Bicycle LOS D Bicycle LOS E Bicycle LOS E Bicycle LOS F



WA WELLS + ASSOCIATES



Source: http://www.capitalbikeshare.com

Figure 2-13 Capital Bike Share Locations eb eb Current Capital Bikeshare Locations

North

Planned Capital Bikeshare Locations







Source: http://www.zipcar.com

Figure 2-15 Zipcar Locations



Zipcar Locations







OF PUBLIC HEALTH\GRAPHICS\4335 REPORT GRAPHICS.DWG GW SCHOOL I SQUARE 39 **\PROJECTS\4335**

DAO





George Washington University – School of Public Health and Health Services Washington, DC



2020 Baseline Peak Hour Traffic Forecasts with Regional Growth





DAO

I





North









North










Wells + Associates, Inc.



Preferred Truck Routes

North





