Transportation Consultants
INNOVATION + SOLUTIONS

WELLS + ASSOCIATES

SIDWELL FRIENDS SCHOOL

Revised Comprehensive Transportation Review

February 2016

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

LIST OF APPENDICES

INTRODUCTION

Overview

This revised report presents a Comprehensive Transportation Review (CTR) conducted in conjunction with the proposal by Sidwell Friends School (herein referred to as the Applicant, Sidwell, or the School) to relocate its Lower School located at 5112 Edgemoor Lane in Bethesda, Maryland, to its Upper/Middle School campus located at 3825 Wisconsin Avenue in northwest Washington, DC. The report has been revised to address comments from the District Department of Transportation (DDOT) dated January 20th and Januray 27th, 2016. The proposed site for the Lower School currently is occupied by the Washington Home and is zoned R-1-B. The 5.7-acre site is bounded by the Friendship Post Office to the west, 37th Street to the east, the existing Sidwell Friends Upper/Middle School campus to the south, and Upton Street to the north. The site location is shown on Figure 1.

To relocate the Lower School and unify it with the Upper/Middle School campus, the Applicant proposes to renovate the existing Washington Home, demo two existing buildings on the Upper/Middle School campus to create a new central landscape, construct a new gym at the Lower School, and build a new addition at the Lower School to link the Upper, Middle, and Lower Schools. The resulting unification will allow the School to operate in a more efficient and coordinated manner. The proposed site plan is shown on Figure 2.

In conjunction with the relocation of the Lower School, Sidwell proposes to increase the cap at its Wisconsin Avenue campus from the current cap of 850 students to 1,250 students. The increased cap would accommodate the 850 students currently enrolled at the Upper and Middle Schools, 300 students currently enrolled at the Lower School in Bethesda, and an increase of 100 students across the three divisions. The faculty/staff cap would be increased from 190 to 260. The increased cap would accommodate the 190 faculty/staff currently enrolled at the Upper/Middle School campus, the 50 faculty/staff currently employed at the Lower School, and an increase of 20 additional faculty/staff members across the three divisions.

Two new drop-off/pick-up areas are proposed to serve the Sidwell Friends School campus. A drop-off/pick-up loop with queuing storage for approximately 21 vehicles is proposed at the existing Upper School tennis courts and would be accessed via existing curb cuts on Wisconsin Avenue. A Lower School drop-off/pick-up area with queueing storage for approximately 58 vehicles is proposed on the Washington Home site and would utilize existing curb cuts on Upton Street and 37th Street. No new curb cuts are proposed in conjunction with the redevelopment.

On the Upper School campus, an existing below-grade garage contains 307 parking spaces and an additional 21 surface spaces also currently serve the Upper School. Faculty/staff for

the Lower School will park in the below-grade garage when the Lower School is relocated. As such, only 20 parking spaces are proposed at the Lower School drop-off/pick-up area to serve as short-term/visitor parking. Access to the short-term/visitor parking would be provided via existing curb cut on Upton Street.

The purpose of this report is to:

- Evaluate existing traffic operational and safety conditions,
- Evaluate future traffic conditions without the proposed project,
- Evaluate future traffic conditions with the proposed project,
- Identify existing mode choice alternatives,
- Identify any traffic operational impacts associated with the proposed project,
- Evaluate the appropriateness of the proposed parking and drop-off/pick-up areas,
- Evaluate effectiveness of the proposed loading facilities, and
- Recommend transportation improvements (including roadway, operational, and demand management strategies) to mitigate the impact of the project 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 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. As depicted on Figure 3, the following intersections were identified for detailed analysis and agreed to by DDOT:

- Wisconsin Avenue/Warren Street,
- Wisconsin Avenue/39th Street,
- Wisconsin Avenue/Van Ness Street,
- Wisconsin Avenue/Upton Street,
- Wisconsin Avenue/Fannie Mae Driveway/Post Office Driveway/Sidwell Driveway,
- Wisconsin Avenue/Rodman Street/Sidwell Driveway,
- Wisconsin Avenue/Quebec Street,
- Wisconsin Avenue/Porter Street,
- Wisconsin Avenue/Idaho Avenue,
- 37th Street/Warren Street,
- 37th Street/Van Ness Street,
- 37th Street/Upton Street,
- 37th Street/Tilden Street/Washington Home Driveway,
- 37th Street/Quebec Street,
- 37th Street/Porter Street,
- 38th Street/Van Ness Street,
- 38th Street/Upton Street,
- Upton Street/Reno Road,
- Upton Street/Site Driveway, and
- Wisconsin Avenue/Service Driveway (Proposed Circle Driveway).

During the scoping process, the expected routing of vehicular trips was developed by loking at the student population distribution, area trip distributions, and network trip distributions. Those distributions are shown on Figures 4-6.

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.

Table 1
Roadway Segment Details

Roadway	Functional Classification	Average Daily Traffic* (vehicles per day)	Speed Limit (miles per hour)
Wisconsin Avenue	Principal Arterial	31,500	30
Warren Street	Local	N/A	25†
39th Street	Local	N/A	25†
Van Ness Street	Collector	3,700	25
Upton Street	Local	N/A	25
Rodman Street	Local	N/A	25†
Quebec Street	Local	N/A	25‡
Porter Street	Minor Arterial / Collector§	N/A	25†
Idaho Avenue	Local	N/A	25
37th Street	Local	N/A	25‡
Tilden Street	Local	8,200	25‡
38th Street	Local	N/A	25
Reno Road	Minor Arterial	9,500	25

* The ADT volume is based on DDOT historical traffic volume data collected in 2013, 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 traffic.
§ Porter Street is a minor arterial west of the study area and a collector east of the study area.

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 7. The subject site is just over ½ mile 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 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.							

The site also is within a ¼ mile radius of bus stops serving eight Metrobus routes (30N, 30S, 31, 33, 96, H3, H4, & X3).

The minimum, maximum, and average headways for the WMATA routes are provided in Table 3.

Table 3
Metrobus (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	0:30	0:27	0:31	0:25	0:07	0:30
Max	0:38	0:35	0:34	0;32	0:55	0:35
Avg	0:32	0:30	0:32	0:29	0:29	0:32
Wisconsin Avenue Line (31, 33)						
Min	0:10	0:08	0:04	0:05	0:08	0:08
Max	0:20	0:22	0:16	0:15	0:22	0:21
Avg	0:14	0:15	0:08	0:08	0:14	0:14
East Capitol St – Cardozo Line (96)						
Min	0:19	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	0:21	0:22	0:23	0:21
Crosstown Line (H2, H3, H4)						
Min	0:02	0:07	0:05	0:10	0:06	0:06
Max	0:16	0:18	0:18	0:16	0:16	0:14
Avg	0:08	0:15	0:10	0:12	0:14	0:09
Benning Road Line (X3)						
Min	0:20	N/A	N/A	N/A	N/A	0:36
Max	0:32	N/A	N/A	N/A	N/A	0:36
Avg	0:24	N/A	N/A	N/A	N/A	0:36

Pedestrian Facilities

The District of Columbia Pedestrian Master Plan[1] (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 call 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 made.

A summary of the pedestrian facilities at each of the study intersections is presented in Table 4. Pedestrian facilities and likely walking routes to the Metro Station and nearest bus stops within a ¼ mile of the site are shown on Figure 8. Figure 8 also shows pedestrian activity and deficiency according to the Pedestrian Master Plan.

Table 4
Pedestrian Inventory by Intersection

Intersection	Pedestrian Heads/ Countdown	Type of Crosswalks	One Ramp/ Crosswalk	Tactile Warning Strip
Wisconsin Avenue/Warren Street (Signalized)	Yes	All Legs – Standard	Yes	Yes
Wisconsin Avenue/39th Street (Unsignalized)	No	None	No Note 1	No Note 1
Wisconsin Avenue/Van Ness Street (Signalized)	Yes	All Legs – High Visibility	Yes	Yes
Wisconsin Avenue/Upton Street (Signalized)	Yes	All Legs – Standard	Yes	Yes
Wisconsin Avenue/ Fannie Mae Driveway/Post Office Driveway/Sidwell Driveway (Signalized)	Yes Note 2	North and South Legs– Standard Note 3	Yes Note 4	Yes Note 4
Wisconsin Avenue/ Rodman Street/Sidwell Driveway (Signalized)	Yes Note 5	North and South Legs – High Visibility East Leg – Standard Note 6	Yes Note 7	Yes Note 7

1. One ramp with tactile warning strips is present on the northeastern corner of the intersection.
2. Pedestrian heads are only in the direction of the northern and southern crosswalks.
3. Crosswalks are only along the northern and southern legs.
4. Tactile warning strips and ramps are only present on the northern and southern legs.
5. Pedestrian countdown heads are only present on the northern, southern, and western legs.
6. Crosswalks are only present on the northern, and southern, and western legs.
7. Tactile warning strips and ramps are only present on the northern, southern, and western legs.

Table 4 (continued)
Pedestrian Inventory by Intersection

Intersection	Pedestrian Heads/ Countdown	Type of Crosswalks	One Ramp/ Crosswalk	Tactile Warning Strip
Wisconsin Avenue/Quebec Street (Unsignalized)	No	West Legs – Standard Note 8	No	Yes Note 9
Wisconsin Avenue/Porter Street (Signalized)	Yes	All Legs – High Visibility	Yes	Yes
Wisconsin Avenue/Idaho Avenue (Signalized)	Yes	All Legs – High Visibility Note 10	Yes	Yes
37th Street/Warren Street (Unsignalized)	No	All Legs – Standard	Yes	No
37th Street/Van Ness Street (Unsignalized)	No	North and South Legs – Standard East and West Legs– High Visibility	Yes	No
37th Street/Upton Street (Unsignalized)	No	All Legs – High Visibility	Yes	Yes
37th Street/Tilden Street/ Washington Home Driveway (Unsignalized)	No	South and West Legs– High Visibility Note 11	Yes Note 12	Yes Note 12
37th Street/Quebec Street (Unsignalized)	No	North, South, and East Legs – High Visibility Note 13	Yes	Yes
37th Street/Porter Street (Unsignalized)	No	All Legs – High Visibility	Yes Note 14	Yes
38th Street/Van Ness Street (Unsignalized)	No	All Legs - Standard	Yes	No

8. Only the western leg has a crosswalk.
9. Tactile warning strips and ramps are only present on the western leg of the intersection.
10. The crosswalk on the eastern leg of the intersection is faded.
11. Crosswalks are only present along the southern and western legs of the intersection.
12. Tactile warning strips and ramps are only present on the southern and western legs.
13. Crosswalks are only present on the northern, southern, and eastern legs.
14. Only one ramp is present on the southeast corner of the intersection.

Table 4 (continued)
Pedestrian Inventory by Intersection

Intersection	Pedestrian Heads/ Countdown	Type of Crosswalks	One Ramp/ Crosswalk	Tactile Warning Strip
38th Street/Upton Street (Unsignalized)	No	East and West Legs – High Visibility South Leg – Standard	Yes	Yes
Upton Street/Reno Road (Unsignalized)	No	West Leg – High Visibility	Note 15	Yes Note 15
Upton Street/Site Driveway (Unsignalized)	No	None	N/A	N/A
Wisconsin Avenue/ Service Driveway – Proposed Circle Driveway (Unsignalized)	No	None	N/A	N/A
15. One ramp is present on the northwest corner and one ramp is present on the southwest corner.				

Bicycle Facilities

The District of Columbia Bicycle Master Plan[2] (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."[3] 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 one mile of the site are shown on Figure 9. Figure 9 also shows the BLOS for roadways in the study area and the reported bicycle crashes in the study area, per the Bicycle Plan.

No dedicated bicycle lanes exist in the vicinity of the subject site. East of 38th Street, sharrows are painted on the north and south sides of Van Ness Street.

Capital Bikeshare

Capital Bikeshare is an automated bicycle rental or bicycle sharing program that provides approximately 3,000 bicycles at 353 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), 30 days ($28), or one year ($85). 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 7, the closest Bikeshare station is located within ½ mile from the site at 39th Street/Veazey Street. This station includes 15 docks. Two additional Bikeshare stations are located roughly ½ mile from the site. One station at Wisconsin Avenue/Albemarle Street contains 15 docks and one station at Wisconsin Avenue/Newark Street includes 19 docks.

The District of Columbia Capital Bikeshare Development Plan[4] 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), 10/10 plan - $10 per month and receive $10 in free driving every month (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.

One Zipcar is located within ¼ mile of the site at 4200 Wisconsin Avenue, as shown on Figure 7. Two Zipcars are located just outside ¼ mile of the site at 3825 38th Street.

Car2Go requires a one-time $35 application fee. Once registered, a member card is issued, which enables members to access and 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 CONDITIONS ANALYSIS

Traffic Volumes

Existing vehicular turning movement, bicycle, and pedestrian counts were conducted on Thursday, May 21, 2015, from 7:00 AM to 10:00 AM and from 3:00 PM to 7:00 PM. Counts were also conducted on Wednesday, October 28, 2015 and Thursday, October 29, 2015 from 7:00 AM to 10:00 AM and from 3:00 PM to 7:00 PM. Following the receipt of scoping comments from DDOT, five intersections were added to the study area and those counts were conducted on Wednesday, November 18, 2015 from 7:00 AM to 10:00 AM and from 3:00 PM to 7:00 PM.

For purposes of volume balancing, common peak hours were selected for the study area. No volume adjustments were necessary as there were no significant volume imbalances between count dates. For analysis purposes, AM, PM School, and PM Commuter peak hours for each of the study intersections were determined individually to provide the most conservative peak hour analysis, per standard DDOT practice. The AM Peak hour for determining individual peak hours was assumed to be between 7:00 AM and 10:00 AM in order to capture the peak school traffic and peak commuter traffic along Wisconsin Avenue (note that the highest volume of traffic generated by the school in the morning generally coincides with the highest volume of commuter traffic in the morning). Since the highest volume of afternoon traffic generated by the school occurs well before the PM commuter peak hour, two PM peak hour analyses were conducted. The PM School Peak hour was assumed to occur between 3:00 PM and 5:00 PM. Since dismissals occur at 3:15 and 3:30, this time period captured peak school traffic, but not the majority of commuter traffic. The PM Commuter Peak period was assumed to occur between 4:00 PM and 7:00 PM, consistent with standard practice in the District.

Existing vehicular peak hour traffic volumes are shown on Figure 10. Pedestrian volumes are shown on Figure 11. 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 12, existing traffic volumes shown on Figure 10, existing pedestrian volumes shown on Figure 11, and existing 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, three of the signalized study intersections and one of the unsignalized study intersections operate at an overall level of service E or F. The following is a summary of the various intersections that currently operate at an overall LOS E or LOS F:

- Wisconsin Avenue/Upton Street – LOS F during the AM and PM School peak hours;
- Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway – LOS F during the PM School peak hour and LOS E during the PM Commuter peak hour;
- Wisconsin Avenue/Rodman Street/Sidwell Driveway – LOS F during the AM peak hour; and
- 37th Street/Van Ness Street (Unsignalized) – LOS F during the PM Commuter peak hour.

Table 5
Level of Service Summary

Approach	Existing Conditions			Background Conditions		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street						
EBLTR	D	D	C	D	D	C
WBLTR	D	D	D	D	D	D
NBLTR	B	B	A	C	B	A
SBLT	A	A	A	A	A	A
SBR		A	A		A	A
Overall	**B**	**A**	**A**	**B**	**B**	**A**
2. Wisconsin Avenue/39th Street						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
3. Wisconsin Avenue/Van Ness Street						
EBL	D	D	E (57.4)	D	E (66.9)	E (72.7)
EBTR	D	D	D	E (57.0)	D	E (64.8)
WBL	D	D	D	E (68.1)	D	E (63.4)
WBTR	E (68.9)	F (95.2)	F (113.5)	F (82.4)	F (111.3)	F (135.1)
NBLTR	B	E (61.0)	B	B	F (90.7)	C
SBLTR	A	B	C	A	B	C
Overall	**C**	**D**	**C**	**C**	**E (63.7)**	**D**
4. Wisconsin Avenue/Upton Street						
EBLR	C	C	D	C	C	D
WBR	C	C	C	C	C	C
NBLT	F (317.2)	F (263.5)	D	F (385.2)	F (318.3)	E (69.7)
NBR	A	B		A	B	
SBTR	A	B	B	A	B	C
Overall	**F (144.3)**	**F (154.1)**	**D**	**F (175.5)**	**F (184.6)**	**D**
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway						
EBLTR	D	E (55.7)	E (57.7)	D	E (57.6)	E (59.4)
WBLTR	D	F (901.8)	F (704.5)	D	F (962.2)	F (760.3)
NBLTR	C	A	A	D	A	A
SBLT	A	C	C	A	C	C
SBR		C			C	
SWLR	D	D	D	D	D	C
Overall	**B**	**F (99.3)**	**E (62.6)**	**C**	**F (104.8)**	**E (65.9)**

[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		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway						
EBLTR	E (62.6)	D	D	E (69.1)	D	D
WBLTR	D	D	C	D	D	D
NBLTR	F (191.4)	A	A	F (250.1)	A	A
SBLTR	B	B	B	B	B	B
Overall	**E (78.1)**	**B**	**A**	**F (102.0)**	**B**	**A**
7. Wisconsin Avenue/Quebec Street						
WBLR	B	B	A	B	B	A
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
8. Wisconsin Avenue/Porter Street						
EBLTR	D	C	D	D	C	D
WBLTR	F (206.5)	F (111.0)	F (131.2)	F (244.1)	F (127.6)	F (152.3)
NBLTR	A	B	B	B	B	B
SBLTR	A	B	B	B	B	B
Overall	**C**	**C**	**C**	**D**	**C**	**C**
9. Wisconsin Avenue/Idaho Avenue						
EBLTR	C	C	C	C	C	C
NBLTR	B	C	B	C	D	B
SBLTR	A	B	A	A	B	A
Overall	**B**	**C**	**B**	**B**	**C**	**B**
10. 37th Street/Warren 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**
11. 37th Street/Van Ness Street						
EBLTR	C	B	B	D	B	C
WBLTR	C	C	C	D	C	C
NBLTR	C	B	B	C	B	B
SBLTR	C	B	B	C	B	B
Overall	**C**	**B**	**C**	**D**	**C**	**C**

[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		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
12. 37th Street/Upton Street						
EBLTR	B	A	A	B	A	A
WBLTR	B	A	A	B	A	A
NBLTR	B	A	A	B	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
13. 37th Street/Tilden Street/Washington Home Driveway						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
14. 37th Street/Quebec Street						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**A**	**A**	**A**	**B**	**A**	**A**
15. 37th Street/Porter Street						
EBLT	B	A	A	B	A	A
WBTR	B	A	B	B	A	B
NBLTR	A	A	A	A	A	A
SBLTR	A	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
16. 38th Street/Van Ness Street						
EBLTR	C	B	B	C	C	B
WBLTR	C	B	B	C	B	B
NBLTR	B	A	A	B	A	A
SBLTR	C	B	A	C	B	B
Overall	**C**	**B**	**B**	**C**	**B**	**B**

[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		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
17. 38th Street/Upton Street						
EBLT	A	A	A	A	A	A
WBR	A	A	A	A	A	A
SBLR	A	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
18. Upton Street/Reno Road						
EBLR	C	C	B	C	C	C
NBLT	A	A	A	A	A	A
SBTR	A	A	A	A	A	A
19. Upton Street/Site Driveway						
EBTR	A	A	A	A	A	A
WBLT	A	A	A	A	A	A
NBLR	A	A	A	A	A	A
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A

[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:

- Wisconsin Avenue/Warren Street – northbound and southbound approaches;
- Wisconsin Avenue/Van Ness Street – eastbound left, eastbound through/right, westbound through/right, northbound approach and southbound approach;
- Wisconsin Avenue/Upton Street – northbound left/through;
- Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway – westbound and southbound approaches;
- Wisconsin Avenue/Rodman Street/Sidwell Driveway – eastbound, westbound, northbound and southbound approaches;
- Wisconsin Avenue/Porter Street – westbound and southbound approaches; and
- Wisconsin Avenue/Idaho Avenue – northbound approach.

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		
		AM	PM School	PM Comm	AM	PM School	PM Comm
1. Wisconsin Avenue/Warren Street							
EBLTR	140	55	43	24	61	44	33
WBLTR	170	91	58	92	94	61	96
NBLTR	305	234m	145	114m	457#m	154	135m
SBLT	205	491#	16	13	573#	13	14
SBR	110		0m	0m		0m	0m
2. Wisconsin Avenue/39th Street							
NBTR	65	0	0	0	0	0	0
SBLT	135	0	0	0	0	0	0
3. Wisconsin Avenue/Van Ness Street							
EBL	100	58	102#	111#	63	116#	124#
EBTR	210	311#	254#	325#	345#	275#	378#
WBL	600	111#	74	86#	127#	78#	107#
WBTR	105	345#	395#	422#	379#	420#	455#
NBLTR	290	186	510~	213	235	568~	227
SBLTR	215	168#	141	691#	279~	146	758#
4. Wisconsin Avenue/Upton Street							
EBLR	210/435	85	75	305#	93	84	329#
WBR	455	0	16	13	1	22	16
NBLT	295	891#	940#m	578#m	981#	1000m#	644#m
NBR	95	2m	18m		2m	18m	
SBTR	280	182	296	293	220	360	351
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway							
EBLTR	520	18	73	127	18	76	132
WBLTR	345	71	325#	283#	74	339#	298#
NBLTR	565	400	394#	90	446	544#	96
SBLT	300	556#	409	347	621#	433	382
SBR	170		9m			9m	
SWLR	75	16	31	46	17	32	48

† 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.

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

Approach	Available Storage†	Existing Conditions			Background Conditions		
		AM	PM School	PM Comm	AM	PM School	PM Comm
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway							
EBLTR	100	159#	75	75	178#	78	78
WBLTR	95	97	88	60	102	92	63
NBLTR	490	576#m	77m	30m	653#m	79m	33m
SBLTR	565	164	605#m	136m	416#	651m#	163m
7. Wisconsin Avenue/Quebec Street							
WBLR	440	16	11	6	16	11	6
NBTR	265	0	0	0	0	0	0
SBLT	490	6	6	10	7	6	11
8. Wisconsin Avenue/Porter Street							
EBLTR	220	125	46	64	131	48	67
WBLTR	310	356#	321#	364#	383#	340#	389#
NBLTR	385	141	213m	270	177	214m	295
SBLTR	265	303	173	139	380	184	143m
9. Wisconsin Avenue/Idaho Avenue							
EBLTR	340	157	135	153	168	144	172
NBLTR	150	342	562#	249	412	626#	275
SBLTR	385	184	288m	137m	205	318m	159m
10. 37th Street/Warren Street							
EBLTR	560	8	5	5	10	5	5
WBLTR	520	8	3	5	8	3	5
NBLTR	230	13	20	13	13	20	15
SBLTR	210	20	3	3	23	3	3
11. 37th Street/Van Ness Street							
EBLTR	560	140	63	88	180	70	93
WBLTR	810	98	115	123	125	135	155
NBLTR	275	73	48	55	90	55	55
SBLTR	230	83	15	23	103	15	23

† 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.

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

Approach	Available Storage†	Existing Conditions			Background Conditions		
		AM	PM School	PM Comm	AM	PM School	PM Comm
12. 37th Street/Upton Street							
EBLTR	550	30	15	8	33	15	8
WBLTR	920	25	15	8	28	18	10
NBLTR	280	30	30	20	33	33	20
SBLTR	275	68	15	10	78	18	10
13. 37th Street/Tilden Street/Washington Home Driveway							
EBLTR	125	0	0	0	0	0	0
WBLTR	790	3	3	3	3	3	3
NBLTR	1065	23	15	15	25	18	15
SBLTR	280	58	13	13	63	15	13
14. 37th Street/Quebec Street							
EBLTR	440	10	13	10	10	13	10
WBLTR	230	15	8	8	15	8	10
NBLTR	240	20	13	15	23	13	18
SBLTR	1065	53	20	13	58	23	13
15. 37th Street/Porter Street							
EBLT	310	28	15	23	30	15	25
WBTR	25	43	30	40	48	33	43
NBLTR	65	15	8	20	15	8	23
SBLTR	240	25	10	13	30	10	13
16. 38th Street/Van Ness Street							
EBLTR	600	93	80	55	113	95	68
WBLTR	560	83	75	73	103	88	88
NBLTR	285	10	10	13	13	10	13
SBLTR	235	85	15	15	105	18	18
17. 38th Street/Upton Street							
EBLT	455	13	10	10	13	13	13
WBR	555	10	8	5	10	8	5
SBLR	285	18	8	8	18	8	8

† 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.

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

Approach	Available Storage†	Existing Conditions			Background Conditions		
		AM	PM School	PM Comm	AM	PM School	PM Comm
18. Upton Street/Reno Road							
EBLR	920	65	25	22	76	28	24
NBLT	500	17	11	0	19	12	0
SBTR	260	0	0	0	0	0	0
19. Upton Street/Site Driveway							
EBTR	135	0	0	0	0	0	0
WBLT	370	1	0	0	1	0	0
NBLR	75	1	2	1	1	2	1
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)							
NBTR	355	0	0	0	0	0	0
SBLT	190	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.

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. 2012, 2013, and 2014) 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 Wisconsin Avenue/Warren Street, Wisconsin Avenue/Upton Street, 37th Street/Upton Street, 38th Street/Upton Street, and 37th Street/Quebec 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)
Wisconsin Avenue/Warren Street	Signal	29	24,790	1.07
Wisconsin Avenue/39th Street	Free Flow	9	26,620	0.31
Wisconsin Avenue/Van Ness Street	Signal	37	35,200	0.96
Wisconsin Avenue/Upton Street	Signal	53	29,910	1.62
Wisconsin Avenue/Rodman Street/Sidwell Driveway	Signal	23	25,300	0.83
Wisconsin Avenue/Quebec Street	One-way Stop	6	31,500	0.17
Wisconsin Avenue/Porter Street	Signal	18	29,600	0.56
Wisconsin Avenue/Idaho Avenue	Signal	4	25,540	0.14
37th Street/Warren Street	All-way Stop	0	2,360	0
37th Street/Van Ness Street	All-way Stop	5	9,330	0.49
37th Street/Upton Street	All-way Stop	6	3,580	1.53
37th Street/Tilden Street/Washington Home Driveway	All-way Stop	2	2,460	0.74
37th Street/Quebec Street	All-way Stop	5	3,500	1.30
37th Street/Porter Street	All-way Stop	3	5,930	0.46
38th Street/Van Ness Street	All-way Stop	1	8,220	0.11
38th Street/Upton Street	All-way Stop	4	2,010	1.82
Upton Street/Reno Road	One-way Stop	4	17,390	0.21
Upton Street/Site Driveway	One-way Stop	N/A	1,420	N/A
Wisconsin Avenue/Service Driveway	NA – Entrance Only	N/A	23,860	N/A

Wisconsin Avenue/Warren Street

A review of the crash types at the Wisconsin Avenue/Upton Street intersection reveals that the majority of the crashes at the intersection were side swipe collisions (31 percent). Rear end collisions made up 28 percent of collisions at the intersection. There were three crashes involving pedestrians (10 percent) 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.

Wisconsin Avenue/Upton Street

A review of the crash types at the Wisconsin Avenue/Upton Street intersection reveals that the majority of the crashes at the intersection involved rear end collisions (28 percent) and side swiped collisions (28 percent). There were two crashes involving pedestrians (4 percent) 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.

37th Street/Upton Street

A review of the crash types at the 37th Street/Upton Street intersection reveals that the majority of crashes that have occurred at the intersection (50 percent) were side swipe collisions. Three other categories that made up more than 10 percent of the crashes included fixed object collisions, back hit moving vehicle, and parked vehicle crashes (17 percent each). No crashes at the intersection involved pedestrians.

Within the study area, 37th Street has parking or pick-up/drop off zones on both sides of the street and is a two-way street. However, the width of the roadway is less than 30 feet and cannot easily accommodate two lanes of travel and two parking lanes simultaneously. The narrowness of 37th Street may account for the large number of side swipe, fixed object, and parked vehicle collisions. Anecdotal feedback from members of the community indicates that drivers frequently run the stop signs at this intersection.

38th Street/Upton Street

A review of the crash types at the 38th Street/Upton Street intersection reveals that the crashes that have occurred at the intersection were either side swipe collisions (50 percent) or collisions involving a parked vehicle (50 percent). No crashes at the intersection involved pedestrians. While the data provided lacks detailed information to determine causation factors, it is likely that the sideswipe collisions or collisions involving parked vehicles are due to the narrow width of 38th Street.

37th Street/Quebec Street

A review of the crash types at the 37th Street/Quebec Street intersection reveals that the majority of the crashes at the intersection (40 percent) were side swiped collisions. Two other categories that made up more than 10 percent of the crashes included parked vehicle crashes and rear end collisions (20 percent each). There was one crash involving a pedestrian (20 percent) at the intersection.

Within the study area, 37th Street has parking or pick-up/drop off zones on both sides of the street and is a two-way street. However, the width of the roadway is less than 30 feet and cannot easily accommodate two lanes of travel and two parking lanes simultaneously. The narrowness of 37th Street may account for the large number of side swipe and parked vehicle collisions.

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

The School is sensitive to redevelopments anticipated in the area, including the Hearst Recreation Center and eventual changes to the existing Fannie Mae site. However, these possible redevelopments have not yet reached a design stage and site trips cannot explicitly be accounted for in the background analysis. In order to account for potential increases in traffic associated with these developments and growth from developments outside of the study area, 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 a growth rate less than one percent per year. Therefore, a growth rate of one percent per year, compounded annually over five years (2015 to 2020), conservatively was applied to the existing vehicular volumes shown on Figure 10. The resulting 2020 volumes with regional growth are shown on Figure 13.

Pipeline Developments

Four 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 2020 study year (see Figure 14 for locations). A summary of each pipeline development is provided below.

4700 Wisconsin Avenue (Steak and Eggs)

The current Steak and Eggs located at 4700 Wisconsin Avenue will be redeveloped to a mixed-use development featuring approximately 16 residential dwelling units and 3,724 SF of retail. Half of the proposed retail use will be occupied by the existing Steak and Eggs restaurant. The proposed redevelopment received approval from the Board of Zoning Adjustment in October 2014. It is anticipated construction will be completed by 2020.

Trip generation for the redevelopment was determined using the Institute of Transportation Engineers' (ITE) Trip Generation[5] and applying an 89 percent non-auto mode split, as was presented in the 4700 Wisconsin Avenue Parking Statement[6]. Square footage for the retail trip generation was calculated using only the square footage of the new retail uses on the site. The redevelopment will generate an estimated 3 AM peak hour vehicle trips and 7 PM peak hour vehicle trips. Given the low trip generation profile and considerable distance from Sidwell Friends School, trips for this pipeline development were not explicitly included in the pipeline forecasts. The conservative regional growth applied to the existing vehicular volumes would account for this nominal increase in traffic.

4614 Wisconsin Avenue

The 4614 Wisconsin Avenue mixed-use development will feature approximately 60 residential dwelling units and 14,000 SF of retail space. The proposed redevelopment received approval from the Zoning Commission in February 2013.

Site trip assignments for the redevelopment were taken from the 4600 Wisconsin Ave Transportation and Parking Assessment Report.[7] According to the study, the development will generate an estimated 10 AM peak hour vehicle trips and 39 PM peak hour vehicle trips.

Washington College of Law

The 2011 American University Campus Plan includes the relocation of the Washington College of Law to the Tenleytown Campus. In addition to the relocation, 400 – 500 parking spaces will be added with the Washington College of Law. The 2011 American University Campus Plan including the relocation of the Washington College of Law was approved by the Zoning Commission in May 2012. Classes will begin at the College's new location in January 2016.

Site trip assignments for the redevelopment were taken from the American University 2011 Campus Plan Transportation Technical Analysis.[8]

Cathedral Commons

The Cathedral Commons mixed-use development contains approximately 146 residential dwelling units and 136,484 SF of commercial/retail space. The proposed redevelopment came online in Spring of 2015. However, the redevelopment was not fully leased at the time counts were conducted. The residential occupancy rate was approximately 80 percent and the commercial/retail occupancy rate was approximately 89 percent

Site trip assignments for the redevelopment were taken from the Wisconsin Avenue Giant Transportation Impact Study[9] prepared by Wells + Associates. Residential and retail/commercial site trips were added to the network proportional to the respective occupancy rates.

Georgetown Day School PUD

The Georgetown Day School Planned Unit Development would consolidate the Lower, Middle, and High School divisions and contain approximately 280 residential dwelling units, 13,000 SF of grocery, and 15,700 SF of retail. As the project has not yet been approved, the background trips associated with this pipeline development have not been finalized. Regardless, rounded estimates of the trip assignments, provided by DDOT, have been included in the forecasts.

The proposed redevelopment is expected to go before the Zoning Commission in Spring 2016.

Combined Pipeline Developments

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 15.

Background Forecasts

Background 2020 traffic forecasts (without the proposed redevelopment) were developed by combining the existing traffic volumes grown to the year 2020 (shown on Figure 13) with the pipeline traffic volumes shown on Figure 15. The resulting 2020 background traffic forecasts are shown on Figure 16.

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 12, future background traffic forecasts shown on Figure 16, and existing DDOT traffic signal timings.

The level of service results for the 2020 background conditions without the Sidwell Friends School 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 Wisconsin Avenue/Van Ness Street intersection would drop from an overall LOS D to an overall LOS E during the PM School peak hour. 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.

Queue Analysis

A queue analysis was conducted for 2020 conditions without the Sidwell Friends School development. 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. At the Wisconsin Avenue/Warren Street intersection, an increase in the queue length from existing conditions would exceed the available storage on the northbound approach during the AM peak hour.

SITE ANALYSIS

Overview

Sidwell proposes to relocate its Lower School located at 5112 Edgemoor Lane in Bethesda, Maryland, to the site of the current Washington Home. With the Washington Home's location adjacent to the Sidwell Upper/Middle School campus located at 3825 Wisconsin Avenue, the move of the Lower School would allow Sidwell to create one unified campus for all three divisions.

The site of the Lower School is located on Square 1825 (Lot 818) in Ward 3, which is in the northwest quadrant of the District. The site is zoned R-1-B.

To accommodate the proposed addition of the Lower School on the Wisconsin Avenue campus, Sidwell proposes to increase its current student cap from 850 to 1,250 students. The increase will accommodate the 850 students currently enrolled in the Upper and Middle Schools, 300 students currently enrolled at the Lower School, plus an additional 100 students across the three divisions. Sidwell also proposes a corresponding increase in faculty/staff from its current cap of 190 to 260 employees. The increase will accommodate the 190 faculty/staff currently employed at the Upper and Middle Schools, 50 faculty/staff

currently employed at the Lower School, plus an additional 20 employees across the three divisions.

Site Access and Circulation

Overview

The proposed development has been designed to facilitate access via all modes of transportation including vehicular (including drop-off/pick-up and parking), pedestrian, and bicycle. Specifically, drop-off/pick-up areas have been carefully designed to ensure that additional vehicles coming to campus can be accommodated on campus and students in each division can easily access their respective buildings. No new curb cuts are proposed in conjunction with the project. The existing and proposed vehicular circulation patterns for the site are shown on Figure 17. The internal pedestrian circulation for the campus is included as Figure 18.

Site Access Points

Five existing access points are currently located off Wisconsin Avenue and will be used under proposed conditions, including:

- Zartman Circle (Unsignalized Ingress),
- Zartman Circle (Unsignalized Egress – right out only),
- Rodman Street (Signalized Ingress/Egress),
- Service Drive (Currently Unsignalized Ingress/Egress for service vehicles only; under proposed conditions, this curb cut will provide unsignalized ingress to the new Shared Loop), and
- Shared Driveway with Post Office and Fannie Mae (Signalized Egress only for Sidwell traffic; Post Office and Fannie Mae traffic have ingress and egress).

Two additional access points serving the Lower School site and loading facilities are proposed on the east side of the campus, including:

- 37th Street (Ingress only during morning drop-off and afternoon pick-up operations; service and delivery vehicles all other times) and
- Upton Street (Egress only during morning drop-off and afternoon pick-up operations; full access all other times).

Detailed descriptions of each location are provided below. Per DDOT's request, consideration of the conceptual geometric design and access consolidation have been included for each access point.

Zartman Circle (Ingress)

The drop-off/pick-up circle located in front of Zartman House accommodates a small portion of school traffic during pick-up and drop-off hours and is primarily for administrative use. Currently, 38 vehicles enter the circle during the AM peak hour and 15 vehicles enter during the PM School peak hour. Access to the circle is unsignalized and ingress to the circle is right-in, left-in. No new trips associated with the proposed redevelopment are anticipated to use the Zartman Circle due to the limited number of parking spaces it serves.

The existing geometry and design of the circle is shown on Figure 19. Ingress to the circle is via the southern curb cut on Wisconsin Avenue.

Zartman Circle (Egress)

As noted above, the drop-off/pick-up circle located in front of Zartman House is primarily for administrative use. Currently, 32 vehicles exit the circle during the AM peak hour and 15 vehicles exit during the PM School peak hour. The egress is unsignalized and is right-out only. No new trips associated with the proposed redevelopment are anticipated to use the Zartman Circle due to the limited number of parking spaces it serves.

Egress from the circle is via the northern curb cut on Wisconsin Avenue, as shown on Figure 19. In an attempt to consolidate access and potentially close the existing northern Zartman Circle curb cut on Wisconsin Avenue, the Applicant explored the possibility of redesigning the circle to tie in with the existing driveway to the parking garage.

The connection between Zartman Circle and the garage driveway was found to be infeasible and undesirable for a number of reasons:

- Any connection would need to intersect the garage driveway at the western most exit from the garage (approximately 90 feet from Wisconsin Avenue) since the driveway is one-way inbound beyond this point (as shown on Figure 19).
- The slope between Zartman Circle and the garage driveway is significant and approximately 26 percent adjacent to the garage driveway, as shown on Figure 20.
- In order to create a connection profile that could potentially be functional, the entire area would need to be regraded, which would require the existing pedestrian path from the bus stop also to be regraded from the bus stop back to Kogod Auditorium.
- The construction of the connection likely would impact underground utilities located in the area.
- Given the significant slopes present, retaining walls would likely be required within the constrained area adding significant cost.

- The connection would result in a significant loss of trees and would have negative impacts to the landscape of the area.
- Given that Zartman House and circle is a historic landmark, such a drastic reconfiguration of its lawn is not likely to be approved by the HPRB.

Rodman Street (Ingress/Egress)

An existing driveway located at the Rodman Street/Wisconsin Avenue intersection serves as the sole ingress point to the Upper School garage, which provides parking for staff/students and the primary pick-up/drop-off area for Upper School and some Middle School students. The access control is right-in/right-out, left-in/left-out and is signalized.

The driveway is one of two existing egress points from the garage, as school traffic may also exit the garage via the signal at the Post Office. Currently, 401 vehicles enter via this Rodman Street access location during the AM peak hour and 75 vehicles during the PM School peak hour. 85 vehicles exit via this access location during the AM peak hour and 109 vehicles during the PM School peak hour, which respectively represent 61 percent and 56 percent of total traffic exiting the garage.

The existing geometry and design of the driveway is shown on Figure 21. This design was previously reviewed and agreed to by DDOT in 2004 when the garage was designed and constructed. While the northern edge of the driveway is slightly out of alignment with Rodman Street, adjusting the driveway is not feasible given the existing parking structure to the north, which is also shown on Figure 21.

Shared Loop (Ingress)

An existing service driveway located south of the Wisconsin Avenue/Fannie Mae/Post Office/Sidwell intersection currently provides service access to the site. Prior to construction of the parking garage on-site, this driveway served as the main driveway for the school and provided access to the surface parking lot that was located on campus and the drop-off/pick-up operation for the Upper School. Due to its proximity to existing signals, the driveway is unsignalized. In the future, this driveway would remain unsignalized and would also provide access to a new Shared Loop for pick-up/drop-off. During pick-up/drop-off, the driveway will be ingress only and control will be right-in. During non-peak times, service vehicles would enter and exit via the driveway as they do today.

Left turns into the curb cut will be facilitated by gaps in northbound traffic created by the adjacent signal at Rodman Street. The traffic signal at Rodman Street provides a southbound left turn phase during which time all northbound traffic is stopped. This phase will create gaps that can be used be vehicles turning into the shared loop.

Understanding the importance of limiting the number of southbound left turns made from Wisconsin Avenue to the service drive, Sidwell has committed to Transportation Demand Management and Operations Management plans. Therefore, the number of southbound left turns made at the Wisconsin Avenue/Service Drive intersection is estimated to be 38 vehicles during the AM peak hour, 27 during the PM School peak hour, and 14 during the PM Commuter peak hour.

The geometry and design of the driveway is shown on Figures 22 and 23.

In an attempt to consolidate access, the Applicant explored the possibility of routing all inbound Middle School traffic to the Shared Loop through the existing garage. This consolidation would remove southbound left turns being made at the existing unsignalized service drive and add those left turns at the Rodman Street access point.

As was presented earlier in this report, the Rodman Street/Wisconsin Avenue intersection is projected to operate at a LOS F under background conditions during the AM peak hour. Concentrating inbound drop-off traffic at this intersection would further exacerbate capacity restraints at this location. From a queuing perspective, mixing garage and Shared Loop pick-up traffic at this location would be problematic during the afternoon pick-up. The maximum queue that occurred at the garage during the afternoon pick-up extended approximately halfway down the driveway. While the queue can be contained within school grounds without backing onto Wisconsin Avenue, adding through traffic destined for the Shared Loop would potentially create queuing issues on Wisconsin Avenue. The existing pick-up queue at the Upper School is already nearing capacity, so concentrating ingress to this location is not recommended. In addition while the garage is designed to have a pick-up/drop-off lane and bypass lane, allowing through traffic to use the bypass lane would likely increase the likelihood of collisions and slow the pick-up/drop-off operations.

Post Office (Egress)

The Wisconsin Avenue/Fannie Mae/Post Office/Sidwell signalized intersection currently provides egress from the Sidwell garage for pick-up/drop-off traffic and those using the parking garage. At this access point, egress from Sidwell is right-out, left-out. This access point is one of two existing egress points from the garage, as school traffic may also exit the garage via the signal at Rodman Street. Currently 55 vehicles exit via this signal during the AM peak hour and 87 vehicles during the PM School peak hour, which respectively represent 39 percent and 44 percent of total traffic exiting the garage.

The approach used by Sidwell traffic is also used by outbound traffic from the property at 3939 Wisconsin Avenue. While this access point does not provide ingress for Sidwell, it is used as an ingress point for 3939 Wisconsin Avenue. It is also important to note the Friendship Post Office driveway is directly adjacent to the driveway used by Sidwell and 3939 Wisconsin Avenue. The two driveways are currently assigned to different actuated

phases for the signal, with the phase for Post Office running concurrently with the Fannie Mae (eastbound) approach. As a result of the intersection geometry and phase assignment, the signal often operates as a three-phase signal.

The existing geometry and design of the intersection is shown on Figure 24. The Applicant explored the possibility of combining the Post Office and Sidwell driveways to create one westbound approach, which would in turn allow the signal to operate with two phases. Unfortunately, there is a significant grade change between the Post Office and Sidwell driveway. To illustrate this point, a picture of the existing retaining wall is shown below on Image 1. A survey of the Post Office currently is underway; a plan showing the topography in this area will be submitted under separate cover upon completion.

Image 1
Post Office Retaining Wall

Regardless of the physical constraints, Sidwell would not have the authority to make significant changes to the intersection as the school does not own the property. In addition, the Post Office would be unlikely to allow re-grading work to be done as it would most likely lose parking spaces for delivery vehicles. Once completed, the survey will show the property lines for each parcel. In the interim, a tax map showing the Sidwell property is shown on Figure 25.

Given the physical and ownership constraints, the Applicant has looked at other options to improve the operation of the intersection. From a volume perspective, reassigning the phasing at the intersection so the Sidwell and Fannie Mae driveways run concurrently would improve the signal's operation. As the volumes coming from the Post Office approach are lower than those coming from the Sidwell approach, this change would allow the signal to more regularly operate as a two-phase signal which raises the intersection levels of service over the peak hour analyses.

In an attempt to consolidate access, the Applicant explored the possibility of all outbound Sidwell traffic exiting via the signal at Rodman Street. As explained earlier, concentrating traffic at the Rodman Street signal would have level of service implications. As was presented earlier in this report, the westbound (Sidwell) approach at the Rodman Street/Wisconsin Avenue intersection is projected to operate at a LOS D during the AM peak and LOS F (with significant delays greater than 500 seconds) during the PM peaks under existing conditions. Concentrating all traffic to the signal would further exacerbate current constraints at the intersection. Additionally, proposing egress at the existing service drive would not be ideal. Allowing egress would halve the proposed queuing capacity, would not be ideal from a circulation perspective, and would add traffic to an unsignalized access point. Thus, maintaining egress at the Post Office signal and implementing the proposed phasing adjustments is recommended to balance traffic between the existing access points.

37th Street (Ingress)

An existing service driveway located adjacent to the 37th Street/Tilden Street unsignalized intersection currently provides service access to the Washington Home. In the future, this driveway would remain unsignalized and would also provide access to the proposed Lower School for pick-up/drop-off. During pick-up/drop-off, the driveway will be ingress only. All other times, the driveway will provide ingress and egress for service and delivery vehicles. Loading activities will be scheduled so they do not occur during pick-up/drop-off periods.

The existing service driveway is slightly out of alignment with the 37th Street/Tilden Street intersection. Per DDOT's request, Sidwell has agreed to realign the driveway, as shown on Figure 26.

During the community process, Sidwell was asked by members of the community to accommodate all pick-up/drop-off activities for the Lower School on the Wisconsin Avenue side of campus. Given the estimated queues in the garage and Shared Loop for all Upper and Middle School traffic, there is not adequate queuing capacity on the Wisconsin Avenue side of campus to accommodate the Lower School. In addition, Sidwell understands that DDOT is concerned with how traffic in the overall area operates and has made a concerted effort to strike a balance between distributing traffic on Wisconsin Avenue and on the neighborhood streets. With Sidwell now agreeing to shift the existing pick-up/drop-off

operation for the Middle School to Wisconsin Avenue, it is estimated there will be a reduction in traffic on the neighborhood streets during the AM peak. During the PM School peak, it is estimated no new traffic on the neighborhood streets would be added.

Upton Street (Egress)

An unsignalized driveway located off Upton Street currently provides access to the Washington Home. In the future, this driveway would remain unsignalized and would also provide egress from the proposed Lower School for pick-up/drop-off. During pick-up/drop-off, the driveway will be egress only and control will be right-out, left-out. All other times, the driveway will provide access to the visitor parking and control will be right-in/right-out, left-in/left-out.

The existing design of the driveway is shown on Figure 27. As was discussed in the previous section, Sidwell has made an effort to distribute its traffic between Wisconsin Avenue and the neighborhood streets so as not to overload one area. Maintaining this access point is essential to support that goal.

Drop-off/pick-up

Three existing drop-off/pick-up areas currently serve the Wisconsin Avenue campus, including:

- Upper School Garage off Wisconsin Avenue at Rodman Street,
- On-Street School Zone on 37th Street between Upton Street and Quebec Street, and
- Zartman House circle off Wisconsin Avenue between Quebec Street and Rodman Street.

Two additional drop-off/pick-up areas that will use existing access points are proposed with the planned redevelopment. These two drop-off/pick-up areas are:

- Lower School drop-off/pick-up area at the Washington Home site and
- New loop at the existing Upper School tennis courts off Wisconsin Avenue.

The existing and proposed drop-off/pick-up locations are shown on Figure 28 and detailed descriptions of each location are provided below.

Upper School Garage

The existing Upper School garage located off Wisconsin Avenue at Rodman Street primarily accommodates Upper School traffic during pick-up and drop-off hours. Ingress is provided via the signalized intersection of Wisconsin Avenue/Rodman Street/Sidwell Driveway. Vehicles may exit the parking garage using either the signal at the Wisconsin

Avenue/Rodman Street/Sidwell Driveway intersection or the Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway intersection.

Queueing space for 34 vehicles is available at the Upper School garage.[1] To determine the current utilization and operation of the drop-off/pick-up area in the garage, queues were recorded every 30 seconds from 7:00 AM to 9:00 AM and from 3:00 PM to 6:30 PM on Wednesday, October 28, 2015. The maximum queue in the garage during the morning peak was 15 vehicles at 7:50 AM. During the PM peak period, the maximum queue was 28 vehicles at approximately 3:30 PM and 3:40 PM. Graphs of the Upper School garage queue over time are included in Appendix I.

On-Street School Zone (37th Street)

Middle School students currently are picked-up/dropped-off on the west side of 37th Street, which is designated as a school loading zone from 8:00 AM to 4:00 PM between Tilden Street and the southern edge of the Middle School buildings (approximately 600 feet in length). If the entire available school zone is utilized, theoretically 30 queued vehicles can be accommodated on-street.[2] On the east side of 37th Street, another on-street school zone is used by Hearst Elementary School for their drop-off/pick-up operations.

To determine the current utilization and operation of the drop-off/pick-up at the Middle School, queues were recorded from 7:00 AM to 9:00 AM and from 3:00 PM to 6:00 PM on October 28, 2015, and October 29, 2015. Queue data was collected for the on-street school zone on 37th Street and for parents picking-up/dropping-off in the neighborhood near the Washington Home. The maximum Sidwell queue during the morning peak was six vehicles at approximately 7:40 AM and 7:50 AM. During the PM peak period, the maximum Sidwell queue was 18 vehicles at approximately 3:20 PM. Graphs of the queue over time are included in Appendix I.

As the drop-off/pick-up zone for the Middle School is directly across from the drop-off/pick-up zone for Hearst Elementary School, parents picking-up/dropping-off at Hearst were often observed using the zone on Sidwell's side of 37th Street. In these cases, parents would park and walk their children into Hearst. Some Sidwell parents were observed using Hearst's drop-off/pick-up zone, but parents generally did not park and leave their car.

---

[1] One exclusive pick-up/drop-off lane with an adjacent bypass lane that accommodates 12 queued vehicles. An additional 10 queued vehicles are accommodated along the Sidwell driveway between the parking garage entrance and the Wisconsin Avenue/Rodman Street/Sidwell Driveway intersection. Parents also utilize a one-way drive aisle in the garage that is wide enough to provide a pick-up/drop-off lane and a bypass lane, which allows for an additional 12 queued vehicles to be accommodated.

[2] In practice, since not all vehicles enter the drop-off/pick-up area from the back of queue, some efficiency is lost in terms of utilization. From a practical standpoint, approximately 23 to 25 cars could be accommodated. The maximum observed queue was 18 and field personnel noted that during this time, a few more vehicles could have been accommodated toward the southern end of the zone.

Given the narrow width of 37th Street, the presence of on-street parking and drop-off/pick-up zones and two travel lanes is not ideal.

To address challenges on 37th Street, Sidwell will move the Middle School drop-off/pick-up operation to the new drop-off/pick-up area on Wisconsin Avenue (families with only middle school students and families with lower and middle school families) and the Upper School garage (families with middle and upper school students). Additionally, Sidwell will continue to maintain staggered start times with Hearst to minimize the overlap in drop-off operations. Currently, Hearst begins at 8:30 AM while the Sidwell Middle School begins at 8:00 AM.

Zartman House Circle

The drop-off/pick-up circle located in front of Zartman House accommodates a small portion of school traffic during pick-up and drop-off hours. Access to the circle is unsignalized and the access control is right-in/left-in/right-out. No new trips associated with the proposed redevelopment are anticipated to use the Zartman House circle.

Lower School

The design and operation of the Lower School has been carefully considered in order to accommodate all drop-off/pick-up operations associated with the Lower School on-site. To determine the current queueing demands and drop-off/pick-up operations for the Lower School, data was collected at the Lower School campus on May 27 and June 3, 2015, from 7:00 AM to 9:00 AM and from 2:30 PM to 6:30 PM. The maximum queue during the morning peak was 14 vehicles at approximately 8:20 AM. During the PM peak period, the maximum was 105 vehicles at approximately 3:15 PM. Graphs of the Lower School queue over time are included in Appendix I.

It is important to note that the drop-off/pick-up operation at the existing Lower School relies on short-term and on-street parking, especially during the PM pick-up period. The data collected is not traditional queueing data, as parents arrive early and then walk their student to and from the school instead of waiting in their vehicles to drive up to the school. In order to make the drop-off and especially the pick-up process more efficient, thereby reducing the amount of vehicles that need to be accommodated at one time, Sidwell will implement a change to its drop-off/pick-up operations for the Lower School.

The proposed Lower School drop-off/pick-up loop will improve operations by requiring parents to remain in their vehicle and drive directly to the front door of the school to drop-off/pick-up their children. In addition, a number of operational improvements will be implemented. These improvements are discussed in detail later in the report, but measures include implementation of a system to efficiently match children with the proper vehicle and increasing the pick-up window for the Lower School from 15 minutes to 30 minutes. Based on data obtained from other DC private schools, it is estimated these

operational improvements would reduce the peak queueing demand by 30 percent. To achieve further reductions, the implementation of a carpool initiative and/or other Transportation Demand Management (TDM) measures would reduce the queueing demand by an additional 30 percent. Therefore, it was determined the Lower School design should accommodate approximately 52 queued vehicles.

The proposed design for the Lower School drop-off/pick-up area is shown on Figure 29. During the morning drop-off time and afternoon pick-up time, parents dropping off or picking up children would enter the campus via the curb cut on 37th Street, wait in the queue until their turn to drop-off or pick-up their children at the circle in front of the main entrance, and then exit via the curb cut on Upton Street. By using existing curb cuts on 37th Street and Upton Street, the site can accommodate a queue of 58 vehicles and the estimated 52 vehicle queue can be accommodated on site. When drop-off/pick-up operations are not taking place, the driveway on 37th Street will be used only for service vehicles. Any visitors to the school during those times would use the curb cut on Upton Street. A gate will be installed to limit access from 37th Street to the service area during times when drop-off and pick-up are not in operation.

New Loop

As part of the proposed project, Sidwell plans to construct a new addition to the Washington Home building to link the Middle/Upper and Lower School sites. For families that have children in the Lower School as well as the Middle and/or Upper School, this would be a logical drop-off/pick-up location. In addition and as mentioned previously, Sidwell proposes to move drop-off and pick-up operations for families with only middle school students to this new loop. Ingress would be provided via the existing unsignalized service road located off Wisconsin Avenue and the access control would continue to be right-in/left-in. Egress would be provided via the signal at the Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway intersection and the access control would continue to be right-out/left-out.

As shown on Figure 22, 21 queued vehicles could be accommodated in the New Loop under interim conditions. Once the tennis courts are relocated (to a location to be determined), the loop will be extended as shown on Figure 23. The estimated pick-up maximum queue was calculated to be 17 vehicles and, therefore, can be accommodated in the new loop. These calculations are included in Appendix I.

Table 8 summarizes the queue capacity and estimated queues for each drop-off/pick-up area.

Table 8
Summary of Drop-off/Pick-up Areas

Location	Queue Capacity	AM Drop-off		PM Pick-up	
		Used By	Estimated Max Queue†	Used By	Estimated Max Queue†
37th Street	30	N/A	0	N/A	0
Lower School	58	Families with LS students only	14	LS Only	52
New Loop	21	Families with students in LS plus any other division + families with MS students only	7	Families with students in LS plus any other division + families with MS students only	17
Garage	34	Families with students in US only + families with US and MS students	14	Families with students in US only + families with US and MS students	29

† Estimated queues for the Middle and Upper School do not take into account implementation of a TDM plan. Any reduction in volume associated with a TDM plan would reduce the queue.

Pedestrian and Bicycle Access

Pedestrian access to the proposed Lower School will be provided via existing sidewalks on Upton Street. The proposed addition to the Washington Home to link the Middle/Upper and Lower School sites will facilitate improved pedestrian access within the campus. The bicycle and pedestrian plan is shown on Figure 18. As shown on Figure 18, there are currently 54 bicycle parking spaces provided on campus. Another 20 short term bicycle parking spaces are proposed at the Lower School. Additionally, 26 long-term bicycle parking spaces will be provided on the ground level of the Lower School building near the locker rooms.

Per DDOT's request, the school evaluated the possibility of creating a cross campus pedestrian and bicycle connection in lieu of a vehicular connection. The school took a two-pronged approach to evaluating the cross campus connection: 1) connectivity for students and 2) connectivity for the general public. The cross campus connections are shown on Figure 18. During the school day, students and employees can traverse through campus between Wisconsin Avenue and 37th Street via three routes. Additionally, students and employees can traverse between the Lower School and the Upper/Middle Schools via a connection through the new Campus Center. Importantly, Sidwell has agreed to close the gate on 37th Street adjacent to the Middle School at 5:15 PM on weekdays **at the request of**

the neighbors. This change will help discourage after hours pick-up on 37th Street when traffic associated with Hearst Elementary School and Recreation Center is significant.

The safety and security of the students is of utmost importance to the school. Sidwell has worked with the neighbors to develop a plan that allows for some access to and through campus at certain times when school is not in session. This plan, which has been well received by the neighbors is shown on Figure 18.

Loading Access

Regular deliveries to the Wisconsin Avenue campus currently occur in five general locations. Non-food deliveries, including FedEx, UPS, office supplies, furniture, and cleaning supplies occur at the main distribution point on the north side of the Upper School garage. Food deliveries associated with the kitchen and Fox Den (café and school store) occur on the north side of the main Upper School building. Food composting is picked-up at the rear (east side) of the main Upper School building, trash and recycling is picked-up adjacent to the tennis courts, and bulk trash and garden composting is picked-up behind the gym and Fox Den. The locations of the current delivery areas are shown on Figure 30. All regular deliveries currently enter and exit the campus via Wisconsin Avenue.

Deliveries to the Washington Home, currently occur via the service driveway on 37th Street, as shown on Figure 30.

Upon relocation of the Lower School to the Washington Home site, all food service deliveries and trash service for the campus will be relocated to the new Lower School. These deliveries will use the service driveway on 37th Street to enter and exit the new loading facilities at the Lower School. At the request of DDOT, the service driveway will be shifted to align with Tilden Street. The non-food service deliveries will continue to occur via the service driveway on Wisconsin Avenue.

Diagrams showing the truck maneuvers in and out of the proposed loading area are included in Appendix J. Sight distance triangles for the new proposed site accesses are also included in Appendix J. As shown on Attachment J-28, parking on the eastern side of the driveway obstructs the sight distance and it is recommended the parking zone be reduced by 4'4" to eliminate the sight distance obstruction.

More detailed information regarding the frequency and size of deliveries in included later in this section.

Proposed Parking

Vehicular Parking

Based on parking requirements prescribed in the DCMR, a total of 253 parking spaces are required for the unified Sidwell Friends School campus. A summary of the parking required and provided is shown in Table 9.

Table 9
Parking Summary

Required	Provided Spaces		
	Existing	Proposed	Total
2 per 3 teachers + MAX(1 per 20 classroom seats **or** 1 per 10 seats in largest area usable for public assembly) 2*(260/3) + (800/10) =253 spaces	328	20	348

Currently 58 total parking spaces are provided at the Lower School campus (17 spaces in the garage and 41 spaces in the parking lot) and the peak demand was measured at 57 spaces. The Wisconsin Avenue campus currently has 328 total parking spaces (307 spaces in the garage and 21 spaces in the surface parking lot). In order to minimize the number of parking spaces provided at the Washington Home site, the Applicant intends to use the existing parking garage to accommodate staff/faculty parking for the Lower School.

Parking occupancy counts were conducted at the Upper School and Lower School to ensure that sufficient parking is available in the Upper School garage to accommodate the parking demand for the Lower School. Parking occupancy counts were conducted at the Lower School every half hour from 7:00 AM to 10:00 AM and from 2:30 PM to 6:30 PM on May 27, 2015. Counts at the Upper School were conducted every half hour from 7:00 AM to 9:00 AM and from 3:00 PM to 6:30 PM on Thursday, October 29, 2015. Parking occupancy counts for the Lower School and Upper School are provided in Table 10.

As shown in Table 10, the weekday peak demand for parking at the Upper School occurred at 9:00 AM, when 76.5 percent of the parking spaces were occupied, leaving 77 available spaces during the peak. Therefore, there is sufficient space in the garage to accommodate the demand of 56 parking spaces for the Lower School faculty/staff. An additional 20 parking spaces are proposed at the new Lower School to serve as short-term/visitor parking.

According to data provided by Sidwell, 228 parking permits have been issued. Of those permits, 63 (or 28 percent) were issued to students and 165 (or 72 percent) were issued to employees. The School reports that some students have been allowed to park without

permits, but has indicated that beginning next semester, all students who drive will be required to obtain a parking permit.

Table 10
Summary of Parking Occupancy Counts
Sidwell Friends Lower School

Time	Lower School		Upper School		Total Demand
	Garage Demand	Surface Lot Demand	Garage Demand	Surface Lot Demand	
7:00 AM	1	16	43	10	70
7:30 AM	7	22	85	11	125
8:00 AM	12	32	196	19	259
8:30 AM	16	38	221	19	294
9:00 AM	**16**	**40**	**231**	**20**	**307**
9:30 AM	16	38	---	---	---
10:00 AM	16	37	---	---	---
2:30 PM	17	35	---	---	---
3:00 PM	16	37	228	15	296
3:30 PM	14	28	212	14	268
4:00 PM	12	27	180	12	231
4:30 PM	10	17	145	11	183
5:00 PM	5	13	125	10	153
5:30 PM	4	13	85	9	111
6:00 PM	1	9	67	9	86
6:30 PM	0	8	49	8	65
Total Spaces	17	41	307	21	384
Max Demand	56 (96.6%)		251 (76.5%)		307

Bicycle Parking

Based on the bicycle parking requirements prescribed in the DCMR, no bicycle parking spaces would be required for the unified Sidwell Friends School campus. Regardless, bicycle parking spaces would be provided with the redevelopment to encourage faculty, staff, and students to bike to school. A plan showing existing and proposed bicycle parking is included as Figure 18.

Loading Evaluation

Currently, the Lower School receives an average of 23.5 deliveries per week and the Wisconsin Avenue Campus currently receives an average of 57 regular deliveries per week, as summarized in Table 11. Additional details regarding the loading at the Lower School and Wisconsin Avenue campuses are provided in Appendix K. All deliveries currently are scheduled so that they do not coincide with the drop-off/pick-up operation for the Middle and Upper Schools.

Table 11
Loading Activities Summary

Delivery Type	Upper School [1]	Washington Home	Lower School
Trash/Recycling			
Frequency	8.5 per week	4 per week	6 per week
Truck Size	30' or less	N/A	30' or less
Non-Food			
Frequency	28.5 per week	14.25 per week	12 per week
Truck Size	One tractor trailer every other week, 30' or less	N/A	30' or less
Food			
Frequency	20 per week	11 per week	5.5 per week
Truck Size	Four tractor trailers, 30' or less	N/A	Three tractor trailers, 30' or less
Other			
Frequency	---	3 per week	---
Truck Size	---	N/A	---
Total			
Frequency	57 per week	32.25 per week	23.5 per week
Truck Size	Up to five tractor trailers, 30' or less	N/A	Three tractor trailers, 30' or less

[1] For special events only, deliveries are made to the Athletic Center using 30' trucks. There are two monthly events in October, April, and June.

In conjunction with the relocation of the Lower School to the Wisconsin Avenue campus, the loading operations for the campus will largely be consolidated. The number of weekly deliveries to the Wisconsin Avenue campus is expected to remain largely unchanged since the Lower School and Upper school use the same vendors. The frequency of trash and recycling service may increase due to the increased volume; however, the details are still

being worked out with the school's trash service provider. Post-relocation, half of the deliveries will occur at the Lower School and will be accessed via the service driveway on 37th Street. Only the non-food deliveries will remain in the current location on the north side of the Upper School garage. In addition, the school has confirmed with its vendors that those vendors currently using WB-40 trucks for deliveries can make deliveries in 30-foot trucks in the future.

In order to determine the net impact of delivery vehicles to the Lower School site, the number of deliveries currently made to the Washington Home was obtained from the Home and is summarized in Table 11. As shown in Table 11, the Washington Home currently receives an average of 32.25 weekly deliveries. Sidwell's Wisconsin Avenue campus currently receives an average of 57 weekly deliveries. Half of these deliveries (28.5 per week) will be relocated to the new Lower School (current Washington Home site). The frequency of trash service may increase to accommodate the increased demand, but even with a slight increase in the frequency of trash service, the net impact in deliveries to the Washington Home site would be de minimis.

The loading requirements for the proposed redevelopment are prescribed by the DCMR and are summarized in Table 12 along with the proposed loading facilities.

Table 12
Loading Summary

Required	Proposed
Any Use ≥ 100,00 SF GFA 1 berth @ 30' 1 berth @ 55' 1 platform @ 100 SF 1 platform @ 200 SF 1 service/delivery @ 20'	2 berths @ 30' 1 berth @ 45' 2 platforms at 100 SF 1 platform @ 200 SF 1 service/delivery space at 30'

Loading Management Plan

In order to ensure that the loading activities do not adversely impact the surrounding roadway network, a loading management plan will be implemented for the site. 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:

1) A loading dock manager will be designated (duties may be part of other duties assigned to the individual). He or she will coordinate with vendors to schedule deliveries and will be on duty from 8:00 AM to 5:00 PM and will coordinate with the community and neighbors to resolve any conflicts should they arise.

2) The dock manager will schedule deliveries such that the dock's capacity is not exceeded. In the event that an unscheduled delivery vehicle arrives while the dock is full, that driver will be directed to return at a later time when a berth will be available so as not to compromise safety or impede street or intersection function.

3) As per the current practice, the dock manager will schedule loading activities such that deliveries and trash pick-up do not occur during the drop-off/pick-up periods for the Lower, Middle, and Upper Schools.

4) The dock manager will monitor inbound and outbound truck maneuvers and will ensure that trucks accessing the loading dock do not block vehicular, bike, or pedestrian traffic along 37th Street and Wisconsin Avenue except during those times when a truck is actively entering or exiting a loading berth.

5) Service vehicle/truck traffic interfacing with 37th Street traffic will be monitored during peak periods and management measures will be taken if necessary to reduce conflicts between truck and vehicular movements.

6) Trucks on campus will not be allowed to idle and must follow all District guidelines for heavy vehicle operation including but not limited to DCMR 20 – Chapter 9, Section 900 (Engine Idling), the regulations set forth in DDOT's Freight Management and Commercial Vehicle Operations document, and the primary access routes listed in the DDOT Truck and Bus Route Map (godcgo.com/truckandbusmap).

7) The dock manager will monitor the timing of the Lower, Middle, and Upper School deliveries to see if any adjustments need to be made to ensure any conflicts are minimized or consolidate loading activities when possible.

8) The dock manager will be responsible for disseminating suggested truck routing maps to drivers from delivery services that frequently deliver to campus as well as notifying all drivers of any access or egress restrictions. The dock manager will also distribute materials as DDOT's Freight Management and Commercial Vehicle Operations document to drivers as needed to encourage compliance with idling laws. The dock manager will also post these documents and notices in a prominent location within the service area.

9) The dock manager will ensure that vendors making deliveries to the site will not use WB-40 or WB-50 trucks. Trucks larger than a WB-40 will be prohibited from making deliveries to the site. WB-40 trucks will not be used for regular deliveries but may be necessary on occasion.

TRANSPORTATION MANAGEMENT PLAN

To help facilitate ingress to, egress from, and the flow of traffic on campus and to reduce the impact of the proposed development, Sidwell will implement a Transportation Management Plan that will consist of a Transportation Demand Management (TDM) Plan, an Operations Management Plan, and a Monitoring Plan. Each plan is summarized below:

Transportation Demand Management

Overview

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. 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.

To determine an appropriate reduction that is both meaningful, in terms of reducing the school's impacts, and achievable, trip characteristic information from other private schools in the District were evaluated. This information is presented below in Table 13.

Based on this information, Sidwell should be able to significantly improve its AVO. If the Lower School achieves a 1.39 AVO with an improved carpool program, the Lower School could achieve a 15 percent reduction in trips. At an AVO of 1.60, the Lower School could achieve a 26 percent reduction in trips. Although the current AVOs at the Middle/Upper Schools are substantially higher than at the Lower School, an improved carpool program for the Middle/Upper Schools could also yield measurable reductions in trips. During the AM peak hour, the expected reduction would range from approximately nine percent (with an AVO of 1.39) to 21 percent (with an AVO of 1.6). During the PM peak hour, a more modest reduction would be realized. An approximate nine percent reduction would be expected with an increase in AVO to 1.6.

Table 13
Summary of Private School Information

	Grades	# of Students	Non-Auto Mode Split	Average Vehicle Occupancy (AVO)
Sheridan School				
Faculty/Staff	K – 8th	230	30%	1.86
Students			18%	1.36
The British School				
Faculty/Staff	PreK – 12th	491	32%	---
Students			23%	1.7 AM/1.57 PM
Saint Patrick's Episcopal Day School				
Faculty/Staff	PreK – 6th	485	---	---
Students			1.5%	1.6
Maret School				
Faculty/Staff	K – 12th	650	---	---
Students			15.2%	1.39
Sidwell Friends Lower School				
Faculty/Staff	PreK – 4th	300	14%	---
Students			26%	1.19 AM/1.17 PM
Sidwell Friends Upper/Middle School				
Faculty/Staff	8th – 12th	860	22%	---
Students			14%	1.26/1.46

Additional reductions can also be realized due to the natural synergy of the site, which will allow families with students in multiple divisions to drop-off/pick-up at one campus as opposed to two campuses. Based on information provided by Sidwell, approximately 14 percent of Lower School families also have children in the Middle and/or Upper School.

Although Sidwell's student non-auto mode splits are in line with or slightly higher than the other schools shown in Table 13, Sidwell has, at the request of the community, developed a busing plan that will enable them to increase the non-auto mode split further. Specifically, Sidwell will run a shuttle to the Tenleytown Metro Station, continue to run its shuttle to Bethesda (though overtime the location of this shuttle may change depending on the geographical characteristics of its student population), and will run two additional bus routes. The exact location of the two bus stops will be determined based on the demand for service, which will be dependent on the geographical characteristics of the student population. It is anticipated that the routes may servce Silver Spring and Capitol Hill.

Given the opportunities for improving carpooling, the synergy created by combing to separate campuses into one, and the proposed concept plan for busing, a 30 percent reduction was considered appropriate and achievable. As demonstrated in subsequent sections of this report, the 30 percent reduction also mitigates the impact of the proposed redevelopment.

Components of TDM Plan

Sidwell proposes the following strategies as part of their TDM plan:

General:

1. Designate a TDM coordinator who will be responsible for organizing, marketing, and accomplishing the tasks in the TDM plan and who will act as a liaison with DDOT.

2. Create a transportation section on the school's website with up-to-date information regarding transportation options available to students, parents/guardians, and employees.

3. Hold meetings with the community twice per year to garner feedback on traffic and parking related issues for the length of the performance monitoring program.

4. Provide a bike maintenance facility in the garage or other easily accessible area for students and faculty/staff.

5. Make showers and lockers available to students and faculty/staff who jog or bike to school.

6. Provide one 200V electric vehicle charging station in the parking garage.

Students:

<u>Rideshare</u>

1. Provide carpool matching assistance for parents to increase the Average Vehicle Occupancy (AVO) for the school. Assistance programs would include:
   - Creation of an online, interactive map for parents to see what other Sidwell families live near them and are interested in carpooling, as well as provide contact information.
   - Register with and promote Commuter Connections School Pool Program to assist parents in finding other parents in their neighborhood to form carpools, walking groups, or biking groups.

<u>Transit Provided by Sidwell</u>

2. Provide a shuttle to the nearby Tenleytown Metro Station for faculty, staff, and students. The stop location will be subject to DDOT approval and require a Public Space Permit.

3. Provide a bus to Bethesda and two other other off-site locations, as determined based on addresses of students taking the bus.
4. Explore a potential partnership with Bridj or other private shuttle/micro-transit company to provide transportation from areas that are not serviced by a school bus or public transportation.

Incentives

5. Provide transit/alternate commute incentives to encourage students to use non-auto modes of transportation to travel to school. Incentives would include:
   - Encourage District of Columbia students to take advantage of the School Transit Subsidy Program, which allows students at private schools to receive discounted transit passes for rail and bus;
   - Provide $100 monthly SmarTrip cards to Virginia and Maryland financial aid students who take public transportation;

Outreach and Education

6. Provide outreach and education events to stress the importance of using non-auto modes of transportation and make information more readily available. Outreach and educational events would include:
   - Hold a "Transportation to School" event at the beginning of each semester, stressing the importance of public transportation, carpooling, biking, etc.;
   - Participate in DDOT's Safe Routes to School Program – The program encourages students and their parents to walk and bicycle to school by examining conditions around schools and conducting projects and activities to improve safety and accessibility. The program also provides pedestrian and bicycle safety training in the classroom;
   - Participate in Walk to School/Bike to School Day;
   - Start weekly "Walking Fridays;"
   - Promote walking/biking in communications with parents; and
   - Have students track walking/biking and its benefits.

Faculty/Staff

Rideshare

1. Provide carpool matching assistance for faculty/staff to increase the Average Vehicle Occupancy (AVO) for the school. Assistance programs would include:

- Creation of an online, interactive map for faculty/staff to see what other Sidwell employees live near them and are interested in carpooling, as well as provide contact information.

Transit Provided by Sidwell

2. Provide a shuttle to the nearby Tenleytown Metro Station for faculty, staff, and students. The stop location will be subject to DDOT approval and require a Public Space Permit.

Incentives

3. Provide transit/alternate commute incentives to encourage faculty/staff to use non-auto modes of transportation to travel to school. Incentives would include:
   - Provide $135 monthly SmarTrip cards for faculty/staff who take public transportation;
   - Allow employees to set aside $225/month in pre-tax funds through their paycheck for transit or vanpool expenses;
   - Enroll in Guaranteed Ride Home, which provides employees who regularly take transit, vanpool, carpool, walk, or bike to work with a reliable ride home when an unexpected emergency arises; and
   - Provide $240 annually to faculty/staff who bike to campus the majority of the time.

Outreach and Education

4. Provide training for the faculty/staff at the beginning of each year to implement and enforce the TDM Plan.

Operations Management Plan

In addition to the TDM plan, Sidwell will implement an Operations Management Plan for the Lower School to improve drop-off/pick-up procedures. The following are the components of the plan:

1. Expand the pick-up window at the Lower School from 15 minutes to 30 minutes to help reduce queuing and allow parents a longer amount of time to pick-up their child(ren).
2. Establish a clear drop-off/pick-up protocol for parents. The protocol will be as follows:
   - Drop-off/pick-up for the Lower School will occur on the Lower School site or in the new Shared/Middle School Loop adjacent to the tennis courts.
     - Traffic entering the drop-off/pick-up lane on the Lower School site will enter via 37th Street and exit via Upton Street. The 37th Street driveway will be open to general traffic only during drop-off/pick-up periods. At all other times, the driveway will be open only to service traffic.
     - Traffic entering the drop-off/pick-up circle adjacent to the Campus Center will enter via the existing service drive on Wisconsin Avenue and exit via the Fannie Mae/Sidwell/Post office signal on Wisconsin Avenue.
   - Parents/guardians will be assigned a drop-off/pick-up location and must use the assigned area. Parents/guardians will be given a color-coded tag. The color will correspond to their assigned drop-off/pick-up location. For parents picking up at the Lower School, the tag also will have a number, which will correspond to their student(s). The tag must be placed in the windshield of the vehicle picking up the student(s). A member of staff will note the number as the vehicle enters the pick-up line and radio the number back to the school as the vehicles enter campus. Staff at the school then will shepherd the appropriate students to the awaiting vehicles once they stop in the circle in front of the school or adjacent to the tennis courts (depending on their assigned location).
   - All parents who must leave their vehicle to drop-off/pick up students during regular drop-off/pick-up times, must park in the Upper School garage. Parents using the drop-off/pick-up lane at the Lower School must remain in their vehicles and will drop-off/pick-up their student(s) when they stop in the circle in front of the school.
   - Staff members will be stationed at each drop-off/pick-up location to direct traffic and to assist students in getting to the appropriate vehicle.

Monitoring Plan

To ensure that the TDM and Operations Management plans are functioning as intended, Sidwell will conduct annual monitoring studies, which will be submitted to DDOT and ANC 3F.

- Elements of the Monitoring Study:
  - The number of vehicle trips generated by the school during the AM peak hour and PM School peak hour.
    - Traffic counts shall be conducted when Sidwell, DC Public Schools, and Congress are in session.
    - Counts shall be conducted during the month of October at the driveways to the school on a typical weekday (a Wednesday or Thursday) from 7:00 AM to 9:00 AM and from 2:30 PM to 4:30 PM. During the first year, counts shall be conducted in January, March, and May in addition to October. Counts shall be conducted on days when no adverse weather impacts travel conditions.
    - The number of trips generated by the school shall be determined as follows:
      - AM peak hour shall be determined by selecting the single highest hourly inbound plus outbound volume (for all driveways combined) between 7:00 AM and 9:00 AM.
      - PM School peak hour shall be determined by selecting the single highest hourly inbound plus outbound volume (for all driveways combined) between 2:30 PM and 4:30 PM.
  - A queue analysis to evaluate whether the Lower School, Middle School and Upper School drop-off/pick-up locations are accommodated in their respective designated locations.
    - The queue study shall be conducted when Sidwell, DC Public Schools and Congress are in session.
    - The queue study shall be conducted in October on a typical weekday (a Tuesday, Wednesday, or Thursday) from 7:00 AM to 9:00 AM and from 2:30 PM to 4:30 PM. During the first year, the queue study shall be conducted in January, March, and May in addition to October. The queue study shall be conducted on days when no adverse weather impacts travel conditions.
  - A mode split survey (conducted approximately one month after the start of the school year) to determine the mode of transportation for students and faculty/staff.

- A list of TDM measures in effect at the time the study was conducted and the number of students enrolled and faculty/staff employed at the time the study was conducted.

- Trip Generation Goals:
  - Sidwell has established a goal of reducing peak hour vehicular traffic by 30 percent through implementation of a TDM plan. The vehicular trip generation goals are provided in Tables 17 (for entire campus) and 18 (for Lower School only).
- Sequencing of Monitoring Studies
  - During the first year the Lower School is open, the monitoring will be conducted two times per semester.
  - After the first year, the monitoring study shall be conducted during the Fall semester each year. If goals, are not met during the Fall semester, a second monitoring study shall be conducted during the Spring semester of that year. If goals are met during the Fall semester, the Spring semester monitoring study will not be required.
  - The monitoring study shall be conducted for a minimum of two consecutive years. In the event that the actual AM or PM School peak hour vehicle trip generation is less than the established Trip Generation Goal for 1,150 students (identified in the table above) for two consecutive years, monitoring will be conducted biennially (every two years).
  - In the event that the actual AM or PM School peak hour vehicle trip generation is less than the established Trip Generation Goal for two consecutive biennial studies, monitoring may cease until such time as Sidwell increases its student enrollment, as allowed below.
  - Sidwell must demonstrate, through the monitoring studies, that Trip Generation Goal is met at an enrollment of 1,150 students for two consecutive years prior to increasing its student enrollment. After Sidwell has successfully demonstrated that the goals have been met for two consecutive years, the student enrollment may be increased by 50 students (to 1,200 students) and the number of faculty/staff may increase to 260 (from an opening day staff count of 250).
  - Upon increase of the enrollment to 1,200 students, Sidwell shall continue with the annual monitoring studies for a minimum of an additional two years, measuring against the Trip Generation Goal.
  - Once Sidwell demonstrates, through the monitoring studies, that the Trip Generation Goal at an enrollment of 1,200 students has been met for two consecutive years, the student enrollment may be increased by an additional 50 students (to 1,250 students).

- Upon increase of the enrollment to 1,250 students, Sidwell shall continue with the annual monitoring studies for a minimum of an additional two years, measuring against the Trip Generation Goal.
- In the event that the actual AM or PM School peak hour vehicle trip generation exceeds the established Vehicle Trip Generation Goal, Sidwell shall continue to perform the monitoring until the vehicle trip generation for the site is less than the established Vehicle Trip Generation Goal for two consecutive years. At such time, Sidwell will perform the monitoring study biennially. If the studies show that the goals continue to be met for two consecutive biennial studies, monitoring may cease. Based on the proposed sequencing, Sidwell will perform a minimum of 11 monitoring studies over a minimum of 10 years, assuming they increase their cap by 100 students in that timeframe. If Sidwell does not increase their cap within the first six years, they will be required to perform a minimum of seven reports in six years and then would be required to resume monitoring reports once they increase their student cap.
- If the AM or PM peak hour Vehicle Trip Generation Goal is not met, Sidwell will include, in the monitoring study, additional TDM measures to be implemented prior to the next monitoring period. In addition, Sidwell will meet with DDOT to explore and develop new TDM strategies.

TOTAL FUTURE CONDITIONS

Trip Generation Analysis

To determine the number of trips generated by the Lower, Middle, and Upper Schools, Wells + Associates conducted counts at the Lower School on May 27 and June 3, 2015, from 7:00 AM to 9:00 AM and from 2:30 PM to 6:30 PM. Counts for the Middle[3] and Upper Schools were conducted on October 28 and 29, 2015, from 7:00 AM to 9:00 AM and from 3:00 PM to 6:30 PM. The number of vehicles entering and exiting campus were recorded during each count period. The existing trip generation for the Wisconsin Avenue campus is summarized in Table 14.

[3] At the Middle School, it was observed that some parents using the Sidwell pick-up/drop-off zone on the west side of 37th Street were affiliated with Hearst Elementary School directly across the street. These parents using the pick-up/drop-off zone were not included in the Middle School trip generation count. A smaller number of Sidwell parents were observed using the east side of 37th Street to pick-up/drop-off children at the Middle School. Those Sidwell parents were included in the Middle School trip generation count.

Table 14
Existing Site Trip Generation Summary

Trip Type	AM Peak			PM School Peak			PM Commuter Peak		
	In	Out	Total	In	Out	Total	In	Out	*Total*
Sidwell Friends Upper School[1]									
Existing	463	267	730	148	221	369	105	169	274
Trips/student	*0.92*	*0.53*	*1.45*	*0.29*	*0.44*	*0.73*	*0.21*	*0.34*	*0.54*
Sidwell Friends Middle School[1,2]									
Existing	139	138	277	46	62	108	25	36	61
Trips/student	*0.40*	*0.40*	*0.80*	*0.13*	*0.18*	*0.31*	*0.07*	*0.10*	*0.18*
Total	***602***	***405***	***1,007***	***194***	***283***	***477***	***130***	***205***	***335***

[1] W+A conducted a trip generation count of the existing Wisconsin Avenue campus on October 28, 2015, and October, 29, 2015.

[2] At the Middle School, it was observed that some parents using the Sidwell drop-off/pick-up zone on the west side of 37th Street were affiliated with Hearst Elementary School directly across the street. These parents using the drop-off/pick-up zone were not included in the Middle School trip generation count. A smaller number of Sidwell parents were observed using the east side of 37th Street to drop-off/pick-up children at the Middle School. Those Sidwell parents were included in the Middle School trip generation count.

Mode Split Survey

Per DDOT's request, a survey was conducted in November 2015 of both the parents and faculty/staff to determine travel characteristics for the school. Out of 888 families, 430 responded to the survey resulting in a 48 percent response rate. Out of 240 faculty/staff, 120 responded to the survey resulting in a 50 percent response rate. The results are summarized in Table 15 and are included in Appendix L.

Table 15
Summary of Mode Split Survey

Travel Mode	Car	Walk	Bike	Metrobus/ Metrorail	School Bus
Lower School					
Students	73.8%	5.4%	1.5%	0.8%	18.5%
Faculty/Staff	86.4%	0%	4.5%	9.1%	---
Middle/Upper School					
Students	86.3%	5.0%	2.7%	2.0%	4.0%
Faculty/Staff	77.7%	10.7%	0%	11.6%	---

Proposed Vehicular Trip Generation

The proposed trip generation for the Wisconsin Avenue campus is summarized in Table 16. The number of trips added as a result of the proposed student and faculty/staff cap increases and the number of trips that will be removed as a result of the Washington Home moving are also included in Table 16.

Table 16
New Site Trip Generation Summary
Without TDM Plan

Trip Type	AM			PM School			PM Commuter		
	In	Out	Total	In	Out	Total	In	Out	Total
Sidwell Friends Lower School									
Total Existing Trips[1]	157	178	335	103	148	251	42	21	63
Trips/student	*0.52*	*0.59*	*1.12*	*0.34*	*0.49*	*0.84*	*0.14*	*0.07*	*0.21*
Proposed Cap Increase[2]	14	15	29	9	13	22	4	2	6
Sidwell Friends Upper School									
Proposed Cap Increase[2]	41	23	64	13	19	32	9	15	24
Sidwell Friends Middle School									
Proposed Cap Increase[2]	12	12	24	4	5	9	2	3	5
Existing Washington Home Trips									
Trips to be Removed	-37	-13	-50	-18	-33	-51	-8	-25	-33
Total	***187***	***215***	***402***	***111***	***152***	***263***	***49***	***16***	***65***

[1] W+A conducted a trip generation count of the existing Bethesda campus on May 21, 2015.

[2] The percent increase in the student population is slightly higher than for the staff/faculty. Therefore, the proposed trips were calculated based on trips/student. It was assumed the cap increases at each school would be proportional to the existing number of students at each school.

As previously indicated, Sidwell has committed to a reduction in overall trips of 30 percent through implementation of the TDM plan. Table 18 summarizes the trip generation goals that would result from the 30 percent reduction of AM and PM School peak hour traffic volumes.

Table 17
Trip Generation Goals
With TDM Plan

Trip Type	AM			PM School		
	In	Out	Total	In	Out	Total
Existing Upper/Middle Schools (from Table 14)	602	405	1,007	194	283	477
Existing Lower School (from Table 16)	157	178	335	103	148	251
Subtotal – All Divisions	759	583	1,342	297	431	728
TDM Reduction (30%)	*-228*	*-175*	*-403*	*-89*	*-129*	*-218*
Net Vehicle Trips	531	408	939	208	302	510
Trip Gen Goal – All Divisions		***939***			***510***	

Note that Sidwell proposes no change to the Trip Generation Goals with the proposed increases in cap beyond 1,150 students.

In addition to the trip generation for the overall campus, the neighborhood surrounding the campus is particularly concerned about the number of trips using the neighborhood streets. As a result, Sidwell agreed to commit to a second set of trip generation goals based on traffic that is projected to enter and exit the Lower School site. Table 18 summarizes the this trip generation.

Table 18
Trip Generation – Neighborhood Streets Only

Land Use	Size/Units	AM Peak Hour			PM School Peak Hour		
		In	Out	Total	In	Out	Total
Lower School	300 Students	157	178	335	103	148	251
Faculty/Staff to Garage	*-9%*	*-26*	*-4*	*-30*	*0*	*0*	*0*
Subtotal Lower School		131	174	305	103	148	251
30% TDM Reduction	*-30%*	*-39*	*-52*	*-91*	*-31*	*-44*	*-75*
Lower School Trips with TDM		92	122	214	72	104	176
Trip Gen Goal – Lower School			***214***			***176***	

Site Trip Distribution and Assignment

The distribution of new peak hour site trips generated by the proposed development was based on student zip code lists, the distribution of inbound and outbound trips to/from the site and general knowledge of commuter routes to/from the site. To account for parents that drop-off students on their way to work in the morning, separate outbound AM Peak distributions were developed. These distributions are based on existing outbound counts at the signalized school driveways on Wisconsin Avenue. The end link trip distributions are shown in Table 19.

Table 19
Site Trip Distributions

Roadway	Direction	Distribution	AM Outbound Distribution
Wisconsin Avenue	North	43.5%	35%
	South	14%	19%
Van Ness Street	East	18%	24%
	West	14.5%	12%
Porter Street	East	5%	5%
Idaho Avenue	West	5%	5%

Lower School Site Trips

The drop-off/pick-up area for the Lower School is proposed to have ingress via the existing Washington Home Driveway on 37th Street (relocated to align with Tilden Street) and egress via the existing curb cut on Upton Street. As families with students in the Lower School and other divisions are likely to opt to use the Lower School drop-off/pick-up area, all existing and proposed trips for the Lower School are projected to use 37th Street to access the site. The resulting Lower School site trips are shown on Figure 31.

Middle School Site Trips

The new drop-off/pick-up area located at the existing tennis courts is proposed to have ingress via the existing service drive on Wisconsin Avenue and egress via the existing signal at the Post Office. Families with students in both the Middle and Upper Schools will be instructed to use the new drop-off/pick-up or the Upper School garage during the morning drop-off and afternoon pick-up. Additionally, all families with only Middle School students will be instructed to pick-up Middle School students at the new drop-off/pick-up area in the afternoon (they will still be able to drop-off students on the 37th Street in the morning). Thus, it is estimated 31 percent of existing AM peak hour and all PM peak hour

Middle School traffic on 37th Street will be rerouted to the new drop-off/pick-up.[4] The resulting rerouted Middle School site trips are shown on Figure 32.

To account for the proposed increase in the student/faculty caps, it was assumed all new students would be dropped-off on 37th Street and picked-up at the new area by the tennis courts. The resulting new Middle School site trips are shown on Figure 33.

Upper School Site Trips

To account for the proposed increase in the student/faculty caps, it was assumed all new Upper School students would be picked-up/dropped-off in the Upper School garage. The resulting new Upper School site trips are shown on Figure 34.

Net new site trips for the Lower, Middle, and Upper Schools are shown on Figure 35. The net new site trips for the Lower, Middle, and Upper Schools with the proposed TDM Plan (i.e. reflecting a 30 percent reduction) are shown on Figure 36.

Removed Washington Home Trips

To account for trips currently generated by the Washington Home during the peak hours, trips to and from the site were removed from the network. Trips were proportionally removed based on existing intersection counts. The resulting removed Washington Home trips are shown on Figure 37.

Traffic Forecasts

Forecasts without TDM Reduction

Total future traffic forecasts with the proposed redevelopment were determined by combining the 2020 background traffic forecasts shown in Figure 16 with the site traffic volumes shown on Figure 35 and removed Washington Home trips shown on Figure 37 to yield the 2020 total future traffic forecasts shown on Figure 38.

Forecasts with TDM Reduction

Total future traffic forescasts with the 30 percent reduction associated with the TDM Plan were determined by combining the 2020 background traffic forecasts shown in Figure 16 with the site trip volumes shown on Figure 36 and subtracting the Washington Home trips shown on Figure 37 to yield the 2020 total future traffic forecasts with TDM shown on Figure 39. Note the 30 percent reduction volumes only apply to the AM and PM School peak hours, as monitoring is not proposed for the PM Commuter peak hour.

[4] The percentage of Middle School students with siblings in the Upper School was determined using address information provided by the Applicant.

Capacity Analysis

Capacity Analysis without TDM Reduction

Capacity analyses were performed at the study intersections using the lane use and traffic controls shown on Figure 12, the total future peak hour traffic forecasts shown on Figure 38, and existing signal timings. The level of service results for the 2020 total future conditions with the proposed redevelopment are included in Appendix M and summarized in Table 20.

Table 20
Level of Service Summary
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Background Conditions			Total Future without TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street						
EBLTR	D	D	C	D	D	C
WBLTR	D	D	D	D	D	D
NBLTR	C	B	A	C	B	A
SBLT	A	A	A	A	A	A
SBR		A	A		A	A
Overall	**B**	**B**	**A**	**B**	**B**	**A**
2. Wisconsin Avenue/39th Street						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
3. Wisconsin Avenue/Van Ness Street						
EBL	D	E (66.9)	E (72.7)	D	E (65.8)	E (75.6)
EBTR	E (57.0)	D	E (64.8)	E (73.0)	D	E (69.8)
WBL	E (68.1)	D	E (63.4)	F (218.1)	E (58.2)	F(80.3)
WBTR	F (82.4)	F (111.3)	F (135.1)	F (102.4)	F (109.3)	F (137.4)
NBLTR	B	F (90.7)	C	B	F (180.2)	C
SBLTR	A	B	C	A	D	C
Overall	**C**	**E (63.7)**	**D**	**C**	**F (112.4)**	**D**
4. Wisconsin Avenue/Upton Street						
EBLR	C	C	D	C	C	D
WBR	C	C	C	C	D	C
NBLT	F (385.2)	F (318.3)	E (69.7)	F (404.6)	F (341.3)	E (74.6)
NBR	A	B		A	B	
SBTR	A	B	C	B	B	C
Overall	**F (175.5)**	**F (184.6)**	**D**	**F (179.2)**	**F (190.9)**	**D**

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

Table 20 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Background Conditions			Total Future without TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway						
EBLTR	D	E (57.6)	E (59.4)	D	E (65.9)	E (67.6)
WBLTR	D	F (962.2)	F (760.3)	F (266.6)	F (1543.6)	F(1116.3)
NBLTR	D	A	A	E (73.8)	A	A
SBLT	A	C	C	B	C	C
SBR		C			C	
SWLR	D	D	C	D	D	C
Overall	**C**	**F (104.8)**	**E (65.9)**	**E (58.0)**	**F (214.8)**	**F(111.0)**
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway						
EBLTR	E (69.1)	D	D	E (69.1)	D	D
WBLTR	D	D	D	D	D	D
NBLTR	F (250.1)	A	A	F (223.7)	A	A
SBLTR	B	B	B	B	B	B
Overall	**F (102.0)**	**B**	**A**	**F (90.0)**	**B**	**A**
7. Wisconsin Avenue/Quebec Street						
WBLR	B	B	A	B	A	A
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
8. Wisconsin Avenue/Porter Street						
EBLTR	D	C	D	D	C	D
WBLTR	F (244.1)	F (127.6)	F (152.3)	F (275.3)	F (162.2)	F (147.9)
NBLTR	B	B	B	B	B	B
SBLTR	B	B	B	B	B	B
Overall	**D**	**C**	**C**	**D**	**C**	**C**
9. Wisconsin Avenue/Porter Street						
EBLTR	C	C	C	D	C	C
NBLTR	C	D	B	C	D	B
SBLTR	A	B	A	A	B	B
Overall	**B**	**C**	**B**	**B**	**C**	**B**

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

Table 20 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Background Conditions			Total Future without TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
10. 37th Street/Warren 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**
11. 37th Street/Van Ness Street						
EBLTR	D	B	C	F (57.8)	C	C
WBLTR	D	C	C	E (42.0)	D	C
NBLTR	C	B	B	D	C	B
SBLTR	C	B	B	D	B	B
Overall	**D**	**C**	**C**	**E (40.9)**	**C**	**C**
12. 37th Street/Upton Street						
EBLTR	B	A	A	B	A	A
WBLTR	B	A	A	B	A	A
NBLTR	B	A	A	B	B	A
SBLTR	B	A	A	C	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
13. 37th Street/Tilden Street/Washington Home Driveway						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**A**	**A**	**A**	**B**	**A**	**A**
14. 37th Street/Quebec Street						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	A	A	A
Overall	**B**	**A**	**A**	**A**	**A**	**A**

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

Table 20 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Background Conditions			Total Future without TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
15. 37th Street/Porter Street						
EBLT	B	A	A	B	A	A
WBTR	B	A	B	B	A	B
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
16. 38th Street/Van Ness Street						
EBLTR	C	C	B	D	C	B
WBLTR	C	B	B	C	B	B
NBLTR	B	A	A	B	B	B
SBLTR	C	B	B	C	B	B
Overall	**C**	**B**	**B**	**C**	**C**	**B**
17. 38th Street/Upton Street						
EBLT	A	A	A	A	A	A
WBR	A	A	A	A	A	A
SBLR	A	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
18. Upton Street/Reno Road						
EBLR	C	C	C	C	C	C
NBLT	A	A	A	A	A	A
SBTR	A	A	A	A	A	A
19. Upton Street/Site Driveway						
EBTR	A	A	A	A	A	A
WBLT	A	A	A	A	A	A
NBLR	A	A	A	B	B	A
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A

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

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 20, where overall intersection levels of service under background conditions are projected to be at a LOS D or better, overall intersection levels of service under total future conditions without TDM also are projected to be at a LOS D or better with one exception. At the 37th Street/Van Ness Street intersection, the overall level of service is projected to drop from a LOS C to an LOS E during the AM peak hour.

At the Wisconsin Avenue/Van Ness Street intersection, the PM School peak hour overall level of service is projected to be at a LOS E under background conditions. With the proposed development, the overall LOS is projected to drop to a LOS F.

At the Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway intersection, the overall PM School and PM Commuter peak hour levels of service are projected to experience an increase in delay of more than five seconds. The westbound approach is projected to drop from a LOS D to a LOS E during the AM peak hour and to experience an increase in delay of more than five seconds during the PM School and PM Commuter peak hours. During the AM peak hour, the northbound approach is projected to drop from a LOS D to a LOS E.

Capacity Analysis with TDM Reduction

Capacity analyses were performed at the study intersections using the lane use and traffic controls shown on Figure 12, the total future peak hour traffic forecasts shown on Figure 39, and existing signal timings.

The level of service results for the 2020 total future conditions with the TDM reduction are included in Appendix N and summarized in Table 21.

Table 21
Level of Service Summary
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Background Conditions			Total Future with TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street						
EBLTR	D	D	C	D	D	C
WBLTR	D	D	D	D	D	D
NBLTR	C	B	A	C	B	A
SBLT	A	A	A	A	A	A
SBR		A	A		A	A
Overall	**B**	**B**	**A**	**B**	**B**	**A**
2. Wisconsin Avenue/39th Street						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
3. Wisconsin Avenue/Van Ness Street						
EBL	D	E (66.9)	E (72.7)	D	E (65.8)	E (75.6)
EBTR	E (57.0)	D	E (64.8)	E (55.5)	D	E (69.8)
WBL	E (68.1)	D	E (63.4)	E (68.3)	D	F(80.3)
WBTR	F (82.4)	F (111.3)	F (135.1)	F (95.2)	F (109.3)	F (137.4)
NBLTR	B	F (90.7)	C	B	F (110.6)	C
SBLTR	A	B	C	B	B	C
Overall	**C**	**E (63.7)**	**D**	**C**	**E (73.8)**	**D**
4. Wisconsin Avenue/Upton Street						
EBLR	C	C	D	C	C	D
WBR	C	C	C	C	C	C
NBLT	F (385.2)	F (318.3)	E (69.7)	F (361.7)	F (302.0)	E (74.6)
NBR	A	B		A	B	
SBTR	A	B	C	A	B	C
Overall	**F (175.5)**	**F (184.6)**	**D**	**F (161.6)**	**F (170.6)**	**D**
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway						
EBLTR	D	E (57.6)	E (59.4)	D	E (58.5)	E (67.6)
WBLTR	D	F (962.2)	F (760.3)	E (57.7)	F (984.2)	F(1116.3)
NBLTR	D	A	A	D	A	A
SBLT	A	C	C	B	C	C
SBR		C			C	
SWLR	D	D	C	D	D	C
Overall	**C**	**F (104.8)**	**E (65.9)**	**C**	**F (109.8)**	**F(111.0)**

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

Table 21 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Background Conditions			Total Future with TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway						
EBLTR	E (69.1)	D	D	E (69.1)	D	D
WBLTR	D	D	D	D	D	D
NBLTR	F (250.1)	A	A	F (195.8)	A	A
SBLTR	B	B	B	B	A	B
Overall	**F (102.0)**	**B**	**A**	**F (80.7)**	**B**	**A**
7. Wisconsin Avenue/Quebec Street						
WBLR	B	B	A	B	A	A
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
8. Wisconsin Avenue/Porter Street						
EBLTR	D	C	D	D	C	D
WBLTR	F (244.1)	F (127.6)	F (152.3)	F (220.8)	F (134.8)	F (147.9)
NBLTR	B	B	B	B	B	B
SBLTR	B	B	B	B	B	B
Overall	**D**	**C**	**C**	**C**	**C**	**C**
9. Wisconsin Avenue/Porter Street						
EBLTR	C	C	C	C	C	C
NBLTR	C	D	B	C	D	B
SBLTR	A	B	A	A	B	B
Overall	**B**	**C**	**B**	**B**	**C**	**B**
10. 37th Street/Warren 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**
11. 37th Street/Van Ness Street						
EBLTR	D	B	C	D	C	C
WBLTR	D	C	C	C	C	C
NBLTR	C	B	B	C	B	B
SBLTR	C	B	B	C	B	B
Overall	**D**	**C**	**C**	**C**	**C**	**C**

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

Table 21 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Background Conditions			Total Future with TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
12. 37th Street/Upton Street						
EBLTR	B	A	A	B	A	A
WBLTR	B	A	A	B	A	A
NBLTR	B	A	A	B	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
13. 37th Street/Tilden Street/Washington Home Driveway						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
14. 37th Street/Quebec Street						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	A	A	A
Overall	**B**	**A**	**A**	**A**	**A**	**A**
15. 37th Street/Porter Street						
EBLT	B	A	A	B	A	A
WBTR	B	A	B	B	A	B
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
16. 38th Street/Van Ness Street						
EBLTR	C	C	B	C	C	B
WBLTR	C	B	B	C	B	B
NBLTR	B	A	A	B	B	B
SBLTR	C	B	B	C	B	B
Overall	**C**	**B**	**B**	**C**	**B**	**B**
17. 38th Street/Upton Street						
EBLT	A	A	A	A	A	A
WBR	A	A	A	A	A	A
SBLR	A	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**

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

Table 21 (continued)
Level of Service Summary
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Background Conditions			Total Future with TDM		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
18. Upton Street/Reno Road						
EBLR	C	C	C	C	C	C
NBLT	A	A	A	A	A	A
SBTR	A	A	A	A	A	A
19. Upton Street/Site Driveway						
EBTR	A	A	A	A	A	A
WBLT	A	A	A	A	A	A
NBLR	A	A	A	B	B	A
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
[x.x] = unsignalized intersection control delay in sec/veh (x.x) = signalized intersection control delay in sec/veh						

As shown in Table 21, where overall intersection levels of service under background conditions are projected to be at 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.

At the Wisconsin Avenue/Van Ness Street intersection, the PM School peak hour overall level of service is projected to be at a LOS E under background conditions. With the proposed development, the overall delay is projected to drop increase by more than 5 seconds.

At the Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway intersection, the overall PM Commuter peak hour level of service is projected to drop from a LOS E to a LOS F. The westbound approach is projected to drop from a LOS D to a LOS E during the AM peak hour

Queue Analysis

Queue Analysis without TDM Reduction

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 22 and queue reports are provided in Appendix M.

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 22, queueing at the Wisconsin Avenue/Warren Street intersection southbound left/through would increase by more than 150 feet under total future conditions with the proposed development.

Table 22
95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future without TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street							
EBLTR	140	61	44	33	61	44	33
WBLTR	170	94	61	96	94	61	95
NBLTR	305	457#m	154	135m	427m#	174	135m
SBLT	205	573#	13	14	632#	431#	16
SBR	110		0m	0m		0m	0m
2. Wisconsin Avenue/39th Street							
NBTR	65	0	0	0	0	0	0
SBLT	135	0	0	0	0	0	0
3. Wisconsin Avenue/Van Ness Street							
EBL	100	63	116#	124#	65	115#	125#
EBTR	210	345#	275#	378#	396#	301#	392#
WBL	600	127#	78#	107#	205#	112#	124#
WBTR	105	379#	420#	455#	415#	419#	456#
NBLTR	290	235	568~	227	328	691~	229
SBLTR	215	279~	146	758#	363~	212#	772#

† 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.

Table 22 (continued)
95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future without TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
4. Wisconsin Avenue/Upton Street							
EBLR	210/435	93	84	329#	94	89	329#
WBR	455	1	22	16	56	96	18
NBLT	295	981#	1000m#	644#m	941~	963m#	617m#
NBR	95	2m	18m		1m	17m	
SBTR	280	220	360	351	288	316m	372
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway							
EBLTR	520	18	76	132	18	77	153#
WBLTR	345	74	339#	298#	340#	485#	393#
NBLTR	565	446	544#	96	418	507#	90
SBLT	300	621#	433	382	700#	452	392
SBR	170		9m			9m	
SWLR	75	17	32	48	17	32	48
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway							
EBLTR	100	178#	78	78	178#	78	78
WBLTR	95	102	92	63	102	92	63
NBLTR	490	653#m	79m	33m	611m#	71m	30m
SBLTR	565	416#	651m#	163m	217#	652m#	160m
7. Wisconsin Avenue/Quebec Street							
WBLR	440	16	11	6	5	4	4
NBTR	265	0	0	0	0	0	0
SBLT	490	7	6	11	7	7	11
8. Wisconsin Avenue/Porter Street							
EBLTR	220	131	48	67	131	48	67
WBLTR	310	383#	340#	389#	401#	373#	383#
NBLTR	385	177	214m	295	181m	217m	297
SBLTR	265	380	184	143m	461#	188	143m
9. Wisconsin Avenue/Idaho Avenue							
EBLTR	340	168	144	172	179	150	176
NBLTR	150	412	626#	275	434	637#	276
SBLTR	385	205	318m	159m	194	332m	163m

† 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.

Table 22 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future without TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School	PM Comm Peak
10. 37th Street/Warren Street							
EBLTR	560	10	5	5	10	5	8
WBLTR	520	8	3	5	8	3	5
NBLTR	230	13	20	15	13	20	15
SBLTR	210	23	3	3	20	3	3
11. 37th Street/Van Ness Street							
EBLTR	560	180	70	93	288	403	103
WBLTR	810	125	135	155	198	175	168
NBLTR	275	90	55	55	110	70	55
SBLTR	230	103	15	23	130	18	23
12. 37th Street/Upton Street							
EBLTR	550	33	15	8	63	30	8
WBLTR	920	28	18	10	28	18	10
NBLTR	280	33	33	20	33	35	20
SBLTR	275	78	18	10	88	25	10
13. 37th Street/Tilden Street/Washington Home Driveway							
EBLTR	125	0	0	0	0	0	0
WBLTR	790	3	3	3	3	3	3
NBLTR	1065	25	18	15	25	20	15
SBLTR	280	63	15	13	73	25	15
14. 37th Street/Quebec Street							
EBLTR	440	10	13	10	10	13	10
WBLTR	230	15	8	10	15	8	8
NBLTR	240	23	13	18	25	15	18
SBLTR	1065	58	23	13	33	18	8
15. 37th Street/Porter Street							
EBLT	310	30	15	25	35	18	25
WBTR	25	48	33	43	50	35	43
NBLTR	65	15	8	23	18	10	23
SBLTR	240	30	10	13	30	13	10

† 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.

Table 22 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions without TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future without TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
16. 38th Street/Van Ness Street							
EBLTR	600	113	95	68	170	130	73
WBLTR	560	103	88	88	145	95	93
NBLTR	285	13	10	13	20	10	15
SBLTR	235	105	18	18	118	18	18
17. 38th Street/Upton Street							
EBLT	455	13	13	13	10	10	10
WBR	555	10	8	5	25	20	5
SBLR	285	18	8	8	18	8	8
18. Upton Street/Reno Road							
EBLR	920	76	28	24	102	24	24
NBLT	500	19	12	0	18	12	0
SBTR	260	0	0	0	0	0	0
19. Upton Street/Site Driveway							
EBTR	135	0	0	0	0	0	0
WBLT	370	1	0	0	0	0	0
NBLR	75	1	2	1	27	19	2
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)							
NBTR	355	0	0	0	0	0	0
SBLT	190	0	0	0	10	5	3

† 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.

Queue Analysis with TDM Reduction

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 23 and queue reports are provided in Appendix N.

As shown in Table 23, none of the individual intersection queues would increase by more than 150 feet under total future conditions with TDM.

Table 23
95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future with TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street							
EBLTR	140	61	44	33	61	44	33
WBLTR	170	94	61	96	94	61	95
NBLTR	305	457#m	154	135m	445m#	155	135m
SBLT	205	573#	13	14	556#	28	16
SBR	110		0m	0m		0m	0m
2. Wisconsin Avenue/39th Street							
NBTR	65	0	0	0	0	0	0
SBLT	135	0	0	0	0	0	0
3. Wisconsin Avenue/Van Ness Street							
EBL	100	63	116#	124#	64	115#	125#
EBTR	210	345#	275#	378#	337#	281#	392#
WBL	600	127#	78#	107#	130#	88#	124#
WBTR	105	379#	420#	455#	403#	419#	456#
NBLTR	290	235	568~	227	253	593~	229
SBLTR	215	279~	146	758#	311~	175	772#
4. Wisconsin Avenue/Upton Street							
EBLR	210/435	93	84	329#	93	84	329#
WBR	455	1	22	16	33	67	18
NBLT	295	981#	1000m#	644#m	953m#	967m#	617m#
NBR	95	2m	18m		0	16m	
SBTR	280	220	360	351	223	374	372
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway							
EBLTR	520	18	76	132	18	76	153#
WBLTR	345	74	339#	298#	123	345#	393#
NBLTR	565	446	544#	96	414	504#	90
SBLT	300	621#	433	382	630#	434	392
SBR	170		9m			9m	
SWLR	75	17	32	48	17	32	48

† 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.

Table 23 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future with TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway							
EBLTR	100	178#	78	78	178#	78	78
WBLTR	95	102	92	63	102	92	63
NBLTR	490	653#m	79m	33m	586m#	69m	30m
SBLTR	565	416#	651m#	163m	196	625m#	158m
7. Wisconsin Avenue/Quebec Street							
WBLR	440	16	11	6	5	4	4
NBTR	265	0	0	0	0	0	0
SBLT	490	7	6	11	7	6	11
8. Wisconsin Avenue/Porter Street							
EBLTR	220	131	48	67	131	48	67
WBLTR	310	383#	340#	389#	364#	348#	383#
NBLTR	385	177	214m	295	173	213m	297
SBLTR	265	380	184	143m	391	184	144m
9. Wisconsin Avenue/Idaho Avenue							
EBLTR	340	168	144	172	167	146	176
NBLTR	150	412	626#	275	408	627#	276
SBLTR	385	205	318m	159m	189	320m	163m
10. 37th Street/Warren Street							
EBLTR	560	10	5	5	8	5	8
WBLTR	520	8	3	5	8	3	5
NBLTR	230	13	20	15	13	20	15
SBLTR	210	23	3	3	20	3	3
11. 37th Street/Van Ness Street							
EBLTR	560	180	70	93	180	80	103
WBLTR	810	125	135	155	123	145	168
NBLTR	275	90	55	55	85	63	55
SBLTR	230	103	15	23	93	15	23

† 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.

Table 23 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future with TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
12. 37th Street/Upton Street							
EBLTR	550	33	15	8	43	23	8
WBLTR	920	28	18	10	25	18	10
NBLTR	280	33	33	20	30	33	20
SBLTR	275	78	18	10	70	20	10
13. 37th Street/Tilden Street/Washington Home Driveway							
EBLTR	125	0	0	0	0	0	0
WBLTR	790	3	3	3	3	3	3
NBLTR	1065	25	18	15	25	18	15
SBLTR	280	63	15	13	53	18	15
14. 37th Street/Quebec Street							
EBLTR	440	10	13	10	10	13	10
WBLTR	230	15	8	10	15	8	8
NBLTR	240	23	13	18	23	15	18
SBLTR	1065	58	23	13	30	15	8
15. 37th Street/Porter Street							
EBLT	310	30	15	25	33	15	25
WBTR	25	48	33	43	45	23	43
NBLTR	65	15	8	23	15	10	23
SBLTR	240	30	10	13	25	10	10
16. 38th Street/Van Ness Street							
EBLTR	600	113	95	68	120	103	73
WBLTR	560	103	88	88	105	88	93
NBLTR	285	13	10	13	15	10	15
SBLTR	235	105	18	18	100	15	18
17. 38th Street/Upton Street							
EBLT	455	13	13	13	10	10	10
WBR	555	10	8	5	20	15	5
SBLR	285	18	8	8	18	8	8

† 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.

Table 23 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future Conditions with TDM Reduction

Approach	Available Storage†	Background Conditions			Total Future with TDM		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
18. Upton Street/Reno Road							
EBLR	920	76	28	24	93	24	24
NBLT	500	19	12	0	17	12	0
SBTR	260	0	0	0	0	0	0
19. Upton Street/Site Driveway							
EBTR	135	0	0	0	0	0	0
WBLT	370	1	0	0	0	0	0
NBLR	75	1	2	1	15	13	2
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)							
NBTR	355	0	0	0	0	0	0
SBLT	190	0	0	0	10	3	3

† 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.

Improvement Analysis

After accounting for the 30 percent reduction in traffic as a result of the TDM plan, additional improvements were necessary to offset any remaining impacts associated with the project. Since the TDM plan is intended to reduce trip generation specifically during the AM and PM School peak hours, improvements during the PM Commuter peak hour do not include a 30 percent reduction in traffic. Note that the cycle lengths and offsets are consistent with existing conditions and the proposed timing adjustments follow DDOT guidelines on vehicular and pedestrian interval calculations, which are included in Appendix O. Results of the analyses are summarized in Tables 24 and 25. For comparison purposes, background conditions also are provided in Tables 24 and 25.

Table 24
Level of Service Summary
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Background Conditions			Total Future with TDM and Improvements		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street						
EBLTR	D	D	C	D	D	C
WBLTR	D	D	D	D	D	D
NBLTR	C	B	A	C	B	A
SBLT	A	A	A	A	A	A
SBR		A	A		A	A
Overall	**B**	**B**	**A**	**B**	**B**	**A**
2. Wisconsin Avenue/39th Street						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
3. Wisconsin Avenue/Van Ness Street						
EBL	D	E (66.9)	E (72.7)	D	E (70.7)	E (62.9)
EBTR	E (57.0)	D	E (64.8)	E (55.5)	D	E (62.1)
WBL	E (68.1)	D	E (63.4)	E (68.3)	D	E (66.9)
WBTR	F (82.4)	F (111.3)	F (135.1)	F (95.2)	F (116.7)	F (121.0)
NBLTR	B	F (90.7)	C	B	F (94.6)	C
SBLTR	A	B	C	A	B	C
Overall	**C**	**E (63.7)**	**D**	**C**	**E (67.4)**	**D**
4. Wisconsin Avenue/Upton Street						
EBLR	C	C	D	C	C	D
WBR	C	C	C	C	C	C
NBLT	F (385.2)	F (318.3)	E (69.7)	F (361.3)	F (293.4)	E (65.1)
NBR	A	B		A	A	
SBTR	A	B	C	B	B	C
Overall	**F (175.5)**	**F (184.6)**	**D**	**F (162.2)**	**F (166.0)**	**D**

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

Table 24 (continued)
Level of Service Summary
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Background Conditions			Total Future with TDM and Improvements		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway						
EBLTR	D	E (57.6)	E (59.4)	D	D	E (61.9)
WBLTR	D	F (962.2)	F (760.3)	D	F (114.2)	F (146.5)
NBLTR	D	A	A	C	C	B
SBLT	A	C	C	B	B	B
SBR		C			A	
SWLR	D	D	C	D	D	E (55.4)
Overall	**C**	**F (104.8)**	**E (65.9)**	**B**	**C**	**C**
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway						
EBLTR	E (69.1)	D	D	E (69.1)	D	D
WBLTR	D	D	D	D	D	D
NBLTR	F (250.1)	A	A	F (195.8)	A	A
SBLTR	B	B	B	B	B	A
Overall	**F (102.0)**	**B**	**A**	**E (78.4)**	**B**	**A**
7. Wisconsin Avenue/Quebec Street						
WBLR	B	B	A	B	A	A
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A
8. Wisconsin Avenue/Porter Street						
EBLTR	D	C	D	D	C	D
WBLTR	F (244.1)	F (127.6)	F (152.3)	F (220.8)	F (134.8)	F (147.9)
NBLTR	B	B	B	B	B	B
SBLTR	B	B	B	B	B	B
Overall	**D**	**C**	**C**	**C**	**C**	**C**
9. Wisconsin Avenue/Porter Street						
EBLTR	C	C	C	C	C	C
NBLTR	C	D	B	C	D	B
SBLTR	A	B	A	A	B	B
Overall	**B**	**C**	**B**	**B**	**C**	**B**

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

Table 24 (continued)
Level of Service Summary
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Background Conditions			Total Future with TDM and Improvements		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
10. 37th Street/Warren 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**
11. 37th Street/Van Ness Street						
EBLTR	D	B	C	D	C	C
WBLTR	D	C	C	D	C	C
NBLTR	C	B	B	C	B	B
SBLTR	C	B	B	C	B	B
Overall	**D**	**C**	**C**	**C**	**C**	**C**
12. 37th Street/Upton Street						
EBLTR	B	A	A	B	A	A
WBLTR	B	A	A	B	A	A
NBLTR	B	A	A	B	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
13. 37th Street/Tilden Street/Washington Home Driveway						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
14. 37th Street/Quebec Street						
EBLTR	A	A	A	A	A	A
WBLTR	A	A	A	A	A	A
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	A	A	A
Overall	**B**	**A**	**A**	**A**	**A**	**A**

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

Table 24 (continued)
Level of Service Summary
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Background Conditions			Total Future with TDM and Improvements		
	AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
15. 37th Street/Porter Street						
EBLT	B	A	A	B	A	A
WBTR	B	A	B	B	A	B
NBLTR	A	A	A	A	A	A
SBLTR	B	A	A	B	A	A
Overall	**B**	**A**	**A**	**B**	**A**	**A**
16. 38th Street/Van Ness Street						
EBLTR	C	C	B	C	C	B
WBLTR	C	B	B	C	B	B
NBLTR	B	A	A	B	B	B
SBLTR	C	B	B	C	B	B
Overall	**C**	**B**	**B**	**C**	**B**	**B**
17. 38th Street/Upton Street						
EBLT	A	A	A	A	A	A
WBR	A	A	A	A	A	A
SBLR	A	A	A	A	A	A
Overall	**A**	**A**	**A**	**A**	**A**	**A**
18. Upton Street/Reno Road						
EBLR	C	C	C	C	C	C
NBLT	A	A	A	A	A	A
SBTR	A	A	A	A	A	A
19. Upton Street/Site Driveway						
EBTR	A	A	A	A	A	A
WBLT	A	A	A	A	A	A
NBLR	A	A	A	B	B	A
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)						
NBTR	A	A	A	A	A	A
SBLT	A	A	A	A	A	A

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

Table 25
95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Available Storage†	Background Conditions			Total Future with TDM and Improvements		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
1. Wisconsin Avenue/Warren Street							
EBLTR	140	61	44	33	61	44	33
WBLTR	170	94	61	96	94	61	95
NBLTR	305	457#m	154	135m	445m#	152	137m
SBLT	205	573#	13	14	556#	28	16
SBR	110		0m	0m		0m	0m
2. Wisconsin Avenue/39th Street							
NBTR	65	0	0	0	0	0	0
SBLT	135	0	0	0	0	0	0
3. Wisconsin Avenue/Van Ness Street							
EBL	100	63	116#	124#	64	118#	119#
EBTR	210	345#	275#	378#	337#	286#	382#
WBL	600	127#	78#	107#	130#	91#	118#
WBTR	105	379#	420#	455#	403#	423#	448#
NBLTR	290	235	568~	227	253	581~	229
SBLTR	215	279~	146	758#	28	172	775#
4. Wisconsin Avenue/Upton Street							
EBLR	210/435	93	84	329#	93	84	329#
WBR	455	1	22	16	33	67	18
NBLT	295	981#	1000m#	644#m	960m#	993m#	669#m
NBR	95	2m	18m		0	19	
SBTR	280	220	360	351	298	374	368
5. Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway							
EBLTR	520	18	76	132	19	88	178#
WBLTR	345	74	339#	298#	121	268#	324#
NBLTR	565	446	544#	96	555#	498	333
SBLT	300	621#	433	382	495	380	323
SBR	170		9m			12	
SWLR	75	17	32	48	21	42	62

† 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.

Table 25 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Available Storage†	Background Conditions			Total Future with TDM and Improvements		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
6. Wisconsin Avenue/Rodman Street/Sidwell Driveway							
EBLTR	100	178#	78	78	178#	78	78
WBLTR	95	102	92	63	102	92	63
NBLTR	490	653#m	79m	33m	586m#	69m	30m
SBLTR	565	416#	651m#	163m	271	539#	393m
7. Wisconsin Avenue/Quebec Street							
WBLR	440	16	11	6	5	4	4
NBTR	265	0	0	0	0	0	0
SBLT	490	7	6	11	7	6	11
8. Wisconsin Avenue/Porter Street							
EBLTR	220	131	48	67	131	48	67
WBLTR	310	383#	340#	389#	364#	348#	383#
NBLTR	385	177	214m	295	173	213m	297
SBLTR	265	380	184	143m	392	183	143m
9. Wisconsin Avenue/Idaho Avenue							
EBLTR	340	168	144	172	167	146	176
NBLTR	150	412	626#	275	408	627#	276
SBLTR	385	205	318m	159m	189	320m	163m
10. 37th Street/Warren Street							
EBLTR	560	10	5	5	8	5	8
WBLTR	520	8	3	5	8	3	5
NBLTR	230	13	20	15	13	20	15
SBLTR	210	23	3	3	20	3	3
11. 37th Street/Van Ness Street							
EBLTR	560	180	70	93	180	80	103
WBLTR	810	125	135	155	123	145	168
NBLTR	275	90	55	55	85	63	55
SBLTR	230	103	15	23	93	15	23

† 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.

Table 25 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Available Storage†	Background Conditions			Total Future with TDM and Improvements		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
12. 37th Street/Upton Street							
EBLTR	550	33	15	8	43	23	8
WBLTR	920	28	18	10	25	18	10
NBLTR	280	33	33	20	30	33	20
SBLTR	275	78	18	10	70	20	10
13. 37th Street/Tilden Street/Washington Home Driveway							
EBLTR	125	0	0	0	0	0	0
WBLTR	790	3	3	3	3	3	3
NBLTR	1065	25	18	15	25	18	15
SBLTR	280	63	15	13	53	18	15
14. 37th Street/Quebec Street							
EBLTR	440	10	13	10	10	13	10
WBLTR	230	15	8	10	15	8	8
NBLTR	240	23	13	18	23	15	18
SBLTR	1065	58	23	13	30	15	8
15. 37th Street/Porter Street							
EBLT	310	30	15	25	33	15	25
WBTR	25	48	33	43	45	33	43
NBLTR	65	15	8	23	15	10	23
SBLTR	240	30	10	13	25	10	10
16. 38th Street/Van Ness Street							
EBLTR	600	113	95	68	120	103	73
WBLTR	560	103	88	88	105	88	93
NBLTR	285	13	10	13	15	10	15
SBLTR	235	105	18	18	100	15	18
17. 38th Street/Upton Street							
EBLT	455	13	13	13	10	10	10
WBR	555	10	8	5	20	15	5
SBLR	285	18	8	8	18	8	8

† 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.

Table 25 (continued)
Synchro 95th Percentile Queue Summary (in feet)
Background Conditions vs. Total Future with TDM Reduction and Improvements

Approach	Available Storage†	Background Conditions			Total Future with TDM and Improvements		
		AM Peak	PM School Peak	PM Comm Peak	AM Peak	PM School Peak	PM Comm Peak
18. Upton Street/Reno Road							
EBLR	920	76	28	24	93	24	24
NBLT	500	19	12	0	17	12	0
SBTR	260	0	0	0	0	0	0
19. Upton Street/Site Driveway							
EBTR	135	0	0	0	0	0	0
WBLT	370	1	0	0	0	0	0
NBLR	75	1	2	1	15	13	2
20. Wisconsin Avenue/Service Driveway (Proposed Circle Driveway)							
NBTR	355	0	0	0	0	0	0
SBLT	190	0	0	0	10	3	3

† 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.

Intersection Improvements

Wisconsin Avenue/Van Ness Street

During the PM School peak hour, the overall delay at this intersection is projected to increase by more than five seconds. In order to mitigate the impact of the school, minor timing adjustments in the PM School peak hour would reduce the overall delay by 6.4 seconds.

During the PM Commuter peak hour, the westbound left would drop from an LOS E to an LOS F. During the course of evaluating potential timing improvements at the intersection, it was noted that the southbound left turn phase is programmed during the PM Commuter peak hour even though the movement is prohibited (except for buses). Reducing the amount of time allotted to the southbound left turn phase to its allowable minimum would mitigate the impact of the development.

The following timing adjustments are recommended to mitigate the impact of the development:

- During the PM peak, shift one second of green time from the southbound left turn phase (phase 1) to the northbound phase (phase 2) and shift one second of green time from the northbound/southbound phase (phases 2 and 6) to the eastbound/westbound phase (phases 4 and 8), and
- During the PM School peak hour or half hour, shift one second of green time from the southbound left turn phase (phase 1) to the northbound phase (phase 2) and shift one half second of green time from the eastbound/westbound phase (phases 4 and 8) to the northbound/southbound phase (phases 2 and 6).

Note that the PM timing plan currently runs from 2:30 PM to 7:00 PM. As currently configured, it is not possible to provide different timings for the PM School peak hour. However, there is precedent for providing slightly different phase times during a portion of the timing plan. For example, at the Wisconsin Avenue/Rodman Street intersection, the southbound left turn phase gets additional green time during a portion of the AM timing plan (i.e. between 7:30 and 8:00 AM).

Wisconsin Avenue/Fannie Mae/Post Office/Sidwell Driveway

During the AM peak hour, the westbound approach is projected to drop from a LOS D to a LOS E. Timing and phasing adjustments would improve the westbound level of service from a LOS E to a LOS D.

During the PM Commuter peak hour, the overall intersection would drop from a LOS E to a LOS F. Timing and phasing adjustments in the PM Commuter peak hour would improve the overall level of service from a LOS F to a LOS C. While the Post Office Driveway would drop from a LOS D to LOS E (note that the delay for this approach would be 55.4 seconds/vehicle and the cut-off for a LOS D is 55.0 seconds/vehicle), the delay on the Sidwell driveway would decrease by 838 seconds/vehicle.

Although not required from a mitigation perspective, the same phasing adjustments were modeled for the PM School peak hour. The phasing changes would improve the overall level of service from a LOS F to a LOS C and would improve the eastbound, westbound, and southbound approaches.

The following timing and phasing changes are recommended to mitigate the impact of the development and improve the overall operation of the intersection:

- Reassign the Sidwell Driveway approach to operate concurrently with the Fannie Mae approach (phase 4), reassign the Post Office approach to operate independently (phase 3), set phase 3 to its minimum split of 13 seconds, and allocate the remaining time to the northbound/southbound phase (phases 2 and 6).

In addition to the noted phasing change, the signal heads for the Post Office driveway should be optically programmed or louvers should be added so that the signal heads are not visible to traffic exiting via the Sidwell driveway. Currently, drivers exiting via the Sidwell driveway can readily see the signal indication for the Post Office driveway, causing

confusion and safety concerns. Drivers were observed proceeding during the Post Office green signal even though the Sidwell approach had a red indication.

The Synchro reports for level of service and queue improvement analyses are provided in Appendix P.

Wisconsin Avenue Corridor Analysis

As the Middle School pick-up/drop-off operations would be shifted from 37th Street, DDOT requested further analysis of the impacts this would have on Wisconsin Avenue. Queues were graphically depicted for all analysis scenarios (Existing, Background, Total Future without the TDM reduction, and Total Future with TDM reduction and Improvments) to determine where queues exceed available storage and spillback into other intersections.

The study area for this analysis was limited to only those intersections along Wisconsin Avenue, as those intersections will be the most impacted by this change on a corridor level. In addition, the peak period for this analysis was limited to the AM peak hour as the morning period is more critical for a school use, since the afternoon school traffic is not as concentrated as the morning. Southbound school traffic attempting to turn left in to the school could potentially contribute to additional queueing as commuter traffic along Wisconsin Avenue is primarily southbound during the AM period. During the PM peak hours, commuter traffic is primarily northbound and the southbound left turns do not create a significant disruption.

Existing

Synchro 95th percentile queues for existing conditions are graphically depicted on Figure 40. As shown, northbound queues at the Upton Street intersection currently spillback to the Rodman Street intersection. Southbound queues at the Fannie Mae Driveway/Post Office Driveway/Sidwell Driveway also spillsback to the Upton Street intersection.

Background

Synchro 95th percentile queues for background conditions are graphically depicted on Figure 41. In addition to existing spillback, southbound queues at the Porter Street intersection are projected to spillback to the Quebec Street intersection.

Total Future and Total Future with Improvements

Synchro 95th percentile queues for total future conditions without the TDM reduction and total future with the TDM reduction and recommended improvements are graphically depicted on Figures 42 and 43, respectively. Spillback expected to occur under background conditions is also projected to occur under total future conditions, but no additional intersections are expected to cause spillback.

Because the 95th percentile queues in the northbound direction show that queues currently block the Sidwell Service Driveway (Proposed New Circle Driveway), a queue analysis was undertaken in the field to determine the extent of the blockages. The queue study was conducted from 7:30 AM to 9:00 AM on Wednesday, February 10, 2016. The queue analysis showed that while northbound queues stemming from the signal at the Post Office/Fannie Mae driveway backed up past the Sidwell Service driveway by the end of the red interval, the queues quickly cleared allowing left turns access to the service drive. Since northbound traffic at the upstream Rodman Street intersection are stopped during the southbound advance left turn phase at the intersection, gaps in northbound traffic are created between the time the queue at the Post Office/Fannie Mae intersection dissipates and the time the northbound traffic at Rodman Street receives green.

The most significant queues were observed between 8:00 and 8:10 AM. During that time, the entire northbound queue did not clear each cycle; however, the residual queue blocked the service driveway only during one cycle. As a result, over the hour and a half observation period, the driveway was blocked for a full cycle only one time and sufficient gaps were available to accommodate left turns into the driveway. Data from the queue study is included in Appendix Q.

Net Expected Southbound Left Turns

Given Sidwell's commitment to a 30 percent campus-wide reduction, the number of added southbound left turns on Wisconsin Avenue would be mitigated to a degree. Table 26 summarizes the number of southbound left turns that are projected to be added or removed at the intersections along Wisconsin Avenue. As shown on Table 26, a slight decrease in the number of southbound left turns made on Wisconsin Avenue during the AM peak hour is projected. Therefore, relocation of the Middle School pick-up/drop-off should have minimal effects on the Wisconsin Avenue corridor.

Table 26
Net Southbound Left Turns on Wisconsin Avenue

Street	Net SBL Turns Added/Subtracted		
	AM Peak	PM School Peak	PM Commuter Peak
Warren Street	30	0	1
Van Ness Street	0	12	0
Service Drive	38	27	14
Subtotal	**68**	**39**	**15**
Rodman Street [1]	-71	-23	-9
Total	**-3**	**+16**	**+6**

[1] The SBL turns subtracted from Rodman Street are a result of the 30 TDM reduction.

It also is worth noting that the existing service drive, which is proposed to provide access to the new circle that will handle the Middle School pick-up/drop-off operation, once served as the main entrance to the school (prior to construction of the garage in 2010). At

that time, 141 vehicles per hour made the southbound left turn into the driveway during the morning peak hour (based on traffic couts conducted by Wells + Associates on October 1, 2003). The volume of traffic that is projected to make the southbound left turn into the driveway under the proposed plan is 23 vehicles per hour during the morning peak hour or 84 percent fewer trips than were made when the driveway functioned as the main entrance to the school. Also noteworthy is the fact that the through volumes on Wisconsin Avenue were slightly higher in 2003 than they are today.

Community Transportation Solutions

During the community engagement process, a number of transportation solutions to alleviate existing congestion on the neighborhood streets and/or improve safety on neighborhood streets were posed by various members of the community. Because these measures are supported by some in the community and opposed by others, Sidwell looked for other solutions to mitigate the impact of the proposed project. Nevertheless, the solutions proposed by the community are summarized below with a qualitative analysis of each.

Removal of Traffic Calming at Wisconsin Avenue/Upton Street

Some members of the community expressed an interest in removing the traffic calming devices located at the Wisconsin Avenue/Upton Street intersection, while other members were opposed to removal of the devices. While not necessary to mitigate the impact of Sidwell's proposed project, capacity and queuing analyses were performed to determine the potential impacts and benefits of removing the traffic calming at this location. As this removal will primarily impact the northern portion of the study area, the study intersections located along Upton Street and Van Ness Street were analyzed. To estimate the volume of traffic that would divert to Upton Street with the removal of the traffic calming, traffic counts conducted prior to the installation of the channelizing island were used and factored to 2020 using a one percent growth rate compounded annually. Volumes along Van Ness Street were adjusted accordingly to account for the fact that some southbound and westbound lefts would be diverted from Van Ness Street to Upton Street. The volumes used to conduct this analysis are shown on Figure 44. The level of service and queue results for the 2020 total future conditions with the removal of the traffic calming devices are included in Appendix R and summarized in Tables 27 and 28.

Compared to Total Future levels of service with the traffic calming in place, the removal of the traffic calming devices is projected to:

- Improve or maintain levels of service for all movements at the Wisconsin Avenue/Van Ness Street intersection,
- Increase overall intersection delay by up to 15 percent during all three peak hours at the Wisconsin Avenue/Upton Street intersection,
- Improve or maintain levels of service for all movements at the 37th Street/Van Ness Street intersection, and

- Maintain acceptable levels of service (LOS D or better) for all movements at the 37th Street/Upton Street, 38th Street/Van Ness Street, 38th Street/Upton Street, and Upton Street/Reno Road intersections.

Compared to queues with the traffic calming in place, the removal of the traffic calming devices is projected to:

- Increase queues for the southbound approach at the Wisconsin Avenue/Upton Street intersection by approximately 220 feet,
- Maintain queues within available storage or within one car length of queues projected under conditions with the traffic calming for all other lane groups at the Wisconsin Avenue/Upton Street and Wisconsin Avenue/Van Ness Street intersections, and
- Maintain queues within available storage at the 37th Street/Van Ness Street, 37th Street/Upton Street, 38th Street/Van Ness Street, 38th Street/Upton Street, and Upton Street/Reno Road intersections.

In summary, the removal of the diverter at the Wisconsin Avenue/Upton Street intersection will reduce traffic on Van Ness Street and other parallel street, which would result in some improvement in operations at the Wisconsin Avenue/Van Ness Street interection. However, the volume of traffic on Upton Street is projected to increase by approximately 200 trips during the morning peak hour and approximately 100 trips during the PM commuter peak hour, which would increase the delay at the Wisconsin Avenue/Upton Street intersection.

Because there is division among the neighborhood on whether the traffic calming devices at the Upton Street/Wisconsin Avenue intersection should be removed, Sidwell is not advocating for or against removal of the traffic calming devices and explored other options for accommodating the school's traffic and mitigating its impact. As outlined earlier in this document, Sidwell will implement a TDM plan that will reduce traffic by 30 percent and will shift its Middle School drop-off/pick-up operations to the new circle on Wisconsin Avenue.

Table 27
Total Future Level of Service Summary
Total Future without Traffic Calming

Approach	Total Future Conditions		
	AM Peak	PM School Peak	PM Comm Peak
3. Wisconsin Avenue/Van Ness Street			
EBL	D	D	E (65.6)
EBTR	E (63.9)	D	E (59.7)
WBL	E (60.7)	D	D
WBTR	E (78.8)	E (72.4)	F (124.1)
NBLTR	B	F (182.1)	C
SBLTR	A	B	C
Overall	**C**	**F (102.6)**	**D**
4. Wisconsin Avenue/Upton Street			
EBLTR	C	D	F (104.7)
WBLTR	E (64.2)	D	C
NBLT	F (409.1)	F (347.1)	E (74.8)
NBR	A	B	
SBLTR	B	E (56.7)	C
Overall	**F (180.4)**	**F (202.2)**	**E (60.6)**
11. 37th Street/Van Ness Street			
EBLTR	E [38.2]	C	C
WBLTR	D	C	C
NBLTR	C	C	B
SBLTR	C	B	B
Overall	**D**	**C**	**C**
12. 37th Street/Upton Street			
EBLTR	B	B	A
WBLTR	B	A	A
NBLTR	B	B	A
SBLTR	C	A	A
Overall	**B**	**B**	**A**
16. 38th Street/Van Ness Street			
EBLTR	C	B	B
WBLTR	C	B	B
NBLTR	B	A	B
SBLTR	C	B	B
Overall	**C**	**B**	**B**

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

Table 27
Total Future Level of Service Summary
Total Future without Traffic Calming

Approach	Total Future Conditions		
	AM Peak	PM School Peak	PM Comm Peak
17. 38th Street/Upton Street			
EBLT	A	A	A
WBR	B	A	A
SBLR	A	A	A
Overall	**A**	**A**	**A**
18. Upton Street/Reno Road			
EBLR	C	C	C
NBLT	A	A	A
SBTR	A	A	A
[x.x] = unsignalized intersection control delay in sec/veh (x.x) = signalized intersection control delay in sec/veh			

Table 28
95th Percentile Queue Summary (in feet)
Total Future without Traffic Calming

Approach	Available Storage†	Total Future Conditions		
		AM Peak	PM School Peak	PM Comm Peak
3. Wisconsin Avenue/Van Ness Street				
EBL	100	62	100#	120#
EBTR	210	366#	269#	357#
WBL	600	107#	103#	66
WBTR	105	371#	354#	438#
NBLTR	290	40m	116m	184m
SBLTR	215	203m#	182	789#
4. Wisconsin Avenue/Upton Street				
EBLR	210/435	110	130	406#
WBR	455	202#	162	52
NBLT	295	941 m#	963m#	617m#
NBR	95	2 m	17 m	
SBLTR	280	192 m	536#	406

† 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.

Table 28 (continued)
Upton Street Analysis – Queue Summary (in feet)

Approach	Available Storage†	Total Future Conditions		
		AM Peak	PM School Peak	PM Comm Peak
11. 37th Street/Van Ness Street				
EBLTR	560	220	75	95
WBLTR	810	120	137.5	140
NBLTR	275	90	67.5	52.5
SBLTR	230	102.5	15	20
12. 37th Street/Upton Street				
EBLTR	550	70	40	12.5
WBLTR	920	45	22.5	12.5
NBLTR	280	37.5	37.5	20
SBLTR	275	102.5	22.5	12.5
16. 38th Street/Van Ness Street				
EBLTR	600	137.5	92.5	65
WBLTR	560	90	75	80
NBLTR	285	20	12.5	17.5
SBLTR	235	105	15	17.5
17. 38th Street/Upton Street				
EBLT	455	17.5	22.5	17.5
WBR	555	50	35	10
SBLR	285	22.5	10	10
18. Upton Street/Reno Road				
EBLR	920	115	34	31
NBLT	500	22	13	0
SBTR	260	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.

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

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

Conversions/Restrictions on 37th Street

Three different possible reconfigurations of 37th Street were proposed during the community engagement process. Those reconfigurations include:

- Conversion of 37th Street to a one-way street between Upton Street and Quebec Street during all or portions of the day,
- Conversion of 37th Street to a one-way southbound street between Porter and Quebec Street, and

- Restrict through traffic on 37th Street between Upton and Quebec Street during the morning drop-off and afternoon pick-up.

Due to the congestion currently present on 37th Street between Upton Street and Quebec Street, some members of the community requested that we consider converting portions of 37th Street from a two-way street to a one-way street. One resident also suggested that through traffic on 37th be restricted during morning drop-off and afternoon pick-up.

Congestion on 37th Street is caused by the fact that there is not sufficient width for two-way traffic to travel along the roadway with vehicles stopped or parked on either side of the roadway. Currently, parking is prohibited on the east and west sides of the roadway from 8:00 AM to 4:00 PM on school days from Tilden Street to the southern edge of Sidwell's Middle School buildings. During this time, the western curb lane is used for the drop-off/pick-up operation for Sidwell's Middle School and the eastern curb is used for the drop-off/pick-up operation for Hearst Elementary School.

Conversion of 37th Street to a one-way street would help address the congestion issues that arises when northbound and southbound vehicles are traveling simultaneously on 37th Street when cars are parked or stopped on both the east and west sides of the street. However, the implications of converting to a one-way street also need to be considered:

- If 37th Street were to be converted to one-way, or if through traffic were to be restricted during certain times of the day, the traffic that would be removed from 37th as a result of the conversion to one-way would be shifted to adjacent streets potentially creating unanticipated impacts on other neighborhood streets.
- One-way streets typically are in pairs in order to minimize the impacts and preserve mobility in both directions. In this case, there is not a parallel street that could work in conjunction with 37th Street as one-way pairs. To the east, the adjacent north-south roadway is Wisconsin Avenue and to the west, the adjacent north-south roadway is Reno Road. As a result, the conversion of 37th Street to one-way would limit connectivity and mobility in the opposite direction.
- Residents who live on Tilden Street have expressed opposition to converting 37th Street to one-way. Since Tilden Street is a dead end street, 37th Street is the sole means of ingress and egress for residents who live on Tilden Street. Conversion of 37th Street was viewed as hindering access to and egress from their residences.
- Depending on whether 37th Street was one-way southbound or one-way northbound, traffic from Hearst or Sidwell would be impacted. Hearst obviously would need to be consulted on such a discussion.

Given the potential implications of converting 37th Street to one-way, or restricting through traffic during certain times of the day, and the disagreement among neighbors on these solutions, Sidwell evaluated other options for reducing congestion on 37th Street. Namely, Sidwell will shift its Middle School drop-off/pick-up operation from 37th Street to the new

circle on Wisconsin Avenue. This will eliminate 277 trips from 37th Street during the morning peak hour and 108 trips during the afternoon peak hour. Vehicles making these trips currently stop along the west side of 37th Street to drop-off/pick-up students. With the relocation of the Middle School's drop-off/pick-up operation, the western curb lane on 37th Street would become available as a travel lane between Tilden Street and the southern edge of Sidwell's Middle School buildings. To ensure that other users do not use the curb lane, the signage should be changed from "School Loading Zone – No Parking 8 AM – 4 PM" to "No Stopping, Standing, or Parking – School Days 8 AM – 4 PM." This would ensure that parking remains in effect during the same times that parking currently is in effect, but would allow the curb lane to be used as a travel lane (free of stopped, standing, or parked vehicles) during the day. Based on this proposed change by Sidwell, we do not recommend conversion of 37th Street to a one-way street at this time.

Removal of parking along the west side of 37th Street between Upton and Tilden

This option was suggested by some members of the community to effectively increase the width of the travel way along portions of Upton Street and 37th Street. Some members of the community were opposed to the loss of additional parking in the neighborhood, even if the parking only was restricted during the day. This option has both benefits and drawbacks:

- Removal of parking would allow two way traffic to flow more freely along the streets during the restricted hours, with proper enforcement.
- Approximately 13 parking spaces would be lost along the west side of 37th Street, between Tilden Street and Upton Street, and approximately 23 spaces would be lost along the south side Upton Street during the hours of restriction.
- On-street parking inventory and occupancy counts were conducted in the area from 7:00 AM to 6:30 PM on October 29, 2015. The counts were conducted on 38th Street between Warren Street and Upton Street, on Upton Street between Wisconsin Avenue and 37th Street, and along 37th Street between Van Ness Street and Quebec Street. Between 8:00 AM and 4:00 PM, approximately 233 parking spaces are available. Between 4:00 PM and 8:00 AM approximately 293 parking spaces are available. The peak on-street parking occupancy (on a percentage basis) occurred at 8:30 AM when 55% of the 245 spaces were occupied. The maximum number of spaces occupied during the count occurred at 4:30 PM when 145 spaces were occupied. Because this peak occurred after 4:00 PM (the time when the parking restrictions on 37th Street are lifted), the percent occupancy, 49%, was lower than the percent occupancy at 8:30 AM.

If parking were to be restricted along the Washington Home frontage, the number of parking spaces in the area would be reduced from 245 to 208 (a 15% reduction). The peak occupancy between 8:00 AM and 4:00 PM would be 65%.

Although it appears that sufficient parking would remain available during the day to accommodate the demand, some residents are concerned that if they arrive home in the evening or at night and the only spaces available are along the Washington Home frontage, the additional restrictions would require them to move their vehicles by 8:00 AM when they would not otherwise have to move them.

Because Sidwell has agreed to move its Middle School drop-off/pick-up to the new circle on Wisconsin Avenue and because the Lower School site has been designed to accommodate the Lower School queues entirely on-site, the functionality of 37th Street will be improved from current conditions without the need to remove additional parking along 37th Street. Therefore, additional parking restrictions along 37th Street and Upton Street are not recommended at this time.

Installation of raised crosswalks at Upton Street/37th Street

This option was discussed as a means to reduce travel speeds if traffic calming devices were removed at the intersection of Upton Street and Wisconsin Avenue. Given the steps Sidwell has taken to reduce traffic on the neighborhood streets and the significant costs associated with installation of raised crosswalks (approximately $20,000 per crosswalk), Sidwell has proposed to employ a traffic control officer at this location during the AM and PM School peak periods in lieu of installation of raised crosswalks. The traffic control officer will help manage the flow of traffic at the intersection and will ensure that motorists obey the stop signs at the intersection.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

1. Currently, the Sidwell Wisconsin Avenue campus generates 1,007 AM peak hour vehicle trips, 477 PM School peak hour vehicle trips, and 335 PM commuter peak hour vehicle trips.
2. The current Lower School in Bethesda generates 335 AM peak hour vehicle trips, 251 PM School peak hour vehicle trips, and 63 PM commuter peak hour vehicle trips.
3. The proposed increase in student cap from 1,150 to 1,250 students and the proposed increase in faculty/staff cap from 190 to 260 employees would result in an anticipated 117 AM peak hour vehicle trips, 63 PM School peak hour vehicle trips, and 35 PM commuter peak hour vehicle trips.
4. As part of the proposed redevelopment of the Washington Home site, no new curb cuts are proposed. The existing curb cut on Upton Street and the existing curb cut on 37th Street will be used, however, at the request of DDOT, the 37th Street driveway will be shifted to align with Tilden Street. During the morning drop-off and afternoon pick-up, vehicles will enter the site via the service driveway on 37th Street and exit the site via the driveway on Upton Street. During all other times of the day, the service driveway will be open to service vehicles only. During the day, visitors to the Lower School will enter and exit the site via the Upton Street driveway.
5. In conjunction with the proposed redevelopment, a new drop-off/pick-up area will be provided adjacent to the tennis courts. This drop-off/pick-up area will be used by families with children in the Lower School and either the Upper or Middle School. This area also will be used by families with Middle School students only.
6. The Upper School garage will be used for drop-off/pick-up by families with students in Upper School only or families with students in the Upper and Middle Schools.
7. Approximately half of Sidwell's current deliveries will move to the loading facility at the Lower School. The average number of weekly deliveries will be less than or equal to the average number of weekly deliveries currently made to the Washington Home. The remaining Sidwell deliveries will continue to be made via the existing service drive on Wisconsin Avenue.
8. To mitigate the impact of the proposed development and to promote safety within the study area, the following are recommended:
    - Implement a robust Transportation Demand Management Plan, as outlined herein, with the goal of reducing vehicular traffic by 30 percent across all divisions.
    - Conduct monitoring studies, as outlined herein, to ensure that TDM goals are met. Prior to increasing the enrollment beyond the current enrollment of 1,150 (across all divisions), the TDM goals should be met for two consecutive years.

- Implement an Operations Management Plan, as outlined herein, to ensure that Lower School drop-off/pick-up operations are accommodated on-site and to ensure that all other drop-off/pick-up queues are accommodated within the designated areas.
- Implement the Loading Management Plan, as outlined herein.
- Modify the phasing at the Wisconsin Avenue/Fannie Mae Driveway/Post Office Driveway/Sidwell Friends Driveway so that the Sidwell and Fannie Mae Driveways run concurrently.
- Install optically programmed signal heads or signal heads with louvers on the Post Office driveway approach to Wisconsin Avenue to shield their visibility from drivers exiting via the Sidwell driveway.
- Employ a traffic control officer at the Upton Street/37th Street intersection during the morning drop-off period (7:30 AM to 8:30 AM) and the afternoon pick-up period (2:30 PM to 5:00 PM), due to safety concerns noted by the community with respect to drivers running the stop signs.
- Move the Middle School drop-off/pick-up operation from 37th Street to the Wisconsin Avenue side of campus to address neighbors' concerns and help alleviate congestion on 37th Street. Families with Middle and Lower School students or Middle School only students would use the new loop on Wisconsin Avenue, while families with Middle and Upper School Students would use the garage.

9. With the implementation of the recommendations indicated above, the proposed increase in enrollment cap from 850 to 1,250 students (which includes the 300 students currently enrolled at the Lower School plus an additional 100 students across the three divisions) in conjunction with the redevelopment of the Washington Home site to Sidwell's Lower School will have only minor impacts on the study area.

REFERENCES

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

2 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].

3 Ibid.

4 District of Columbia Capital Bikeshare Development Plan, Foursquare Integrated Transportation Planning, September 2015.

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

6 4700 Wisconsin Avenue Parking Statement, Gorove/Slade, October 2014.

7 4600 Wisconsin Ave Transportation and Parking Assessment Report, O.R. George & Associates, September 2012.

8 American University 2011 Campus Plan Transportation Technical Analysis, Gorove/Slade, March 2011.

9 Wisconsin Avenue Giant Transportation Impact Study, Wells + Associates, May 2008.