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SQUARE 701

Comprehensive Transportation Review

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INTRODUCTION

Overview

This report presents a Comprehensive Transportation Review (CTR) conducted in conjunction with the proposal by Half Street Residential PJV, LLC (herein referred to as the Applicant) to modify previously approved plans (Zoning Commission Cases 06-46 and 06-46A) for a mixed-use development located on Square 701, Lots 857, 858, and 859 in southeast Washington, DC. The site is bounded by Half Street to the west, Cushing Place to the east, N Street to the south, and an existing office building (55 M Street) to the north. The site location is shown on Figure 1.

The previous approval, which was granted originally by the Zoning Commission in February 2007 and then subsequently modified and approved by the Zoning Commission in January 2008, included a mixed-use development in two buildings. The first (north) building included office with ground floor retail and has since been constructed and is fully occupied (55 M Street). The second (south) building was approved for 320,511 SF of residential space (330 dwelling units), a 106,269 SF hotel (190-keys), and 37,144 SF of retail space but was never constructed. The Applicant proposes to modify the development program to one of the five following options:

- Option 1A: 445 residential dwelling units and 60,100 SF of retail
- Option 1B: 430 residential dwelling units and 68,000 SF of retail
- Option 2A: 365 residential dwelling units, 80 key hotel, and 60,100 SF of retail
- Option 2B: 350 residential dwelling units, 80 key hotel, and 68,000 SF of retail
- Option 2C: 365 residential dwelling units, 128 key hotel, and 48,100 SF of retail

In conjunction with the proposed modification, the Applicant proposes to extend Cushing Place from its current terminus at the garage access for 55 M Street southward to N Street. A portion of the newly constructed Cushing Place (the portion south of the existing right-of-way for a 20' east – west public alley) will be constructed across the subject property as a private roadway with a public access easement. The ground floor plan and second floor plan are shown on Figures 2A and 2B, respectively. Full size plans are included in Appendix A.

Parking for the retail use will be provided in the existing below-grade parking garage at 55 M Street. The Applicant has access rights to approximately 88 parking spaces, as memorialized in a reciprocal easement agreement with the owner of 55 M Street. Access to the existing parking garage under the office building is located on Cushing Place. Parking for the residential use and hotel use, if applicable, will be provided in a new parking garage with approximately 231 parking spaces. Access to the new garage is proposed via the

public portion of Cushing Place. Access to the loading facilities is also proposed via Cushing Place.

The purpose of this report is to:

- Evaluate existing traffic operational and safety conditions,
- Evaluate future traffic conditions without the proposed development,
- Evaluate future traffic conditions with the proposed development,
- Identify existing mode choice alternatives,
- Identify any traffic operational impacts associated with the proposed development,
- Evaluate the appropriateness of the proposed parking,
- Evaluate effectiveness of the proposed loading facilities, and
- Recommend transportation improvements (including roadway, operational, and demand management strategies) to mitigate the impact of the redevelopment and promote the safe and efficient flow of vehicular and pedestrian traffic associated with the proposed redevelopment.

Study Scope

In order to assess the impacts of the proposed development on the surrounding roadway network, the Applicant commissioned this transportation impact study. The scope of the study and proposed methodologies were approved by the District Department of Transportation (DDOT) prior to beginning the study. The agreed upon scoping document is included in Appendix B.

The study area was selected based on those roadway segments that potentially could be affected by the proposed redevelopment. The following intersections were identified for detailed analysis and agreed to by DDOT:

- M Street/South Capitol Street,
- M Street/Half Street,
- M Street/Cushing Place,
- M Street/First Street,
- M Street/New Jersey Avenue,
- L Street/First Street,
- L Street/Half Street,
- N Street/South Capitol Street,

- N Street/Half Street,
- N Street/First Street,
- N Street/Tingey Street/New Jersey Avenue,
- I Street/South Capitol Street, and
- N Street/Cushing Place.

EXISTING TRANSPORTATION FACILITIES

Roadway Network

General details regarding the surrounding roadway segments, including functional classification, average daily traffic volume (ADT), and speed limit are summarized in Table 1.

Table 1
Roadway Segment Details

Roadway	Functional Classification	Average Daily Traffic* (vehicles per day)	Speed Limit (miles per hour)
M Street	Minor Arterial	19,100	25
N Street	Local	N/A	25 [†]
L Street	Local	N/A	25 [†]
South Capitol Street	Principal Arterial	52,000	25
Cushing Place	Local	N/A	25 [†]
Half Street	Local	N/A	25 [†]
First Street	Local	N/A	25
New Jersey Avenue	Collector	5,200	25 ^{†‡}
Tingey Street	Local	N/A	25 [†]
* The ADT volume is based on DDOT historical traffic volume data collected in 2012, which are the most recent data available. † Speed limit unposted in the study area; assumed to be 25 mph. ‡ A 15 mph School Speed Limit When Children are Present is posted for northbound traffic on New Jersey Avenue north of M Street and for southbound traffic south of K Street. No End School Zone sign is posted in either direction.			

All roadways in the study area operate as two-way streets. However, both Half Street, south of M Street, and N Street are closed to vehicular traffic during home games for the Washington Nationals.

Non-Auto Transportation Facilities

Public Transportation Facilities and Services

The subject site is well served by public transportation, including both bus and Metrorail, as shown on Figure 3. The proposed project is located at the Navy Yard Metro Station. The entrance to the residential lobby would be located on Half Street just 350 feet from the metro station entrance.

The Navy Yard Metro Station provides access to the Metro Green line. Riders can transfer to the Blue, Orange, Silver, and Yellow lines at L'Enfant Plaza Metro Station or to the Red Line at Gallery Place-Chinatown Metro Station.

The minimum, maximum, and average headways for the Green Line is summarized in Table 2.

Table 2
Metrorail Headways (in minutes)

Headway*	AM Rush 5:00 AM – 9:30 AM	Midday 9:30 AM – 3:00 PM	PM Rush 3:00 PM – 7:00 PM	Evening 7:00 PM – 9:30 PM	Late Night 9:30 PM – Close	Weekend Open – 9:30 PM	Weekend 9:30 PM – Close
GREEN LINE (NAVY YARD - BALLPARK METRO STATION)							
Min	0:06	0:12	0:06	0:12	0:20	0:12	0:20
Max	0:06	0:12	0:06	0:12	0:20	0:15	0:20
* Headways presented represent headways in both directions.							

According to WMATA's Metrorail Station Access and Capacity Study,¹ the Navy Yard Metro Station had the 14th highest pedestrian access during the PM peak period in 2002 out of the 86 stations studied (the Silver Line was not open at the time of the study). The station also is among the list of high forecasted development stations and is expected to see an increase in ridership of 80 percent between 2005 and 2030. The projected increase in ridership is based on an anticipated 87.2 percent increase in households and 61.3 percent increase in jobs in the area during the same time period.

The Metrorail Station Access and Capacity Study provided a list of recommendations for the Navy Yard Metro Station, including the following:

- Relocate kiosk, faregate and farecard vendor to surface,

- Add additional faregates and farecard vendors,
- Construct new stair between mezzanine and platform, and
- Install new elevator between surface and platform.

These improvements were made at the west station entrance in conjunction with the construction of the office building at 55 M Street prior to the opening of Nationals' Park. The improvements tripled the operating capacity of the station (from 5,000 to 15,000 persons per hour).

The site also is within a ¼ mile radius of bus stops serving 16 WMATA, DC Circulator, Maryland Transit Authority (MTA), Potomac and Rappahannock Transportation Commission (PRTC), and Loudon County Transit routes. Stops along M Street are served by nine Metrobus routes (P6, V7, V8, V9, A9, A42, A46, A48, & W9), the DC Circulator Union Station – Navy Yard route, Loudoun County Commuter buses, MTA Commuter buses, and PRTC Commuter buses. Stops on South Capitol Street are served by three Metrobus routes (P17, P19, and W13).

The site is two blocks west of the Union Station-Navy Yard route of the Circulator, which provides direct access to the most important intercity rail and bus terminal in the metro area

The minimum, maximum, and average headways for the WMATA and DC Circulator routes are provided in Table 3. The minimum, maximum, and average headways for the commuter bus routes are provided in Table 4.

Table 3
 Metrobus and DC Circulator Headways (in minutes)

HEADWAY	NORTHBOUND/WESTBOUND			SOUTHBOUND/EASTBOUND		
	AM Peak Period	Midday Period	PM Peak Period	AM Peak Period	Midday Period	PM Peak Period
	7:00 AM – 10:00 AM	10:00 AM – 4:00 PM	4:00 PM – 7:00 PM	7:00 AM – 10:00 AM	10:00 AM – 4:00 PM	4:00 PM – 7:00 PM
MARTIN LUTHER KING JR. AVENUE LIMITED LINE (A9)						
Min	0:10	N/A	N/A	N/A	N/A	0:13
Max	0:20	N/A	N/A	N/A	N/A	0:21
Avg	0:15	N/A	N/A	N/A	N/A	0:16
ANACOSTIA – CONGRESS HEIGHTS LINE (A42, A46, A48)*						
Min	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A
Avg	N/A	N/A	N/A	N/A	N/A	N/A
ANACOSTIA – ECKINGTON LINE (P6)						
Min	0:12	0:16	0:14	0:15	0:15	0:15
Max	0:20	0:22	0:30	0:30	0:23	0:20
Avg	0:15	0:19	0:17	0:16	0:30	0:16
OXON HILL – FORT WASHINGTON LINE (P17)						
Min	0:14	N/A	N/A	N/A	N/A	0:10
Max	0:35	N/A	N/A	N/A	N/A	0:29
Avg	0:20	N/A	N/A	N/A	N/A	0:17
OXON HILL – FORT WASHINGTON LINE (P19)						
Min	0:10	N/A	N/A	N/A	N/A	0:09
Max	0:17	N/A	N/A	N/A	N/A	0:28
Avg	0:13	N/A	N/A	N/A	N/A	0:18
MINNESOTA AVENUE – M STREET LINE (V7, V8)#						
Min	0:16	0:20	0:19	0:18	0:20	0:20
Max	0:24	0:31	0:44	0:25	0:31	0:24
Avg	0:20	0:28	0:23	0:21	0:28	0:20
MINNESOTA AVENUE – M STREET LINE (V9)+						
Min	0:18	N/A	N/A	N/A	N/A	0:19
Max	0:23	N/A	N/A	N/A	N/A	0:26
Avg	0:20	N/A	N/A	N/A	N/A	0:21
* Overnight service only, therefore no headways provided.						
# Weekend only service, therefore no headways provided.						
+ Evening service starts at 3:03, included in the PM Peak Period.						

Table 3 (continued)
 Metrobus and DC Circulator Headways (in minutes)

HEADWAY	NORTHBOUND/WESTBOUND			SOUTHBOUND/EASTBOUND		
	AM Peak Period	Midday Period	PM Peak Period	AM Peak Period	Midday Period	PM Peak Period
	7:00 AM – 10:00 AM	10:00 AM – 4:00 PM	4:00 PM – 7:00 PM	7:00 AM – 10:00 AM	10:00 AM – 4:00 PM	4:00 PM – 7:00 PM
L'ENFANT PLAZA – COAST GUARD LIMITED LINE (W9)						
Min	0:14	N/A	N/A	N/A	0:08	0:14
Max	0:30	N/A	N/A	N/A	0:08	0:35
Avg	0:21	N/A	N/A	N/A	0:08	0:24
BOCK ROAD LINE (W13)						
Min	0:00	N/A	N/A	N/A	N/A	0:00
Max	0:20	N/A	N/A	N/A	N/A	0:30
Avg	0:14	N/A	N/A	N/A	N/A	0:19
DC CIRCULATOR UNION STATION – NAVY YARD LINE						
Min	0:10	0:10	0:10	0:10	0:10	0:10
Max	0:10	0:10	0:10	0:10	0:10	0:10
Avg	0:10	0:10	0:10	0:10	0:10	0:10
* Overnight service only, therefore no headways provided. # Weekend only service, therefore no headways provided. + Evening service starts at 3:03, included in the PM Peak Period.						

Table 4
Commuter Bus Headways (in minutes)

HEADWAY	NORTHBOUND/WESTBOUND		SOUTHBOUND/EASTBOUND	
	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period
MTA COMMUTER BUS: COLUMBIA AND SILVER SPRING – WASHINGTON DC (315)				
Min	N/A	0:20	0:20	N/A
Max	N/A	0:40	0:28	N/A
Avg	N/A	0:25	0:22	N/A
MTA COMMUTER BUS: CHARLOTTE HALL/WALDORF – WASHINGTON DC (735)*				
Min	0:15	N/A	N/A	0:15
Max	0:30	N/A	N/A	0:30
Avg	0:21	N/A	N/A	0:20
LOUDON COUNTY TRANSIT COMMUTER BUS: ARLINGTON, VA & WASHINGTON, DC				
Min	N/A	0:02	0:05	N/A
Max	N/A	0:37	1:24	N/A
Avg	N/A	0:15	0:41	N/A
PRTC OMNIride: DALE CITY – WASHINGTON NAVY YARD (D300)				
Min	N/A	0:14	0:25	N/A
Max	N/A	1:47	0:31	N/A
Avg	N/A	0:56	0:28	N/A

In March 2015, WMATA, in cooperation with DDOT, completed the Metrobus Service Evaluation Study of the U-V Lines. Specific concerns noted in the study included reliability due to congestion and delays (including around Nationals Park on game days) and general lack of amenities at bus stops.

The study provided a list of short, medium, and long-term recommendations. Short-term recommendations included the following:

- Running time calibration for all routes to ensure that service runs on time at least 80 percent of the time;
- Specific improvements for certain routes, including increasing frequency and service span, and adding Sunday service;
- Bus stop amenities, including adding bus stop flags, installing missing ADA loading pads, improving sidewalk accessibility, installing information cases, installation of trash receptacles, and installation of bus shelters; and
- Potential restructuring of U and V lines.

Within the study area, the following short-term improvements were recommended:

- Installation of information case at the M Street/New Jersey Avenue (eastbound side);
- Rerouting of the V7 Route to operate between the Capitol Heights Metro Station and the Navy Yard Metro Station (see Figure 4 for details); and
- Extension of the V9 Route to the Bureau of Engraving and Printing to replace the V7 Route peak period service.

Medium-term recommendations included the following:

- Potential bus stop consolidations for stops less than 0.2 to 0.25 miles apart;
- Traffic infrastructure improvements, including signal timing issues, coordination with DDOT to improve travel conditions along roadways, coordination with DDOT regarding physical constraints (i.e. inadequate radii, on-street parking, narrow roadways); and
- Medium-term route restructuring of the U and V Lines.

Within the study area, the following medium-term improvements were recommended:

- Potential consolidation of the M Street/Half Street stop (eastbound side) and
- Coordination with DDOT regarding slow travel times along M Street during the PM peak period, especially during events at Nationals Park.

Long-term recommendations included restructuring of the U-V Lines. No long-term recommendations were made within the study area.

In January 2012, WMATA, in cooperation with DDOT, completed the Metrobus Anacostia – Congress Heights Line Study (A2, 6, 7, 8, 42, 46, 48, A4, 5, and A9). The Anacostia – Congress Heights Line was selected for study because it experiences one of the highest levels of ridership in the Metrobus system. The purpose of the study was to identify ways to improve reliability, travel times, and safety/security, reduce crowding, improve customer experience, update schedules to reflect actual travel times, reduce transfers into central Washington, improve transit services within the Anacostia area, and establish a strategy for implementing recommendations.

Improvements were divided into four phases: 1) Initial Phase (2012 – 2013), Phase Two (2013 – 2014), Phase Three (after 2014), and Subsequent Phases. The initial phase included the following recommendations:

- Operational improvements, including enforcement of parking, route specific training for bus drivers, improved safety and security measures, and additional dedicated supervisor staff for the Anacostia – Congress Heights Line;
- Service modifications, including the restructuring of Routes A4 and W5 (formerly A5) and the introduction of the MetroExtra Route A9; and

- Improved bus stops and facilities.

Importantly, the MetroExtra Route A9 has been implemented and operates in the peak period/direction with limited stop service between the Livingston Loop and McPherson Square. The closest stop to the proposed project is located at the intersection of M Street and 8th Street, SE (Navy Yard).

Phase Two improvements include the following:

- Recalibrating running times on Routes A2/A42, A6/A46, and A8/48;
- Extending the overnight service on Routes A2/A42, A6/A46, and A8/48 to McPherson square from the Archives; and
- Introduction of the MetroExtra Route A7 (note that this would not operate in the study area for the proposed development).

Phase Three improvements include implementation of bi-directional peak period service operating every ten minutes on the MetroExtra Routes A7 and A9.

Pedestrian Facilities

The District of Columbia Pedestrian Master Plan² (the Pedestrian 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.

The Pedestrian 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 Pedestrian Plan also estimates areas of pedestrian activity and deficiency.

As part of the Pedestrian 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 6 is M Street between 6th Street SW and Isaac Hull SE, which includes the portion of M Street within the study area. Within the study area, the recommended pedestrian improvements include (where improvements have been completed, they are indicated as such):

- South Capitol Street/M Street (West) –
 - Extend the M Street median on the west side of the intersection (Note that the M Street median on the west side of the intersection currently extends into and nearly through the crosswalk. However, the median does not have pedestrian ramps, so it essentially acts as a barrier to pedestrians with disabilities),

- Construct new ADA ramps on all four corners (ADA ramps currently are installed on the northwest and southwest corners of the intersection; the ramps on the northeast and southeast corners are not ADA compliant),
 - Install new crosswalk striping on the south leg of the intersection (complete),
 - Restripe crosswalks on the west and north legs of the intersection (complete),
 - Restrict right turns on red from 7:00 AM to 7:00 PM on the eastbound and southbound approaches,
 - Reconstruct/repair sidewalk on the southwest corner of the intersection (complete), and
 - Replace the bus stop currently located on the southwest corner of the intersection and the bus stop currently located on the southeast corner of the M Street/ Howison Place SW intersection with a new bus stop located on the south side of M Street SW between Half Street SW and South Capitol Street.
- South Capitol Street/M Street (East) –
 - Construct new median on M Street east of the intersection,
 - Construct new ADA ramps on all four corners (ADA ramps currently are installed on the northeast and southeast corners of the intersection; the ramps on the northwest and southwest corners are not ADA compliant),
 - Install new crosswalk striping on the north leg of the intersection (complete),
 - Restripe crosswalks on the east and south legs of the intersection (complete),
 - Restrict right turns on red from 7:00 AM to 7:00 PM on the northbound approach, and
 - Create three foot minimum clear sidewalk on the southeast corner of the intersection and along the south side of M Street to Van Street (complete).
 - M Street/Van Street –
 - Restripe existing crosswalk across Van Street (complete) and
 - Construct new ADA ramps on the east and west sides of the crosswalk (complete).
 - M Street/Half Street –
 - Install traffic signal (complete),
 - Stripe high visibility crosswalks on all four legs of the intersection (complete),
 - Construct new ADA ramps on all four corners (complete), and
 - Construct new median on M Street west of the intersection.

- M Street/Cushing Place –
 - Restripe crosswalk on the north leg of the intersection (complete),
 - Construct new ADA ramps on all four corners (complete),
 - Widen sidewalk on the north side of M Street west of Cushing Place (appears to be complete – an aerial from September 2007 appears to show a narrower sidewalk than that currently in place; additionally, the sidewalk in this area is relatively new), and
 - Construct new median on M Street, east of the intersection (complete).
- M Street/1st Street –
 - Construct new ADA ramps on all four corners (complete) and
 - Construct new median on M Street, west of the intersection (complete).
- M Street/New Jersey Avenue –
 - Implement exclusive pedestrian phase at existing traffic signal,
 - Construct new ADA ramps on all four corners (complete), and
 - Restrict right turns on red at all times on the southbound and westbound approaches (right turns on red are restricted on all approaches from 7:00 AM to 7:00 PM).

All of the crosswalks at all of the signalized intersections along M Street in the study area are equipped with pedestrian countdown heads.

At the southwest corner of the site, the N Street/Half Street T-intersection is all-way stop controlled. This intersection is adjacent to the main pedestrian entrance for the site. The intersection has high visibility crosswalks and ADA ramps with detectable warning strips on all approaches.

East of the site, the N Street/First Street intersection is signalized. The intersection has high visibility crosswalks, ADA ramps with detectable warning strips, and pedestrian countdown heads on all four approaches.

Pedestrian facilities and likely walking routes to the Metro Station, nearest bus stops within a ¼ mile of the site, and key generators in the site vicinity are shown on Figure 5. Figure 5 also shows pedestrian activity and deficiency according to the Pedestrian Master Plan.

Bicycle Facilities

The District of Columbia Bicycle Master Plan³ (the Bicycle Plan) seeks to create a more bicycle-friendly city by establishing high-quality bicycle facilities and programs that are safe and convenient.

The Bicycle Plan provides bicycle levels of service (BLOS) for roadways in the District where bicycles share the road with vehicles. The Bicycle Plan also reports the number of bicycle crashes that occurred between 2000 and 2002.

Finally, the Bicycle Plan identifies areas and corridors that are barriers to cyclists. These barriers include “freeways, railroad and highway grade separations, neighborhoods with heavy traffic, and other impediments to bicycle travel.”⁴ The South Capitol Street corridor identified in the Bicycle Plan falls within the study area.

Bicycle facilities and likely biking routes to the Metro Station, nearest bus stops within a ¼ mile of the site, and key generators in the site vicinity are shown on Figure 6. Figure 6 also shows the BLOS for roadways in the study area and the reported bicycle crashes in the study area, per the Bicycle Plan.

Several dedicated bicycle lanes exist in the vicinity of the subject site. First Street has dedicated bicycle lanes on the east and west sides of the roadway for northbound and southbound bicycle traffic, respectively. I Street and Potomac Avenue have dedicated bicycle lanes on the north and south sides of the roadway for westbound and eastbound bicycle traffic. 4th Street has a dedicated bicycle lane on the west side of the roadway for southbound bicycle traffic. In addition, the Anacostia Riverwalk Trail is located south of the subject site.

Capital Bikeshare

Capital Bikeshare is an automated bicycle rental or bicycle sharing program that provides over 2,500 bicycles at 340 stations across Washington, DC, Maryland, and Virginia.

Membership, which is required to use Capital Bikeshare, includes four options for joining: 24 hours (\$7), three days (\$15), 30 days (\$25), or one year (\$75). The first 30 minutes of use are free; users then are charged a usage fee for each additional 30-minute period. Bicycles can be returned to any station with an available dock.

As shown on Figure 3, the closest Bikeshare station is located just ½ block from the site at 1st Street/N Street. This station includes 39 docks. Three additional Bikeshare stations are located within ¼ mile from the site. One is located north of the site at 1st Street/K Street and houses 15 docks. The other two are east of the site, at M Street/New Jersey Avenue (17 docks) and just west of 3rd Street/Tingey Street (19 docks).

Car Sharing Services

Three car-sharing providers currently operate in the District. Zipcar requires a \$25 application fee and members can choose from three plans: \$60 per year (pay as you go based on the standard hourly or daily rate), \$6 per month (pay as you go based on the standard hourly or daily rate), or \$50 per month (pay as you go based on a discounted hourly or daily rate). Cars must be returned to the same designated parking spaces from which they were picked up. Nine Zipcars are located just over ¼ mile of the site, as shown on Figure 3. One Zipcar (cargo van) is located in the parking lot at 3rd Street/Tingey Street. Three Zipcars are located in the Colonial Parking Garage at 4th Street/M Street. Four Zipcars are located at the Capitol Skyline Hotel at I Street/South Capitol Street. One Zipcar is located in the Greenleaf Senior Center parking lot on Delaware Avenue, south of M Street.

Car2Go requires a one-time \$35 application fee. No reservation is required and car usage is charged by the minute, with hourly and daily maximum fees. Unlike Zipcar, a Car2Go vehicle does not have to be returned to its original location; a Car2Go vehicle can be parked in any unrestricted curbside parking space, in any metered/paystation curbside parking space (without paying meter/paystation fees), or in any residential permit parking space. Car2Go currently has 500 vehicles in the District.

Enterprise CarShare has a \$40 annual membership fee. Cars can be reserved by the hour or day (hourly and daily fees are charged per usage). In the District, cars must be returned to their original location. Five Enterprise Carshare vehicles are located just ½ block from the site in the parking lot on the southeast corner of 1st Street/N Street. Six other Enterprise Carshare vehicles are located just over ¼ mile north of the site in the parking lot on the east side of 1st Street, north of K Street. All car sharing locations are shown on Figure 3.

EXISTING CONDITIONS ANALYSIS

Traffic Volumes

Existing vehicular turning movement, bicycle, and pedestrian counts were provided by DDOT. For intersections where DDOT had no recent available data, vehicular turning movement, bicycle, and pedestrian counts were conducted on Tuesday, March 17, 2015 from 7:00 AM to 10:00 AM and from 4:00 PM to 7:00 PM. AM and PM peak hours for each of the study intersections were determined individually to provide the most conservative peak hour analysis, per standard DDOT practice.

Existing vehicular peak hour traffic volumes are shown on Figure 7. Pedestrian volumes are shown on Figure 8. Traffic count data are included in Appendix C.

Capacity 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 9, baseline traffic volumes shown on Figure 7, pedestrian volumes shown on Figure 8, and traffic signal timings obtained from DDOT, included in Appendix D.

Synchro software (Version 7, Build 773) was used to evaluate levels of service at the study intersections during the peak hours. Synchro is a macroscopic model used to evaluate the effects of changing intersection geometrics, traffic demands, traffic control, and/or traffic signal settings and to optimize traffic signal timings. The levels of service reported were taken from the Highway Capacity Manual 2000 (HCM) reports generated by Synchro. Level of service descriptions are included in Appendix E.

The results of the analyses are summarized in Table 5. Capacity analysis worksheets are included in Appendix F.

As shown in Table 5, under existing conditions, the signalized study intersections operate at overall levels of service D or better, with the exception of the I Street/South Capitol Street intersection, which currently operates with an overall intersection LOS F during the AM and PM peaks. The following is a summary of the various lane groups that currently operate at a LOS E or LOS F:

- M Street/South Capitol Street (West) – southbound left and southbound through/right operate at a LOS E during the AM peak hour;
- M Street/South Capitol Street (East) – westbound through/right operates at a LOS E during the AM peak hour;
- N Street/South Capitol Street – westbound left/through and westbound right operate at a LOS E during the AM and PM peak hours, the southbound frontage road through operates at a LOS F during the AM and PM peak hours, and the southbound right from the frontage road operates at a LOS E during the AM peak hour; and
- I Street/South Capitol Street – the eastbound left/through operates at a LOS F during the AM and PM peak hours, the westbound through operates at a LOS E during the AM peak hour and an LOS F during the PM peak hour, the westbound right operates at a LOS E during the AM peak hour and the northbound through/right operates at a LOS F during the AM peak hour.

Table 5
Level of Service Summary

Approach	Existing Conditions		Background Conditions		Total Future Conditions	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1. M Street/South Capitol Street (West)						
EBT	D	D	E (79.3)	D	F (83.1)	D
EBR	D	C	D	C	D	C
WBLT	A	A	A	B	A	C
SBL	E	D	F (379.9)	F (101.7)	F (390.5)	F (126.9)
SBLTR	E	D	F (395.2)	F (94.3)	F (406.1)	F (117.5)
Overall	C	C	F (144.4)	D	F (148.9)	D
2. M Street/South Capitol Street (East)						
EBLT	A	A	F (134.2)	A	F (142.0)	B
WBTR	E	D	F (295.1)	F (232.3)	F (343.0)	F (253.8)
NBL	D	D	F (156.4)	E (73.2)	F (156.4)	E (73.2)
NBLTR	D	D	F (163.2)	E (70.8)	F (163.2)	E (70.8)
Overall	D	C	F (179.5)	F (111.6)	F (195.0)	F (120.2)
3. M Street/Half Street						
EBLTR	A	A	A	B	A	B
WBLTR	A	A	A	A	A	A
NBLTR	C	C	C	C	C	C
SBLTR	D	C	D	F (462.1)	D	F (459.9)
Overall	A	A	B	F (123.4)	B	F (120.8)
4. M Street/Cushing Place						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	C	C	F [171.8]	F [861.2]	F [213.5]	F [916.9]
SBLTR	B	B	C	C	C	C
5. M Street/First Street						
EBLTR	B	B	B	E (62.2)	B	F (85.5)
WBLTR	A	A	A	B	A	B
NBLTR	C	C	C	C	C	C
SBLTR	C	C	C	C	C	C
Overall	B	B	B	D	B	D
[x.x] = unsignalized intersection control delay in sec/veh						
(x.x) = signalized intersection control delay in sec/veh						

Table 5 (Continued)
Level of Service Summary

Approach	Existing Conditions		Background Conditions		Total Future Conditions	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
6. M Street/New Jersey Avenue						
EBLTR	B	B	B	B	B	B
WBLTR	B	B	B	B	B	B
NBL	B	B	B	B	B	B
NBTR	B	B	B	C	B	C
SBL	B	C	C	D	C	D
SBTR	B	B	B	C	B	C
Overall	B	B	B	B	B	B
7. L Street/First Street						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	A	A	A	A	A	A
Overall	A	A	A	A	A	A
8. L Street/Half Street						
EBLTR	A	A	A	C	A	C
WBLTR	A	A	A	B	A	B
NBLTR	A	A	B	B	B	B
SBLTR	A	A	A	B	A	B
Overall	A	A	A	B	A	B
9. N Street/South Capitol Street						
WBLT	E	E	F (86.5)	F (237.6)	F (95.4)	F (293.4)
WBR	E	E	D	E (62.5)	D	E (62.5)
NBTR	D	B	F (297.0)	B	F (318.1)	B
SBT mainline	C	C	C	D	C	D
SBT frontage	F (236.1)	F (174.8)	F (437.2)	F (702.5)	F (437.2)	F (702.5)
SBR frontage	E	D	E (57.7)	D	E (57.7)	D
Overall	D	D	F (155.7)	F (168.4)	F (167.2)	F (172.3)
[x.x] = unsignalized intersection control delay in sec/veh						
[x.x] = signalized intersection control delay in sec/veh						

Table 5 (Continued)
Level of Service Summary

Approach	Existing Conditions		Background Conditions		Total Future Conditions	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
10. N Street/Half Street						
EBLT	A	A	B	A	B	A
WBTR	A	A	A	A	B	A
SBLR	A	A	A	A	A	A
Overall	A	A	A	A	A	A
11. N Street/First Street						
EBLTR	C	B	C	B	C	B
WBLTR	C	C	D	D	D	E
NBLTR	A	B	A	B	A	B
SBLTR	A	B	A	B	A	B
Overall	B	B	B	C	B	C
12. N Street/Tingey Street/New Jersey Avenue						
EBLT	A	A	B	B	B	B
WBTR	A	B	A	B	A	C
SBL	A	A	A	B	A	B
SBTR	A	A	A	A	A	A
Overall	A	A	A	A	A	A
13. I Street/South Capitol Street						
EBLT	F (174.5)	F (746.0)	F (1175.8)	F (7444.8)	F (1175.8)	F (7444.8)
EBR	D	D	D	D	D	D
WBT	E	F (173.3)	F (137.1)	F (590.5)	F (137.1)	F (590.5)
WBR	E	D	F (190.2)	D	F (191.3)	D
NBTR	F (147.5)	B	F (234.2)	F (101.2)	F (247.8)	F (109.9)
SBT	B	B	B	B	B	B
SBR	A	A	A	A	A	A
Overall	F (94.4)	F (83.2)	F (189.8)	F (704.7)	F (195.0)	F (697.2)
14. N Street/Cushing Place						
EBLT	-	-	-	-	A	A
WBTR	-	-	-	-	A	A
SBLR	-	-	-	-	A	B
Overall	-	-	-	-	A	A
[x.x] = unsignalized intersection control delay in sec/veh						
[x.x] = signalized intersection control delay in sec/veh						

Queue Analysis

A queuing analysis was conducted for existing conditions. Synchro was used to conduct the analyses, using the 95th percentile queue lengths. The results are summarized in Table 6. Queue reports are provided in Appendix F.

As shown in Table 6, the following lane groups have 95th percentile queues that exceed the available storage under existing conditions:

- M Street/South Capitol Street (East) – northbound left,
- M Street/South Capitol Street (East) – northbound left/through right,
- N Street/South Capitol Street – northbound through/right,
- N Street/South Capitol Street – southbound (frontage lane) through,
- I Street/South Capitol Street – eastbound left/through,
- I Street/South Capitol Street – westbound through,
- I Street/South Capitol Street – westbound right,
- I Street/South Capitol Street – northbound through/right, and
- I Street/South Capitol Street – southbound through.

Queues that extend to adjacent intersections are typical in urban environments where intersections are closely spaced.

Table 6
Synchro 95th Percentile Queue Summary (in feet)

Approach	Available Storage [†]	Existing Conditions		Background Conditions		Total Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1. M Street/South Capitol Street (West)							
EBT	305'	129	237	275 [#]	326	282 [#]	340
EBR	305'	58	61	62	62	62	62
WBLT	50'	5 ^m	6	18	211	23	224
SBL	555'	327 [#]	230	880 [#]	574 [#]	893 [#]	629 [#]
SBLTR	555'	317 [#]	284	884 [#]	561 [#]	897 [#]	617 [#]
† All distances measured to nearest intersection or end of turn lane, as appropriate. Where two storage lengths are given, the first is the distance to the driveway, the second is the distance to the nearest intersection.							
m Volume for 95 th percentile queue is metered by upstream signal.							
# 95 th percentile volume exceeds capacity; queue may be longer.							

Table 6 (Continued)
Synchro 95th Percentile Queue Summary (in feet)

Approach	Available Storage [†]	Existing Conditions		Background Conditions		Total Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
2. M Street/South Capitol Street (East)							
EBLT	50'	12	42	575	139	588	143
WBTR	350'	220 [#]	168	421 [#]	680 [#]	452 [#]	709 [#]
NBL	425'	656 [#]	282 [#]	997 [#]	415 [#]	997 [#]	415 [#]
NBLTR	425'	641 [#]	262	1006 [#]	405 [#]	1006 [#]	405 [#]
3. M Street/Half Street							
EBLTR	350'	100	121	163	223	169	247
WBLTR	160'/345'	32	27	66	70	67	59
NBLTR	570'	24	25	73	59	64	60
SBLTR	295'	30	73	93	685 [#]	93	685 [#]
4. M Street/Cushing Place							
EBLTR	160'	2	1	5	3	5	3
WBLTR	160'	1	1	5	7	6	18
NBLTR	165'/580'	14	12	163	625	245	693
SBLTR	290'	1	2	6	10	7	13
5. M Street/First Street							
EBLTR	150'/345'	82	93	115	315 ^{m#}	122	340 ^{m#}
WBLTR	375'	31	57	48	79	49	85
NBLTR	250'/555'	69	76	77	101 ^m	77 ^m	101 ^m
SBLTR	265'	35	72	41	83	41	83
6. M Street/New Jersey Avenue							
EBLTR	385'	92	86	130	108 ^m	138	111
WBLTR	115'	97	100	167	146	168	151
NBL	475'	19	41	24	46	24	46
NBTR	475'	32	64	62	110	62	110
SBL	290'	31	56	64	144 [#]	64	144 [#]
SBTR	290'	29	59	70	117	74	129
7. L Street/First Street							
EBLTR	135'	8	10	10	18	10	18
WBLTR	290'	13	10	23	18	23	18
NBLTR	265'	15	13	20	23	23	25
SBLTR	230'	8	15	10	20	10	20
[†] All distances measured to nearest intersection or end of turn lane, as appropriate. Where two storage lengths are given, the first is the distance to the driveway, the second is the distance to the nearest intersection.							
^m Volume for 95 th percentile queue is metered by upstream signal.							
[#] 95 th percentile volume exceeds capacity; queue may be longer.							

Table 6 (Continued)
Synchro 95th Percentile Queue Summary (in feet)

Approach	Available Storage [†]	Existing Conditions		Background Conditions		Total Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
8. L Street/Half Street							
EBLTR	355'	10	5	25	173	28	175
WBLTR	165'	8	10	10	20	13	20
NBLTR	295'	10	5	43	18	43	18
SBLTR	260'	8	5	15	38	18	38
9. N Street/South Capitol Street							
WBLT	335'	106	179	208	477 [#]	242	538 [#]
WBR	90'	17	100	26	178	26	178
NBTR	505'	1614 [#]	316	2606 [#]	561	2623 [#]	607
SBT mainline	1290'	578	548	660	614	660	614
SBT frontage	555'	446 [#]	613 [#]	632 [#]	1406 [#]	632 [#]	1406 [#]
SBR	555'	31	21	39	80	39	80
10. N Street/Half Street							
EBLT	335'	15	10	38	30	38	35
WBTR	155'/345'	13	15	28	35	40	43
SBLR	570'	5	5	8	18	10	10
11. N Street/First Street							
EBLTR	345'	67	35	97	80	99	84
WBLTR	505'	52	266 [#]	113 [#]	355 [#]	116 [#]	361 [#]
NBLTR	230'	39	41	43	54	44	55
SBLTR	555'	13	96	16	112 ^m	16 ^m	109 ^m
12. N Street/Tingey Street/New Jersey Avenue							
EBLT	220'/505'	35	18	43	35	45	38
WBTR	330'	13	60	23	100	25	103
SBL	490'	15	10	20	28	20	28
SBTR	490'	3	13	5	18	5	18
† All distances measured to nearest intersection or end of turn lane, as appropriate. Where two storage lengths are given, the first is the distance to the driveway, the second is the distance to the nearest intersection.							
^m Volume for 95 th percentile queue is metered by upstream signal.							
[#] 95 th percentile volume exceeds capacity; queue may be longer.							

Table 6 (Continued)
Synchro 95th Percentile Queue Summary (in feet)

Approach	Available Storage [†]	Existing Conditions		Background Conditions		Total Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
12. N Street/Tingey Street/New Jersey Avenue							
EBLT	220'/505'	35	18	43	35	45	38
WBTR	330'	13	60	23	100	25	103
SBL	490'	15	10	20	28	20	28
SBTR	490'	3	13	5	18	5	18
13. I Street/South Capitol Street							
EBLT	345'	471 [#]	674 [#]	950 [#]	1130 [#]	950 [#]	1130 [#]
EBR	345'	67	133	113	177	114	179
WBT	310'	321	653 [#]	600 [#]	1297 [#]	600 [#]	1297 [#]
WBR	90'	313 [#]	35	632 [#]	61	634 [#]	61
NBTR	270'	1592 [#]	565	1844 [#]	1351 [#]	1898 [#]	1389 [#]
SBT	235'	305	321	578	497	585	523
SBR	130'	21	22	23	37	23	37
14. N Street/Cushing Place							
EBLT	160'	-	-	-	-	3	3
WBTR	160'	-	-	-	-	0	0
SBLR	220'	-	-	-	-	75	11

[†] All distances measured to nearest intersection or end of turn lane, as appropriate. Where two storage lengths are given, the first is the distance to the driveway, the second is the distance to the nearest intersection.

^m Volume for 95th percentile queue is metered by upstream signal.

[#] 95th percentile volume exceeds capacity; queue may be longer.

Safety Analysis

Crash data at the study intersections were obtained from DDOT. The information provided by DDOT included the total number of crashes over the latest three years of available data (i.e. 2011, 2012, and 2013) at each intersection and was further categorized by type of crash. Based on the data, Table 7 shows the overall intersection crash rates at each of the study intersections.

As shown in Table 7, the crash rates at the M Street/South Capitol Street, N Street/South Capitol Street, and I Street/South Capitol Street intersections are above 1.0, which is considered high by DDOT.

Table 7
Crash Data Summary

Intersection	Type of Control	No. of Crashes (3 Years)	ADT (veh/day)	Crash Rate (MEV)
M Street/South Capitol Street	Signal	61	24,010	2.32
M Street/Half Street	Signal	6	15,280	0.36
M Street/Cushing Place	Two-way Stop	1	14,350	0.06
M Street/First Street	Signal	16	18,180	0.80
M Street/New Jersey Avenue	Signal	14	16,540	0.77
L Street/First Street	All-way Stop	2	4,580	0.40
L Street/Half Street	All-way Stop	1	2,400	0.38
N Street/South Capitol Street	Signal	48	28,240	1.55
N Street/Half Street	All-way Stop	0	2,410	0.00
N Street/First Street	Signal	5	9,340	0.49
N Street/Tingey Street/New Jersey Avenue	All-way Stop	1	5,510	0.17
I Street/South Capitol Street	Signal	106	38,110	2.54

M Street/South Capitol Street

A review of the crash types at the M Street/South Capitol Street intersection reveals that the majority of the crashes at the intersection involved left turn crashes (26 percent) and rear end collisions (25 percent). Two other categories that made up more than 10 percent of the crashes included side swipe collisions and right angle crashes (20 percent each). No crashes at the intersection involved pedestrians.

Based on the limited information provided, no discernable pattern, trend, or causation factors could be identified. However, a field reconnaissance of the intersection indicated that eastbound left turn striping is lacking in the eastbound left turn lane on the bridge over South Capitol Street. The portion of the eastbound left turn lane west of the bridge (to turn north onto South Capitol Street) is striped as left turn only. However, no such striping is provided in the eastbound left lane on the bridge causing confusion as to whether motorists in that lane must turn lane or if they can also proceed straight through the intersection. Without specific details regarding the crash history such as direction of travel, time of day (daylight or nighttime), and weather conditions, it is not possible to determine whether the lack of striping in the eastbound left turn lane on the bridge is a potential causation factor.

N Street/South Capitol Street

A review of the crash types at the N Street/South Capitol Street intersection reveals that the majority of crashes that have occurred at the intersection (69 percent) were rear end crashes, which are not uncommon at signalized intersections. Another 38 percent were side swipe collisions.

Based on the limited information provided, no discernable pattern, trend, or causation factors could be identified. In order to make recommendations to improve safety, details regarding the crash history including direction of travel, time of day (daylight or nighttime), and weather conditions would be needed.

I Street/South Capitol Street

A review of the crash types at the I Street/South Capitol Street intersection reveals that the majority of the crashes at the intersection (40 percent) were rear end collisions which are not uncommon at signalized intersections. Side swipe crashes made up 25 percent and right angle crashes made up 10 percent of the crashes at the intersection.

Based on the limited information provided, no discernable pattern, trend, or causation factors could be identified. In order to make recommendations to improve safety, details regarding the crash history including direction of travel, time of day (daylight or nighttime), and weather conditions would be needed.

FUTURE BACKGROUND CONDITIONS

Traffic Volumes

Overview

In order to forecast year 2018 background traffic volumes in the study area without the proposed redevelopment, increases in traffic associated with growth outside the immediate site vicinity (regional growth) and increases in traffic associated with planned or approved but not yet constructed developments in the study area (pipeline developments) were considered.

Regional Growth

DDOT's historical average daily traffic (ADT) volume maps were examined to determine an appropriate growth rate for the study area. The historical ADTs indicate that traffic volumes in the study area generally have a growth rate less than one percent. Therefore, a growth rate of one percent per year, compounded annually over three years (2015 to

2018), conservatively was applied to the existing vehicular volumes shown on Figure 7. The resulting 2018 volumes with regional growth are shown on Figure 10.

Pipeline Developments

Twenty-two other developments that are planned in and around the study area were identified during the scoping process and were considered as part of the background traffic growth for the 2018 study year (see Figure 11 for locations). A summary of each pipeline development is provided below. The AM and PM peak hour trip generation for each development is summarized in Table 8.

Akridge at Half Street (Square 700)

The Akridge at Half Street mixed-use development will feature approximately 280 residential dwelling units, 371,000 SF of office space, and 54,000 SF of retail space. The proposed redevelopment received approval from the Zoning Commission in February 2011. It is anticipated construction will be completed in 2018.

Site trip assignments for the redevelopment were taken from the Traffic Impact Assessment for Square 700 Development.⁵ According to the study, the Akridge development will generate an estimated 355 AM peak hour vehicle trips and 416 PM peak hour vehicle trips.

Arthur Capper/Carrollsborg and Capitol Quarter

The Arthur Capper/Carrollsborg and Capitol Quarter mixed-use development will feature approximately 1,130 residential dwelling units, 698,000 SF of office space, and 31,000 SF of retail space. The proposed redevelopment received approval from the Zoning Commission in February 2004.

As of December 2014, approximately 683 dwellings units, 276,000 SF of office, and 3,000 SF of retail have been constructed. Construction of a 156 dwelling unit apartment building is expected to be completed in 2016. The remaining residential, office, and retail uses have not begun construction and have no anticipated completion date. Only the 156-unit apartment building is included in the pipeline forecasts for this development.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation⁶ and applying a 40 percent non-auto mode split. The remaining portion of the redevelopment expected to be complete by 2018 will generate an estimated 48 AM peak hour vehicle trips and 62 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

The Yards at Southeast Federal Center

The Yards at Southeast Federal Center is a mixed-use development that will feature approximately 1,860 residential units, 1.5 million SF of office space, and 217,000 SF of ground-level retail. Construction of a 218 unit apartment building (Twelve12 Apartments) was completed in June 2014, but the apartments were only 76 percent occupied when counts were conducted. The construction of Parcel N, a 335 dwelling unit apartment building with 20,976 SF of retail, is expected to be completed in 2016.

Trip generation for Parcel N and the remaining unoccupied dwelling units in Twelve12 Apartments was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual⁷ and applying a 40 percent non-auto mode split for the residential uses and a 50 percent non-auto mode split for the retail uses. The development will generate an estimated 127 AM peak hour vehicle trips and 180 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area.

Phase 1 of the DC Water Site will include a movie theatre and approximately 2,000 SF of retail. It is anticipated Phase 1 construction will be completed in 2016. Site trip assignments for the DC Water Site were taken from the Traffic Impact Study for DC Water Occupied Sites.⁸ According to the study, the development will generate an estimated 123 PM peak hour vehicle trips. No trips are anticipated to be generated during the AM peak hour according to the study.

1015 Half Street

The development at 1015 Half Street SE consists of approximately 379,000 SF of office space. While construction was completed in 2011, the building was only 10% occupied when traffic counts were conducted.

Trip generation for the office building was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual⁹ and applying a 40 percent non-auto mode split. The development will generate an estimated 300 AM peak hour vehicle trips and 272 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Congressional Square (The Plaza on K)

Congressional Square, previously referred to as The Plaza on K, is bounded by I Street, K Street, First Street, and Half Street in southeast Washington, DC. The mixed-use development will include approximately 320,000 SF of office space and 30,000 SF of retail space. It is anticipated construction will be completed in 2018.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual¹⁰ and applying a 40 percent non-auto mode split for the office component and a 50 percent non-auto mode split for the retail component. The development will generate an estimated 306 AM peak hour vehicle trips and 317 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Square 699/Velocity

The Square 699/Velocity apartments have been constructed and are fully occupied. Therefore, traffic associated with the development has not been included in background forecasts.

1111 New Jersey Avenue

The 1111 New Jersey Avenue SE mixed-use development will feature approximately 312 residential dwelling units and 10,000 SF of retail space. The proposed redevelopment received approval from the Zoning Commission in February 2011. It is anticipated construction will be completed in 2016.

Site trip assignments for the redevelopment were taken from the 1111 New Jersey Avenue Traffic Impact Study.¹¹ According to the study, the development will generate an estimated 92 AM peak hour vehicle trips and 139 PM peak hour vehicle trips.

50 M Street

The 50 M Street SE mixed-use development will feature a 195-key Homewood Suites hotel and 4,874 SF of retail space. The proposed redevelopment received approval from the Zoning Commission in July 2014. It is anticipated construction will be completed by 2018.

Trip generation for the redevelopment was taken from the 50 M Street Transportation Assessment.¹² According to the study, the development will generate an estimated 27 AM peak hour vehicle trips and 46 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

1100 South Capitol Street

The 1100 South Capitol Street SE development will include approximately 330,168 SF of office space. It is anticipated construction will be completed in 2018.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual¹³ and applying a 40 percent non-auto mode split. The development will generate an estimated 299 AM peak hour vehicle trips and 269 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Admiral at Barracks Row

The Admiral at Barracks Row redevelopment will include approximately 19,000 SF of office and 3,000 SF of retail. The redevelopment is located at the Virginia Avenue/8th Street intersection, outside of the study area. Traffic associated with the redevelopment is not included in the pipeline forecasts.

225 Virginia Avenue

The former printing plant at 225 Virginia Avenue SE was redeveloped to a 350,000 SF office building. As construction was completed in 2012, traffic associated with the development is not included in the pipeline forecasts.

Historic Car Barn (National Community Church)

The Historic Car Barn is currently occupied by two charter schools and the site was recently sold by Madison Marquette to the National Community Church. As there is no current evidence of proposed plans for the site, traffic associated with the redevelopment is not included in the pipeline forecasts.

Waterfront Station

Phase 3 of the Waterfront Station development will include approximately 365 residential dwelling units and 5,000 SF of retail. It is anticipated construction will be complete in 2016.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual¹⁴ and applying a 40 percent non-auto mode split for the residential component and a 50 percent non-auto mode split for the retail component. The development will generate an estimated 39 AM peak hour vehicle trips and 53 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

The Randall School

The redevelopment of the Randall School at 65 I Street SW will include approximately 485 residential dwelling units and 100,000 SF for college education in arts. The proposed

redevelopment received approval from the Zoning Commission in May 2014 and it is anticipated construction will be complete in 2016.

Site trip assignments for the redevelopment were taken from the Randall School Transportation Impact Study.¹⁵ According to the study, the development will generate an estimated 100 AM peak hour vehicle trips and 156 PM peak hour vehicle trips.

St. Matthew's Church and Community Center

The mixed-use redevelopment at 222 M Street SW for St. Matthew's Church and Community Center will include approximately 17,213 SF of church space and 210 residential dwelling units. The proposed redevelopment received approval from the Zoning Commission in November 2012 and it is anticipated construction will be complete in 2018.

Site trip assignments for the redevelopment were taken from the St. Matthew's Church and Community Center Planned Unit Development Traffic Impact Study.¹⁶ According to the study, the development will generate an estimated 137 AM peak hour vehicle trips and 142 PM peak hour vehicle trips.

Camden South Capitol

The mixed-use development at 1345 South Capitol Street SW includes approximately 276 residential dwelling units and 3,000 SF of ground-floor retail. As construction was completed in 2014, traffic associated with the development is not included in the pipeline forecasts.

Square 737

The Square 737 mixed-use development includes the Park Chelsea building, currently under construction, and 800 New Jersey Avenue. The development will include approximately 758 residential dwellings units and a 35,690 SF supermarket. It is anticipated construction will be completed by 2018.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual¹⁷ and applying a 40 percent non-auto mode split for the residential component and a 50 percent non-auto mode split for the retail component. The development will generate an estimated 287 AM peak hour vehicle trips and 452 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Riverfront on the Anacostia

Phase 1 of the Riverfront on the Anacostia mixed-use development will include approximately 324 residential dwelling units and 12,520 SF of retail. The proposed redevelopment received approval from the Zoning Commission in January 2013 and it is anticipated construction will be complete in 2018.

Trip generation for the redevelopment was taken from the RiverFront on the Anacostia Planned Unit Development Traffic Impact Study.¹⁸ According to the study, the development will generate an estimated 69 AM peak hour vehicle trips and 95 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Ballpark Square (Square 701)

The Ballpark Square development will include approximately 250 residential dwelling units, 45,000 SF of retail, 225,000 SF of office, and a 165 key hotel. Construction began in January 2014 and it is anticipated construction will be completed by 2018.

Trip generation for the redevelopment was taken from the Ballpark Square Transportation Impact Study.¹⁹ According to the study, the development will generate an estimated 223 AM peak hour vehicle trips and 273 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

One M Street

The mixed use redevelopment at One M Street consists of approximately 17,260 SF of retail and 311,542 SF of office. It is anticipated construction will be completed by 2018.

Site trip assignments for the redevelopment were taken from the One M Street SE Transportation Impact Study.²⁰ According to the study, the development will generate an estimated 192 AM peak hour vehicle trips and 196 PM peak hour vehicle trips.

1244 South Capitol Street

The mixed-use development at 1244 South Capitol Street SE will consist of approximately 303 residential units and 23,000 SF of retail. The proposed redevelopment received approval from the Zoning Commission in January 2015 and the targeted delivery date is 2017.

Site trip assignments for the redevelopment were taken from the 1244 South Capitol Street Transportation Impact Study.²¹ According to the study, the development will generate an estimated 115 AM peak hour vehicle trips and 195 PM peak hour vehicle trips.

1000 South Capitol Street

The development at 1000 South Capitol Street will consist of approximately 320,000 SF of office space. It is anticipated construction will be completed by 2018.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation Manual²² and applying a 40 percent non-auto mode split. The development will generate an estimated 291 AM peak hour vehicle trips and 262 PM peak hour vehicle trips. The AM and PM peak hour trips were added to the roadway network utilizing distributions based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the development.

Combined Pipeline Developments

As shown in Table 8, the pipeline developments are expected to generate an additional 3,007 trips during the AM peak hour and 3,648 trips during the PM peak hour by 2018. Details for each of the pipeline developments and trip assignments are included in Appendix G. The traffic associated with the pipeline developments combined is shown at each of the study intersections on Figure 12.

Background Forecasts

Background 2018 traffic forecasts (without the proposed redevelopment) were developed by combining the existing traffic volumes grown to the year 2018 (shown on Figure 10) with the pipeline traffic volumes shown on Figure 12. The resulting 2018 background traffic forecasts are shown on Figure 13.

Table 8
Pipeline Development Summary

Pipeline Development	Study Available?	Trips Generated	
		AM Peak Hour	PM Peak Hour
Akridge at Half Street (Square 700)	Yes	355	416
Arthur Capper/Carrollburg	No	48	62
The Yards at Southeast Federal Center	No	127	303
1015 Half Street	No	300	272
Congressional Square (The Plaza on K)	No	306	317
1111 New Jersey Avenue	Yes	92	139
50 M Street	Yes	27	46
1100 South Capitol Street	No	299	269
Waterfront Station	No	39	53
The Randall School	Yes	100	156
St. Matthew's Church and Community Center	Yes	137	142
Square 737	No	287	452
Riverfront on the Anacostia	Yes	69	95
Ballpark Square	Yes	223	273
One M Street	Yes	192	196
1244 South Capitol Street	Yes	115	195
1000 South Capitol Street	No	291	262
Total Pipeline Developments		3,007	3,648

Capacity 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 9, future background traffic forecasts shown on Figure 13, and existing DDOT traffic signal timings.

The level of service results for the 2018 background conditions without the Square 701 development are presented in Appendix H and summarized in Table 5. As shown in Table 5, under background conditions, many of the study intersections will experience an increase in delay as a result of the background traffic growth and the numerous pipeline projects.

The following intersections would drop from an acceptable overall intersection level of service (i.e. LOS D or better), to an overall LOS E or F under background conditions:

- M Street/South Capitol Street (West) – Overall LOS F during the AM peak hour,

- M Street/South Capitol Street (East) – Overall LOS F during the AM and PM peak hours,
- M Street/Half Street – Overall LOS F during the PM peak hour,
- N Street/South Capitol Street – Overall LOS during the AM and PM peak hours.

As shown in Table 5, a number of lane groups at the study intersections also would operate at a LOS E or LOS F during the AM and PM peak hours under background conditions.

Additionally, the I Street/South Capitol Street intersection would continue to operate at an overall LOS F during the AM and PM peak hours under background conditions but would experience a significant increase in delay during the AM and PM peak hours when compared to existing conditions.

Finally, the northbound Cushing Place approach at its intersection with M Street would experience a significant increase in delay as a result of the pipeline developments.

Queue Analysis

A queuing analysis was conducted for 2018 conditions without the Square 701 redevelopment. Synchro was used to conduct the analyses, using the 95th percentile queue lengths. The results are summarized in Table 6. Queue reports are provided in Appendix H.

As shown in Table 6, the 95th percentile queues at several study intersections will increase under background conditions. An increase in queue lengths from existing conditions that would exceed the available storage includes:

- M Street/South Capitol Street (West) – Westbound left/through during the PM peak hour,
- M Street/South Capitol Street (West) – Southbound left and southbound left/through the AM and PM peak hours,
- M Street/South Capitol Street (East) – Eastbound left/through during the AM and PM peak hours,
- M Street/South Capitol Street (East) – Westbound through/right during the AM and PM peak hours,
- M Street/Half Street – Southbound left/through/right during the PM peak hour, and
- N Street/South Capitol Street – Westbound left/through during the PM peak hour.

SITE ANALYSIS

Overview

The subject site is located on Square 701 (Lots 857, 858, and 859) in Ward 6, which is in the southeast quadrant of the District. The site is located in the CR zone and lies within the Capitol Gateway Overlay. The site currently is vacant.¹

The site is part of a prior Zoning Commission approval in February 2007 and a subsequent modification and approval in January 2008. The most recent approval included a mixed-use development in two buildings. The northern building, located immediately north of and adjacent to the subject site, included office with ground floor retail and has since been constructed and is fully occupied (55 M Street). The southern building was approved for the subject site and included 320,511 SF of residential space (330 dwelling units), a 106,269 SF hotel (190-keys), and 37,144 SF of retail space. The southern building was never constructed.

The Applicant proposes to modify the development plans for the southern building under one of the five following options:

- Option 1A: 445 residential dwelling units and 60,100 SF of retail
- Option 1B: 430 residential dwelling units and 68,000 SF of retail
- Option 2A: 365 residential dwelling units, 80 key hotel, and 60,100 SF of retail
- Option 2B: 350 residential dwelling units, 80 key hotel, and 68,000 SF of retail
- Option 2C: 365 residential dwelling units, 128 key hotel, and 48,100 SF of retail

Site Access and Circulation

Overview

The proposed development has been designed to facilitate access via all modes of transportation including vehicular (parking and loading/service), pedestrian, and bicycle. Because N Street and Half Street are closed to vehicular traffic during Nationals' home games, these closures have been considered in the design to ensure that the proposed design promotes safe and efficient vehicular access when N Street and Half Street are closed. Specifically, a turnaround has been incorporated into the site design to ensure that trucks can exit and enter the front-first to and from the public street system even when N Street is closed. The proposed circulation for the site on non-game days and game days is

¹ A portion of the below-grade parking garage for the building immediately to the north of the site (55 M) extends approximately 125 feet onto the property.

shown on Figures 14 and 15, respectively. Access for each mode is more fully described below.

Vehicular Access

In conjunction with the proposed modification, the Applicant proposes to extend Cushing Place from its current terminus at the garage access for 55 M Street southward to N Street. A portion of the newly constructed Cushing Place (the portion south of the existing right-of-way for a 20' east – west public alley) will be constructed across the subject property as a private roadway with a public access easement.

DDOT policy indicates that vehicular access should be provided via public alleys or expended alley systems when possible. Since all vehicular access to the proposed site, including parking and loading, will be provided via Cushing Place, the proposed access is in accordance with DDOT's policy.

Parking for the residential and hotel (if applicable) will be provided in a new below grade parking garage. Parking for the retail component will be provided in the existing garage under 55 M Street through a reciprocal easement agreement with the owner of the building.

Under the hotel option, a circular driveway is contemplated off of Cushing Place to provide a short-term drop-off/pick-up area for hotel guests. Vehicles would enter the circular driveway near Monument Place Row and would exit the circular driveway just north of the garage access. In order to accomplish the circular driveway, the retail space and maintenance area in the northeast corner of the building would be lost. A draft potential layout for the hotel option is shown on Figures 16A and 16B:

Access to the loading facilities for the subject site also will be provided via Cushing Place. Trucks and service vehicles will enter Cushing Place front-first either via M Street or N Street and will then back into one of the loading berths from Cushing Place. Trucks will then exit the loading area onto Cushing Place front-first and proceed to N Street. Since N Street is closed on Game Days, the site has been designed so that trucks exiting the loading area can proceed southward on Cushing Place to a turnaround and then head north on Cushing Place to M Street. Diagrams showing the truck maneuvers in and out of the proposed loading area are included in Appendix I. Internal access between the proposed loading facilities and each component of the proposed development is shown on Figures 17A and 17B.

Pedestrian Access

A new pedestrian way (Monument Place Row) will be completed with the proposed project. Monument Place Row will run along the north side of the site and connect Half Street and Cushing Place. Monument Place Row will provide pedestrian access to retail space on the

ground floor and the retail lobby for the second level retail space. It also would provide access to a small lobby that would provide access to the hotel under the hotel option making the access from the Metro station to the hotel very convenient.

Pedestrians can access the residential lobbies via Half Street and N Street. Half Street and N Street also will provide pedestrian access for additional retail space along those streets.

Bicycle Access

Bicycle parking for the project will be provided in a bicycle storage room(s) on the ground floor and/or in the first level of the below-grade garage. The ground floor bicycle room will be located off of Monument Place Row and will be accessed directly from Monument Place Row. Bicycle parking in the first parking level will be accessed via the garage ramp on Cushing Place.

Bicycle parking for visitors would be provided along Monument Place Row and on Half Street. The exact number of exterior bicycle racks will be determined in consultation with DDOT during the public space process.

Trip Generation Analysis

Overview

A trip generation comparison of the five development options was conducted to determine the development program with the highest trip generation to provide the most conservative analysis. While the trip generation is similar under all five options, Option 1B is slightly more conservative than the other scenarios. Therefore, Option 1B was used for the detailed traffic impact evaluation. Trip generation details for all five scenarios are included in Appendix J.

Option 1B consists of 430 residential dwelling units and 68,000 SF of retail. The total number of trips generated by the proposed redevelopment would be comprised of vehicular trips, pedestrian/bicycle trips, and transit trips.

Total Trips

The total number of trips anticipated to be generated by the proposed redevelopment was estimated based on ITE's Trip Generation Manual.²³ Land Use Code (LUC) 230 (Condominium), LUC 220 (Apartment), and LUC 820 (Retail) were used to estimate the total number of trips to/from the proposed project. The square footage of the retail use and the number of dwelling units for the residential uses were used as the independent variables.

The trip generation for the proposed development is summarized in Table 9. As shown, the proposed development would generate 281 **total** AM peak hour trips and 510 **total** PM peak hour trips based on standard ITE rates/equations.

Table 9
Site Trip Generation Summary

Land Use		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Development							
117 DU Condominium (LUC 230)	Total Trips	10	49	59	46	22	68
	Non-auto Trips	4	20	24	18	9	27
	Transit	2	10	12	9	5	14
	Bicycle	0	1	1	1	0	1
	Pedestrian	2	9	11	8	4	12
	Vehicle Trips	6	29	35	28	13	41
313 DU Apartment (LUC 220)	Total Trips	31	126	157	124	66	190
	Non-auto Trips	12	50	62	50	26	76
	Transit	6	26	32	26	14	40
	Bicycle	1	3	4	3	1	4
	Pedestrian	5	21	26	21	11	32
	Vehicle Trips	19	76	95	74	40	114
68,000 SF Retail (LUC 820)	Total Trips	40	25	65	121	131	252
	Non-auto Trips	20	13	33	61	66	127
	Transit	14	9	23	42	45	87
	Bicycle	5	3	8	15	16	31
	Pedestrian	1	1	2	4	5	9
	Vehicle Trips	20	12	32	60	65	125
Total Proposed Development	Total Trips	81	200	281	291	219	510
	Non-auto Trips	36	83	119	129	101	230
	Transit	22	45	67	77	64	141
	Bicycle	6	7	13	19	17	36
	Pedestrian	8	31	39	33	20	53
	Vehicle Trips	45	117	162	162	118	280

Non-auto Mode Split

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 use public transportation is dependent on the proximity of the site to transit stops, the walkability of the surrounding area, and the degree to which the use of public transit is encouraged, such as by implementation of a transportation demand management (TDM) program.

According to US Census data, approximately 57 percent of residents in the vicinity of the site take public transportation, walk, or bike to work. Another four percent carpool and another five percent stay home. Therefore, it is anticipated that the non-auto mode split for the proposed residential component could be as high as 66 percent. However, as requested by DDOT, a non-auto mode split of 40 percent was used for the residential component based on the proposed parking supply. As agreed by DDOT, the non-auto mode split for the retail component was estimated to be 50 percent for the retail use based on the neighborhood serving nature of the proposed retail, the walkability of the site, and the abundance of transportation options near the site.

Based on these mode split estimates, the project is expected to generate 119 AM peak hour trips and 230 PM peak hour trips by non-auto modes of transportation.

The non-auto trips will be comprised on transit, pedestrian, and bicycle trips. The estimates for the specific modes were based on data contained in the 2005 WMATA Ridership Survey.²⁴

Pass-by Trips

A portion of the trips generated by retail and service uses are made by vehicles already using the adjacent streets to reach a different destination but stop at the site in passing. This type of trip is called a pass-by trip, and is defined by Trip Generation Manual²⁵ as a trip in which the retail or service destination is the secondary part of a primary trip, such as a work-to-shopping-to-home trip. An example of a pass-by trip would be one in which a driver stops at the retail or service uses on his/her way home from work. As requested by DDOT, no pass-by trips were taken for the proposed retail component.

New Vehicle Trips

Taking into account the non-auto mode share, the proposed development would generate an estimated 162 new AM peak hour external vehicular trips and 280 new PM peak hour external vehicular trips, as shown on Table 9.

Site Trip Distribution and Assignment

The distribution of new peak hour site trips generated by the proposed development was based on existing traffic patterns in the study area and general knowledge of commuter routes to/from the site.

The trip distributions shown in Table 10 were applied to the new vehicle trip generation for the proposed redevelopment. The resulting traffic assignments for the proposed development are shown on Figure 18.

Table 10
Site Trip Distributions

Roadway	Direction	Residential	Retail
M Street	East	10%	20%
	West	15%	25%
South Capitol Street	North	45%	15%
	South	20%	15%
N Street	East	0%	5%
	West	0%	5%
First Street	North	0%	0%
	South	5%	0%
New Jersey Avenue	North	5%	15%

Proposed Parking

Vehicular Parking

The parking requirements for the proposed redevelopment are prescribed by the District of Columbia Municipal Regulations (DCMR) and are summarized in Table 11 along with the proposed parking supply. A new garage with approximately 231 parking spaces will be provided for the residential/hotel component. Retail parking will be provided in the existing garage at 55 M Street, SE.

Residential parking in the proposed garage will be secure access requiring residents of the project to have a card, fob, or RFID tag to open the gate or garage door (the exact parking control system has not been determined yet). Therefore, under Options 1A and 1B, the proposed garage will be closed to the general public on both non-game days and game days. Under Options 2A and 2B (hotel options), the residential parking and the hotel parking will

be separated so that the residential parking can be secure as described above for Options 1A and 1B. Until such time as a hotel operator is selected, it is not possible to determine whether the hotel parking will be open to the public or whether card access will be required. At this time, it is anticipated that the hotel parking would not be open to the general public on non-game days or on game days.

Table 11
Parking Summary

Land Use	Required Parking				
	Option 1A	Option 1B	Option 2A	Option 2B	Option 2C
Residential	149 spaces	143 spaces	122 spaces	117 spaces	122 spaces
Retail	76 spaces	93 spaces	76 spaces	93 spaces	60 spaces
Hotel ¹	N/A	N/A	20 spaces	20 spaces	32 spaces
Total	225 spaces	236 spaces	218 spaces	230 spaces	214 spaces
Land Use	Proposed Parking				
	Option 1A	Option 1B	Option 2A	Option 2B	Option 2C
Residential ²	231 spaces	231 spaces	211 spaces	211 spaces	211 spaces
Retail ³	88 spaces	88 spaces	88 spaces	88 spaces	88 spaces
Hotel ²	N/A	N/A	20 spaces	20 spaces	20 spaces
Total ⁴	231/88 spaces	231/88 spaces	231/88 spaces	231/88 spaces	231/88 spaces
¹ The hotel use does not include any function rooms or exhibit space. ² The residential and hotel parking will be accommodated in the proposed garage, which will house approximately 231 spaces. ³ The retail parking will be accommodated in the existing parking garage at 55 M Street, SE through access rights to approximately 88 parking spaces as memorialized in a reciprocal easement agreement with the owner of 55 M Street. ⁴ 231 represents the number of spaces proposed in the new garage. 88 represents the number of spaces available in the existing garage through agreement with the owners of 55 M Street.					

Notwithstanding the reciprocal agreement between the Applicant and the owner of 55 M Street, a parking occupancy study was conducted at the 55 M Street garage to ensure that sufficient parking is available in the garage. Parking occupancy counts were conducted at hourly intervals from 10:00 AM to 3:00 PM on Wednesday, March 25, 2015. Parking occupancy counts are provided in Table 12.

As shown in Table 12, the weekday peak demand for parking in the 55 M Street garage occurred at 2:00 PM, when 53.5 percent of the parking spaces were occupied, leaving 139 available spaces during the peak. Therefore, there is sufficient space in the garage to

accommodate the required 88 parking spaces for the retail component of the proposed development.

Table 12
Summary of Parking Occupancy Counts
55 M Street Garage

Time	Level 1	Level 2	Level 3	Total
10:00 AM	62	39	50	151
11:00 AM	66	41	40	147
12:00 PM	68	48	39	155
1:00 PM	67	44	42	153
2:00 PM	68	43	49	160
3:00 PM	60	41	57	158
Total Spaces	111	110	78	299
Max Occupancy	61.3%	39.1%	62.8%	53.5%
Available Spaces	43	67	29	139

Bicycle Parking

According to the DCMR, bicycle parking spaces shall be provided for office, retail, and service uses, except retail and services uses in the C-3-C, C-4, and C-5 (PAD) Districts.²⁶ Therefore, the proposed redevelopment is required to provide bicycle parking for five percent of the retail vehicular parking space requirement.

District law also requires that one bicycle parking space be provided for every three residential dwelling units.²⁷ The number of required bicycle parking spaces for each development option is summarized in Table 13.

Table 13
Bicycle Parking Summary

Land Use	Required Parking				
	Option 1A	Option 1B	Option 2A	Option 2B	Option 2C
Residential	148 spaces	143 spaces	122 spaces	117 spaces	122 spaces
Retail	4 spaces	5 spaces	4 spaces	5 spaces	3 spaces
Total	152 spaces	148 spaces	126 spaces	122 spaces	125 spaces

The proposed development will provide, at minimum, the required number of bicycle parking spaces. Bicycle parking will occur on Monument Place, on Half Street, and inside the subject site on the ground and P1 garage levels.

Proposed Loading

The loading requirements for the proposed redevelopment are prescribed by the DCMR and are summarized in Table 14 along with the proposed loading facilities.

The proposed loading facilities are consistent with the loading facilities approved in conjunction with the previous zoning cases for the site (Case Nos. 06-46 and 06-46A).

Table 14
Loading Summary

Component	Required Loading	
	Option 1A/2A	Option 2A/2B/2C
Residential	1 berth @ 55' 1 platform @ 200 SF 1 service/delivery @ 20'	1 berth @ 55' 1 platform @ 200 SF 1 service/delivery @ 20'
Retail	1 berth @ 55' 1 platform @ 200 SF 2 berth @ 30' 2 platforms @ 100 SF 1 service/delivery @ 20'	1 berth @ 55' 1 platform @ 200 SF 2 berth @ 30' 2 platforms @ 100 SF 1 service/delivery @ 20'
Hotel	N/A	1 berth @ 30' 1 platform @ 100 SF 1 service/delivery @ 20'
	Proposed Loading	
	Option 1A/2A	Option 2A/2B/2C
Total	1 berth @ 55' 1 platform @ 200 SF 3 berths @ 30' 3 platforms @ 100 SF 2 service/delivery @ 20'	1 berth @ 55' 1 platform @ 200 SF 3 berths @ 30' 3 platforms @ 100 SF 2 service/delivery @ 20'

In order to ensure that the loading relief does not adversely impact the surrounding roadway network, a loading management plan will be implemented for the building. The goals of this plan are to maintain a safe environment for all users of the site, loading dock, street, and nearby intersection; minimize undesirable impacts to pedestrians and to building tenants; reduce conflicts between truck traffic using the loading facilities and other street users; and ensure smooth operation of the loading facilities through appropriate levels of management and scheduled operations. The following are the components of the loading management plan: