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4620 Wisconsin Avenue

Comprehensive Transportation Review

November 2016

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INTRODUCTION

Overview

This report presents a Transportation Impact Study (TIS) conducted in support of the Planned Unit Development (PUD) application filed by The UIP Companies, Inc. (herein referred to as the Applicant). The proposed mixed-use project, known as 4620 Wisconsin Avenue NW, will be located at 4620-4624 Wisconsin Avenue in northwest Washington, DC (Square 1732, Lots 45 and 49). The site is situated along the west side of Wisconsin Avenue between Brandywine Street and Chesapeake Street, as shown on Figure 1.

The site is zoned MU-4 per the 2016 Zoning Regulations of the District of Columbia (ZR16). The site is currently occupied by buildings providing a total of approximately 41,900 SF of office, approximately 13,000 SF of retail, and three residential units. The Applicant proposes to redevelop the site to allow for the construction of a multi-story mixed-use redevelopment that would contain approximately 136 residential units and approximately 10,500 SF of ground floor retail space. In conjunction with the redevelopment, the site would be rezoned to the MU-7 district.

Approximately 74 off-street parking spaces would be provided for the proposed redevelopment project. Access to the parking and loading facilities will be provided via the public alley system to the west of the site. The proposed site plan is shown on Figure 2.

The purpose of this report is to identify potential traffic impacts resulting from the proposed redevelopment project and recommend improvements required to mitigate the impact at full build out (2020).

Study Scope

In order to assess the impacts of the proposed development on the surrounding roadway network, the Applicant commissioned this comprehensive transportation review. 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 A.

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

- Chesapeake Street/Wisconsin Avenue,
- Chesapeake Street/42nd Street,
- River Road/42nd Street,
- Brandywine Street/42nd Street,
- Brandywine Street/River Road, and
- Brandywine Street/Wisconsin Avenue.

The objectives of this study were to:

- Evaluate existing traffic conditions,
- Evaluate future traffic conditions without the proposed redevelopment (Background Conditions),
- Evaluate future traffic conditions with the proposed redevelopment (Total Future Conditions),
- Identify existing mode choice alternatives,
- Identify any traffic operational impacts associated with the proposed redevelopment,
- 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.

EXISTING TRANSPORTATON 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. All roadways in the study area operate as two-way streets, with the exception of 41st Street which operates as a one-way northbound.

Table 1
Roadway Segment Details

Roadway	Functional Classification	Average Daily Traffic* (vehicles per day)	Speed Limit (miles per hour)
Chesapeake Street	Local	N/A	25†
Wisconsin Avenue	Principal Arterial	34,600	30
42nd Street	Collector/Local§	5,700	25†
Brandywine Street	Local	N/A	25‡
River Road	Minor Arterial	8,400	25†
41st Street	Local	2,300	25

* The ADT volume is based on DDOT historical traffic volume data collected in 2014, which are the most recent data available.
† A 15 mph School Speed Limit When Children are Present is posted for traffic.
‡ Speed limit unposted in the study area; assumed to be 25 mph.
§ 42nd Street is a collector south of River Road and is a local north of River Road.

Per DDOT's request, improvements recommended in the Wisconsin Avenue Corridor Transportation Study[i] are summarized below. Note the study was conducted in 2005 and some recommended improvements may already be implemented. The following reccomendations were identified for intersections within the study area (those that have been implemented are indicated in parentheses):

- River Road/42nd Street/Brandywine Street –
  - Trim overgrown vegetation obstructing the view of the eastbound signals east of the intersection (implemented);
  - Install "Do Not Block Intersection" sign on eastbound Brandywine Street and northbound 42nd Street;
  - Correct the sign direction on northbound River Road;
  - Adjust signal timing to provide more time for River Road;
  - Reconstruct the small section of Brandywine Street between 42nd Street and River Road to be one lane wide; and
  - Reconstruct wheelchair ramps along Brandywine Street from 42nd Street and River Road to current ADA and DDOT standards.
- Brandywine Street/Wisconsin Avenue –
  - Adjust signal timings and phasing to provide sufficient green time for the arterial flow and reduce the green time for the side street (Brandywine Street);
  - Provide improved pavement markings to assist in proper lane utilization;
  - Establish parking limits with "L" striping on the east and west legs;
  - Restripe pedestrian crosswalks across Wisconsin Avenue to current DDOT standards;
  - Install signal mast arms along Wisconsin Avenue;
  - Install speed limit signs north and south of Brandywine Street for northbound and southbound traffic on Wisconsin Avenue (implemented);
  - Install new "No Parking" to corner signs on the east and west legs of the intersection (implemented);
  - Restripe worn stop bars (implemented);
  - Install semi-actuated traffic signal system for the left turn lanes and subsequently install pedestrian actuation equipment; and
  - Reconstruct wheel chair ramps to current ADA and DDOT standards on the northeast corner (implemented).

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 subject site is approximately 1,050 feet walking distance (an approximate five minute walk) from the Tenleytown – AU Metro Station, which provides access to the Metro Red line. Riders can transfer to the Blue, Orange, and Silver lines at the Metro Center Metro Station or to the Green and Yellow lines at the Gallery Place-Chinatown Metro Station.

The typical minimum and maximum headways for the Red Line are 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
RED LINE (TENLEYTOWN - AU STATION)							
Min	0:03	0:12	0:03	0:06	0:15	0:12	0:15
Max	0:06	0:12	0:06	0:10	0:18	0:15	0:15

* Headways presented represent headways in both directions.

Per DDOT's request, improvements recommended in the WMATA Tenleytown-AU Metrorail Station Access Improvements Study [ii] are summarized below. Note a number of recommendations from the study require coordination with the community and American University stakeholders. However, the following reccomendations were identified for more immediate implementation (those that have been implemented are indicated in parentheses):

- Restripe pedestrian crosswalks across Wisconsin Avenue to current DDOT standards at Brandywine Street, River Road, the Whole Foods entrance, Albemarle Street, and Tenley Cirlce (implemented),
- Upgrade existing non-conforming wheelchair ramps to improve accessibility,
- Replace faded or missing pavement markings to improve visibility and safety,
- Install pedestrian count down signals across the Whole Foods entrance (implemented),
- Improve and repair the existing station area crosswalk markings and sidewalk pavement which are in a state of disrepair, and

- Add stop bars and/or markings at the driveway exits surrounding the east station entrance in order to reduce auto-pedestrian conflicts (implemented at some driveways).

The Washington Metropolitan Area Transit Authority (WMATA) currently provides Metrobus service near the site. Metrobus routes that provide service with stops located within ¼ mile of the site include:

- Friendship Heights – Southeast Lines (Routes 30N and 30S)
- Wisconsin Avenue Lines (Routes 31 and 33)
- Wisconsin Avenue Limited Line (Route 37)
- East Capitol Street – Cardozo Line (Route 96)
- Massachusetts Avenue Line (Route N2)
- Wilson High School Line (Route W47)

The stop closest to the site is located at the Chesapeake Street/Wisconsin Avenue intersection and provides service for five routes. The bus stops located proximate to the subject site are shown on Figure 3. Table 3 presents the minimum, maximum and average headways for Metrobus routes in the site vicinity.

Table 3
Metrobus Headways (in minutes)

Headway	Northbound/Westbound			Southbound/Eastbound		
	AM Peak Period 7:00 AM – 10:00 AM	Midday Period 10:00 AM – 4:00 PM	PM Peak Period 4:00 PM – 7:00 PM	AM Peak Period 7:00 AM – 10:00 AM	Midday Period 10:00 AM – 4:00 PM	PM Peak Period 4:00 PM – 7:00 PM
Friendship Heights – Southeast Line (30N, 30S)						
Min	0:31	0:27	0:19	0:16	0:18	0:22
Max	0:39	0:35	0:33	0:34	0:35	0:39
Avg	0:34	0:31	0:28	0:28	0:29	0:30
Wisconsin Avenue Line (31, 33)						
Min	0:10	0:08	0:04	0:05	0:06	0:07
Max	0:21	0:21	0:16	0:18	0:22	0:21
Avg	0:15	0:15	0:08	0:08	0:14	0:13
Wisconsin Avenue Limited Line (37) *						
Min	N/A	N/A	0:18	0:15	N/A	N/A
Max	N/A	N/A	0:26	0:18	N/A	N/A
Avg	N/A	N/A	0:20	0:16	N/A	N/A

* This route only provides northbound service during the PM peak and southbound service during the AM peak.

Table 3 (Continued)
Metrobus Headways (in minutes)

Headway	Northbound/Westbound			Southbound/Eastbound		
	AM Peak Period 7:00 AM – 10:00 AM	Midday Period 10:00 AM – 4:00 PM	PM Peak Period 4:00 PM – 7:00 PM	AM Peak Period 7:00 AM – 10:00 AM	Midday Period 10:00 AM – 4:00 PM	PM Peak Period 4:00 PM – 7:00 PM
East Capitol St – Cardozo Line (96)						
Min	0:20	0:18	0:21	0:20	0:21	0:21
Max	0:27	0:27	0:24	0:24	0:24	0:21
Avg	0:21	0:24	0:22	0:22	0:23	0:21
Massachusetts Avenue Line (N2)						
Min	0:28	0:30	0:10	0:10	0:28	0:16
Max	0:31	0:31	0:25	0:31	0:30	0:34
Avg	0:29	0:30	0:19	0:19	0:30	0:26
Wilson High School Line (W47)†						
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

† This route provides PM service only when public schools are open.

Pedestrian Facilities

The District of Columbia Pedestrian Master Plan[iii] (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. 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 3 is Wisconsin Avenue NW between Western Avenue NW and Woodley Road NW, which falls within the study area. Within the study area, the Pedestrian Plan calls for construction of curb extensions, reconstruction or replacement of ADA ramps, installation of high visibility crosswalks and/or restriping of existing crosswalks, construction of sidewalks to "fill in" gaps, reconstruction of sidewalks in disrepair, and removal of bus stops. Excerpts from the Pedestrian Master Plan, which include more details of the recommendations within the study area, are included in Appendix B. Field observations in the study area indicate that many of the recommendations have been implemented.

Per DDOT's request, an assessment of existing conditions for all pedestrian facilities within one block of the proposed redevelopement, including the route to the nearest Metro Station, was conducted. The results of this assessment are depicted on Figure 4A. In particular, a portion of the sidewalk in front of the subject site does not meet DDOT standards for pedestrian clear zone. This portion of sidewalk will be brought up to DDOT standards with the proposed development, as shown on the streetscape plan included as Figure 4B.

A summary of the existing pedestrian facilities provided at each of the study intersections is presented in Table 4.

Table 4
Pedestrian Inventory by Intersection

Intersection	Pedestrian Heads/ Countdown	Type of Crosswalks	One Ramp/ Crosswalk	Tactile Warning Strip
Chesapeake Street/ Wisconsin Avenue (Unsignalized)	NA	North Leg – High Visibility East Leg – Standard Note 1	Yes	Yes
Chesapeake Street/42nd Street (Unsignalized)	NA	All Legs – High Visibility	Yes	Yes
River Road/42nd Street (Signalized)	No Note 2	All Legs – High Visibility	No Note 3	No Note 4
Brandywine Street/42nd Street (Unsignalized)	NA	All Legs – High Visibility	No Note 5	Yes
Brandywine Street/River Road (Unsignalized)	NA	All Legs – High Visibility	No Note 6	No Note 7
Brandywine Street/Wisconsin Avenue (Signalized)	Yes	All Legs – High Visibility	Yes	Yes
Chesapeake Street/41st Street/Belt Road (Unsignalized)	NA	All Legs – High Visibility	Yes	Yes

1. Crosswalks are only present along the northern and eastern legs.
2. Pedestrian heads are only present on the western leg for pedestrians crossing River Road.
3. One ramp with tactile warning strips is present on the southeast corner of the intersection.
4. Ramps on the northeast and northwest corners of the intersection do not have tactile warning strips.
5. One ramp with tactile warning strips is present on the northeast corner of the intersection.
6. One ramp with tactile warning strips is present on the northwest corner and one ramp without tacile warning strips is present on the southeast corner of the intersection.
7. Tactile warning strips are only present for the ramp on the northwest corner of the intersection.

Per DDOT's request, improvements recommended in the Rock Creek West Livability Study[iv] are summarized below. Note the study was conducted in 2011 and some recommended improvements may already be implemented. The following reccomendations were identified within the study area (those that have been implemented are indicated in parentheses):

- Brandywine Street/42nd Street –
  - Add curb extensions; and
  - Remove Brandywine Street between 42nd Street and River Road and replace the area with green space;
- Brandywine Street/Wisconsin Avenue –
  - Provide a leading pedestrian interval to improve pedestrian safety (implemented);
- 42nd Street between River Road and Van Ness Street –
  - Add a centerline to prevent motorists from speeding; and
  - Add bike sharrows in both directions (implemented);
- River Road between Garrison Street and Wisconsin Avenue –
  - Add bike sharrows in both directions (implemented between Fessenden and Chesapeake Streets); and
  - Request permanent speed camera from the Metropolitan Police Department (MPD).

Bicycle Facilities

The District of Columbia Bicycle Master Plan[v] (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."[vi] No such barriers exist in the vicinity of the site.

Bicycle facilities and likely biking routes to the Metro Station and nearest bus stops within ½ mile of the site are shown on Figure 5. Figure 5 also shows the BLOS for roadways in the study area and reported bicycle crashes in the study area, per the Bicycle Plan.

Capital Bikeshare

Capital Bikeshare is an automated bicycle rental or bicycle sharing program that provides approximately 3,100 bicycles at 370 stations across Washington, DC, Arlington, VA, Alexandria, VA, and Montgomery County, MD.

Membership, which is required to use Capital Bikeshare, includes four options for joining: 24 hours ($8), three days ($17), day key ($10 initial fee + $7/day), 30 days ($28), one year ($85), or one year with monthly installments ($96, $8/month for 12 months). 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 within ¼ mile of the site at Wisconsin Avenue/Albemarle Street. This station includes 15 docks. Three additional Bikeshare stations are located roughly ½ mile from the site. One station at 39th Street/Veazey Street contains 15 docks, one station at Yuma Street/Tenley Circle contains 19 docks, and one station at Wisconsin Avenue/Fessenden Street includes 15 docks.

The District of Columbia Capital Bikeshare Development Plan[vii] outlines a system-wide expansion plan including 99 new Bikeshare stations by the end of 2018 and 21 existing stations to be expanded by the end of 2017. In the vicinity of the site, the nearest new Bikeshare station is identified on Wisconsin Avenue south of Macomb Street and is slated for completion in 2018.

Car Sharing Services

Three car-sharing providers currently operate in the District. Zipcar requires a $25 application fee and members can choose from four plans: occasional driving plan - $70 per year (pay as you go based on the standard hourly or daily rate), monthly plan - $7 per month (pay as you go based on the standard hourly or daily rate), extra value plan - $50 per month and receive 10% discount on driving (after the $50 is used up you pay as you go based on a discounted hourly or daily rate), and the works - $10 per month and receive one free day on a three day weekend rental with Budget. Cars must be returned to the same designated parking spaces from which they were picked up.

As shown on Figure 3, two Zipcars are located at 4027 Brandywine Street, one Zipcar is located at the Tenley View Apartments, and two Zipcars are located at 40th Street/Albemarle Street. Note the number of cars at any given location change frequently.

Car2Go requires a one-time $35 application fee. Once registered, a member card is issued, which enables members to access an available car. 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. No Enterprise Carshare vehicles are located in the immediate vicinity of the subject site.

EXISTING CONDITONS ANALYSIS

Traffic Volumes

Existing vehicular turning movement, bicycle, and pedestrian counts were conducted on Wednesday, May 7, 2014 and Wednesday, November 19, 2014 from 7:00 AM to 10:00 AM and from 4:00 PM to 7:00 PM.

The common peak hours were reviewed for the study area and no volume adjustments were necessary as there were no significant volume imbalances between count dates. Individual peak hour volumes were grown to the year 2016 assuming ½ percent regional growth determined during the scoping process.

Existing vehicular peak hour traffic volumes are shown on Figure 6. Pedestrian volumes are shown on Figure 7. 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 8, existing traffic volumes shown on Figure 6, existing pedestrian volumes shown on Figure 7, and existing traffic signal timings obtained from DDOT, included in Appendix D.

Synchro software (Version 9) 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, all of the study intersections operate at acceptable overall levels of service. In addition, all lane groups operate at acceptable levels of service, with one exception. The southbound left at the Brandywine Street/Wisconsin Avenue intersection operates at a LOS F during the PM 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. Chesapeake Street/Wisconsin Avenue						
EBLR	B	B	B	B	B	B
NBLT	A	A	A	A	A	A
SBTR	A	A	A	A	A	A
2. Chesapeake Street/42nd Street						
EBLTR	B	A	B	A	B	A
WBTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	B	A	B	A
Overall	**B**	**A**	**B**	**A**	**B**	**A**
3a. River Road/42nd Street NW						
EBLTR	B	B	B	B	B	B
WBLTR	A	B	A	B	A	B
NBLTR	D	C	D	C	D	C
SBLTR	D	C	D	C	D	C
Overall	**C**	**B**	**C**	**B**	**C**	**B**
3b. Brandywine Street/42nd Street						
EBLTR	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**
3c. Brandywine Street/ River Road						
EBL	A	A	A	A	A	A
EBR	A	A	A	A	A	A
WBLR	A	A	A	A	A	A
NBT	A	A	A	A	A	A
SBT	B	A	B	A	B	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
4. Brandywine Street/Wisconsin Avenue						
WBLTR	D	D	D	D	D	D
NBL	D	C	D	C	D	C
NBTR	C	C	C	C	C	C
SBL	C	F(113.7)	C	F(113.7)	C	F(113.4)
SBTR	C	C	C	C	C	C
Overall	**C**	**C**	**C**	**C**	**C**	**C**

[x.x] = unsignalized intersection control delay in sec/veh
(x.x) = signalized intersection control delay in sec/veh

Queue Analysis

A queue 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:

- River Road/42nd Street – westbound and northbound approaches; and
- Brandywine Street/Wisconsin Avenue – northbound left, northbound through/right, and southbound left.

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. Chesapeake Street/Wisconsin Avenue							
EBLR	275'	25	9	25	9	29	7
NBLT	460’	4	6	4	6	3	6
SBTR	340’	0	0	0	0	0	0
2. Chesapeake Street/42nd Street							
EBLTR	330'	23	5	23	5	23	5
WBLTR	120’/275'	8	10	8	10	8	5
NBLTR	300’	28	18	28	18	28	20
SBLTR	120'/765’	53	35	53	35	53	35
3a. River Road/42nd Street							
EBLTR	470’	143	121	143	121	144	123
WBLTR	75’	68	147	68	147	70	150
NBLTR	25’	170	171	170	171	173	173
SBLTR	300’	197	160	197	160	197	160
3b. Brandywine Street/42nd Street*							
EBLTR	75'/435'	5 – 9	5 – 8	5 – 9	5 – 8	5 – 10	8 – 10
NBLTR	260'	1 – 33	0 – 25	1 – 33	0 – 25	1 – 33	0 – 25
SBLTR	35'	0	0	0	0	0	0

† 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.

* Intersection sign configuration not allowed in HCM analysis. Ranges for the queues are presented when all-way stop control results differ from two-way stop control results (northbound/southbound approaches are free with TWSC analysis). Note a range is not shown for the southbound approach, as this approach has no sign control.

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
3c. Brandywine Street/ River Road*							
EBL	20’	0	0	0	0	0	0
EBR	35’	5	5 – 6	5	5 – 6	5	5 – 6
WBLR	240’	20 – 23	40	20 – 23	40	23 – 24	41 – 43
NBT	255'/410’	0 – 3	0 – 8	0 – 3	0 – 8	0 – 3	0 – 8
SBT	50’	0	0	0	0	0	0
4. Brandywine Street/Wisconsin Avenue							
WBLTR	20'/380’	78	85	78	85	78	85
NBL	100’	118	127	118	127	86	129
NBTR	95’/215’	243	397	243	397	241	395
SBL	50’	79	111	79	111	80	111
SBTR	435’	349	144	349	144	349	141

† 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.

* Intersection sign configuration not allowed in HCM analysis. Ranges for the queues are presented when all-way stop control results differ from two-way stop control results (northbound/southbound approaches free with TWSC analysis). Note a range is not shown for the southbound approach, as this approach has no sign control.

Safety Analysis

Crash data at the study intersections were obtained from DDOT and are included in Appendix G. The information provided by DDOT included the total number of crashes over the latest three years of available data (i.e. 2013, 2014, and 2015) at each intersection and was further categorized by type of crash. As shown in Table 7, the crash rate at the Brandywine Street/42nd Street intersection is 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)
Chesapeake Street/Wisconsin Avenue	One-way Stop	7	19,900	0.32
Chesapeake Street/42nd Street*	All way Stop	0	4,990	0
River Road/42nd Street	Signal	5	8,750	0.52
Brandywine Street/42nd Street	Two way Stop	6	5,090	1.08
Brandywine Street/River Road	Three way Stop	5	5,580	0.82
Brandywine Street/Wisconsin Avenue	Signal	22	24,780	0.81

* No crashes reported for the years 2013 – 2015.

Brandywine Street/42nd Street

A review of the crash types at the Brandywine Street/42nd Street intersection reveals that the majority of the crashes at the intersection were parked car collisions (50 percent). Left turn collisions and collisons while backing made up 17 percent of collisions at the intersection. One crash involved a bicycle.

A review of the crash data at this intersection reveals the majority of collisions (83 percent) occurred during the daytime. Half of the collisions (50 percent) also occurred under clear weather conditions. Given this information and the number of parked car collisions, it is possible the on-street parking provided in this area narrows the roadway and is a contributing factor to collisions. More information regarding the direction of travel would be required to make recommendations to improve safety.

FUTURE BACKGROUND CONDITIONS

Traffic Volumes

Overview

In order to forecast year 2020 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

In order to account for potential increases in traffic, a regional growth rate was applied to existing traffic volumes. DDOT's historical average daily traffic (ADT) volume maps were examined to determine an appropriate growth rate for the study area. The historical ADTs indicate that traffic volumes in the study area generally have decreased. Therefore, at DDOT's request, no background growth was applied.

Pipeline Developments

While the Georgetown Day School Planned Unit Development is within the study area of the site, the project has not yet been approved and is not expected to be delivered prior to the opening of this development. No other developments were identified during the scoping process to be considered as part of the background traffic growth for the 2020 study year. Therefore, the 2020 background traffic forecasts are the same as the 2016 existing traffic volumes that are included on Figure 6. Likewise, background capacity analyses and background queue analyses are consistent with existing conditions.

SITE ANALYSIS

Overview

The subject site is located on Square 1732, Lots 45 and 49 in Ward 3, which is in northwest quadrant of Washington, DC. The site is zoned MU-4 and the site is currently occupied by buildings providing a total of approximately 41,900 SF of office, approximately 13,000 SF of retail, and three residential units.

The proposed multi story mixed-use redevelopment would include approximately 136 residential units and approximately 10,500 SF of ground floor retail space.

Site Access

Vehicular access to the below-grade and at-grade parking area will be provided via the public alley system to west side of the site. The public alley will also provide access to the site's loading facilities. Trucks and service vehicles will enter the public alley from Chesapeake Street or Brandywine Street front-first and will then back into the loading berth or the service/delivery space. Trucks will then exit the loading area via the public alley onto Chesapeake Street or Brandywine Street front-first.

Pedestrians can access the residential lobby and ground floor retail via the Wisconsin Avenue sidewalk. Bicycles can access secure bicycle storage and parking via the public alley.

Trip Generation Analysis

Overview

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 net new trips anticipated to be generated by the proposed redevelopment was estimated based on ITE's Trip Generation Manual.[viii] To estimate the number of trips currently generated by the site, Land Use Code (LUC) 710 (Office), LUC 220 (Apartment), and LUC 820 (Retail) were used with the occupied square footage for the office and retail uses and the number of occupied residential units as the independent variables.

To estimate the number of trips anticipated to be generated by the new uses on site, LUC 220 (Apartment) and LUC 820 (Retail) were used with the proposed number of dwelling units and anticipated square footage as the independent variables, respectively.

The trip generation for the proposed development is summarized in Table 8. As shown, the proposed development would generate 2 net ***total*** AM peak hour trips and 16 net ***total*** PM peak hour trips based on standard ITE rates/equations.

Table 8
Site Trip Generation Summary

Land Use		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	*Total*
Existing Development							
33,300 SF of occupied Office (LUC 710)	Total Trips	70	9	79	20	96	116
	Non-auto Trips	*28*	*4*	*32*	*8*	*38*	*46*
	Transit	*21*	*3*	*24*	*6*	*29*	*35*
	Bicycle	*3*	*0*	*3*	*1*	*4*	*5*
	Pedestrian	*4*	*1*	*5*	*1*	*6*	*7*
	Vehicle Trips	42	5	47	12	58	70
3 DU of occupied Apartment (LUC 220)	Total Trips	1	4	5	12	7	19
	Non-auto Trips	*1*	*2*	*3*	*7*	*4*	*11*
	Transit	*1*	*2*	*3*	*5*	*3*	*8*
	Bicycle	*0*	*0*	*0*	*1*	*0*	*1*
	Pedestrian	*0*	*0*	*0*	*1*	*1*	*2*
	Vehicle Trips	0	2	2	5	3	8
6,147 SF of occupied Retail (LUC 820)	Total Trips	17	11	28	44	48	92
	Non-auto Trips	*9*	*6*	*5*	*24*	*26*	*50*
	Transit	*7*	*4*	*11*	*18*	*19*	*37*
	Bicycle	*1*	*1*	*2*	*2*	*2*	*4*
	Pedestrian	*1*	*1*	*2*	*4*	*5*	*9*
	Vehicle Trips	8	5	13	20	22	42

Table 8 (Continued)
Site Trip Generation Summary

Land Use		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	*Total*
Proposed Development							
136 DU Apartment (LUC 220)	Total Trips	14	56	70	60	32	92
	Non-auto Trips	*8*	*31*	*39*	*33*	*18*	*51*
	Transit	6	22	28	24	13	37
	Bicycle	*1*	*3*	*4*	*3*	*2*	*5*
	Pedestrian	*1*	*6*	*7*	*6*	*3*	*9*
	Vehicle Trips	6	25	31	27	14	41
10,500 SF Retail (LUC 820)	Total Trips	24	15	39	63	69	132
	Non-auto Trips	*13*	*8*	*21*	*35*	*38*	*73*
	Transit	10	6	16	25	28	53
	Bicycle	*1*	*0*	*1*	*3*	*3*	*6*
	Pedestrian	*2*	*2*	*4*	*6*	*7*	*13*
	Vehicle Trips	11	7	18	28	31	59
Net Trips							
Proposed - Existing	Total Trips	(49)	51	2	59	(43)	16
	Non-auto Trips	*(16)*	*29*	*13*	*36*	*(8)*	*28*
	Transit	(12)	21	9	25	(7)	18
	Bicycle	*(2)*	*2*	*0*	*3*	*(1)*	*2*
	Pedestrian	*(2)*	*6*	*4*	*7*	*(1)*	*6*
	Vehicle Trips	(33)	20	(13)	18	(38)	(20)

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 47 percent of residents in the vicinity of the site take public transportation, walk, or bike to work. Another six percent carpool and another nine percent stay home. Therefore, it is anticipated that the non-auto mode split for the proposed residential component would be 55 percent. As agreed by DDOT, the non-auto mode split for the retail component also was estimated to be 55 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. For the office use, the non-auto mode split was based on 2005 WMATA Ridership equations and assumed to be 40 percent.

Based on these mode split estimates, the project is expected to generate 13 net AM peak hour trips and 28 net 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 US Census data and the 2005 WMATA Ridership Survey.[ix]

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 Manual[x] 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. As such, the results of the analysis should be considered conservative.

Net Vehicle Trips

Taking into account the non-auto mode share, the proposed development would generate an estimated 13 fewer AM peak hour vehicular trips and 20 fewer PM peak hour vehicular trips, as shown on Table 8.

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 existing office trips were removed from the network based on the distribution of existing counts, assuming the vast majority of office trips are routed via Wisconsin Avenue. The trip distributions shown in Table 9 were applied to the new residential and retail vehicle trips generated by the proposed development.

Removed office site trips are shown on Figure 9, new residential site trips are shown on Figure 10, and new retail site trips are shown on Figure 11. The resulting total site trips for the proposed development are shown on Figure 12.

Table 9
Site Trip Distributions

Roadway	Direction	Residential	Retail
Wisconsin Avenue	North	20%	30%
	South	45%	35%
42nd Street	North	10%	10%
	South	10%	10%
River Road	East	0%	0%
	West	15%	10%
Brandywine Street	East	0%	0%
	West	0%	5%

Proposed Parking

Vehicular Parking

Based on parking requirements prescribed in ZR16, a minimum of 27 parking spaces are required for the proposed development (including the 50 percent reduction allowed within ½ mile of a metro station). A summary of the parking required and provided for each land use is provided in Table 10. As shown in Table 10, the Applicant is not seeking relief from the minimum parking requirements nor is the Applicant providing "excess parking" as defined in ZR16.

Table 10
Parking Summary

Land Use	Required Parking	Proposed Parking
Residential	1 per 3 units (in excess of four units) = (136-4)/3 **44 spaces**	**58 spaces**
Retail	1.33 per 1,000 SF in excess of 3,000 SF = 1.33*(10,500-3,000)/1,000 **10 spaces**	**16 spaces**
Total	50% reduction within ½ mile of Metrorail = (44 + 10)/2 **27 spaces**	**74 spaces**

Bicycle Parking

The development would also be required to provide long-term and short-term bicycle parking. Long-term bicycle parking is intended for use by employees and residents and must be located on the first level below grade or on the ground floor of each building. Short-term bicycle parking is intended for use by visitors to the site and should be located in public space with input from DDOT during the public space process. The required bicycle parking for the development is summarized in Table 11 below.

Long-term bicycle parking for the residential use is located on the first floor of the garage in two separate bike storage rooms. Long-term bicycle parking for the retail use is also located on the first floor of the garage, adjacent to the retail elelevator vestibule.

Table 11
Bicycle Parking Summary

Land Use	Required Parking		Proposed Parking	
	Long-term	Short-term	Long-term	Short-term
Residential	136 units 1 per 3 units = **45 long-term**	136 units 1 per 20 units = **7 short-term**	**78 long-term**	**7 short-term**
Retail	10,500 SF 1 per 10,000 SF = **1 long-term**	10,500 SF 1 per 3,500 SF = **3 short-term**	**4 long-term**	**3 short-term**
Total	**46 long-term**	**10 short-term**	**82 long-term**	**10 short-term†**

† The exact number and location of short-term bicycle parking spaces will be finalized through the public space process.

Proposed Loading

The loading requirements for the proposed redevelopment are prescribed by the ZR16 and are summarized in Table 12.

The loading facilities are planned along the western edge of the site on the ground level and can be accessed via the public alley system west of the site. Based on the proposed design, trucks can enter and exit the alley system front first. The current development plans show one 30' berth to serve the site. Also as proposed, one 20-foot service/delivery space would be provided. The Applicant is not seeking relief from the loading requirements. Diagrams showing the truck maneuvers in and out of the alley and loading areas are included in Appendix H.

Table 12
Loading Summary

Land Use	Required
Residential	≥ 50 units 1 berth 1 service/delivery
Retail	5,000 to 20,000 SF 1 berth
Total*	1 berth 1 service/delivery
* Note when two or more uses in different categories share a building, the building is only required to provide enough berths and spaces to meet the requirement for the use category with the highest requirement.	

TOTAL FUTURE CONDITIONS

Traffic Forecasts

Total future traffic forecasts with the proposed redevelopment were determined by combining the existing volumes shown on Figure 6 with the site traffic volumes shown on Figure 12 to yield the 2020 total future traffic forecasts shown on Figure 13.

Capacity Analysis

Capacity analyses were performed at the study intersections using the lane use and traffic controls shown on Figure 8, the total future peak hour traffic forecasts shown on Figure 13, and existing signal timings.

The level of service results for the 2020 total future conditions with the proposed redevelopment are included in Appendix I and summarized in Table 5.
By comparing total future levels of service to background levels of service, the impact of the proposed development can be identified. In accordance with the methodology outlined during the scoping process, an impact is defined as follows:

- Degradation in approach or overall level of service to LOS E or LOS F or
- Increase in overall intersection delay by more than five seconds when compared to background conditions for intersections operating at an overall LOS E or LOS F under background conditions.

As shown in Table 5, where overall intersection levels of service under background conditions are projected to be a LOS D or better, overall intersection levels of service under total future conditions with the proposed redevelopment also are projected to be at a LOS D or better. Therefore, the proposed redevelopment is not projected to have any LOS impacts.

Queue Analysis

A queue analysis was conducted for 2020 total future conditions. Synchro was used to conduct the analyses, using the 95th percentile queue lengths. The results are summarized in Table 6 and queue reports are provided in Appendix I.

By comparing total future queues to background queues, the impact of the proposed development can be identified. In accordance with the methodology outlined during the scoping process, an impact is defined as an increase in the 95th percentile queue greater than 150 feet when compared to background conditions. As shown in Table 6, no queues would increase by more than 150 feet and the proposed redevelopment is not projected to have any queueing impacts.

TRANSPORTATION DEMAND MANAGEMENT

Traffic and parking congestion can be solved in one of two ways: 1) increase supply or 2) decrease demand. Increasing supply requires building new roads, widening existing roads, building more parking spaces, or operating additional transit service. These solutions are often infeasible in constrained conditions in urban environments and, where feasible, can be expensive, time consuming, and in many instances, unacceptable to businesses, government agencies, and/or the general public. The demand for travel and parking can be influenced by Transportation Demand Management (TDM) plans implemented by those in the private sector. Typical TDM measures include incentives to use transit or other non-auto modes of transportation, bicycle and pedestrian amenities, parking management, alternative work schedules, telecommuting, and better management of existing resources. TDM plans are most effective when tailored to a specific project or user group.

TDM measures have proven to be effective in reducing vehicle travel and parking demand. As indicated in Arlington County's Residential Building Performance Monitoring Study, vehicle ownership and vehicle travel has decreased in residential projects where TDM measures were employed and where transit is prevalent.[xi] Additionally, Wells + Associates' own experience in the Washington, DC metropolitan area shows that TDM plans reduce the number of vehicle trips generated by developments with TDM plans.

While the location of the proposed redevelopment adjacent to the Tenleytown-AU Metrorail Station, five Metrobus routes, and other transportation options will naturally encourage the use of non-auto modes of transportation, the Applicant also has developed a TDM plan with strategies to reduce the number of vehicles at the proposed project. Specific TDM measures for the residential component would include:

1. A member of the property management team will be designated as the Transportation Management Coordinator (TMC). The TMC will be responsible for ensuring that information is disseminated to tenants of the building. The position may be part of other duties assigned to the individual.

2. The property management website will include information on and/or links to current transportation programs and services, such as:
   - Capital Bikeshare,
   - Car-sharing services,
   - Uber,
   - Ridescout,
   - Commuter Connections Rideshare Program, which provides complimentary information on a variety of commuter programs to assist in determining which commuting options work best for commuters,
   - Commuter Connections Guaranteed Ride Home, which provides commuters who regularly (twice a week) carpool, vanpool, bike, walk or take transit to work with a free and reliable ride home in an emergency, and
   - Commuter Connections Pools Program, which incentivizes commuters who currently drive alone to carpool. Participants can earn money for carpooling to work and must complete surveys and log information about their experience.
3. An electronic display will be provided in a common, shared space in the building and will provide public transit information such as nearby Metrorail stations and schedules, Metrobus stops and schedules, car-sharing locations, and nearby Capital BikeShare locations indicating the number of bicycles available at each location.
4. Convenient and covered secure bike parking facilities will be provided in excess of the minimum required by ZR16.

Specific TDM measures for the retail component would include:

1. Convenient and covered bike parking facilities will be provided in excess of the minimum required by ZR16.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

1. The subject site is well served by a high-quality multi-modal transportation system that includes: a corridor of arterial, collector, and local streets; a connected network of sidewalks and pedestrian facilities; the Tenleytown-AU Metrorail station; multiple bus lines; and bicycle facilities.
2. The proposed development will include approximately 136 residential dwelling units and 10,500 SF of retail space. The proposed redevelopment is anticipated to generate 13 fewer AM peak hour vehicle trips and 20 fewer PM peak hour vehicle trips than the current uses on site.
3. Vehicular access to the site parking and loading facilities is proposed via the existing alley network to the west of the site.
4. Approximately 58 residential parking spaces and 16 retail parking spaces are proposed with the redevelopment.
5. As one 30-foot loading berth and a service/delivery space will be provided, the Applicant is not seeking relief from the loading requirements.
6. Long-term bicycle parking, including bicycle storage rooms, will be provided on the first floor of the garage. Approximately 78 spaces will be available for the residential use and four spaces will be available for the retail use. Approximately 10 short-term bicycle spaces will be provided. The exact number and locations of short-term bicycle parking spaces will be determined through the public space process.
7. While the proposed redevelopment is not projected to create any LOS or queueing impacts, the Applicant will still implement a Transportation Demand Management Plan to encourage the use of non-auto modes of transportation.

REFERENCES

[i] Wisconsin Avenue Corrridor Transportation Study, District Department of Transportation, October 2005, [https://comp.ddot.dc.gov/Documents/Wisconsin%20Ave%20Corridor%20Transportation%20Study.pdf]

[ii] Tenleytown-AU Metrorail Station Access Improvements Study, District Department of Transportation and WMATA, March 2014, [https://www.wmata.com/pdfs/planning/Tenleytown_Station_Access_Final_Report_041414.pdf]

[iii] District of Columbia Pedestrian Master Plan, District Department of Transportation, April 2009, [http://ddot.dc.gov/page/pedestrian-master-plan-2009].

[iv] Rock Creek West II Livability Study, District Department of Transportation, February 2011, [https://comp.ddot.dc.gov/Documents/Rock%20Creek%20West%202%20Livability%20Study.pdf]

[v] District of Columbia Bicycle Master Plan, District Department of Transportation, April 2005, [http://ddot.dc.gov/DC/DDOT/On+Your+Street/Bicycles+and+Pedestrians/Bicycles/Bicycle+Master+Plan/DC+Bicycle+Master+Plan+-+April+2005].

[vi] Ibid.

[vii] District of Columbia Capital Bikeshare Development Plan, Foursquare Integrated Transportation Planning, September 2015.

[viii] Trip Generation Manual, 9th Edition, Volumes 2 and 3, Institute of Transportation Engineers, Washington, DC, 2012.

[ix] 2005 Development-Related Ridership Survey, Washington Metropolitan Area Transit Authority, Washington, DC, March 2006.

[x] Trip Generation Manual, 9th Edition, Volumes 2 and 3, Institute of Transportation Engineers, Washington, DC, 2012.

[xi] Residential Building Performance Monitoring Study, Arlington County Commuter Services, September 2013.

FIGURES

4620 Wisconsin Avenue

Figure 1
Site Location

4620 Wisconsin Avenue
Washington, DC

Source: The UIP Companies
Date: Received 10/24/2016

Figure 2
Site Plan

4620 Wisconsin Avenue
Washington, DC

NORTH

The number of cars at any given location change frequently. These numbers are accurate as of 10/26/16.

* In addition to the car sharing services shown, Car2Go has 500 cars in the District. Since Car2Go vehicles can be returned to any legal on-street parking space in the District or certain parking garages that are Car2Go approved, their locations could not be shown on this map.

Figure 3
Multi-Modal Transportation Options

4620 Wisconsin Avenue
Washington, DC

XX Metrobus Route
XX MetroExtra Route
M Tenleytown-AU Metrorail Station (Red Line)
Bus Stop

Capital Bikeshare Locations (Number of Docks)
Zipcar Locations (Number of Zipcars)
Enterprise Car Share (Number of Cars)

NORTH

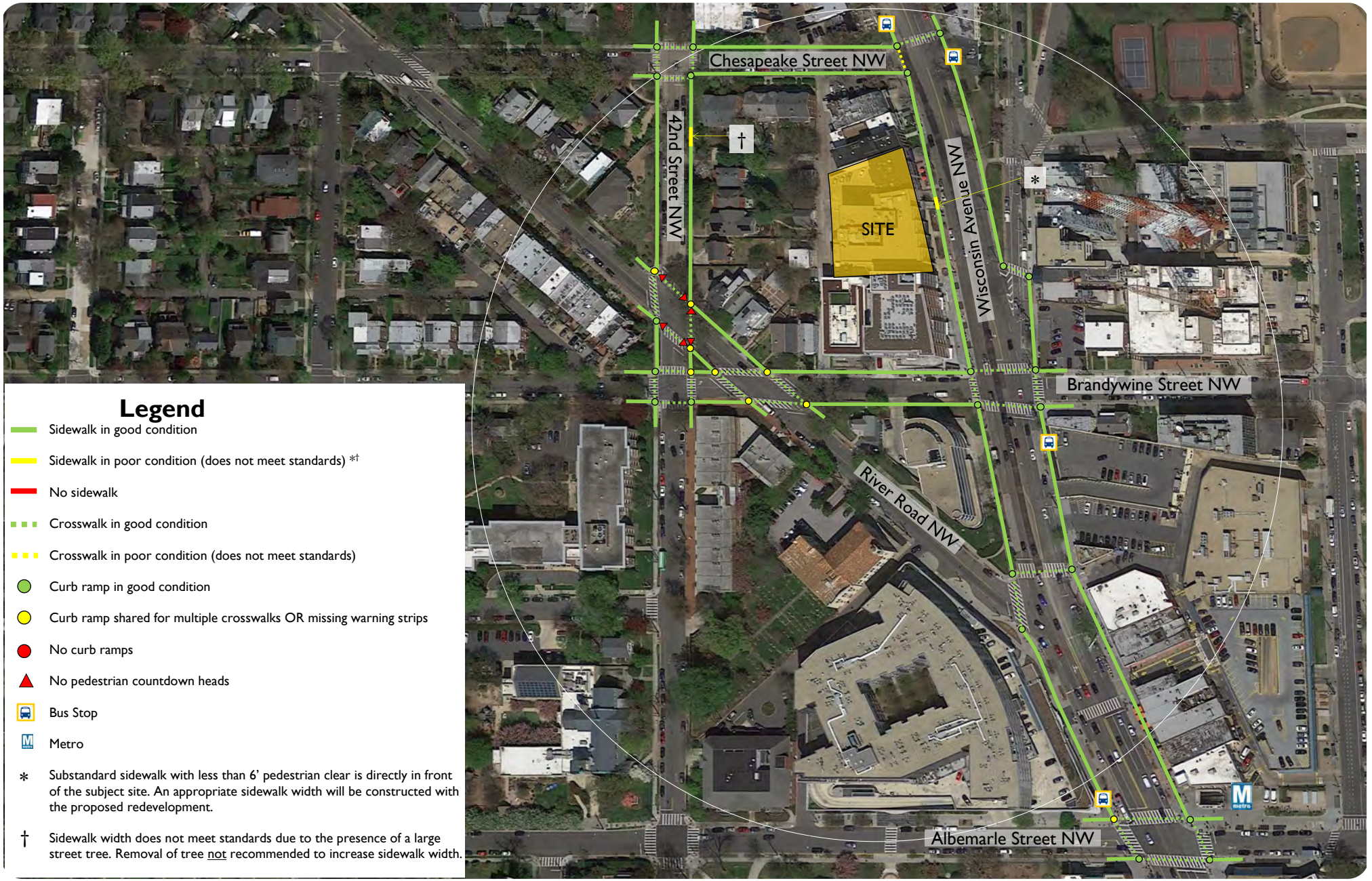

Figure 4A
Qualitative Pedestrian Analysis

4620 Wisconsin Avenue
Washington, DC

NORTH

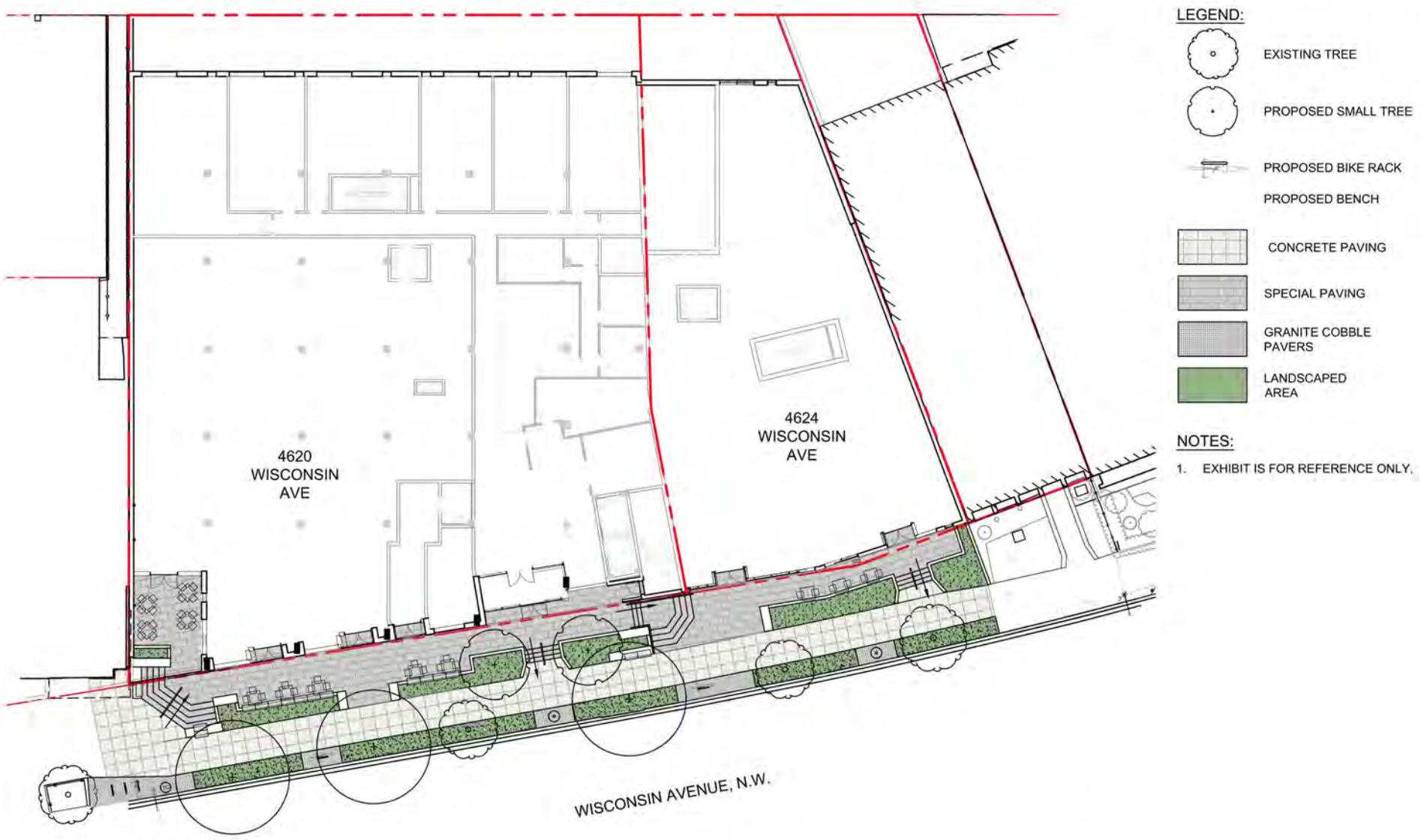

Figure 4B
Streetscape Concept Plan

4620 Wisconsin Avenue
Washington, DC

Source: WMC
Date: 10/05/2016

NORTH

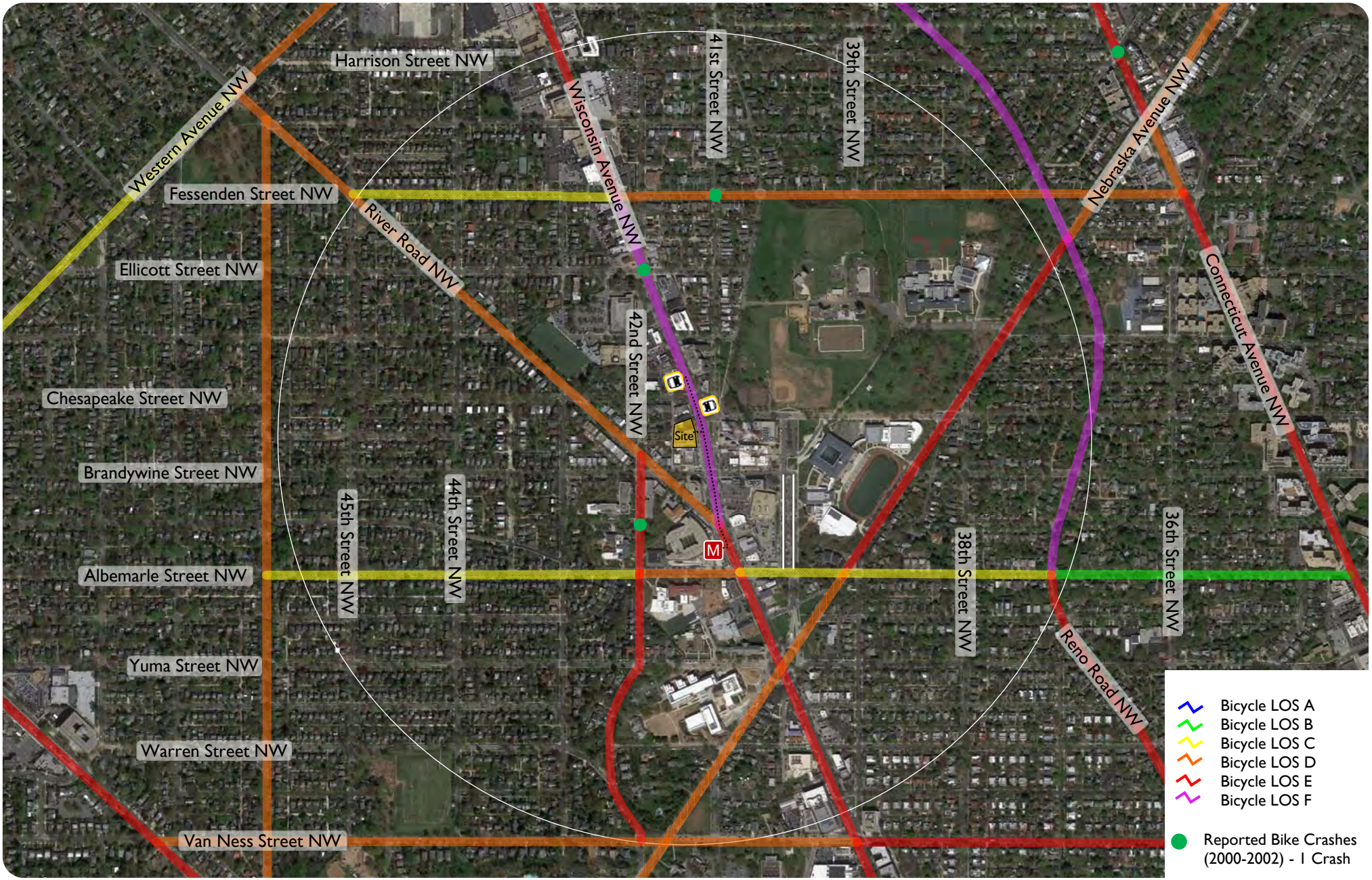

Figure 5
One Half Mile Bike Shed

4620 Wisconsin Avenue
Washington, DC

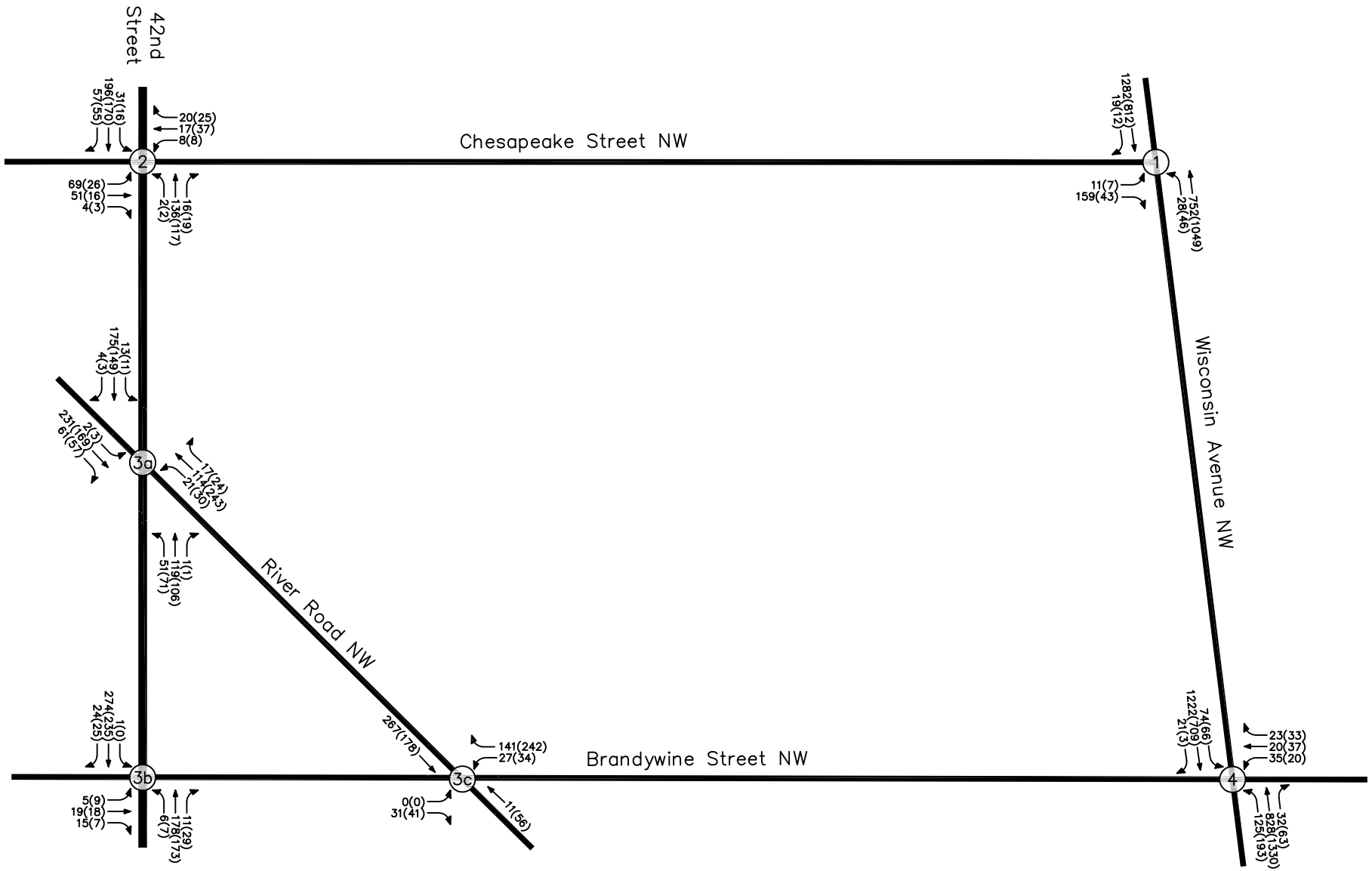

Figure 6
Existing Vehicular Peak Hour Traffic Volumes

4620 Wisconsin Avenue NW
Washington, DC

AM Peak Hour
PM Peak Hour
000(000)

NORTH

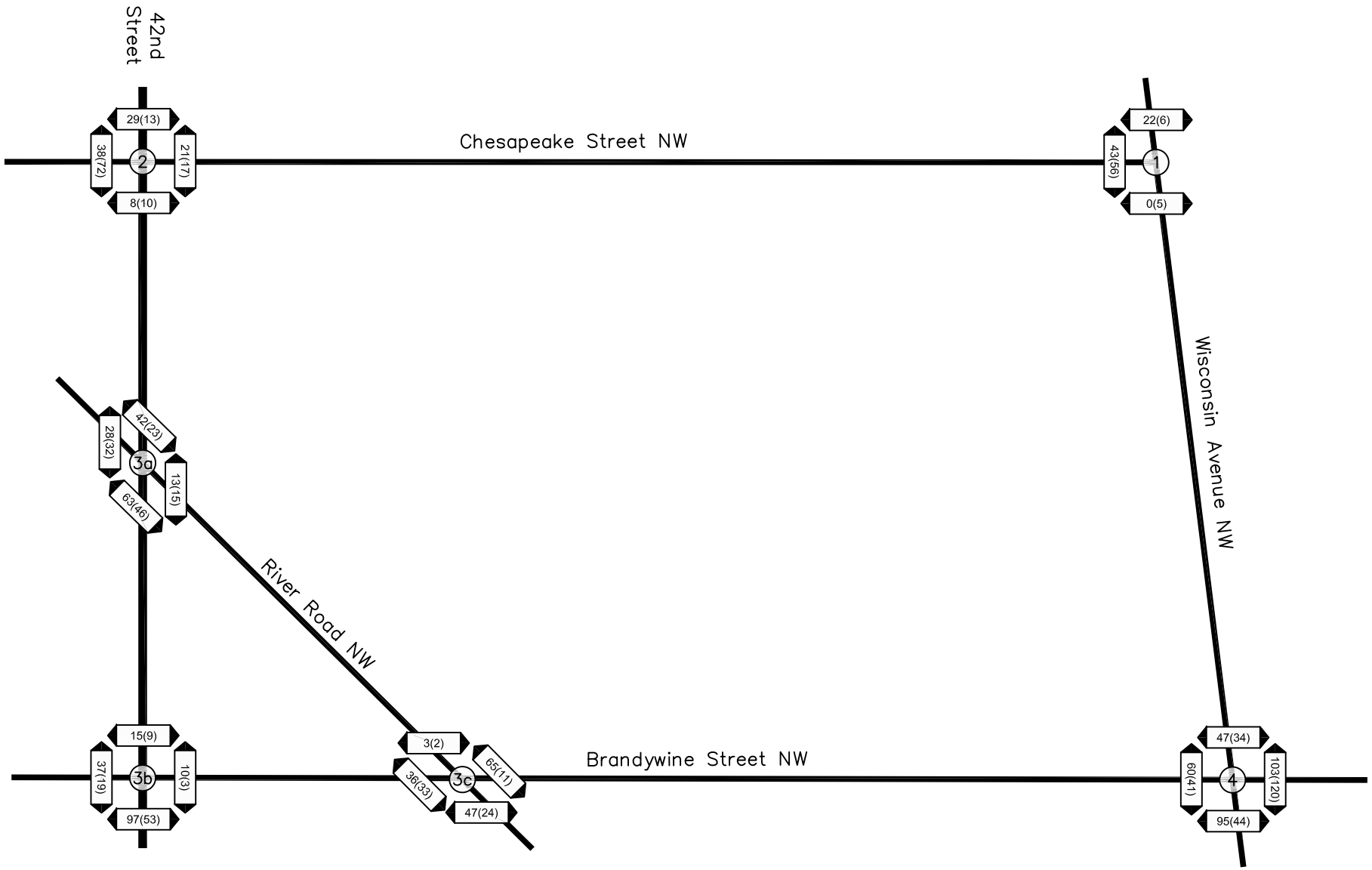

Figure 7
Existing Pedestrian Volumes

4620 Wisconsin Avenue NW
Washington, DC

AM Peak Hour
PM Peak Hour
000(000)

NORTH

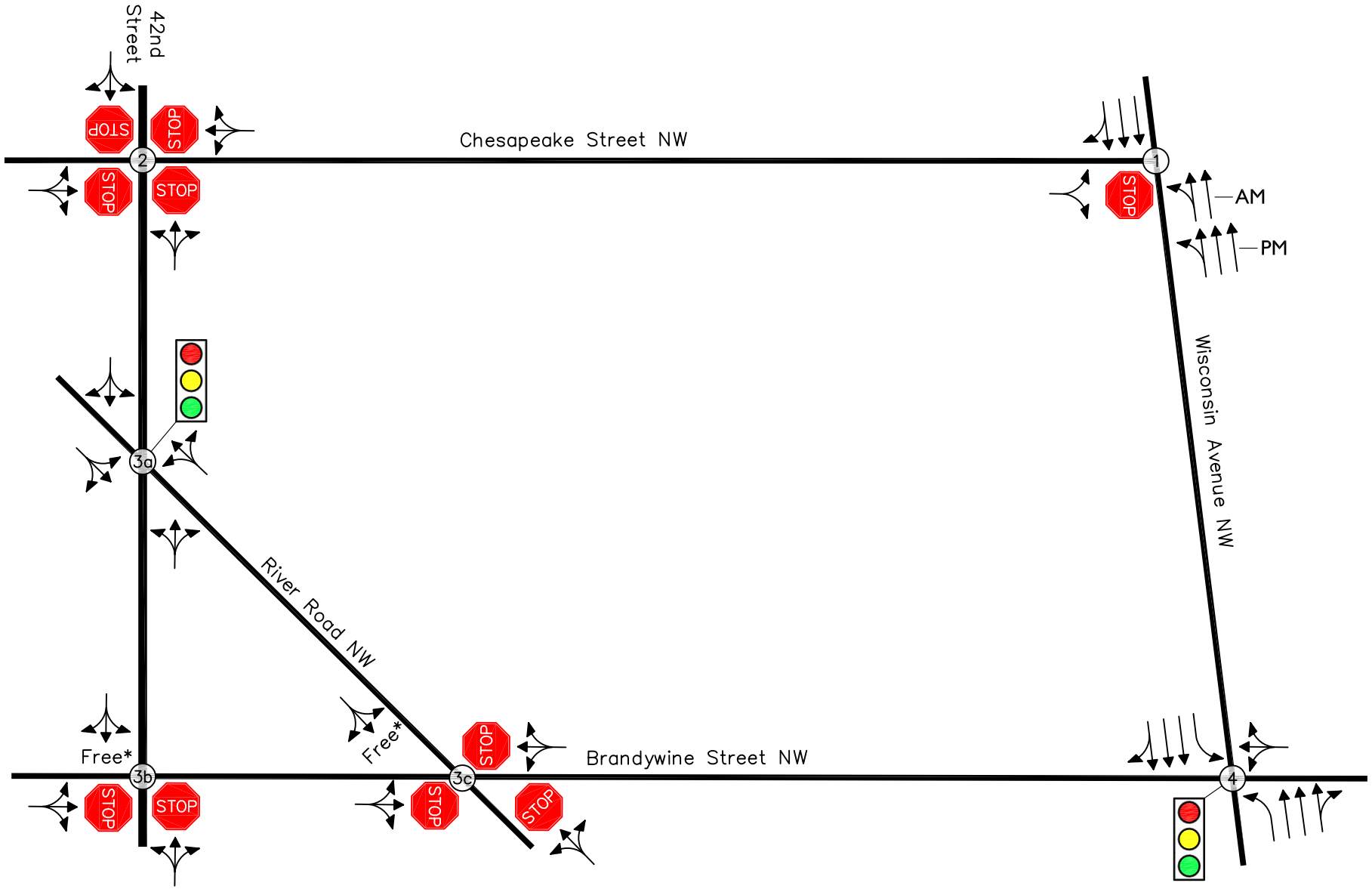

Figure 8
Existing Lane Use and Traffic Control

4620 Wisconsin Avenue NW
Washington, DC

*Intersection signal control not allowed for HCM analysis.
Southbound approach modeled as yield control.

← Represents One Travel Lane
Signalized Intersection
STOP Stop Sign

NORTH

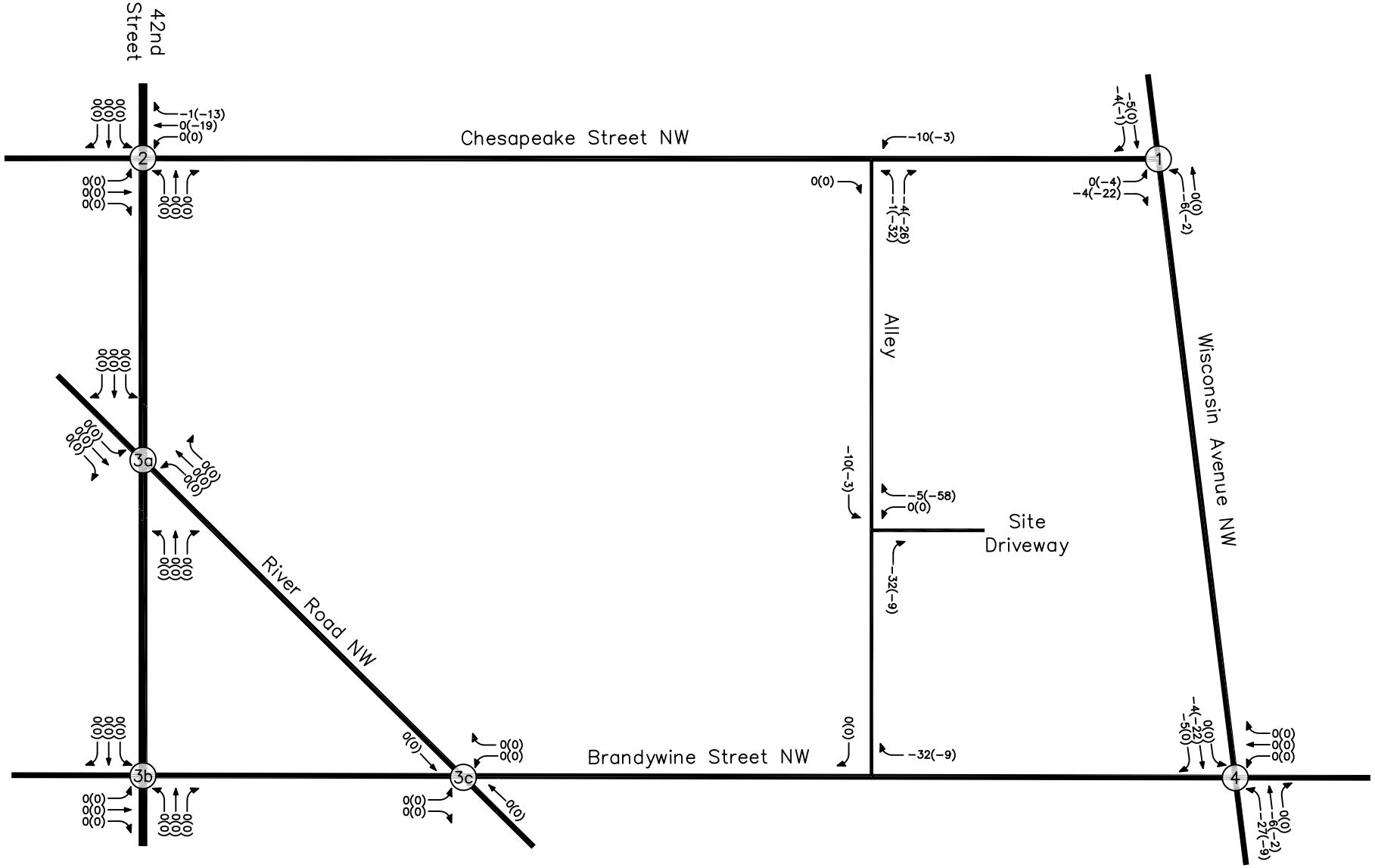

Figure 9
Removed Office Site Trips

4620 Wisconsin Avenue NW
Washington, DC

AM Peak Hour
PM Peak Hour
000(000)

NORTH

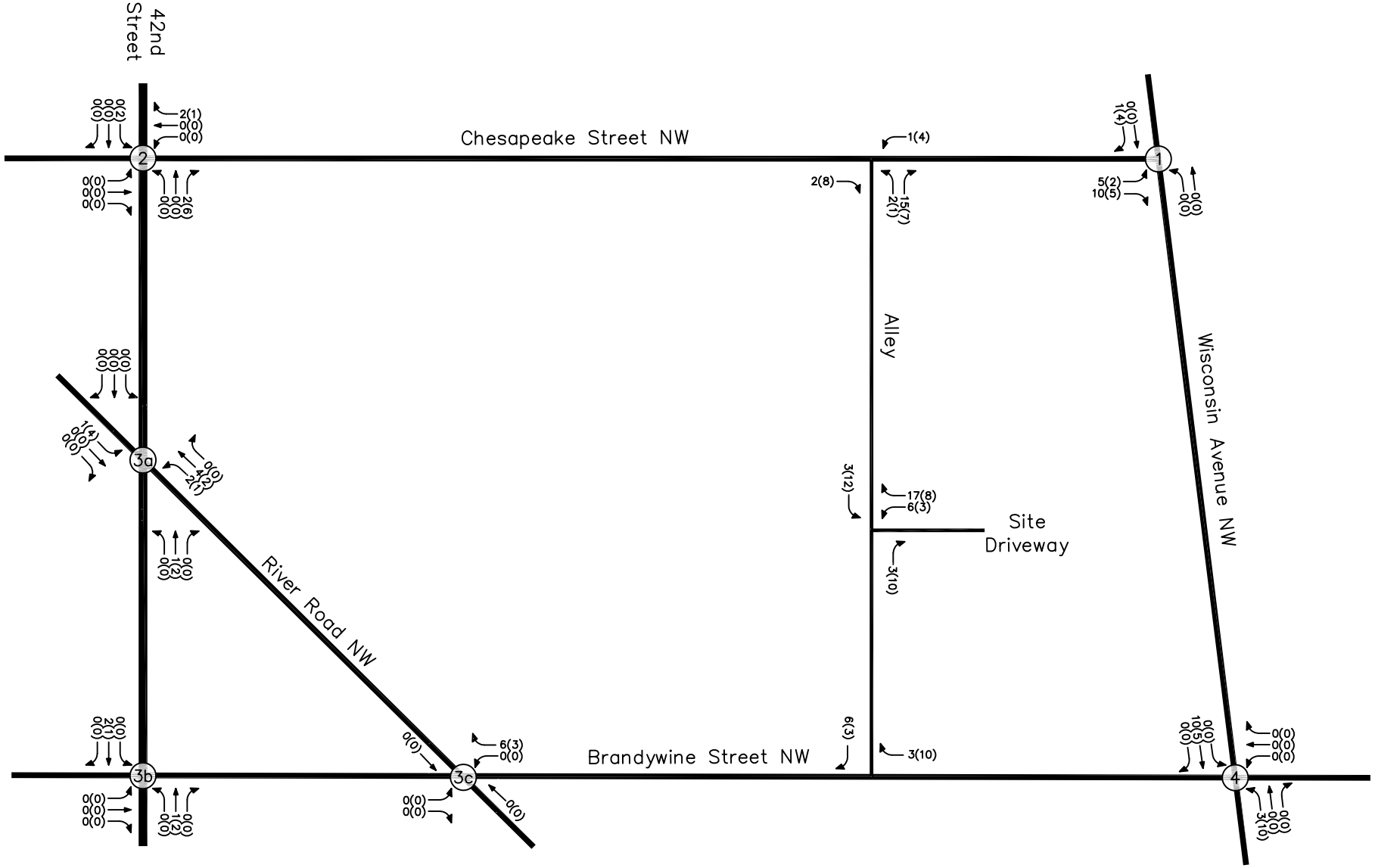

Figure 10
New Residential Site Trips

4620 Wisconsin Avenue NW
Washington, DC

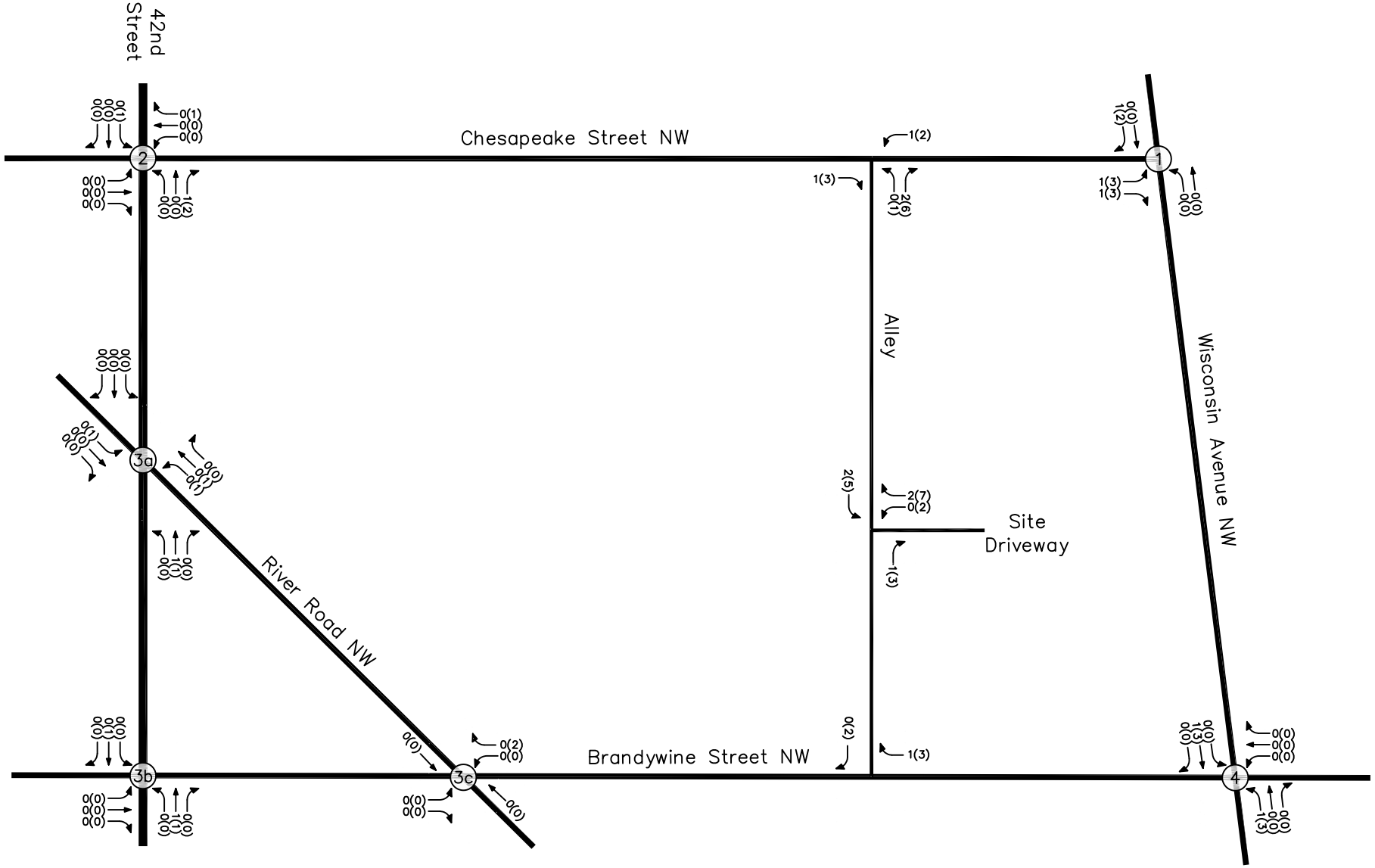

Figure 11
New Retail Site Trips

4620 Wisconsin Avenue NW
Washington, DC

AM Peak Hour
PM Peak Hour
000(000)

NORTH

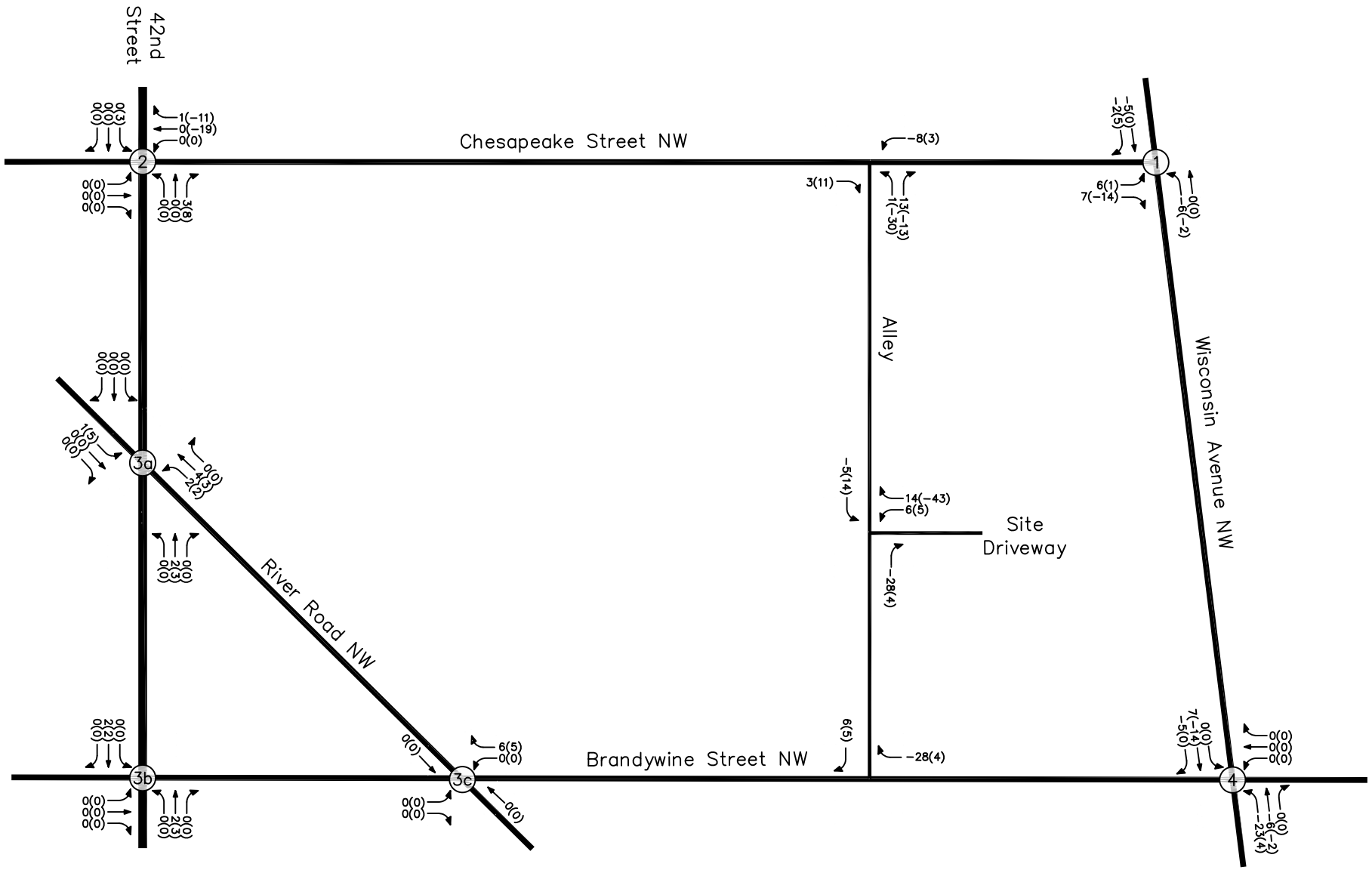

Figure 12
Total Site Trips

4620 Wisconsin Avenue NW
Washington, DC

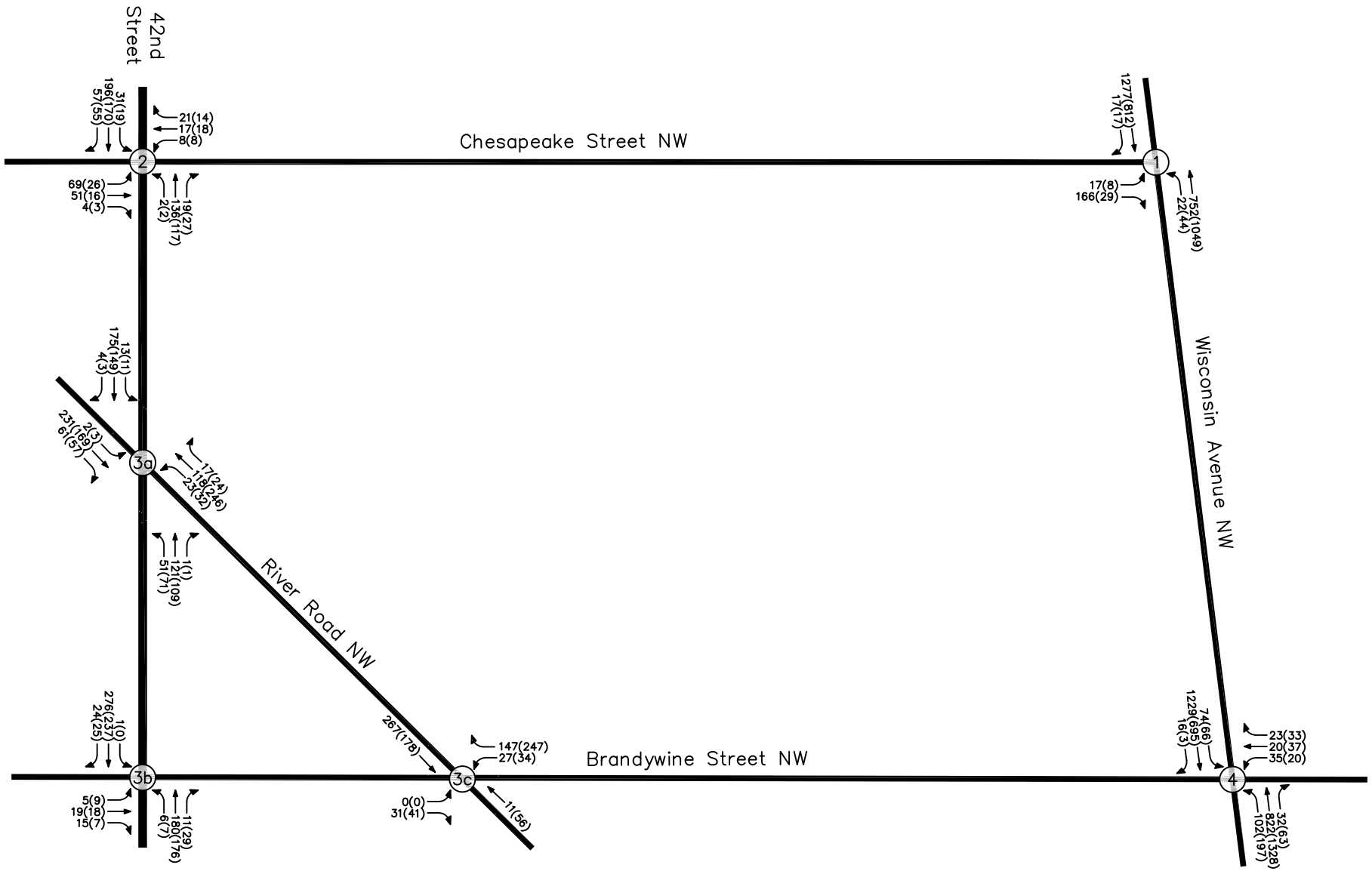

Figure 13
2020 Total Future Traffic Forecasts

4620 Wisconsin Avenue NW
Washington, DC

AM Peak Hour
PM Peak Hour
000(000)

NORTH