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TECHNICAL MEMORANDUM

To:	Ryan Westrom	District Department of Transportation
From:	Erwin N. Andres, P.E. Jim Watson, PTP	**DRAFT**
cc:	Ronnie McGhee	R. McGhee & Associates
	Raqueeb Albaari	R. McGhee & Associates
	Michael Quadrino	Brailsford & Dunlavey
	Sarah Hasselmann	Brailsford & Dunlavey
Date:	March 2, 2016	
Subject:	Murch Elementary School Access Summary	

Introduction

This memorandum outlines the proposed access and circulation scheme associated with the proposed modernization of the historic Murch Elementary School building located within the block bordered by Ellicott Street, 36th Street, Davenport Street, and Reno Road in Northwest Washington D.C., as shown on Figure 1. The proposed access scheme will be geared to improve upon existing conditions with a new parking area accessed from Reno Road and modern facilities within the historic school building and an addition along the southern portion of the property.

Existing Conditions

The school is currently occupied with 630 students and 83 faculty/staff members. Carpool operations associated with student drop-off and pick-up currently take place along the north side of the building along Ellicott Street and on the south side of the building along Davenport Street. Faculty/staff currently park in a 17-space surface parking lot accessed midblock from Davenport Street and on some surrounding neighborhood streets. Additional parking adjacent to this lot is currently occupied by trailers serving the site. Loading for the site currently occurs from this curb cut as well.

It should be noted that the northwestern portion of the property (approximately one third of the block) is occupied by National Park Service land. This area occupies approximately one half of the school's frontage along Reno Road and the majority of the school's frontage along Ellicott Street. A depiction of the existing school is shown on Figure 2.

Proposed Conditions

The renovations and expansion of the school is expected to add 60,300 square feet of additional space, primarily in a new structure along the southern portion of the site, adjacent to Davenport Street. The school is proposed to be occupied with 700 students when renovated and expanded. Carpool operations

associated with student drop-off and pick-up will continue to take place along Ellicott Street and Davenport Street.

In an effort to maximize the number of parking spaces on-campus and to reduce the potential impacts of faculty/staff members parking in the surrounding neighborhood, 36 parking spaces are planned to be provided in two parking areas. The existing 17-space parking lot served by a midblock curb cut on Davenport Street will be replaced with a 19-space parking lot accessed from Reno Road that will include additional area for trucks to maneuver on-site without the need for backing maneuvers from the public street, as is the case today. This parking lot will be constructed at grade, but is planned to be below the new gymnasium proposed within the expanded building. In addition, 17 parking spaces on the existing surface lot currently occupied by trailers will be made available via a relocation of the curb cut serving Davenport Street approximately 90 feet to the east of its existing location.

Given the placement of the existing historic building and the available area on site remaining to build the expanded school, limited areas exist to accommodate additional parking on-site. Since the expanded building is expected to occupy most of the Davenport Street frontage, the historic building occupies most of the 36th Street frontage, and National Park Service property occupies most of the Ellicott Street frontage and approximately half of the Reno Road frontage, Reno Road provides the only manageable point for external vehicular access to additional parking on-site beyond the existing parking lot that is planned for a relocated access point along Davenport Street. The proposed site plan is shown on Figure 3.

Proposed New Reno Road Access Condition

As mentioned previously, the proposed access into the additional school parking lot is proposed to be provided on Reno Road in order to provide additional parking on-site and to minimize the impacts of faculty/staff members parking in the surrounding neighborhoods. The Reno Road access is proposed to be full-access, but can be modified as a right-turn in/right-turn out driveway, if required. This proposed access driveway is appropriate for the following reasons:

- Meets District Design and Engineering Manual policy for new driveways.
    - The driveway is designed as such that it meets all standards laid out in Section 31.2.3 of the DDOT Design and Engineering Manual regarding the design of new driveways. Among other items, this includes the driveway's width, the design of the sidewalk intersecting the driveway, and the accommodation of turning maneuvers on site so that no backing maneuvers occur from the public street.
- Works best with the constraints of the property.
    - Reno Road allows access to the at-grade parking lot given the constraints of the site with most of the Davnport Street, 36th Street, and Ellicott Street frontages occupied by the expanded school building, historic school building, and National Park Service land, respectively.
- Provides safer location for pedestrian activity.
    - The location of the driveway along Reno Road is located on the opposite side of the property from most pedestrian activity with student drop-off/pick-up operations

planned from Davenport Street and Ellicott Street and the historic main entrance's location along 36th Street.

- Allows for improved drop-off/pick-up operations along Davenport Street.
    - The relocation of the existing curb cut serving the parking area along Davenport Street allows for a more extensive curbside area for drop-off/pick-up operations than is currently the case. Were this lot to be expanded to accommodate additional parking, an inefficient use of the property would result with much of the area that would be better served for school expansion utilized parking. Given the need to provide additional parking on-site, the location of the new curb cut along Reno Road places the driveway at the location which least impacts the safety of pedestrians and pick-up/drop-off operations surrounding the school.
- Offers minimal impact to vehicular operations along Reno Road.
    - The new 19-space parking lot is planned to serve faculty/staff members and loading access and could, at most, expect to see 19 inbound vehicles in the morning from Reno Road and 19 outbound vehicles in the afternoon (or less than one every three minutes). Given that school faculty/staff members typically arrive prior to normal morning and afternoon peak hours, their impacts to peak hour traffic along Reno Road will be minimal. It should be noted that the peak hours for the adjacent intersection were noted to be from 7:45 to 8:45 AM and from 5:15 to 6:15 PM, both after the time periods that faculty/staff members would be expected to arrive and depart, respectively.
    - As mentioned, while this driveway is planned for full access, a modification to restrict access to right-in/right-out only would further ensure minimal impacts to vehicular operations along Reno Road.

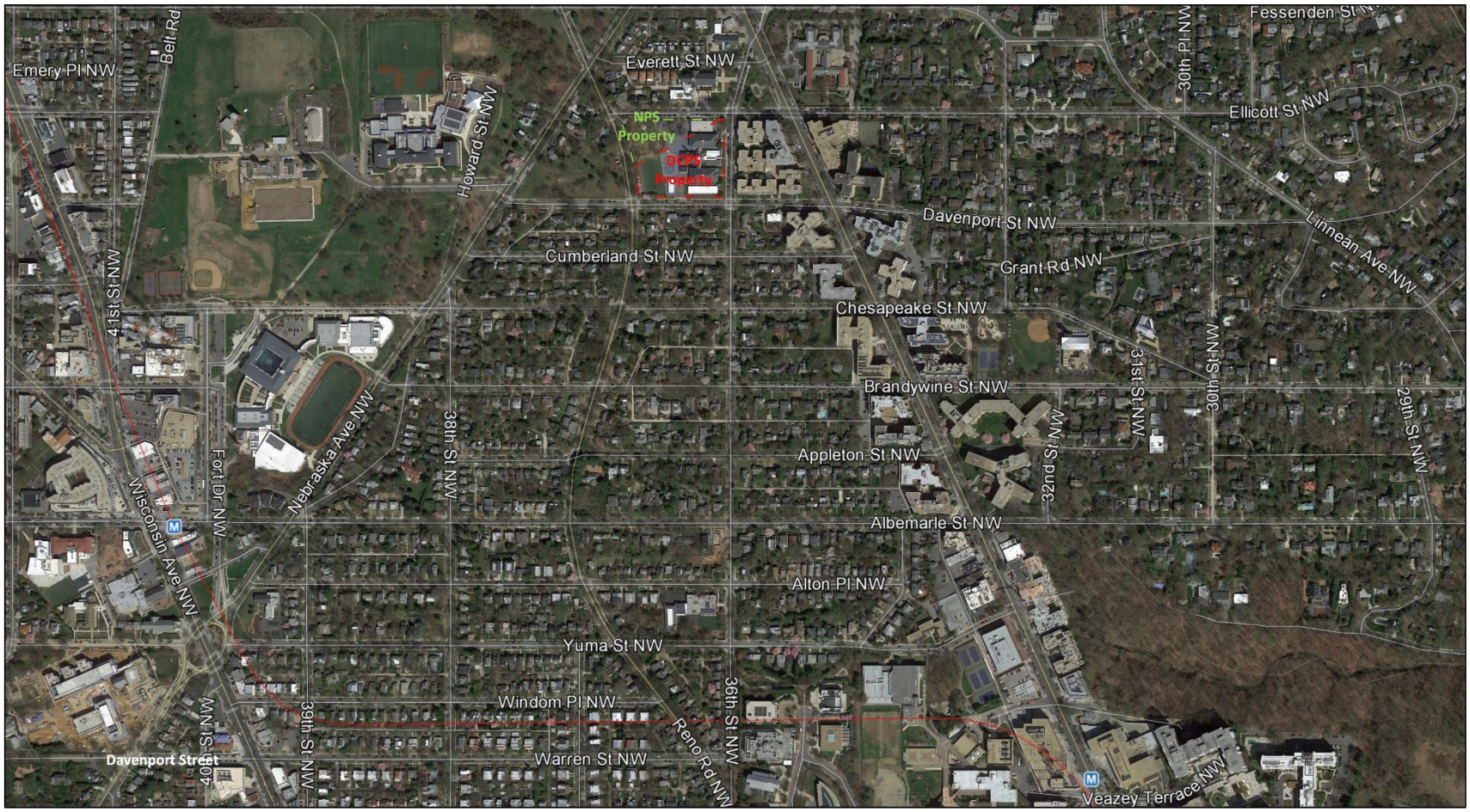

Figure 1: Site Location

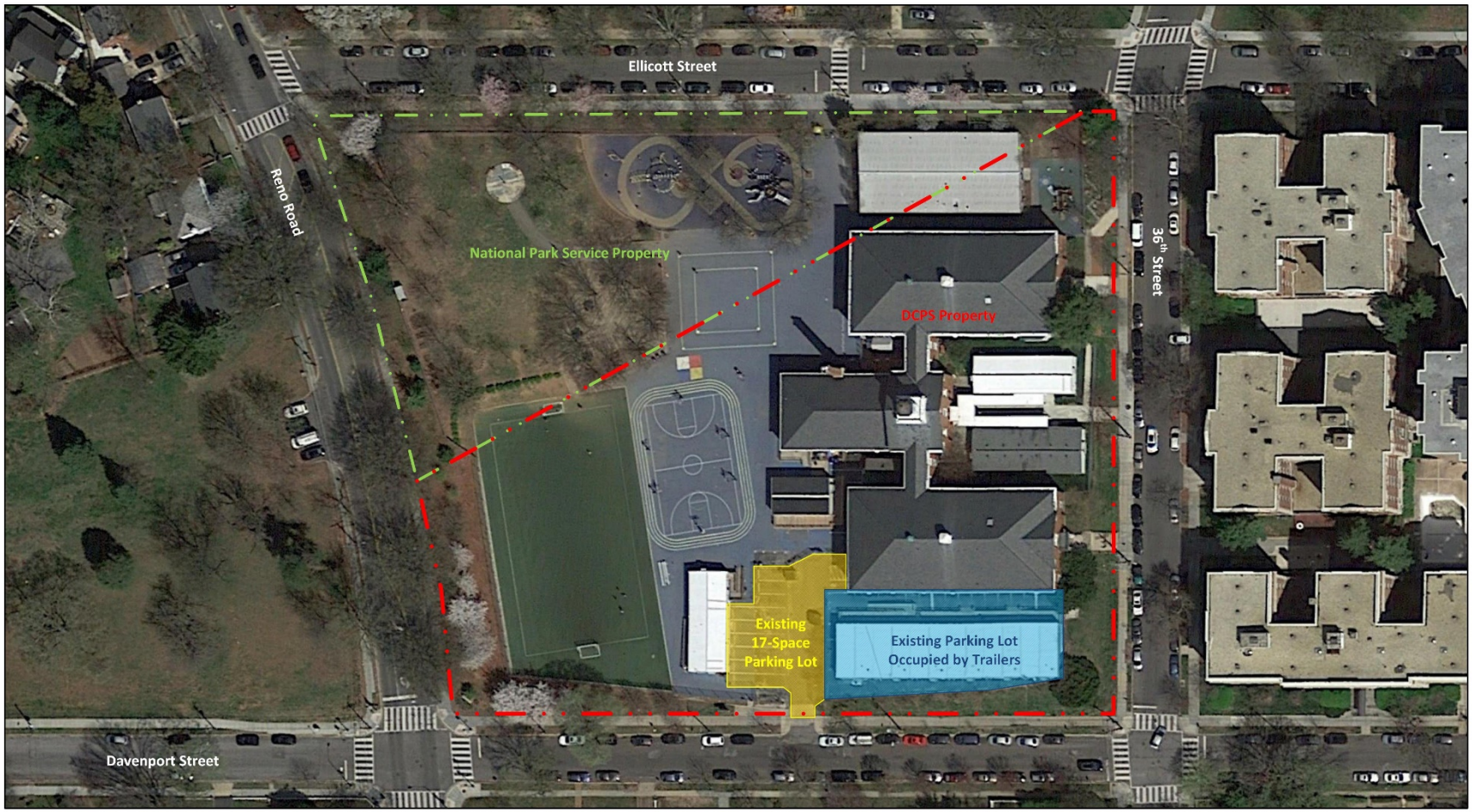

Figure 2: Existing Site Layout

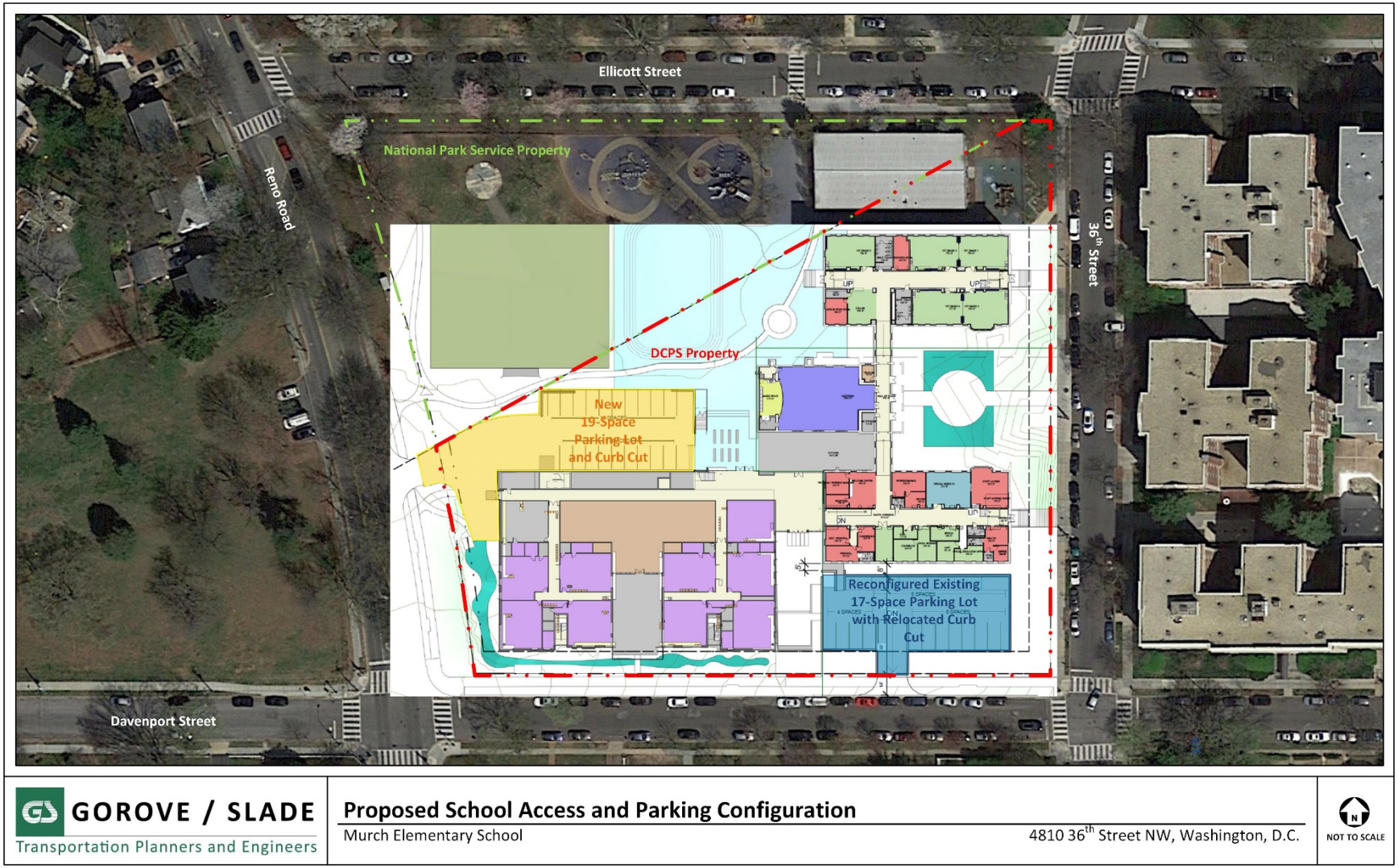

Figure 3: Proposed Site Plan

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TECHNICAL MEMORANDUM

To: Raqueeb Albaari — R. McGhee & Associates

From: Jim Watson, PTP
Erwin Andres, P.E.

DRAFT

Date: August 10, 2015

Subject: Murch Elementary School Addition – Traffic Impact Analysis for Environmental Impact Screening Form

INTRODUCTION

This memorandum presents the results of a traffic impact analysis prepared for the Murch Elementary School Restoration and Addition project which will provide additional space by expanding and adding new facilities to the existing school. Current enrollment at the school is 630 students with approximately 83 faculty and staff members. While the addition will primarily house existing students and staff on the campus, the school anticipates student enrollment to increase to 700 when the project is complete. The scope of this effort is to determine the potential impacts of the proposed restoration and addition as it relates to completing the District of Columbia Environmental Impact Statement Form (EISF). Overall, the results of this analysis show that adding facilities to Murch Elementary School will have a negligible impact on existing and projected full build-out traffic conditions within the study area.

BACKGROUND AND STUDY AREA

Murch Elementary School is located in Ward 3 of Northwest Washington, DC. Figure 1 shows the regional site location within the District. The school is located between Reno Road to the West, 36th Street to the East, Ellicott Street to the north and Davenport Street to the south. The project will add 60,300 square feet of space consisting of several new facilities with the expansion of and renovation of existing infrastructure. The site plan for the project is shown in Figure 2.

The existing Murch School provides 15 surface parking spaces, located on the southern portion of the property near Davenport Street. The Murch School restoration and addition will provide an additional 64 below-grade parking spaces on-site, accessed from Reno Road. As shown in Figure 2, existing pick-up/drop-off areas along Ellicott Street and Davenport Street will be used to access the expanded and renovated school. Two pedestrian access points are located with pick up/drop-off areas along with a third access mid-block along 36th Street.

TRAFFIC IMPACT ANALYSIS

Scope of Analysis

This traffic impact study was conducted in general accordance with the typical parameters set forth by DDOT for preparing such studies, tailored to focus on answering the questions contained in the EISF, most notably questions 14 and 15 which revolve around capacity constraints. The following intersections (shown in Figure 3) were included in this study:

1. Connecticut Avenue and Davenport Street NW

2. 36th Street and Davenport Street NW
3. Reno Road and Davenport Street NW
4. Reno Road Nebraska Avenue NW
5. 36th Street and Ellicott Street NW

The analysis contained herein compares three traffic volume scenarios: (1) existing conditions within the study area; (2) background conditions, representing future traffic levels with ambient traffic growth; and (3) total future conditions, representing background conditions with the addition of the proposed development. The following section outlines the components of each scenario.

2015 Existing Conditions

Field surveys were performed to record lane designations, traffic controls, and signal timings and to observe traffic levels. Figure 4 shows the existing and future lane designations.

Turning movement counts were performed for the study area intersections on Tuesday, April 21, 2015 from 6:00 to 9:00 AM and from 2:00 to 7:00 PM, in accordance with DDOT requirements. This count was taken on an "a typical" weekday when the Murch Elementary and surrounding schools were in session. Trips were generated for the existing Murch Elementary School based on the most current enrollment numbers in order to provide a comparison for the number of trips the current school could be expected to contribute to the surrounding roadways. Trips were generated for the existing School based on methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation,* 9th Edition. Table 1 shows the trip generation for the school assuming a vehicular mode split of 85 percent (or a non-auto mode split of 15 percent).

Table 1: Existing Vehicular Trip Generation

Proposed Development	Quantity	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Elementary School	630 students	156	218	284	47	48	95
Non-Auto Reduction	*-15%*	*-125*	*-102*	*-227*	*-38*	*-38*	*-76*
Vehicular Trip Generation		**31**	**26**	**57**	**9**	**10**	**19**

The AM and PM peak hours were determined to be 7:45 to 8:45 AM and 5:15 to 6:15 PM, respectively. The detailed traffic volume worksheets are included in the Technical Appendix.

2018 Background Conditions

The background traffic volumes were attained by summing the existing volumes and ambient traffic growth anticipated to occur through the study area, assuming a build-out year of 2018, the Murch Elementary School Restoration and Addition project is expected to be complete. Based on a review of the District of Columbia Economic Development website, it was determined that no planned developments were found to be approved within the study area that would contribute to additional traffic on the network.

Inherent growth on the study area roadways due to ambient growth in the vicinity of the site was accounted for with a 0.5 percent per year growth rate compounded annually over the study period. This rate was estimated based on a comparison

between existing and past average annual weekday traffic volumes obtained from DDOT and was applied to through movements along all roadways in the study area.

In order to determine the volumes for future background conditions the trips generated by the inherent growth on the study area roadways were added to the existing traffic volumes. The future background traffic volumes are shown in Figure 6.

2018 Future Conditions

Trips were generated for the proposed Murch Elementary School addition based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 9th Edition. For this analysis, the methodology was supplemented to account for the urban nature of the site (*Trip Generation* provides data for non-urban, low transit use sites) and to generate trips for multiple modes. ITE *Trip Generation* was used to develop base vehicular-trip rates, not accounting for reductions due to mode split. A non-auto mode split reduction of 80 percent was applied to the base trips to account for students and staff that walk, bike, or take public transit to school and was developed based on input from the school.

The projected existing trips were subtracted from the projected future trips in order to determine the net increase in trips at completion of the Murch Elementary School Addition, as shown in Table 2.

Table 2: Net New Vehicular Trip Generation

Land Use	Size		Trip Generation					
			AM Peak Hour			PM Peak Hour		
			In	*Out*	*Total*	*In*	*Out*	*Total*
Future Conditions								
Middle School	700	Students	173	142	315	51	54	105
Non-Auto Reduction		*-80%*	*-138*	*-114*	*-252*	*-41*	*-43*	*-84*
Total Future Trip Generation			**35**	**28**	**63**	**10**	**11**	**21**
Existing Conditions								
Middle School (Existing)	630	Students	156	128	284	47	48	95
Non-Auto Reduction		*-80%*	*-125*	*-102*	*-227*	*-38*	*-38*	*-76*
Total Existing Trip Generation			**31**	**26**	**57**	**9**	**10**	**19**
Net New Vehicular Trip Generation			**4**	**2**	**6**	**1**	**1**	**2**

Based on these assumptions, the proposed Murch Elementary School Addition is expected to generate approximately 6 new vehicular trips (4 inbound, 2 outbound) during the AM peak hour and 2 new vehicular trips (1 inbound, 1 outbound) during the PM peak hour. Based on existing travel patterns and the proposed site access location shown on Figure 2, the site-generated vehicular trips were distributed through the study area intersections as shown in Figure 7. The site-generated trips were then added to the background volumes in order to determine the total future volumes, as shown on Figure 8.

Analysis Results

Intersection capacity analyses were performed for the three scenarios outlined above at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 7.0* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on

the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS E is typically used as the acceptable LOS threshold in the District; although LOS F is sometimes accepted in urbanized areas.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes outlined previously; (2) the lane use and traffic controls outlined previously; and (3) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software). The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. Detailed LOS descriptions and the analysis worksheets are included as Technical Attachment B.

Table 3 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the existing, background, and future scenarios. The capacity analysis results are shown in Figure 9 for the AM peak hour and Figure 10 for the PM peak hour.

As shown in the capacity analysis results, all intersections are expected to operate at an acceptable level of service in the existing, background, and total future conditions. Overall, the trips generated by the proposed development result in a negligible impact on the surrounding transportation network.

Table 3: Vehicular Level of Service Results

Intersection	Approach	Existing Conditions (2015)				Background Conditions (2017)				Future Conditions (2017)			
		AM Peak Hour		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Connecticut and Davenport	**Overall**	**16.0**	**B**	**13.4**	**B**	**16.1**	**B**	**14.5**	**B**	**16.1**	**B**	**14.5**	**B**
	Eastbound	32.6	C	46.3	D	32.6	C	50.5	D	32.6	C	50.7	D
	Westbound	58.9	E	31.8	C	58.9	E	32.0	C	59.2	E	32.1	C
	Northbound	6.9	A	11.0	B	7.0	A	12.0	B	7.0	A	12.0	B
	Southbound	12.5	B	7.1	A	12.7	B	7.2	A	12.7	B	7.2	A
36th and Davenport	Eastbound	7.9	A	8.5	A	7.9	A	8.5	A	7.9	A	8.5	A
	Westbound	8.6	A	7.9	A	8.6	A	7.9	A	8.7	A	7.9	A
	Northbound	8.1	A	7.9	A	8.1	A	7.9	A	8.1	A	7.9	A
	Southbound	7.9	A	8.0	A	7.9	A	8.0	A	8.0	A	8.0	A
Reno and Davenport	**Overall**	**20.4**	**C**	**23.4**	**C**	**20.5**	**C**	**24.3**	**C**	**20.5**	**C**	**24.3**	**C**
	Eastbound	25.7	C	27.8	C	25.7	C	28.2	C	25.7	C	**28.2**	**C**
	Westbound	30.8	C	26.5	C	30.8	C	26.7	C	31.0	C	26.9	C
	Northbound	12.2	B	14.7	B	12.3	B	16.1	B	12.4	B	16.1	B
	Southbound	25.5	C	33.3	C	25.6	C	34.0	C	25.5	C	34.0	C
Nebraska and Reno	**Overall**	**36.5**	**D**	**29.4**	**C**	**37.8**	**D**	**33.8**	**C**	**38.0**	**D**	**33.9**	**C**
	Eastbound	25.9	C	20.4	C	26.3	C	22.1	C	26.2	C	22.8	C
	Westbound	44.1	D	20.8	C	45.4	D	22.0	C	46.4	D	22.0	C
	Northbound	25.6	C	36.6	D	26.1	C	46.0	D	26.1	C	46.0	D
	Southbound	44.2	D	34.5	C	46.2	D	36.0	D	46.2	D	36.0	D
36th and Ellicott	Eastbound	7.3	A	7.5	A	7.3	A	7.5	A	**7.3**	**A**	**7.5**	**A**
	Westbound	7.7	A	7.8	A	7.7	A	7.8	A	7.7	A	7.8	A
	Northbound	7.6	A	7.8	A	7.6	A	7.8	A	7.6	A	7.8	A
	Southbound	7.4	A	7.8	A	7.4	A	7.8	A	7.4	A	7.8	A

EISF TRANSPORTATION ITEMS

The Environmental Impact Screening Form (EISF), Part III Project Description responses can be provided based on the results of the traffic study as follows:

EISF Form questions (Gorove/Slade Findings)

6 Provide the modal split of residents, employees and daily customers/visitors (i.e., how many would be expected to arrive by automobile/mass transit/walking/bicycle):

It is expected that 20% of staff/students will drive or be driven to school and the other 80% will either take public transit, walk, or bike.

7a Provide the estimated number of peak hour morning (6:30 AM – 9:30 AM) and evening (4:30 PM – 6:30 PM) vehicular trips into and out of the property:

Murch Elementary School Addition is anticipated to generate a net new vehicular impact of 6 AM trips (4 inbound, 2 outbound) and 2 PM trips (1 inbound, 1 outbound).

7b Provide the location of parking entry; drop off areas and pedestrian entry:

The entrance to the future parking garage is planned from Reno Road. There are two existing pick up/drop off areas and pedestrian entries, one on Davenport Street and other on Ellicott Street towards north of the School; these existing pick up/drop of areas and pedestrian entries are planned to be used in the future.

8 Cite the number of daily deliveries by truck, if any, and location of loading area, if any:

There will be no change in daily truck deliveries due to the addition to the Murch Elementary School.

10 Will the proposed project provide 50 or more new parking spaces? Yes _X__ No ___

14 Will the proposed project increase traffic volume, which would result in a street volume-to-capacity ratio of 0.90, or greater (Street Level-of- Service E or F)? Yes ____ No _X__

15 Will the proposed project increase traffic volume that would result in a vehicle delay of 55 or more seconds at any signalized intersection? (Intersection Level-of-Service E or F) Yes ____ No _X__

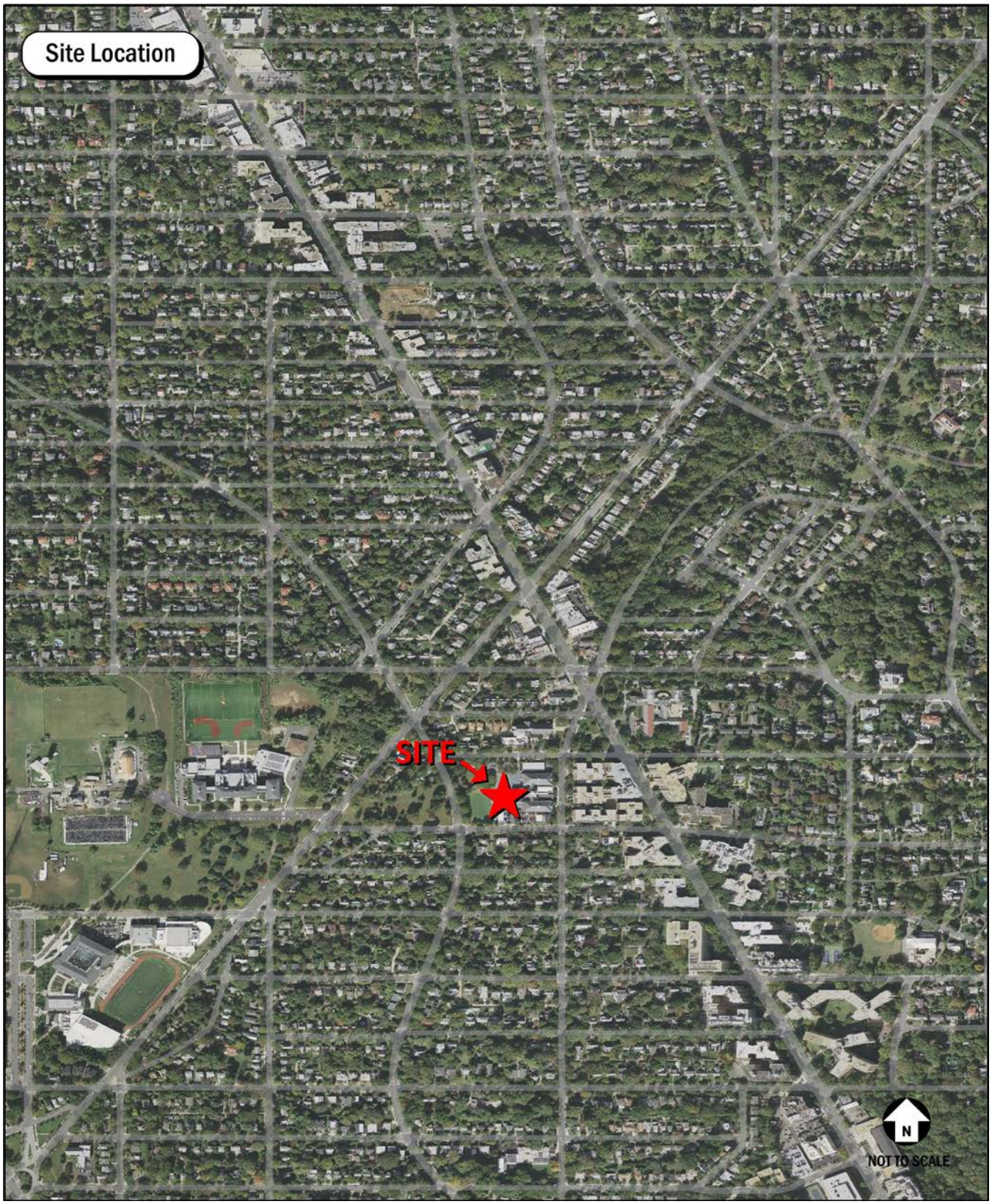

Figure 1: Site Location

Figure 2: Site Plan

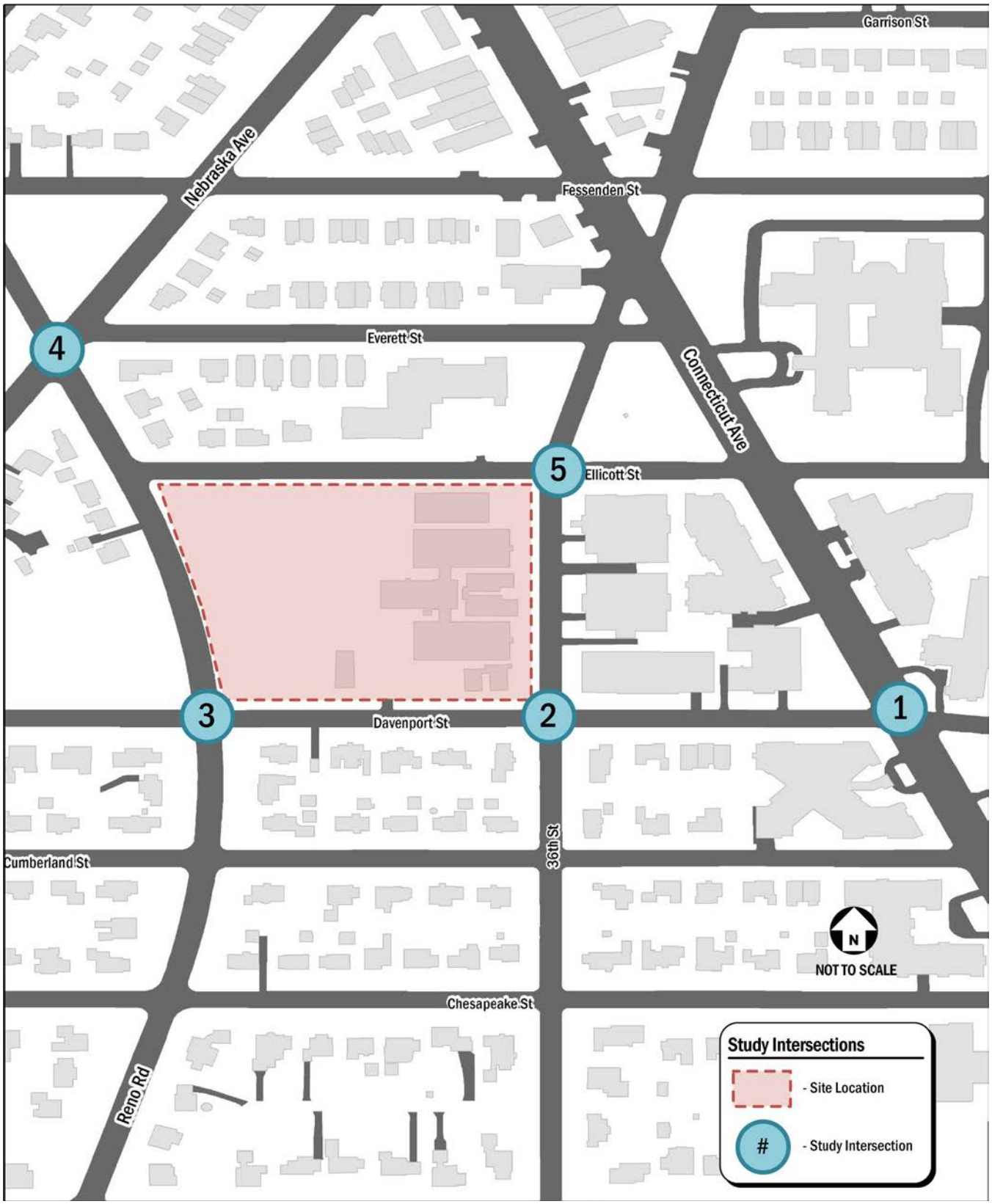

Figure 3: Study Intersections

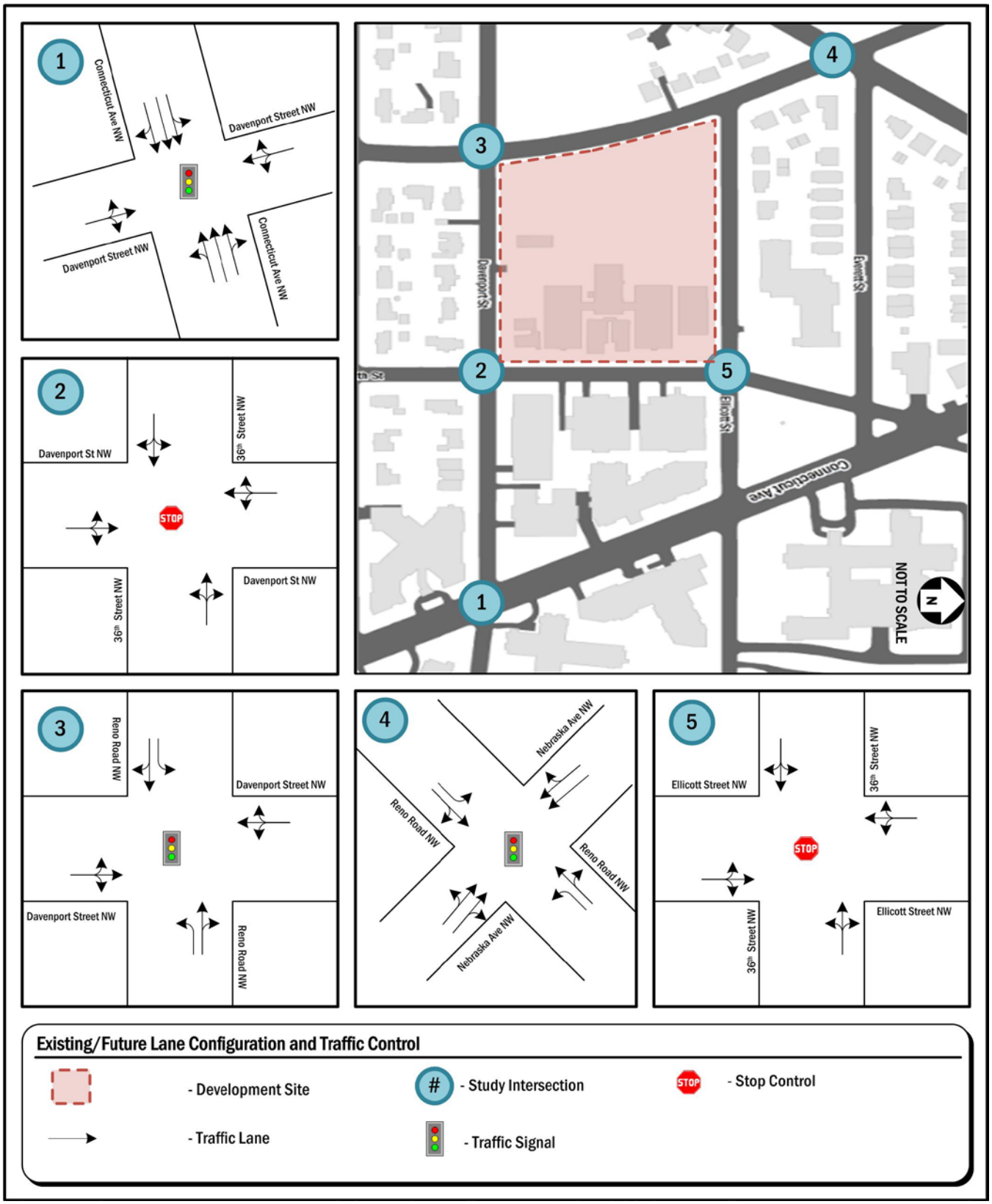

Figure 4: Existing and Future Lane Configuration and Traffic Control

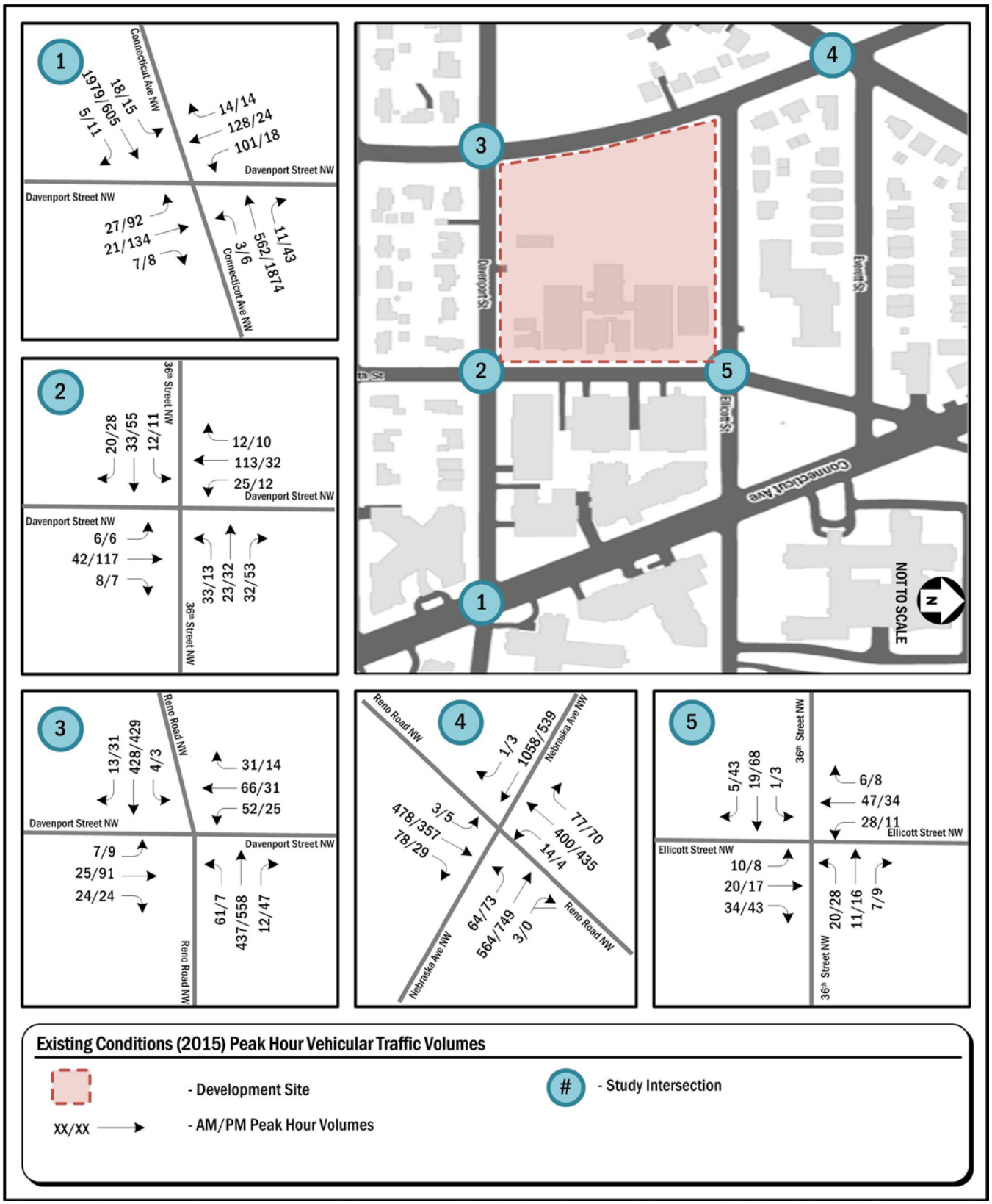

Figure 5: 2015 Existing Traffic Volumes

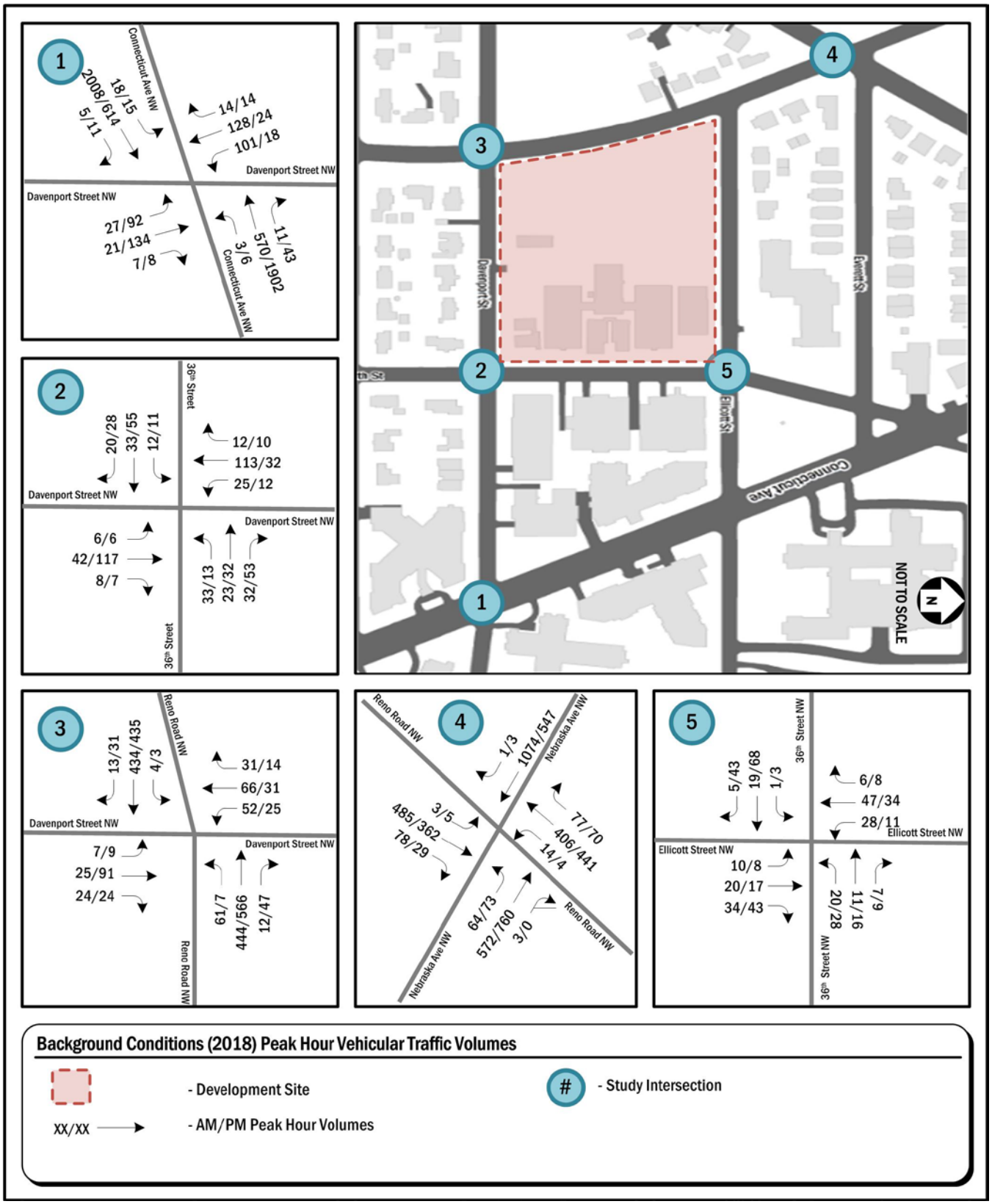

Figure 6: 2018 Background Traffic Volumes

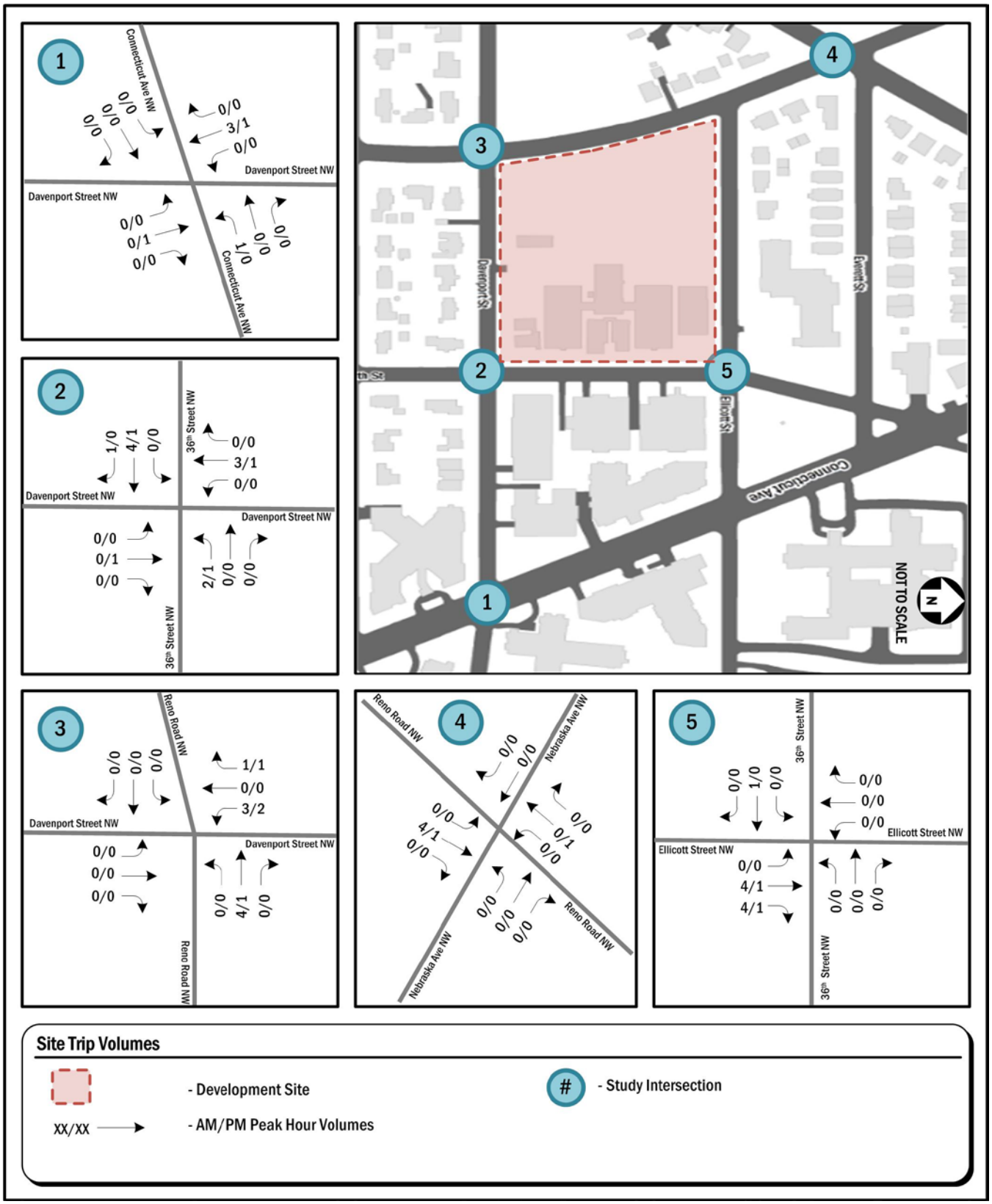

Figure 7: 2018 Site-Generated Traffic Volumes

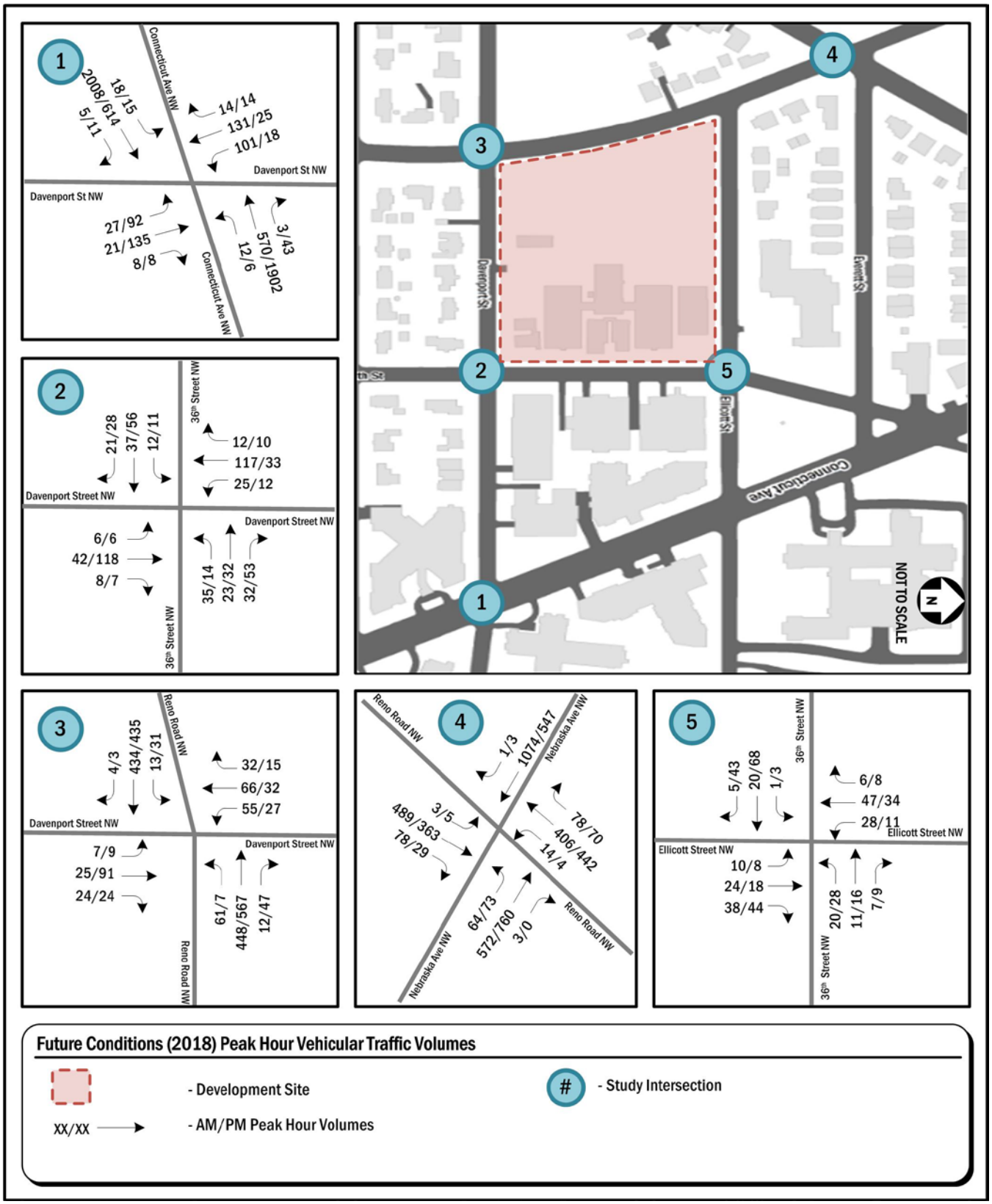

Figure 8: 2018 Total Future Traffic Volumes

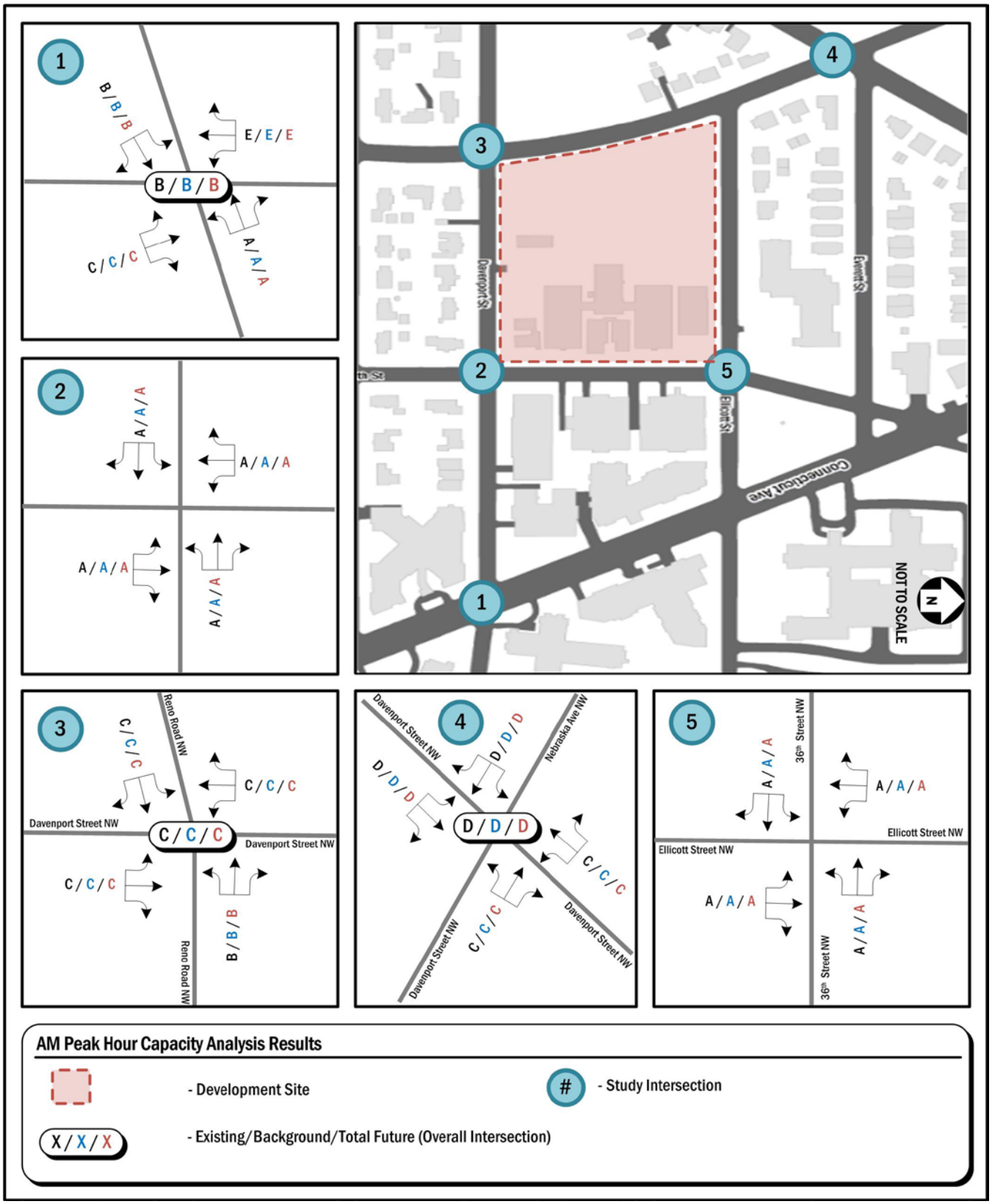

Figure 9: Morning Peak Hour Capacity Analysis Results

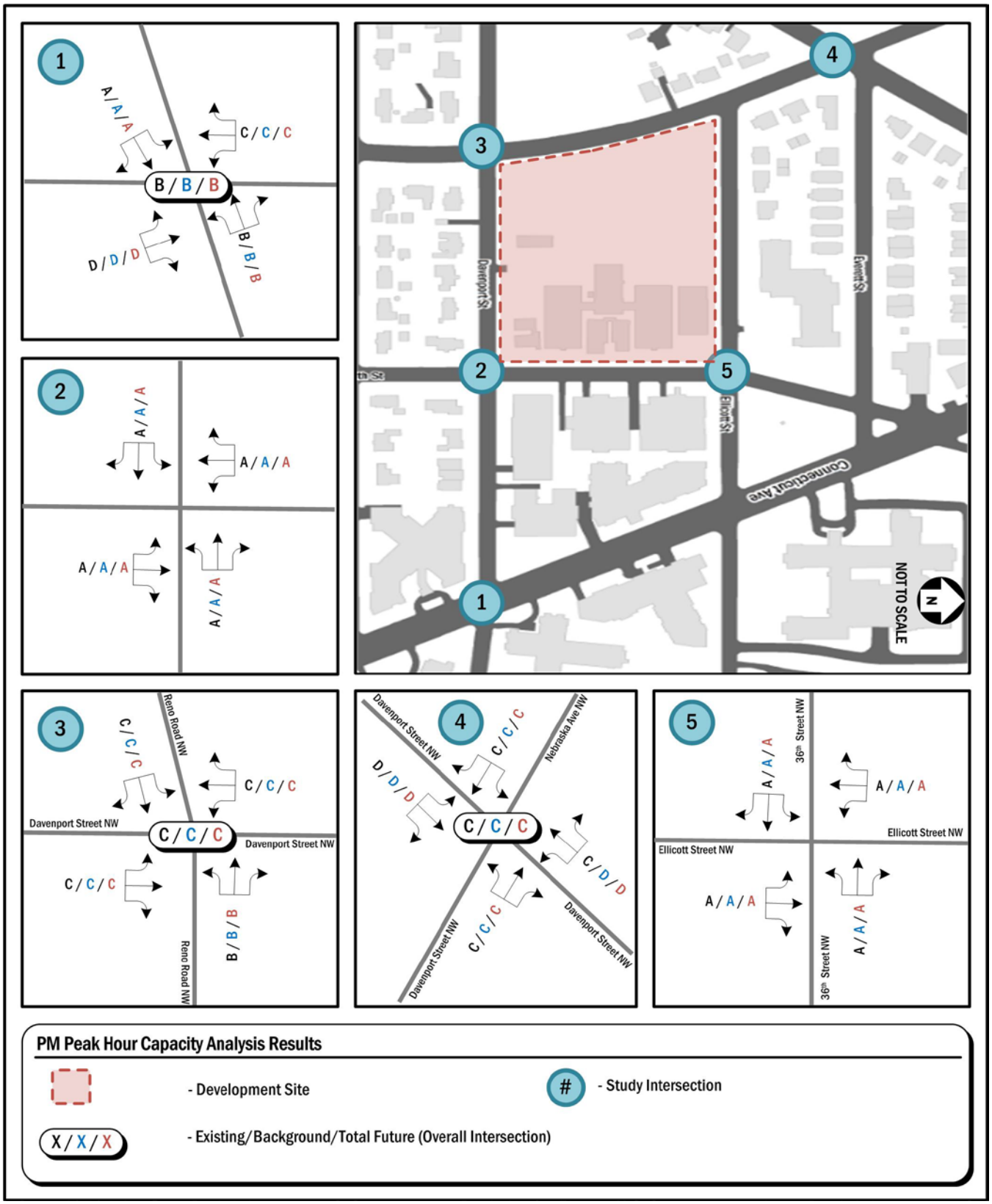

Figure 10: Afternoon Peak Hour Capacity Analysis Results

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TECHNICAL MEMORANDUM

To: Ronnie McGhee — R. McGhee & Associates
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From: Jim Watson, PTP
Erwin Andres, P.E.

Date: September 13, 2015

Subject: Murch Elementary School Transportation Management Plan (TMP)

INTRODUCTION

This memorandum presents the framework for the development and implementation of a Transportation Management Plan (TMP) for Murch Elementary School that would be geared to better manage the traffic and parking demand for the school. This plan would identify the various measures that the school can employ to incentivize faculty, staff and students from arriving at the site in a single-occupant vehicle (SOV). Ultimately, the implementation of these measures will likely require a shift in the culture of the entire school population.

It is important to note that the District Department of Transportation (DDOT) and the DC Office of Planning support measures to reduce parking demand for public facilities throughout the District. As part of the new Zoning Rewrite Draft, which identifies changes to the existing zoning regulations, the following parking requirement for public education facilities has been proposed, which results in a significantly reduced parking requirement for the Murch School project:

Use Category	Minimum number of vehicle parking spaces
Agriculture, Residential	None
Animal Sales, Care and Boarding	1 per 1,000 sq. ft., in excess of 3,000 sq. ft.
Antennas	None
Arts Design and Creation	1 per 1,000 sq. ft., in excess of 3,000 sq. ft.
Basic Utilities	0.33 per 1,000 sq. ft., in excess of 3,000 sq. ft.
Chancery	0.5 per 1,000 sq. ft., in excess of 3,000 sq. ft.
Community-Based Institutional Facility	1 per 1,000 sq. ft.
Daytime Care	0.25 per 1,000 sq. ft.
Eating and Drinking Establishments	1.33 per 1,000 sq. ft., in excess of 3,000 sq. ft.
Education, College/University	as per approved campus plan
Education, Private	1.25 per 1,000 sq. ft.
Education, Public	0.25 per 1,000 sq. ft.

Using the proposed development plan of approximately 100,000 s.f. , the parking requirement under the Zoning Rewrite would consist of a minimum of 25 parking spaces for the entire site, which is less than the currently proposed parking supply of 55 - 75 parking spaces on site. In developing these proposed regulations, DDOT envisions that the District would continue to be a more environmentally sustainable city that would promote measures to reduce traffic and parking demand throughout the District by taking advantage of the existing and proposed pedestrian, bicycle, and transit networks.

MURCH ELEMENTARY SCHOOL DEVELOPMENT

Murch Elementary School is located in Ward 3 of northwest Washington, DC. Figure 1 shows the site location and the local roadway network serving the school. The school is located between Reno Road to the West, 36th Street to the East, Ellicott Street to the north and Davenport Street to the south. The project will add 60,300 square feet of space consisting of several new facilities with the expansion of and renovation of existing infrastructure. The site plan for the project is shown in Figure 2.

The existing Murch School provides 15 surface parking spaces, located on the southern portion of the property near Davenport Street. The Murch School restoration and addition will provide a below-grade parking garage on-site, accessed from Reno Road. As shown in Figure 3, existing pick-up/drop-off areas along Ellicott Street and Davenport Street will be used to access the expanded and renovated school. Two pedestrian access points are located with pick up/drop-off areas along with a third access mid-block along 36th Street.

EXISTING TRANSIT NETWORK

The nearest Metrorail stations are along the Red Line with the AU/Tenleytown Metrorail station at the intersection of Wisconsin Avenue and Albemarle Street and the VanNess/UDC Metrorail station at the intersection of Connecticut Avenue and Veazey Terrace, which are 0.59 miles (12-minute walk) and 0.67 miles from the school (14-minute walk), respectively.

Although these walking distances are relatively short, there are three bus routes that have the nearest Metrobus stops that are only a few blocks away. The nearest L1, L2 bus stops are located only one block east of the school site at the intersection of Connecticut Avenue and Ellicott Street for the southbound bus and at the intersection of Connecticut Avenue and Davenport Street for the northbound bus. The nearest M4 bus stops for both the northbound and southbound directions are at the intersection of Nebraska Avenue and Reno Road, which is one block to the northwest of the school site.

Additionally, there are the H2, H3, H4, N2, 30N, 30S, 31, 33, 37 MetroExtra and 96 bus routes that have bus stops that are near the AU/Tenleytown Metrorail Station. The H2, H3 and H4 bus stop located at the intersection of 40th Street and Albemarle Street and the 30N, 30S, 31, 33, 37 MetroExtra and 96 bus stops located at the intersection of Wisconsin Avenue and Albemarle Street. These bus stops are located approximately 0.67 miles away (14-minute walk).

Table 1 shows a summary of the bus route information for the lines that serve the site vicinity, including service hours and the headways. Figure 3 shows the existing transit network in the vicinity of the site.

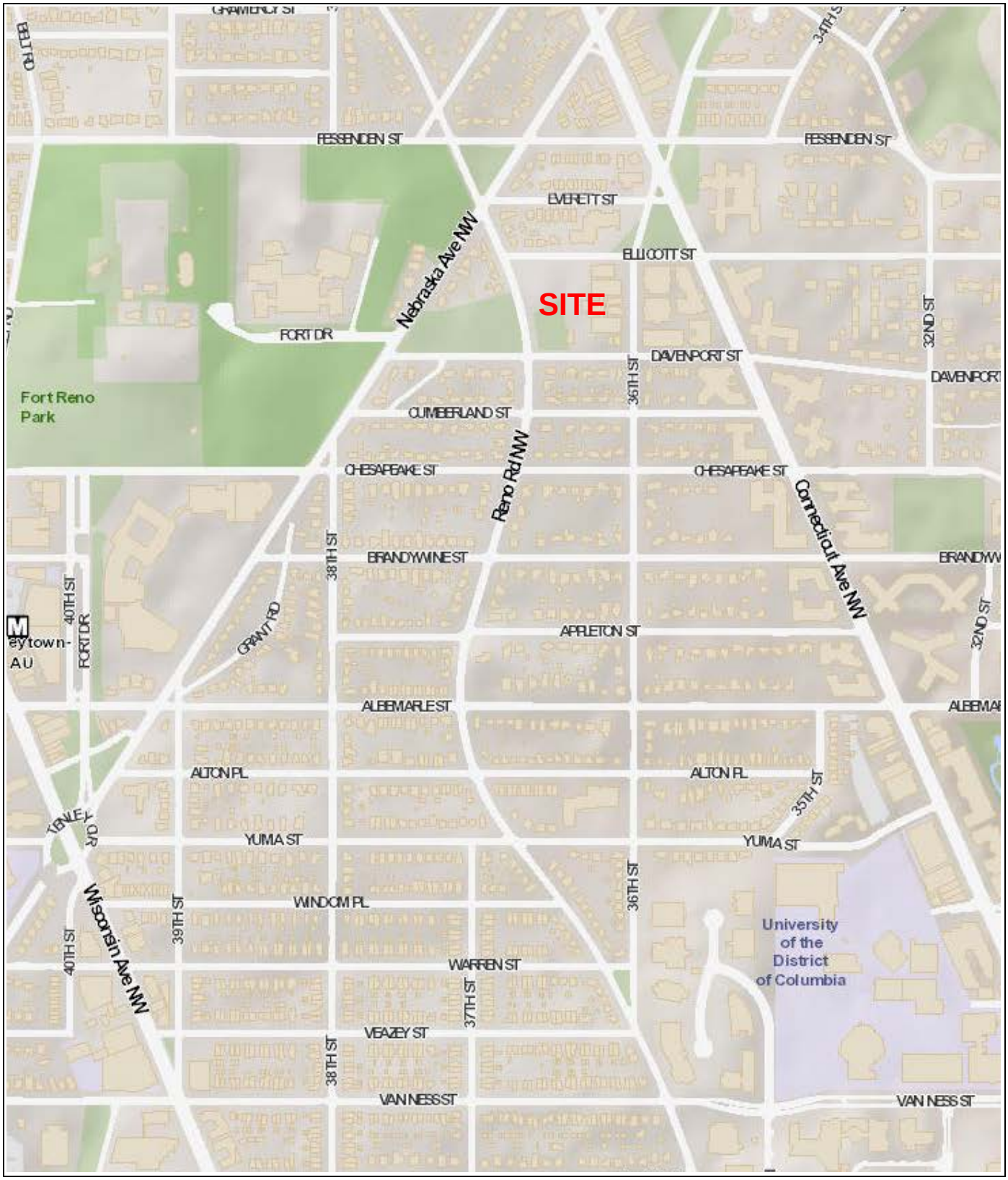

Figure 1: Site Location & Local Roadway Network

Figure 2: Proposed Site Plan

Figure 3: Existing Transit Network

Table 1: Bus Route Information

Route Number	Route Name	Weekday Service Hours	Peak Period Headway
L1, L2	Connecticut Avenue Line	5:05 a.m. – 1:30 a.m.	12-20 minutes
M4	Nebraska Avenue Line	5:56 a.m. - 9:33 p.m.	5-13 minutes
H2, H3, H4	Crosstown Line	4:40 a.m. – 1:59 a.m.	30-37 minutes (H2) 13-34 minutes (H3) 6-25 minutes (H4)
30N, 30S	Friendship Heights-Southeast Line	4:02 a.m. – 2:46 a.m.	54-75 minutes
31, 33	Wisconsin Avenue Line	5:07 a.m. – 11:22 p.m.	10-20 minutes
37 MetroExtra	Wisconsin Avenue Limited Line	6:45 a.m. – 10:03 a.m. 4:00 p.m. – 7:47 p.m.	15-18 minutes
96	East Capitol Street-Cardozo Line	4:46 a.m. – 3:47 a.m.	20-27 minutes

With the school day starting at 8:45 a.m. at Murch Elementary School, the arrivals for faculty/staff and students would occur between primarily between 7:30 a.m. to 8:45 a.m. Using the frequencies of bus arrivals at the nearby bus stops for the bus routes identified above between the 7:30 a.m. to 8:45 a.m. timeframe, the number of bus arrivals during that time period for the various bus routes consists of 88 bus arrivals that are broken down by the following bus routes and corresponding trips between 7:30 a.m. – 8:45 a.m.:

- Routes L1/L2: 18
- Route M4: 19
- Routes H2, H3 & H4: 16
- Routes 30N & 30S: 6
- Routes 31 & 33: 17
- Route 37 MetroExtra: 5
- Route 96: 7

Similarly, the Red Line Metrorail station at AU/Tenleytown serves trips in each direction with train headways between 3-6 minutes during the morning and afternoon peak commuter periods. Using every 6 minutes as a basis for estimation, there would be approximately 12 Metrorail trips in each direction for a total of 24 Metrorail trips that would occur between 7:30 a.m. and 8:45 a.m. Therefore, during the peak arrival period of 7:30 a.m. to 8:45 a.m., there is a total of 88 Metrobus trips and 24 Metrorail trips that area available to serve the Murch School population of faculty, staff and students.

EXISTING PEDESTRIAN NETWORK

There are satisfactory pedestrian facilities and connectivity throughout the neighborhood surrounding the Murch School. The sidewalks along all four sides of the school property bordering the school are in relatively good condition. There are also adequate crosswalks provided at each intersection in all four directions from Connecticut Avenue to Nebraska Avenue east to west and from Chesapeake Street to Everett Street south to north. The pedestrian network that extends into the residential neighborhoods surrounding the school provides opportunities for promoting improved walking volumes to the school.

The direct pedestrian paths to the bus stops are accommodated from the school via Davenport Street and Ellicott Street to the nearest bus stops on Nebraska Avenue and on Connecticut Avenue. These sidewalks are in good condition and provide a pleasant walking experience with large sections of the sidewalks shaded with street trees. The bus stops along Reno Road do not provide any bus shelters. The bus stops on Connecticut Avenue provide comfortable bus shelters.

EXISTING BICYCLE NETWORK

According to DDOT's most current Bicycle Map as shown on Figure 4, the arterials surrounding the site that include Reno Road and Nebraska Avenue to the west and Connecticut Avenue to the east have no designated bike lanes or shared bicycle travel lanes. Consequently, DDOT has classified those roads to have poor bicycling conditions. The only bus facility in the vicinity of the site consists of a signed bike route that extends north to south along 36th Street just east of the school.

The nearest Capital Bikeshare (CaBi) stations are located at the intersections of Connecticut Avenue and Nebraska Avenue, which is approximately 0.2 miles (4-minute walk) from the school site. There are also Capital Bikeshare stations at the AU/Tenleytown Metrorail station and the VanNess/UDC Metrorail station. These Capital Bikeshare stations provide the connections from the two nearest Metrorail stations to a location that is relatively close to the school site.

Given these opportunities that include transit, pedestrian and bicycle facilities, it would be possible to promote these alternative commuting methods by establishing various programs that would need to be coordinated with the entire school population.

Figure 4: Existing Bicycle Network

TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES

This section contains a proposed set of Transportation Demand Management (TDM) strategies for Murch School. The goal of TDM strategies are to minimize the impact of site traffic on the transportation network and promote the efficient use of transportation resources. TDM strategies are specifically tailored to promote travel modes that have the least impact on the transportation network and other resources, such as the environment, and discourage those that have the greatest impact. Private vehicle congestion, parking demand, and service and loading activities are the primary transportation issues in the District, along the Wisconsin Avenue, Nebraska Avenue, Reno Road and Connecticut Avenue NW corridors and within the neighborhood surrounding the site. To address these issues, this report recommends TDM strategies that promote walking, cycling, and transit use as well as strategies that manage and minimize the impact of site generated vehicle traffic.

Potential TDM Strategies

An aggressive TDM program has been proven to reduce the impact of the school on the surrounding road network. Various private schools throughout the District have employed many of the following measures, but have committed significant cost and personnel resources to ensure the program is well coordinated. It is important to identify potential goals to reduce drivers to the school, especially since there is an opportunity to reduce the potential construction of on-site parking spaces. With a staff population of approximately 80, achieving a non-drive mode share of 40 - 50% can reduce the need to build up 32 - 40 parking spaces.

Several TDM measures that can be considered to specifically address reducing the need to provide parking on-site include the following:

- *TDM Coordinator*
  A staff member can be designated as the TDM coordinator who would administer and monitor the implementation of the TDM measures identified in this section. This coordinator would not need to be a full-time position but could be an additional responsibility that an administrator could take on.
- *TDM Promotion*
  Using the school's website, a commitment to sustainability can be emphasized with the introduction of the TDM coordinator as well as a forum to introduce the TDM measures that area available for both faculty and staff. This website can also list helpful smartphone apps and website links that introduce technology to facilitate using transit and cycling options. This can also be accomplished with the installation of a TransitScreen at the school that could alert the school population of the next bus and train arrivals and available bikes at nearby bikeshare stations.
- *New Bicycle Spaces*
  Additional convenient bicycle spaces can be installed adjacent to existing spaces at the school. The opportunity to take advantage of the signed bicycle route on 36th Street can be emphasized with this measure.

- *Carpooling*

  Carpooling to and from the school can greatly impact traffic within a neighborhood. A directory of families can be distributed to allow families to promote carpooling or revolving carpool duties. This can be implemented by modifying the school's website that would integrate Google Maps with the school's directory. The TDM coordinator could also consider implementing SchoolPool, which is a program established by MWCOG to promote trip-sharing.

- *Priority On-site Parking*

  If the parking on-site were to be minimized, a minimum requirement would be that any staff member parking on-site would need to bring another staff member with him or her. This can be facilitated by distributing a staff directory to identify opportunities for staff members to carpool.

- *Pre-tax Transit Benefits*

  The school can subsidize public transit for employees by implementing SmartBenefits as a pre-tax transit incentive for employees, which can be used to ride Metrorail or Metrobus. As identified earlier in the discussion of available transit serving the site, there are a total of 88 Metrobus trips and 24 Metrorail trips during the morning peak period that can serve the Murch School population.

- *Additional Transit Benefits*

  The school can subsidize public transit for employees by providing them with a monthly stipend to use for transit, bikeshare and carshare. This stipend is additional compensation and not included as part of their salary.

- *Walking Groups*

  The TDM coordinator can organize walking groups to facilitate a safe walking experience to nearby bus stops and Metrorail stations, especially in the Fall and Winter months when daylight hours are limited.

- *Guaranteed Ride Home*

  The TDM coordinator can participate in the Guaranteed Ride Home (GRH) program established by MWCOG Commuter Connections that would provide commuters who regularly (twice a week) carpool, vanpool, bike, walk or take transit to work with a free and reliable ride home when one of life's unexpected emergencies arise. Commuters may take advantage of GRH up to four times per year to get home for unexpected emergencies such as a personal illness or a sick child.

- *Safe Routes to School*

  The TDM coordinator can coordinate with DDOT's Safe Routes to School coordinator who would provide guidance on promoting safe walking routes to the school.

- *Incorporate semi-regular walk/bike to school days*

  The TDM coordinator can promote semi-regular walk/bike to school days, especially when the weather is conducive to such events in the Spring and Fall.

- *Monitor the mode choice resulting from the implementation of the various TDM elements*
  The TDM coordinator should take periodic surveys of the faculty/staff and student population on how they chose to get to school. This survey should be established before the TDM coordinator is designated and at the end of each subsequent school year to determine if the traffic and parking demand has been affected by the various TDM measures.

MODE CHOICE SURVEY

In order to identify the level of effectiveness of the TDM measures, it is important to get an understanding of how the different segments of the school population (faculty/staff/parents/students) get to school. This survey is relatively easy to conduct and can be conducted by handing out sheets to the staff and to the students. It is not necessary to track the actual person, especially since the anonymity could promote fair reporting. The survey should include the following questions:

FACULTY AND STAFF

1) What is your zip code? _____
2) What time do you typically arrive at school?
3) How did you get to school today? ***Please circle one letter and fill in any corresponding blanks.***
   a. Drove myself: Did you park on-site or on-street? _____
   b. Drove myself and a staff member: How many staff members (including yourself) were in your car? _____ Did you park on-site or on-street? _____
   c. Rode with a staff member that drove
   d. Metrobus: Identify Bus Route: _____
   e. Metrorail: Identify Metrorail Station: _____
   f. Used own bike to school
   g. Used Capital Bikeshare and walked
   h. Walked from home
   i. Taxi/Uber
   j. Dropped off at school

PARENTS

1) What is your zip code? _____

2) How many of your children currently attend Murch?

3) How did your children get to school today? ***Please circle one letter and fill in any corresponding blanks.***

    a. I drove and dropped off my own children. How many children were in your car that you dropped off at Murch? _____

    b. I drove and dropped off my own children and other children who carpooled with me. How many children were in your car (including your own) that you dropped off at Murch? _____

    c. My children rode in a carpool driven by another parent

    d. Metrobus: Identify Bus Route: _____

    e. Metrorail: Identify Metrorail Station: _____

    f. Used own bike to school

    g. Used Capital Bikeshare and walked

    h. Walked from home

    i. Taxi/Uber

4) What time do your children typically arrive at school?