WELLS + ASSOCIATES

THE MARET SCHOOL BALL FIELDS

COMPREHENSIVE TRANSPORTATION REVIEW

January 2022

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Comprehensive Transportation Review

Washington, D.C.

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INTRODUCTION

OVERVIEW

This report presents a Comprehensive Transportation Review (CTR) conducted for the Maret School's proposed plan to construct off-campus ball fields. The proposed site is approximately five acres and is located at 5901 Utah Avenue NW in the Upper Chevy Chase neighborhood of Washington, DC. The proposed facility would be located adjacent to the Episcopal Center for Children (ECC). Maret School (referred to herein as the Applicant, Maret, or the School) has signed a long-term lease with the ECC that will allow Maret to use the grounds behind the ECC's buildings, as well as the smallest of its four buildings, to create new athletic fields, including a multi-sport field (to be used for football, soccer, and lacrosse) and baseball diamond. The existing 4,720 square foot (SF) media center building will be converted to locker room and equipment storage space.

The site is in the R-1-B zone and generally is bordered by Nebraska Avenue on the southeast, the retained ECC buildings and a public alley on the west, a public alley on the north, and single-family homes on the east (as shown on Figure 1). Approximately 48 off-street surface parking spaces and accommodations for a bus drop-off on Nebraska Avenue will be provided. Access to the proposed parking will be provided via a new curb cut on Nebraska Avenue.

The proposed facility (as shown on Figure 2) would supplement Maret's existing athletic facilities on its campus located at 3000 Cathedral Avenue NW. Historically, Maret has used athletic facilities throughout the District to fulfill its athletic needs, including Duke Ellington Field, Wilson High School, Taft Junior High School, Jelleff Recreation Center, and the University of the District of Columbia. Creation of the new ball fields would not only provide Maret with necessary facilities for its athletic programs but also would provide a significant community benefit by allowing local schools, youth sports programs, and residents of the surrounding community to use the fields.

Because the proposed site is in a residential zone, the proposed project will require the approval of a Special Exception application by the Board of Zoning Adjustment (BZA). The purpose of this report is to:

- Evaluate existing traffic operational and safety conditions,
- Evaluate future traffic conditions without the proposed development,
- Evaluate future traffic conditions with the proposed development,
- Identify existing mode choice alternatives,
- Identify any traffic operational impacts associated with the proposed development,
- Evaluate the appropriateness of the proposed parking,

- Evaluate effectiveness of the proposed loading facilities, and
- Recommend transportation improvements (including roadway, operational, and transportation management strategies) to mitigate the impact of the development and promote the safe and efficient flow of vehicular and pedestrian traffic associated with the proposed development.

STUDY SCOPE

This study was undertaken to assess the impacts of the proposed development on the surrounding roadway network. 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 intersections that potentially could be impacted by the proposed development. The following study intersections were selected for detailed analysis:

1. Nebraska Avenue/Utah Avenue,
2. Utah Avenue/Rittenhouse Street/30th Street,
3. Nebraska Avenue/Rittenhouse Street/27th Street, and
4. Military Road/27th Street.

TRANSPORTATION FACILITIES

ROADWAY NETWORK

Existing Conditions

General details regarding the surrounding roadway segments, including functional classification, average daily traffic (ADT) volume, and speed limit are summarized in Table 1. All roadways in the study area operate as two-way streets.

Table 1
Existing Conditions by Roadway Segment Details

Roadway	Functional Classification	Average Daily Traffic (vehicles per day)[1]	Speed Limit (miles per hour)
Nebraska Avenue NW	Collector	7,072	25
Utah Avenue NW	Collector	4,182	20-25[2]
Rittenhouse Street NW	Local	2,000	25
Military Road NW	Principal Arterial	29,393	25
27th Street NW	Collector	3,908	25[2]

[1] 2018 AADT from opendata.dc.gov.
[2] 15 mph School Zone ("When Children are Present") speed limit posted NB and SB in advance of the Rittenhouse Street intersection.

Future Conditions

A project to reconstruct Oregon Avenue NW in Ward 4 from Military Road to Western Avenue and Western Avenue from Oregon Avenue to 31st Street is currently underway. This DDOT project will improve roadways for multimodal transportation and create a safe environment for cyclists and pedestrians.

The reconstruction project has been designed to improve and/or implement the following:

- Roadway Improvements,
- Installation of a new sidewalk - west side,
- New curb and gutters,
- Streetlights,
- Signage and pavement markings,
- Drainage structures and systems,
- LID facilities, and
- Construction of a new bridge over Pinehurst Run.

Although the reconstruction of Oregon Avenue NW will not increase the capacity of the road significantly, it will improve safety for all road users. Traffic counts for the Maret School project were collected before the reconstruction of Oregon Avenue NW and were not affected by the road construction project.

MULTI-MODAL TRANSPORTATION FACILITIES

Existing Public Transportation Facilities and Services

Public transportation facilities in the vicinity of the site include bus stops immediately south of the site.

Bus Service

The site is approximately 600 feet from bus stops serving Metrobus route M4. Within about 0.3 miles of the site, the bus stop at Nebraska Avenue/30th Place NW serves both Metrobus route M4 and E4. The M4 route provides a connection to the Friendship Heights Metro Station, which is located approximately 1.6 miles from the site. Existing bus service is shown on Figure 3.

Pedestrian Facilities

MoveDC 2021 is the City's long-range transportation plan that establishes goals, policies, strategies, and metrics to guide the City's investment in transportation facilities and programs over the next 25 years. *MoveDC* establishes seven goals in the area of safety, equity, mobility, project delivery, management and operations, sustainability, and enjoyable spaces. These goals are supported by 18 policies and 41 strategies established in the plan to help achieve the goals.

MoveDC 2021 highlights policies and needs for pedestrians. The goal for pedestrian infrastructure is to have a safe, connected sidewalk on every street in the District. MoveDC 2021 includes the following pedestrian strategies:

- Maintain a database of asset conditions,
- Use Complete Streets principles to make streets and sidewalks safer for all users,
- Develop new ways to measure the effectiveness of different modes in projects,
- Implement road diets to make streets safer,
- Make intersections safer for pedestrians,
- Increase public art on streets and sidewalks, especially art that improves safety,
- Expand street tree coverage,
- Improve walkability and pedestrian amenities with more car free zones and plazas,
- Maintain and update the ADA transition plan, and

- Build more trails in the Capital Trails Network.

MoveDC 2021 provides a Pedestrian Friendliness Index Map, which characterizes the walkability of an area based on sidewalk availability, building accessibility, and street network design. The subject site is located in a moderate walkability zone.

Based on the existing condition of the study intersections within ¼ mile of the site, all crosswalks have one ramp at each crosswalk (two ramps per corner) and have visible signs and pavement markings. Crosswalk conditions are shown in Table 2.

Table 2
Pedestrian Inventory by Intersection

Intersection	Ped Countdown Heads?	Type of Crosswalks	One Ramp Per Crosswalk?	Tactile Warning Strip
Nebraska Avenue/ Utah Avenue	Yes	All Legs – High Visibility	Yes	Yes
Utah Avenue/ Rittenhouse Street/30th Street	N/A	All Legs – High Visibility	Yes	Yes
Nebraska Avenue/ Rittenhouse Street	N/A	Two Legs – High Visibility (NEB & SWB) Two Legs – Standard	Yes	Yes
Military Road/ 27th Street	Yes	All Legs – High Visibility	Yes	Yes

As mentioned previously, the reconstruction of Oregon Avenue includes the construction of a sidewalk along the west side of the roadway along with other safety improvements that will improve pedestrian and bicycle access to the Maret Ball Fields, once the reconstruction is complete.

The existing sidewalk situation is shown on Figure 4.

Bicycle Facilities

MoveDC 2021 identifies the Priority Bicycle Network, which includes roadways with existing bicycle facilities and roadways for which bicycle facilities are proposed. Currently, no on-street bicycle lanes are present within ½ mile of the site. Existing trails do exist within ½ mile of the site through Rock Creek Park. Notably, a north-south trail runs along the east side of Oregon Avenue and an east-west trail runs along the north side of Bingham Drive, east of Oregon Avenue.

Based on the *moveDC 2021* Bicycle Priority Map, an on-street bicycle facility is proposed (but not yet funded) on Nebraska Avenue, which would provide a connection to the Oregon Avenue Trail and Bingham Drive Trail.

An on-street bicycle facility also is proposed along Military Road, east of Nebraska Avenue.

Capital Bikeshare

As shown on Figure 5, the closest Bikeshare station is located at the Northampton Street NW/Broad Branch Road NW intersection, approximately 0.6 mile from the site location, and includes 18 docks.

The Draft Capital Bikeshare Development Plan Update (May 2020) outlined a system-wide expansion plan. The Draft Plan estimates that 81 new stations could be added to the program while remaining within existing fiscal constraints. Simultaneously, the program would refurbish 194 stations and replace 2,533 bicycles either retired due to end-of-life or lost due to theft and vandalism. E-bikes would replace half of all bicycles retired at the end of their useful life.

The proposed station locations are identified as DDOT-planned stations or stations recommended by the CaBi project team. Stations recommended by the project team were classified as low priority and high priority. Based on the Draft Capital Bikeshare Development Plan Update (May 2020), two high-priority stations and one low-priority station are recommended near the project site, as shown on Figure 5.

Car Sharing Services

Two car-sharing providers currently operate in the District. Zipcar uses a reserved space model, meaning cars must be returned to the same designated parking spaces from which they were picked up. No Zipcars are located near the site.

Free2Move uses a point-to-point model, which means a vehicle does not have to be returned to its original location; a Free2Move vehicle can be parked in any unrestricted curbside parking space, in any metered curbside parking space (without paying meter fees), or in any residential permit parking space. Free2Move currently has 600 vehicles in the District.

EXISTING CONDITIONS ANALYSIS

TRAFFIC VOLUMES

Vehicular turning movement counts were obtained for the PM and the Saturday peak hours. Given ongoing pandemic traffic patterns and as scoped with DDOT, historic Saturday count data was obtained from Streetlight Data for all study intersections. Streetlight Data provides transportation metrics based on location data from mobile devices and mobility trends on the road. Data from 2017 and 2019 were compared at all study intersections. The 2019 traffic volumes were used since they were higher than the 2017 data. The 2019 volumes were then grown to 2021 based on the growth rate approved by DDOT during the scoping process. Historic PM count data was obtained from Quality Counts for 2017 at the Nebraska Avenue/Utah Avenue and Military Road/27th Street intersections, and from Streetlight for the Utah Avenue/Rittenhouse Street/30th Street and Nebraska Avenue/ Rittenhouse Street intersections. As with the Saturday data, these counts were also grown to 2021 based on the growth rate approved by DDOT during the scoping process. Since the PM data originated from different sources, these counts were balanced throughout the study area.

Balanced 2021 vehicular peak hour traffic volumes are shown on Figure 6. Traffic count data are included in Appendix B.

CAPACITY ANALYSIS

Capacity/level of service (LOS) analyses were conducted at the study intersections based on the 2021 peak hour traffic volumes shown on Figure 6 and the existing lane use and traffic control shown on Figure 7.

Synchro software (Version 10.3, Build 151) was used to evaluate levels of service at the study intersections for the PM and Saturday Commuter 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 (HCM) 2000 reports generated by Synchro[1]. Level of service descriptions are included in Appendix C. The results of the analyses are summarized in Table 3. Capacity analysis worksheets for existing conditions are included in Appendix D.

[1] HCM 2000 reports typically are used because HCM 2010 does not allow for many of the non-standard intersection configurations present in the District. Because HCM 2000 does not provide queue results for all-way stop control intersection, the HCM 6th Edition results were used for those study intersections.

Table 3
Level of Service Results

Approach	Existing Conditions						2024 Background Conditions						2024 Total Future Conditions						2024 Total Future Conditions (With Improvements)					
	PM Peak			SAT Peak			PM Peak			SAT Peak			PM Peak			SAT Peak			PM Peak			SAT Peak		
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
1. Utah Avenue/Nebraska Avenue NW																								
EB	E	63.8	0.99	C	23.6	0.66	E	72.0	1.02	C	24.0	0.67	F	95.7	1.10	C	26.6	0.72	D	51.3	0.94	NA		
WB	B	13.6	0.15	B	16.2	0.37	B	13.6	0.15	B	16.2	0.38	B	16.1	0.34	B	19.2	0.52	B	15.9	0.29			
NB	B	14.3	0.35	B	15.8	0.45	B	14.5	0.37	B	15.9	0.46	B	14.8	0.39	B	16.7	0.49	B	16.8	0.38			
SB	B	15.8	0.44	B	14.2	0.34	B	17.6	0.53	B	14.3	0.34	B	17.9	0.54	B	14.6	0.36	C	20.0	0.54			
Overall	C	34.7	0.66	B	17.9	0.51	D	37.7	0.72	B	18.1	0.52	D	45.3	0.76	B	19.8	0.56	C	30.1	0.71			
2. Utah Avenue/Rittenhouse Street NW																								
EB	B	10.6	0.29	A	8.9	0.18	B	10.6	0.29	A	9.0	0.18	B	10.7	0.29	A	8.9	0.18	NA			NA		
WB	A	10.0	0.18	A	8.8	0.10	A	10.0	0.18	A	8.8	0.10	B	10.1	0.18	A	8.8	0.10						
NB	B	13.8	0.52	B	10.5	0.35	B	13.8	0.52	B	10.6	0.36	B	14.3	0.54	B	10.5	0.35						
SB	B	10.3	0.27	A	8.8	0.17	B	10.3	0.27	A	8.8	0.17	B	10.5	0.28	A	8.8	0.17						
SWB	A	8.6	0.03	A	8.4	0.06	A	8.6	0.03	A	8.4	0.06	A	8.7	0.03	A	8.4	0.06						
3. Nebraska Avenue/Rittenhouse Street NW																								
EB	A	9.0	0.17	A	8.3	0.09	A	9.0	0.17	A	8.4	0.09	A	9.0	0.17	A	8.4	0.09	NA			NA		
WB	A	8.8	0.16	A	8.3	0.09	A	8.8	0.16	A	8.3	0.10	A	8.9	0.16	A	8.3	0.10						
NB	A	9.5	0.29	A	8.7	0.23	A	9.6	0.29	A	8.8	0.23	A	9.7	0.30	A	8.8	0.24						
SB	A	8.8	0.16	A	8.5	0.18	A	8.9	0.16	A	8.5	0.19	A	8.9	0.17	A	8.5	0.19						
Overall	NA	NA	NA	A	8.5	NA	NA	NA	NA	A	8.6	NA	NA	NA	NA	A	8.6	NA						
4. Military Road/27th Street																								
EB	F	201.8	1.43	F	3487.8	8.69	F	211.1	1.42	F	3544.3	8.82	F	211.1	1.42	F	3742.8	9.25	F	211.1	1.42	F	297.4	1.62
WB	F	109.7	1.24	F	223.0	1.48	F	115.6	1.24	F	232.1	1.50	F	114.3	1.24	F	250.4	1.55	F	114.3	1.24	F	210.6	1.46
NB	C	25.3	0.59	C	33.0	0.65	C	25.5	0.59	C	33.4	0.66	C	25.6	0.59	C	29.2	0.59	C	25.3	0.58	D	35.8	0.69
SB	F	122.8	1.16	D	41.3	0.74	F	167.4	1.24	D	42.1	0.75	F	223.4	1.38	D	42.7	0.78	F	155.1	1.24	C	30.2	0.54
Overall	F	145.5	1.42	F	1623.5	7.05	F	155.5	1.44	F	1652.6	7.15	F	160.0	1.49	F	1724.2	7.23	F	153.8	1.44	F	226.8	1.48
5. Nebraska Avenue/Site Entrance																								
EB	NA						NA						A	1.3	0.02	A	1.7	0.04	NA			NA		
SB	NA						NA						A	9.0	0.07	A	9.5	0.06						
Where approach includes multiple lane groups, the lane group with the highest v/c ratio is provided.																								

As shown in Table 3, all approaches at the study intersections operate at a LOS D or better under existing conditions, with the exception of the following intersections/approaches:

- Intersection #1 (Nebraska Avenue/Utah Avenue)
    - The eastbound (Nebraska Avenue) approach operates at a LOS E during the PM peak hour.
- Intersection #4 (Military Road/27th Street)
    - The eastbound approach operates at a LOS F during the PM and Saturday peak hours.
    - The westbound approach operates at a LOS F during the PM and Saturday peak hours.
    - The southbound approach operates at a LOS F during the PM peak hour.

QUEUE ANALYSIS

A queuing analysis was conducted for the study intersections under existing conditions using the 50th and 95th percentile queue lengths reported by HCM 2000 and 6th Edition (HCM 6th Edition was only used for queues at all-way stop intersections since HCM 2000 does not provide queues for such intersections). The results are summarized in Table 4. Queue reports for existing conditions are provided in Appendix D.

As shown in Table 4, the results of the queuing analysis indicate that the existing queues would be adequately accommodated within the existing turn lane bays (where present) or without spilling back through adjacent intersections, with the following exceptions:

- Intersection #1 (Nebraska Avenue/Utah Avenue)
    - The 95th percentile eastbound (Nebraska Avenue) approach currently exceeds the available storage during the PM and Saturday peak hours.
- Intersection #4 (Military Road/27th Street)
    - The 50th and 95th percentile eastbound (Military Road) shared left-through and through-right lane groups currently exceed the available storage length during the PM and Saturday peak hours.
    - The 50th and 95th percentile queues for the westbound through movement (Military Road) currently exceed the available storage length during the Saturday peak hour.

Table 4
50th and 95th Percentile Queue Results

Approach	Available Storage	Existing Conditions				2024 Background Conditions				2024 Total Future Conditions				2024 Total Future Conditions (With Improvements)			
		PM Peak		SAT Peak		PM Peak		SAT Peak		PM Peak		SAT Peak		PM Peak		SAT Peak	
		50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile	50th %-tile	95th %-tile
1. Utah Avenue/Nebraska Avenue NW																	
EBLTR	115	98	241	63	153	106	250	64	157	129	267	71	175	126	282	NA	
WBLTR	870	11	35	36	78	11	36	37	80	26	64	51	105	30	69		
NBLTR	240	37	78	48	98	38	81	49	100	40	85	53	108	50	100		
SBLTR	140	40	93	28	71	51	115	28	71	52	117	30	75	67	139		
2. Utah Avenue/Rittenhouse Street NW																	
EBLTR	455	NA	30	NA	17.5	NA	30	NA	17.5	NA	30	NA	17.5	NA		NA	
WBLTR	490	NA	15	NA	7.5	NA	15	NA	7.5	NA	17.5	NA	7.5				
NBLTR	300	NA	77.5	NA	40	NA	77.5	NA	40	NA	82.5	NA	40				
SBLTR	110	NA	27.5	NA	17	NA	27.5	NA	15	NA	30	NA	15				
SWBLTR	665	NA	2.5	NA	5	NA	2.5	NA	5	NA	2.5	NA	5				
3. Nebraska Avenue/Rittenhouse Street NW																	
EBLTR	610	NA	12.5	NA	7.5	NA	15	NA	7.5	NA	15	NA	7.5	NA		NA	
WBLTR	160	NA	15	NA	7.5	NA	15	NA	7.5	NA	15	NA	7.5				
NEBLTR	65	NA	30	NA	22.5	NA	30	NA	22.5	NA	30	NA	22.5				
SEBLTR	137	NA	15	NA	17.5	NA	15	NA	17.5	NA	15	NA	17.5				
4. Military Road/27th Street																	
EBLRT	260	540	671	1460	1742	553	684	1484	1766	553	684	1481	1751	553	684	586	747
WBL	175	13	67	5	22	13	67	5	24	13	67	5	23	13	67	5	26
WBT	950	655	884	1037	1357	671	901	1061	1381	671	901	1077	1365	671	901	1036	1344
WBR	950	39	73	12	35	42	78	12	35	47	85	19	45	47	85	16	42
NBLTR	1800	120	200	106	158	123	202	107	160	123	203	101	159	122	201	108	166
SBL	665	149	291	78	131	176	323	78	132	208	360	88	154	180	328	39	79
SBTR														9	26	45	82
5. Nebraska Avenue/Site Entrance																	
EBLT		NA		NA						NA	2	NA	3	NA		NA	
SBLR	265	NA		NA						NA	6	NA	5				

SAFETY EVALUATION

Per DDOT's request, a qualitative safety evaluation was undertaken surrounding the site. The following elements were reviewed:

- Sidewalk conditions of all study intersections within ¼ mile of the site, and
- Signage and markings associated with the two unsignalized intersections of Utah Avenue/Rittenhouse Street and Nebraska Avenue/Rittenhouse Street.

Sidewalk Conditions

Sidewalks along the site frontage on Nebraska Avenue are in good condition. No obstructions or tripping hazards were observed. Likewise, sidewalks along the Utah Avenue on the west of the site are in good condition. No obstructions or tripping hazards were observed.

All the sidewalks from the site to the nearest bus stops are in good condition.

Crosswalk Signage and Markings

According to DDOT's Design and Engineering Manual, crosswalks must meet the following criteria:

- 10 feet wide on local streets, 15 feet wide on collector streets, and 20 feet wide on major arterials with high pedestrian volumes,
- High-visibility markings at all uncontrolled crosswalks,
- Equipped with ADA ramps on both sides of the crosswalk, and
- Located at the nearest intersection to all bus stops.

The Manual on Uniform Traffic Control Devices offers the following additional guidance regarding signage at crosswalks:

- Pedestrian warning signs may be used to alert road users in advance of the crosswalk,
- Where advanced warning signs are used, they should be supplement with "Ahead" or "xx feet" plaques,
- If a post-mounted pedestrian warning sign is placed at the location of the crossing point a diagonal downward pointing arrow plaque shall be mounted below the sign.

All crosswalks at Utah Avenue/Rittenhouse Street/30th Street intersection (all-way stop controlled) are high visibility and are approximately 15 feet wide. ADA ramps are present on both sides of each crosswalk as well as tactile warning strips. School area signs are posted on the northbound and southbound approaches of Utah Avenue in advance of Rittenhouse Street.

Northbound and southbound crosswalks on Nebraska Avenue at its intersection with Rittenhouse Street are uncontrolled. Both crosswalks are high visibility and are approximately 15 feet wide. Advanced Pedestrian Warning signs are present 150 feet in advance of each crosswalk with appropriate distance plaques. Pedestrian crossing signs are posted at each crosswalk; however, the required downward pointing arrow plaque is missing from each sign. Crosswalks on the Rittenhouse Street approaches are marked with two parallel lines, and they meet the standards for a local street. ADA ramps are present on both sides of each crosswalk as well as tactile warning strips.

Crosswalks at the signalized intersection of Nebraska Avenue and Utah Street are all high visibility and approximately 15 feet wide. ADA ramps are present on both sides of each crosswalk as well as tactile warning strips.

According to the DDOT's *2017 Vision Zero Data*, serious injuries decreased for nearly all modes of transportation, but compared to 2016, fatalities increased. No fatal crashes within ½ mile of the project were noted in the *Vision Zero Plan.*

The goal of Vision Zero is no fatalities and no serious injuries on the transportation system. In order to achieve the Vision Zero goal, the *Vision Zero Plan* identifies a number of strategies to improve safety. The strategies are categorized into four themes: 1) create safer streets, 2) protect vulnerable users, 3) prevent dangerous driving, and 4) be transparent and responsive.

The proposed project includes several operational recommendations to the transportation network that will further the Vision Zero goals, as indicated below:

- The curb cut on Nebraska Avenue has been designed such that no vehicles (including trash trucks) will need to back into the site. All backing maneuvers would occur internally, on private property.
- The hours of trash service have been restricted to avoid times when traffic generated by the ball fields is highest.
- A flagger will be required to be positioned in the parking lot during certain situations when the parking lot is expected to reach capacity to ensure that traffic seeking parking spaces does not back up onto Nebraska Avenue.

2024 BACKGROUND CONDITIONS

TRAFFIC VOLUMES

Overview

The proposed ball fields are anticipated to be constructed and open in 2024. In order to forecast year 2024 background traffic volumes in the study area without the proposed project, increases in traffic associated with growth outside the immediate site vicinity (regional growth) and increases in traffic associated with approved but not yet constructed developments in the study area (pipeline developments) were considered.

Regional Growth

DDOT's historical average daily traffic (ADT) volume maps were examined to determine an appropriate growth rate for the study area. Based on the calculated growth rates as summarized in the scoping document (included in Appendix A), an annual growth rate of 0.5 percent, compounded annually, was used for the study area.

Pipeline Developments

The Episcopal Center for Children (ECC), located at 5901 Utah Avenue NW, is a nondenominational, nonprofit organization that has been dedicated to serving the needs of children and their families for the past 125 years. In June 2019, the ECC suspended operation for its Kindergarten through 8th grade therapeutic school for children with emotional challenges from the greater Washington, D.C. Metropolitan area. The ECC is planning to open an after-school enrichment program for neighborhood children in pre-K through 3rd grade in January 2022. The after-school program is expected to serve approximately 30 neighborhood children from 3:00 PM to 6:00 PM.

Beginning in Fall 2022, the ECC plans to reinstitute its day school program serving approximately 20 to 25 students with approximately 25 faculty/staff. During the 2017-2018 school year, the ECC operated a day school with an enrollment of 40 to 45 students. Since the weekday traffic counts used for the analyses contained herein were taken from 2017, traffic from the day school at the ECC already was included in the counts. Because the after-school program was not in operation when the counts were conducted, the traffic associated with the after school program was included in the future traffic forecasts. The pick-up and drop-off activities were assumed to utilize the school's circular driveway that connects Utah Avenue and Nebraska Avenue. Estimated trips generated by the ECC's after school program are shown in Figure 8.

Background Forecasts

Background 2024 traffic forecasts were developed by combining the traffic volumes grown to the year 2024 with the pipeline traffic volumes. The resulting 2024 background traffic forecasts (without the project) are shown on Figure 9.

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 7 and the future background traffic forecasts shown on Figure 9.

The results of the analyses are summarized in Table 3. Capacity analysis worksheets are included in Appendix E. As shown in Table 3, background conditions generally are consistent with existing conditions for all study intersections, with the intersection of Military Road and 27th Street generally expected to experience additional delay.

QUEUE ANALYSIS

A queuing analysis was conducted for the study intersections under 2024 background conditions using the 50th and 95th percentile queues reported by Synchro. The results are summarized Table 4. Queue reports are provided in Appendix E.

As shown in Table 4, the 50th and 95th percentile queues at the study intersections under 2024 background conditions generally are consistent with existing conditions. No additional lane groups are expected to exceed available storage other than those that currently exceed the available storage under existing conditions.

SITE ANALYSIS

OVERVIEW

The subject site is approximately five acres located on Square 2319, Lot 0832 in Ward 4 and within the boundaries of ANC 3G02. The proposed facility would be located adjacent to the Episcopal Center for Children (ECC). Maret School has signed a long-term lease with the ECC that will allow Maret to use the grounds behind the ECC's buildings, as well as the smallest of its four buildings, to create new athletic fields, including a multi-sport field (to be used for football, soccer, and lacrosse) and baseball diamond. The existing 4,720 sf media center building will be converted to locker room and equipment storage space.

Approximately 48 surface parking spaces would be provided on site with access via a new curb cut on Nebraska Avenue. A 100-foot pick-up/drop-off (PUDO) zone to accommodate buses is proposed on Nebraska Avenue along the site frontage. When not occupied by buses, the PUDO zone should be used for parents picking up or dropping off children at the ball fields or the ECC.

The proposed facility would supplement Maret's existing athletic facilities on its campus located at 3000 Cathedral Avenue NW. Historically, Maret has used athletic facilities throughout the District to fulfill its athletic needs, including Duke Ellington Field, Wilson High School, Taft Junior High School, Jelleff Recreation Center, and the University of the District of Columbia. Creation of the new ball fields would not only provide Maret with necessary facilities for its athletic programs but also would provide a significant community benefit by allowing local schools, youth sports programs, and residents of the surrounding community to use the fields.

SITE ACCESS AND CIRCULATION

While existing curb cuts do serve the adjacent ECC property, the Maret site is not currently served by any curb cuts on Nebraska Avenue. Under the proposed plan, one curb cut is proposed along Nebraska Avenue. The project team explored the possibility of providing access to the property via the abutting alley; however, it was determined to be infeasible due to the loss of additional trees, grading challenges, and significant opposition from the neighbors abutting the alley. In conjunction with the new curb, an existing adjacent curb cut that serves the ECC will be closed.

Vehicular, pedestrian, and bicycle circulation is shown on Figure 10.

CURBSIDE MANAGEMENT

A curbside bus PUDO zone on Nebraska Avenue along the site frontage is proposed to facilitate drop-off/pick-up operations for the site. When not in use by buses for Maret practices and games, the PUDO zone should operate as five-minute PUDO for parents picking up or dropping off students at the ball fields or the ECC. Other existing curbside parking is not planned to be modified with this project. The loss of two parking spaces to accommodate the proposed curb cut will be offset by the gain of two spaces resulting from the closure of the adjacent curb cut currently serving the ECC. In total, six parking spaces will be lost to accommodate the 100-foot PUDO zone. The existing curbside uses are shown on Figure 11A. The proposed curbside management is shown on Figure 11B.

PROPOSED PARKING

Vehicular Parking

Based §701.5 of ZR16, private education uses require "2 spaces for each 3 teachers and other employees, plus…1 space for each 10 seats in the largest…area usable for public assembly." The proposed plan would provide 80 permanent bleacher seats plus 80 portable bleacher seats. In addition, approximately 10 faculty/staff are anticipated (including coaches, referees, and umpires). As a result, 16 spaces are required to meet the spectator and participant parking needs (160 people/10 parking spaces) and seven spaces are required to meet the "teacher or other employee" parking needs (10 employees x 2 spaces/3 employees), resulting in a minimum parking requirement of 23 parking spaces for the site. The project plans to provide approximately 48 spaces on-site, exceeding this minimum requirement.

Bicycle Parking

Per §802.1 of ZR16, private education uses require one long-term bicycle space for every 7,500 sf of GFA in excess of 4,000 sf and one short-term bicycle parking space per 2,000 sf of GFA. Since GFA "does not include floor area devoted to off-street parking or loading facilities, including aisles, ramps, and maneuvering space, ***or space devoted exclusively to bicycle storage or support (lockers and showers) facilities"*** [emphasis added] per §803.2 of ZR16, the remaining square footage in the 4,720 sf media center building would be less than 4,000 SF and no long-term bicycle parking would be required. As such, two short-term bicycle parking spaces would be required for the 4,720 sf converted media center building. The Applicant plans to provide 12 spaces on six bicycle racks, exceeding this minimum requirement.

PROPOSED LOADING

Per §901.1 of ZR16, educational uses with less than 30,000 SF of GFA are not required to provide loading facilities. However, trash storage is planned adjacent to the parking lot. Trash pick-up routing is shown in Appendix F.

ON-STREET PARKING ASSESSMENT

To assess the availability of on-street parking in the neighborhood, Wells + Associates performed a detailed parking inventory for all streets within ¼ mile of the subject site. Figure 12 shows the number of on-street parking spaces on each road segment. Approximately 1,178 total on-street parking spaces are located in the surveyed area. Detailed parking occupancy counts were also conducted on Wednesday, September 15, 2021, at 30-minute intervals from 4:30 PM to 7:00 PM and Saturday, September 25, 2021, at 30-minute intervals from 8:30 AM to 12:30 PM. Block by block parking occupancy counts are included in the Appendix G.

As shown in Table 5, the weekday peak parking demand for the study area occurred at 7:00 PM when 523 of the 1,178 neighborhood street parking spaces were occupied, resulting in a parking occupancy of approximately 44 percent. The Saturday peak parking demand for the study area occurred at 8:30 AM when 519 of the 1,178 neighborhood street parking spaces were occupied, also resulting in a parking occupancy of approximately 44 percent. Graphs showing parking occupancy by time of day for the study area for the weekday and weekend study periods are shown in Figures 13 and 14, respectively.

The assessment of on-street parking in the vicinity of the site indicates that on-street parking within the study area is substantially underutilized. Specifically, 655 and 659 on-street parking spaces were available during the weekday and Saturday peak periods, respectively. Therefore, sufficient capacity exists in the neighborhood to accommodate additional parking needs on-street.

Table 5
Parking Occupancy Summary

Time of Day	Total Occupied Spaces	Percent Occupied
WEEKDAY (1,178 total on-street parking spaces)		
4:30 PM	450	38%
5:00 PM	452	38%
5:30 PM	492	42%
6:00 PM	504	43%
6:30 PM	521	44%
7:00 PM	523	44%
SATURDAY (1,178 total on-street parking spaces)		
8:30 AM	519	44%
9:00 AM	491	42%
9:30 AM	480	41%
10:00 AM	469	40%
10:30 AM	469	40%
11:00 AM	473	40%
11:30 AM	459	39%
12:00 PM	464	39%
12:30 PM	430	37%

TRIP GENERATION ANALYSIS

Overview

The total number of trips generated by the proposed development would be comprised of vehicular, pedestrian, bicycle, and transit trips. To provide a conservative analysis, all trips were assumed to be either vehicular trips or bus trips (reflecting the fact that all Maret team members and visiting team members and most coaches will travel to/from the site via bus during the school year).

Trip generation estimates were derived based on information provided by Maret, which included the frequency of games/practices, the number of individuals using the field in each circumstance, and the number of anticipated spectators. The number of vehicular trips for each situation was then estimated based on an average vehicle occupancy (AVO) of 2.1 persons per vehicle (per the recommended AVO for social/recreational trips in DDOT's *Guidance for Comprehensive Transportation Review*).

Maret team members and coaches and visiting team students and coaches will be required to travel to/from the site via bus during the school year, with the exception of coaches traveling from their workplace who would pass the site to get to Maret's campus (e.g a coach who works in Silver Spring would meet the team at the fields). Maret estimates that no more than five coaches would travel by car rather than by bus. Bus trips were added to the vehicular trips to determine the total number of peak hour trips for the project.

The PM peak hour trip generation is expected to vary depending on the season and the types of games/practices hosted by Maret. For analysis purposes, the PM peak hour trip generation was based on days when Maret games that have spectators (such as soccer, lacrosse, and baseball games) are followed by the fields being used by outside users. In other words, traffic exiting the Maret games and traffic from outside groups entering to use the fields would occur within the same hour.

During the Saturday peak hour, the trip generation used for purposes of analysis was based on the use of the fields by outside youth sports groups and reflects back-to-back sporting events (i.e. traffic exiting one game overlaps with traffic entering for the next).

The anticipated programming for the ball fields, including the estimated number of trips for each sporting event, is included in Appendix G. The peak hour trip generation estimates are included in Table 6.

Table 6
The Maret Ball Fields Peak Hour Trip Generation[2]

User	AM PEAK HOUR			PM PEAK HOUR			SAT PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Local DC School Rental - Cars‡	0	0	0	33	23	56	48	48	96
Local DC School Rental - Buses‡	1	1	2	0	0	0	0	0	0
Maret Soccer Games - Cars†	0	0	0	0	34	34	0	0	0
Maret Soccer Games - Buses†	0	0	0	0	2	2	0	0	0
Total	**1**	**1**	**2**	**33**	**59**	**92**	**48**	**48**	**96**

† Soccer games occur in Sept., Oct., and 1st 3 weeks of Nov.
‡ AM and PM peak hour trips for local DC School Rental based on anticipate usage in Sept., Oct., and the 1st 3 weeks of Nov. - PM. Saturday peak hour trips for local DC School Rental based on anticipated usage in Sept., Oct., the 1st 3 weeks of Nov., Mar., Apr., and May.

As shown in Table 6, the school would be expected to generate 2 vehicle trips (1 inbound, 1 outbound) during the AM peak hour, 94 vehicle trips (33 inbound, 61 outbound) during the PM peak hour, and 96 (48 inbound, 48 outbound) vehicle trips during the Saturday peak hour.

Site Trip Distribution and Assignment

The distribution of new peak hour site trips generated by the ball fields was based on the location of the site and the anticipated origin of the majority of users considering the primary routes around the site. The PM and Saturday peak hour distributions are shown on Figure 15.

The trip distributions then were applied to the vehicle trip generation for the ball fields. The resulting traffic assignments for the PM and Saturday peak hours are as shown on Figure 16.

[2] Since completion of the analysis, the programming estimates for the field were refined resulting in a slightly reduced PM peak hour trip generation estimate (two fewer PM peak hour vehicle trips). Therefore, the analysis included herein is based on 36 PM peak hour vehicle trips rather than 34.

TRANSPORTATION MANAGEMENT PLAN

The Maret School will implement a Transportation Management Plan to help facilitate ingress to, egress from, and the flow of traffic on site and to reduce the impact of the proposed development. The Transportation Management Plan will consist of: 1) a Transportation Demand Management (TDM) Plan and 2) an Operations Management Plan. Each plan is summarized below.

Transportation Demand Management

Traffic and parking congestion can be solved in one of two ways: 1) increase supply or 2) decrease demand. Increasing supply requires building new roads, widening existing roads, building more parking spaces, or operating additional transit service. These supply solutions are often infeasible in constrained urban environments and, where feasible, can be expensive, time consuming, and in many instances, unacceptable to businesses, government agencies, and/or the general public. Alternatively, 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.

Proposed Components of TDM Plan

In order to more effectively reduce school-generated traffic volumes, the School will enhance bicycle infrastructure to encourage non-auto modes of travel. Additionally, provisions will be made for transporting Maret students and visiting teams to/from the site via buses during the school year. Maret proposes the following strategies as part of their TDM plan:

Infrastructure Improvements:

1. Provide a minimum of six short-term bicycle racks (12 spaces) on the property.

2. Subject to DDOT approval, designate a bus drop-off/pick-up zone on Nebraska Avenue, as shown on Figure 10, with sufficient length to accommodate two full size school buses.

Non-Auto Travel:

1. During the school year, all Maret School team members and most coaches will be required to travel to and from the ball fields by bus for practices, except team members who live in the neighborhood or who ride Metrobus. Team members who live in the neighborhood will be permitted to walk or bike to practice. Up to five coaches may be permitted to drive to/ from the ball fields.

2. During the school year, all Maret School and visiting team members and most coaches will be required to travel to the ball fields by bus for games, except those who live in the neighborhood or use Metrobus. Team members who live in the neighborhood will be permitted to walk or bike. The buses will transport team members from the fields after the conclusion of the games. Team members whose parents attended the game may leave with their parents or on the bus. Up to five coaches may be permitted to drive to/ from the ball fields.

3. During the preseason (three weeks from mid-August to Labor Day), up to 12 team members and five coaches will be permitted to travel to the ball fields via personal vehicles for both the morning and afternoon practice sessions. Other team members and coaches will travel to the ball fields via bus.

4. Other visitors to the ball fields will be encouraged to use the adjacent Metrobus M4 line, providing connectivity to the Tenleytown Metrorail station when feasible.

Operations Management Plan

In addition to the TDM plan, Maret will implement an Operations Management Plan to promote safe and efficient traffic flow into and out of the site. The following are the components of the plan:

1. Provide notification to Maret parents, visiting teams, and all outside users of the fields including the following:
    - When the on-site parking lot is full, park only in legal on-street parking spaces (i.e. do not block driveways or park in alleys) and obey any parking restrictions in place and
    - Obey all traffic laws when traveling to/from the site.
2. Provide flaggers in the parking lot to direct traffic to available spaces in the lot during games/practices in which the parking lot is expected to be at or near capacity. Flaggers to be provided by Maret or by groups who may be leasing the field.
3. Trash and recycling receptacles will be located in the corner of the parking lot. Trash trucks will use the Nebraska Avenue curb cut and will circulate through the parking lot in order to pick up trash and recycling. Trash and recycling pick up will be restricted during the following hours:
    - Between 9:00 PM and 7:00 AM, in accordance with DCMR §20-2806,
    - During the school year, from 3:00 PM to 5:00 PM on weekdays and from 10:00 AM to 5:00 PM on Saturdays, and
    - During the summer months, no trash pick-up before 9:00 AM or after 3:00 PM on weekdays and no trash pick-up from 10:00 AM to 5:00 PM on Saturdays.

2024 TOTAL FUTURE CONDITIONS

TRAFFIC FORECASTS

Total future traffic forecasts with the proposed ball fields were determined by combining the 2024 background traffic forecasts shown in Figure 9 with the site traffic volumes shown on Figure 16 to yield the 2024 total future traffic forecasts shown on Figure 17.

CAPACITY ANALYSIS

Capacity analyses were performed at the study intersections using the total future peak hour traffic forecasts shown on Figure 17. The level of service results for the 2024 total future conditions with the proposed development are included in Appendix H and summarized in Table 3.

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 in DDOT's *Guidance for Comprehensive Transportation Review*, an impact is defined as follows:

- Degradation in overall or approach level of service to LOS E or LOS F, or
- Increase in intersection volume-to-capacity (v/c) ratio to 1.0 or greater with the addition of site-generated traffic, or
- Increase in overall or approach delay or v/c ratio by five percent or more when compared to background conditions for intersections operating at an approach delay of LOS E or LOS F.

As shown in Table 3, impacts were identified at the following locations:

- Intersection #1 (Nebraska Avenue/Utah Avenue)
    - The eastbound (Nebraska Avenue) approach is projected to drop from a LOS E to a LOS F during the PM peak hour.
- Intersection #4 (Military Road/27th Street)
    - The eastbound (Military Road) approach operates at a LOS F during the PM and Saturday peak hours and the total future delay increases by more than 5 percent during the Saturday peak hour.
    - The westbound approach (Military Road) operates at a LOS F during the PM and Saturday peak hours and the total future delay increases by more than 5 percent during the Saturday peak hour.
    - The southbound approach operates at a LOS F during the PM peak hour and the total future delay increases by more than 5 percent.

QUEUE ANALYSIS

A queuing analysis was conducted for the study intersections under 2024 total future conditions. Synchro was used to conduct the analyses, using the 95th percentile queue lengths. The results are summarized in Table 4 and queue reports are provided in Appendix H.

By comparing total future queues to background queues, the impact of the proposed development can be identified. In accordance with DDOT guidelines, an impact is defined as:

- An increase in the 95th percentile queue greater than 150 feet when compared to background conditions, or
- A 95th percentile queue that exceeds the available storage length as the result of the proposed development.

As shown in Table 4, total future 50th and 95th percentile queues are projected to be generally consistent with background conditions. No adverse queuing impacts are expected.

IMPROVEMENT ANALYSIS

Overview

Based on the analysis, the proposed project would have level of service impacts at the Nebraska Avenue/Utah Avenue and Military Road/27th Street intersections. A summary of improvement opportunities is noted below.

Intersection #1 (Nebraska Avenue/Utah Avenue)

Currently, this intersection operates with a cycle length of just 50 seconds during the PM peak hour. Such a short cycle length is very unusual. While the queues remain relatively short due to the short cycle length, the Synchro analysis indicates that the natural cycle (or the shortest cycle length at which the intersection would achieve acceptable levels of service) is 60 seconds. Given that there are no other signalized intersections within ½ mile of the Nebraska Avenue/Utah Avenue intersection, an increased cycle length of 60 seconds is recommended. The 60 second cycle length would allow all approaches to operate at acceptable levels of service (i.e. a LOS D or better) while maintaining 50th and 95th percentile queue lengths general consistent with current conditions.

Intersection #4 (Military Road/27th Street)

This intersection can be mitigated by removing parking on the southbound approach to provide a separate southbound left turn lane. Given that parking on east side of 27th Street is already restricted on school days during school hours, this restriction would need to be instituted at all times to create the southbound left turn lane. In addition, parking on the eastbound approach

of the intersection should be restricted on Saturdays to create two eastbound through lanes, as the intersection operates during the PM peak period. Since this mitigation would require new parking restrictions, non-automotive mitigation measures could be provided in lieu of roadway mitigation measures.

The improvement analysis is summarized in Table 3 and shown in Appendix I.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are as follows:

1. The proposed site is approximately five acres and is located at 5901 Utah Avenue NW. Maret has signed a long-term lease with the ECC that will allow Maret to use the grounds behind the ECC's buildings, as well as the smallest of its four buildings, to create new athletic fields, including a multi-sport field and baseball diamond. The existing media center building will be converted to locker room and equipment storage space.

2. A new curb cut on Nebraska Avenue will be constructed. A 100' bus loading zone is proposed along Nebraska Avenue to accommodate the movement of students to and from the ball fields from the school.

3. When the bus loading zone is not in use by buses, it should be designated as a pick-up/drop-off zone for parents dropping off or picking up children.

4. Weekday peak parking demand for the study area occurred at 7:00 PM when 523 of the 1,178 neighborhood street parking spaces were occupied, resulting in an occupancy of approximately 44 percent. The Saturday peak parking demand for the study area occurred at 8:30 AM when 519 of the 1,178 neighborhood street parking spaces were occupied, also resulting in a parking occupancy of 44 percent.

5. Sufficient on-street parking is available to accommodate overflow parking demand for certain games/practices where the number of parked vehicles is expected to exceed the on-site parking supply.

6. During the weekday PM peak hour, when Maret games that include spectators (such as soccer, lacrosse, and baseball games) overlap with field use by outside users, the project would generate an estimated 87 peak hour vehicle trips. On a typical Saturday, when the field is used by youth sports groups, the project would generate an estimated 96 peak hour vehicle trips.

7. Based on the analysis, the minor impact at the Nebraska Avenue/Utah Avenue intersection could be mitigated by increasing the cycle length from 50 seconds to 60 seconds during the PM peak hour.

8. Impacts at the Military Road/27th Street intersection may be mitigated by the restriction of on-street parking for additional travel lanes or non-auto safety or infrastructure improvements in the study area.

9. With the implementation of the Transportation Management Plan, modification of the cycle length at the Nebraska Avenue/Utah Avenue intersection, and the removal of parking at the Military Road/27^{e} Street intersection to create additional capacity at the intersection, ***or other non-auto infrastructure improvements to encourage the use of non-auto modes of travel***, the proposed project would not have an adverse impact on the surrounding off-site intersections.

FIGURES

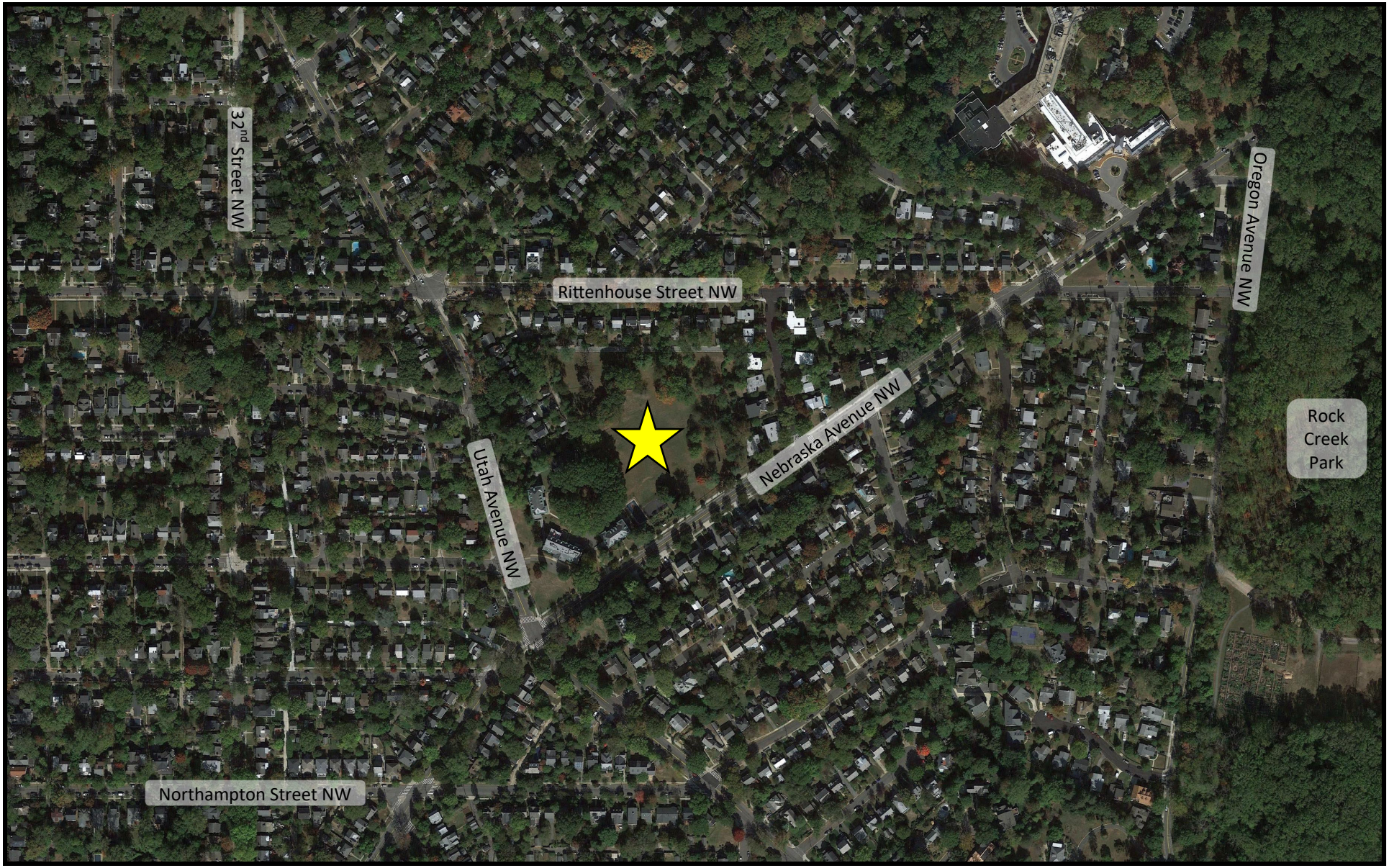
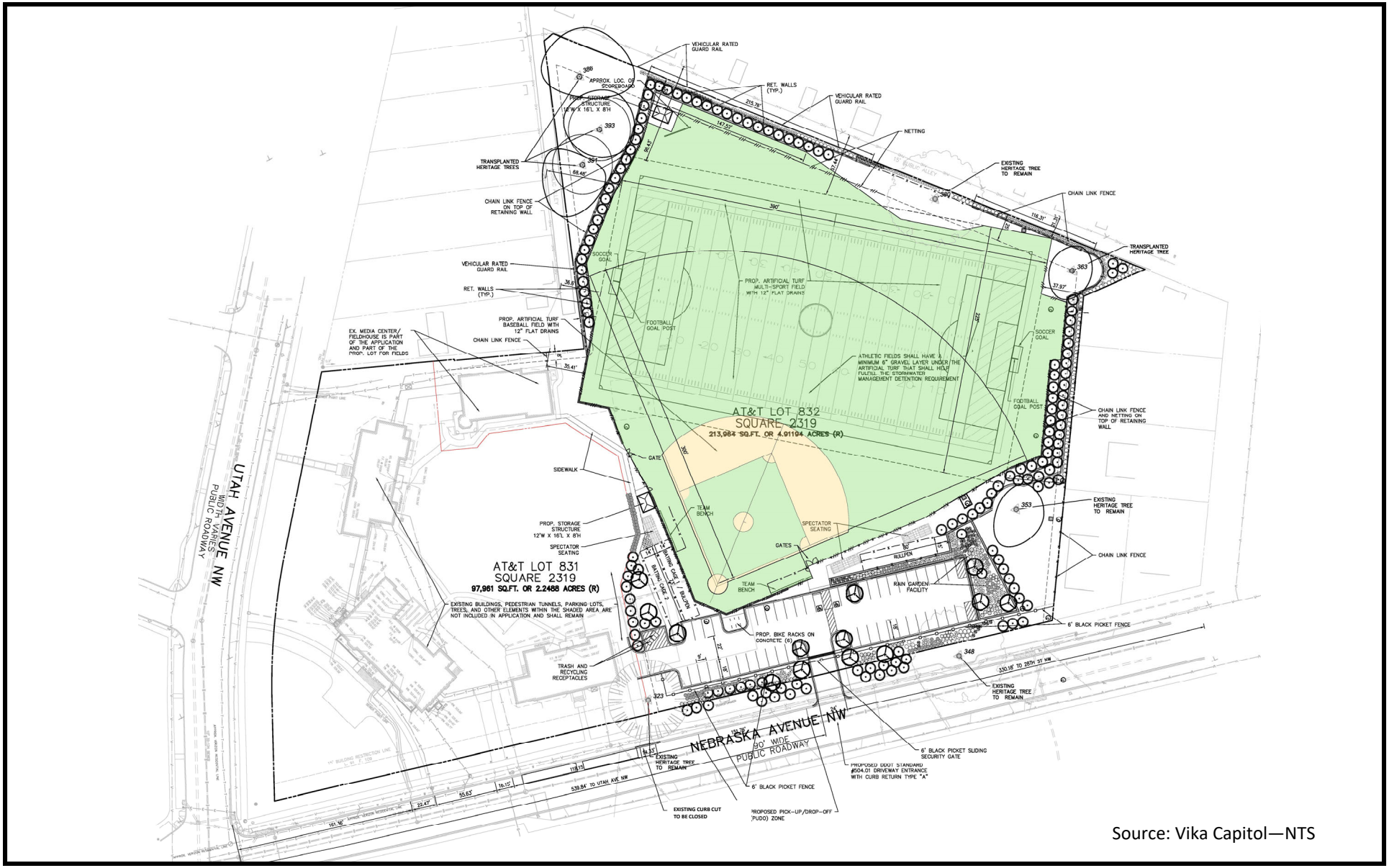


Figure 1
Site Location

Site Location

NORTH

Maret Ball Fields
Washington, DC



Source: Vika Capitol—NTS

Figure 2
Proposed Plan

NORTH

Maret Ball Fields
Washington, DC

Figure 3
Multi-Modal Transportation Network

- Site
- XX Bus Stop (Route Number)
- # Capital Bike Share (Number of Docks)
- # Zipcar (Number of Cars)

NORTH

Maret Ball Fields
Washington, DC

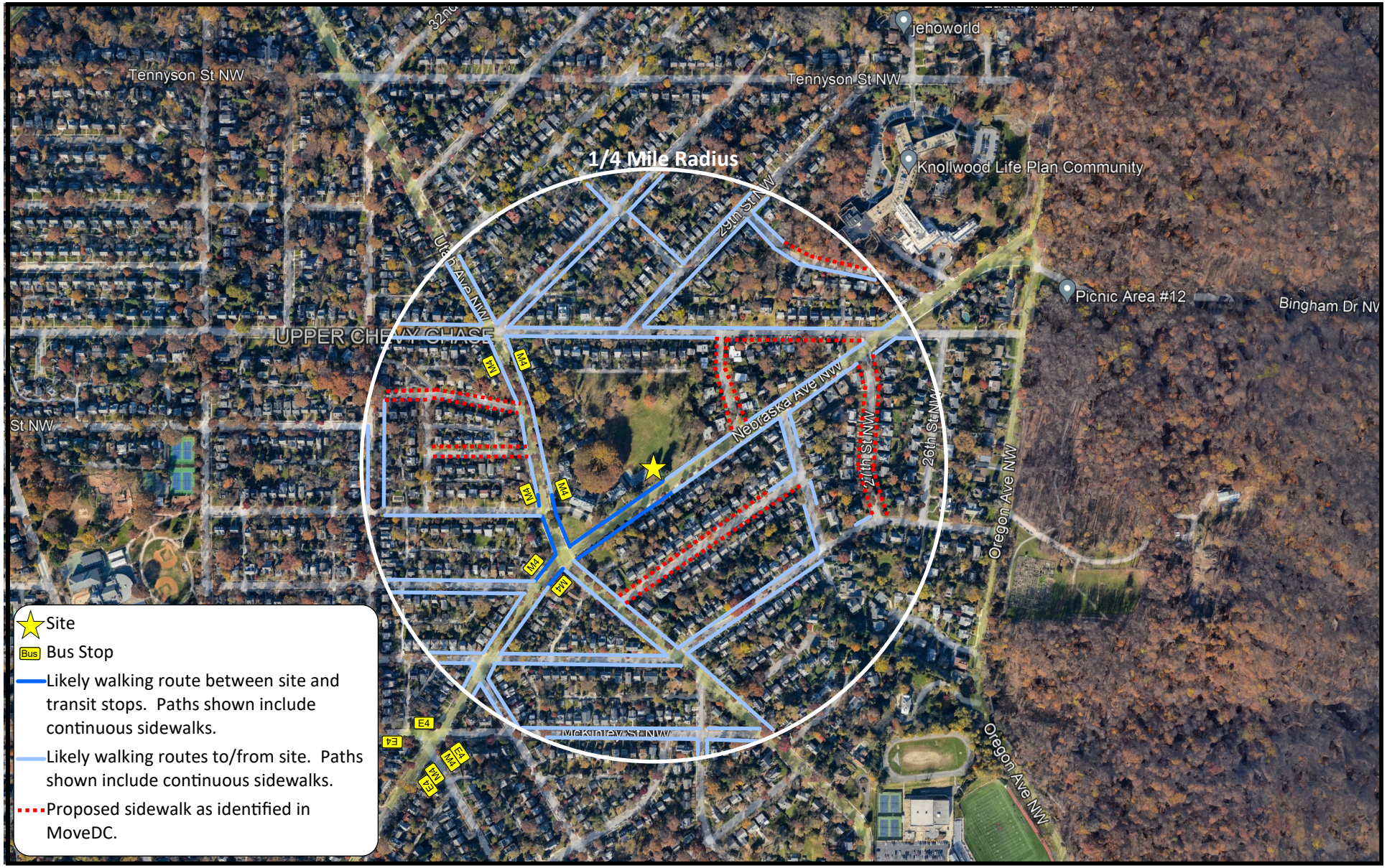


Figure 4
Quarter Mile Walk-Shed

NORTH

Maret Ball Fields
Washington, DC

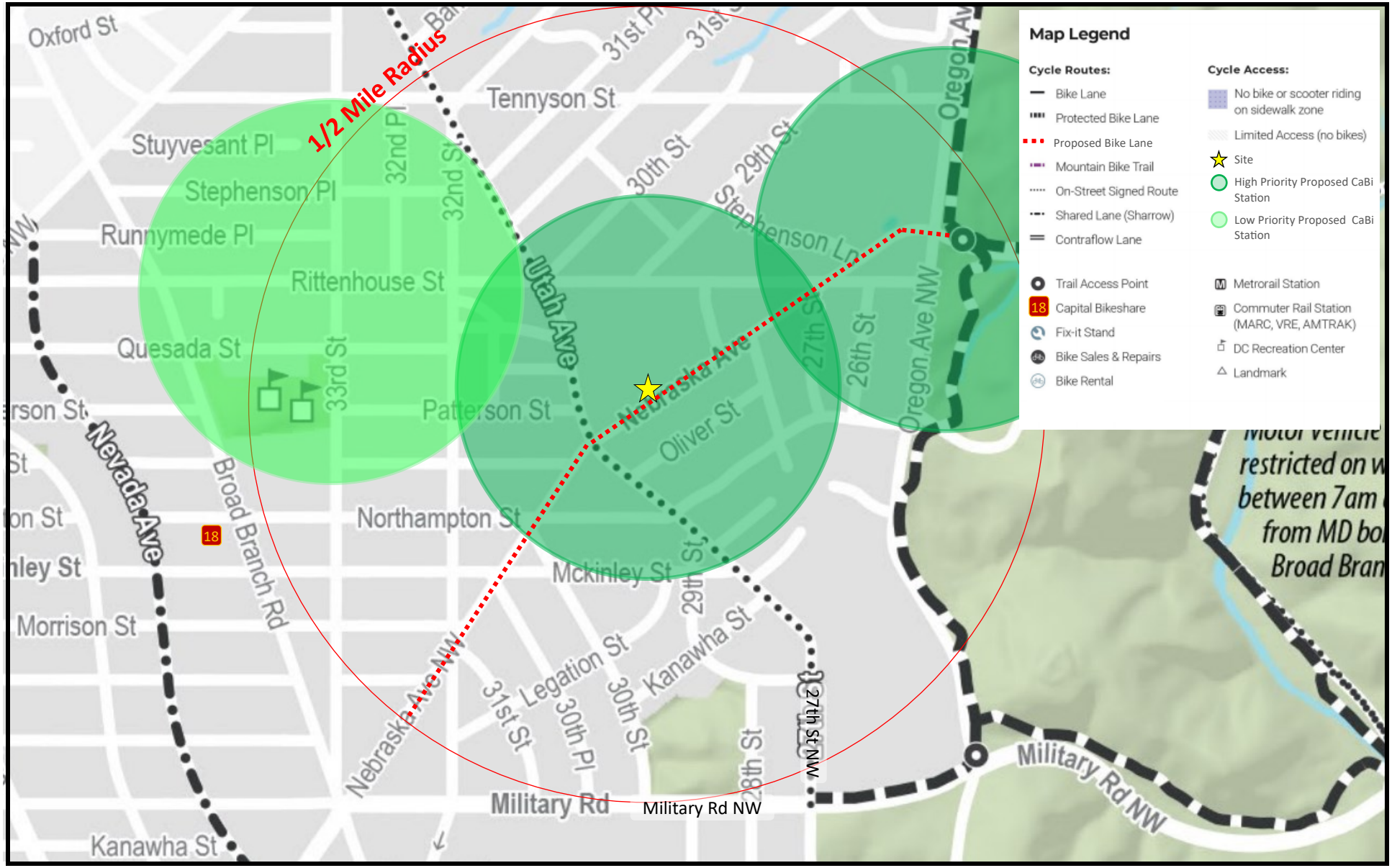


Figure 5
Half-Mile Bike Shed

NORTH

Maret Ball Fields
Washington, DC

Figure 6
2021 Traffic Volumes

NORTH
Maret School
Washington, DC

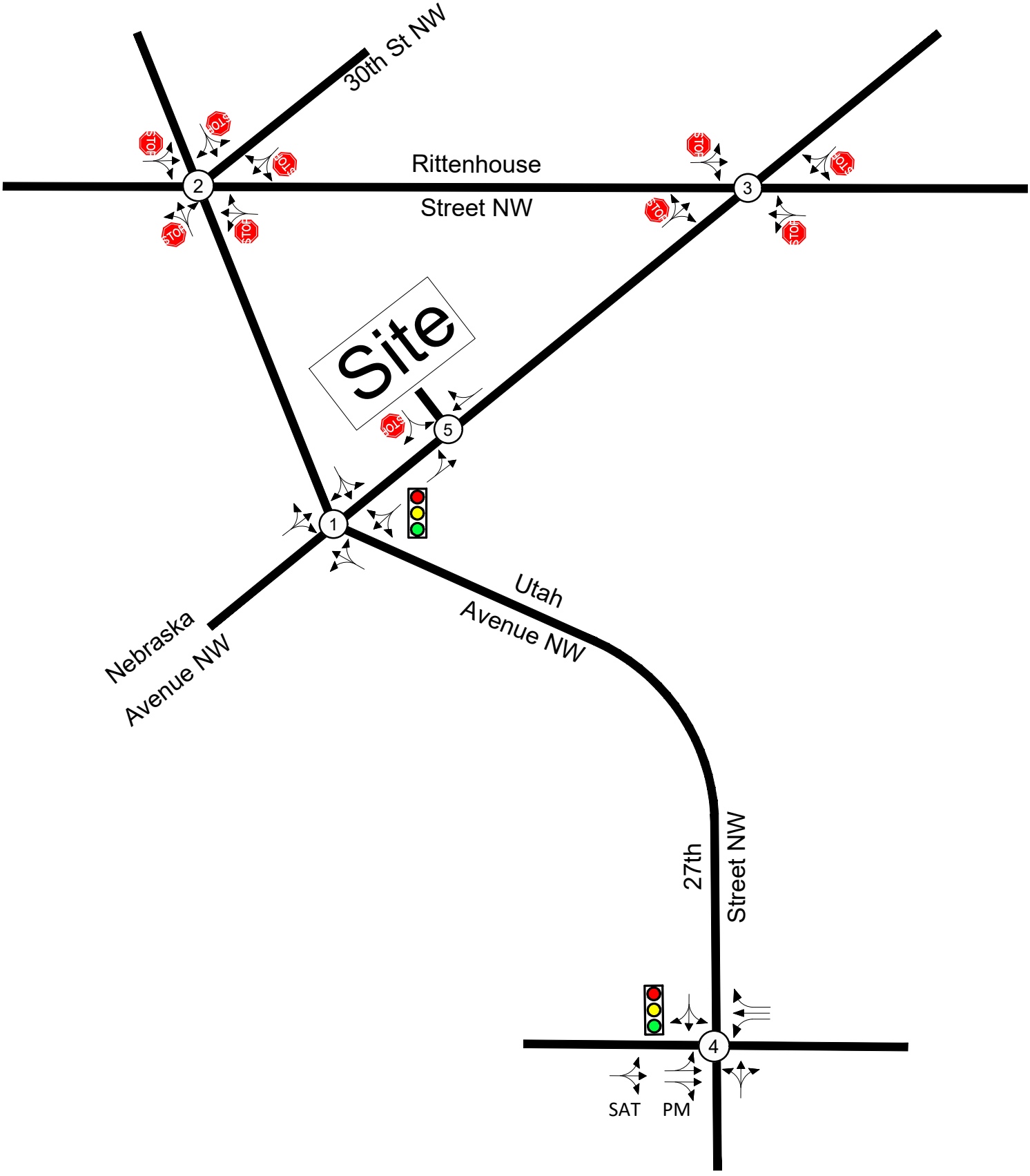


Figure 7
Existing Lane Use and Traffic Control

NORTH
Maret School
Washington, DC

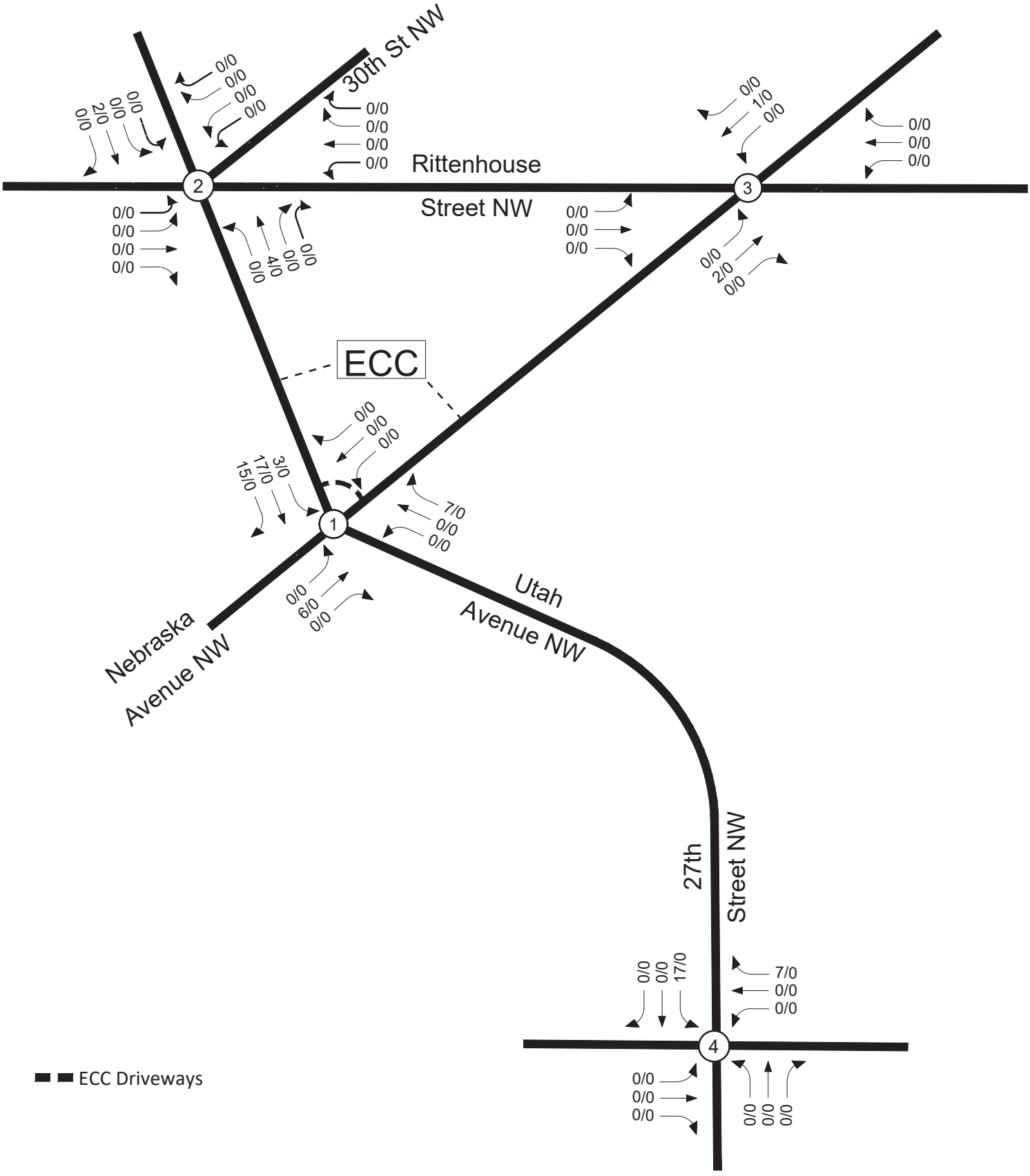
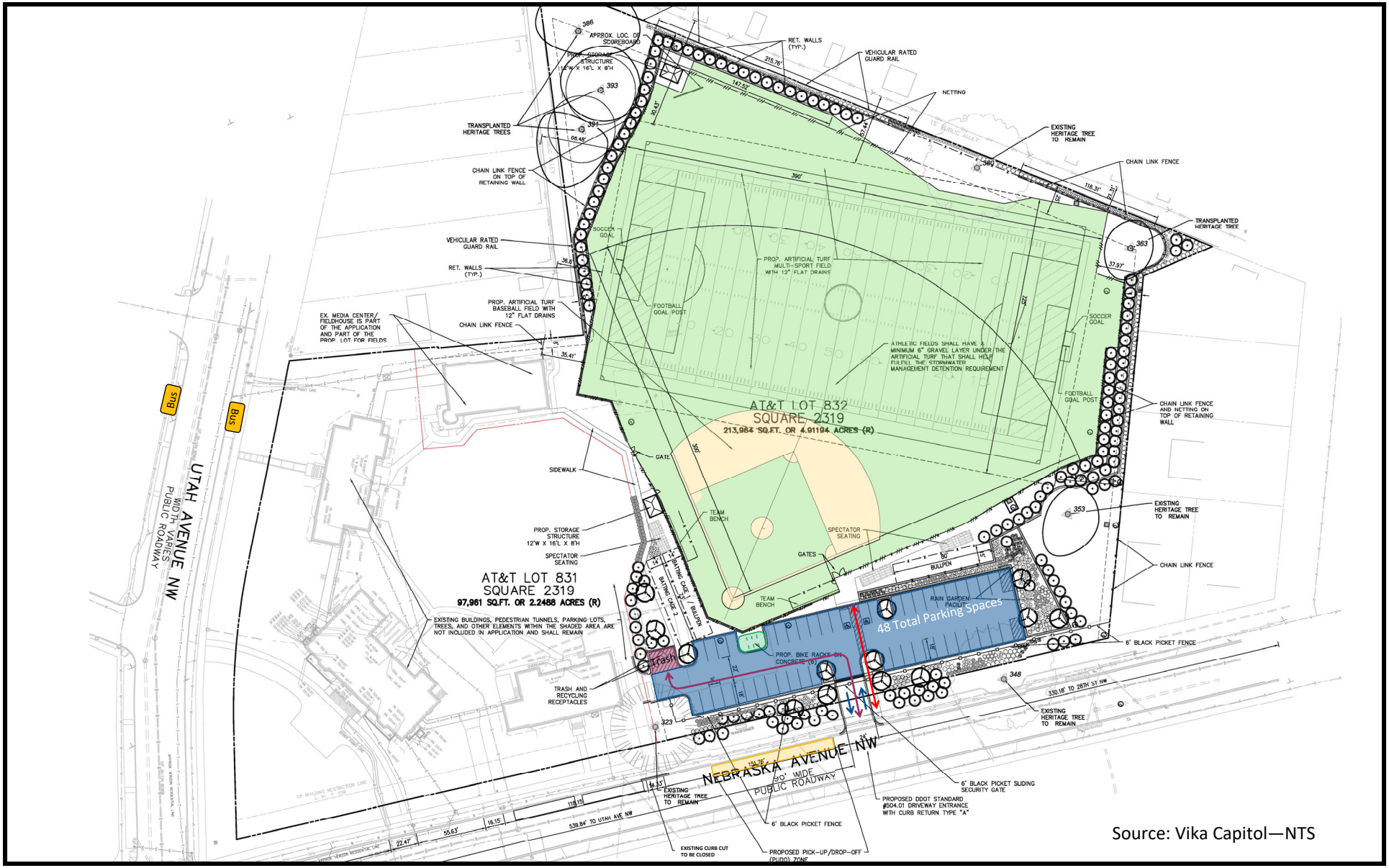


Figure 8
Pipeline Site Trips

NORTH
Maret School
Washington, DC

Figure 9
2024 Background Traffic Forecasts

NORTH
Maret School
Washington, DC



Source: Vika Capitol—NTS

Figure 10
Site Circulation

→ Inbound/Outbound Vehicle Access
→ Trash Pick-Up Access
→ Pedestrian Access
Bus Metrobus Stop (M4)

Short-Term Bicycle Parking
Bus Pick-Up/Drop Off Zone
(100' Maret Events Only)
5 Minute Pick-Up/Drop Off
All Other Times

NORTH

Maret Sports Fields
Washington, DC

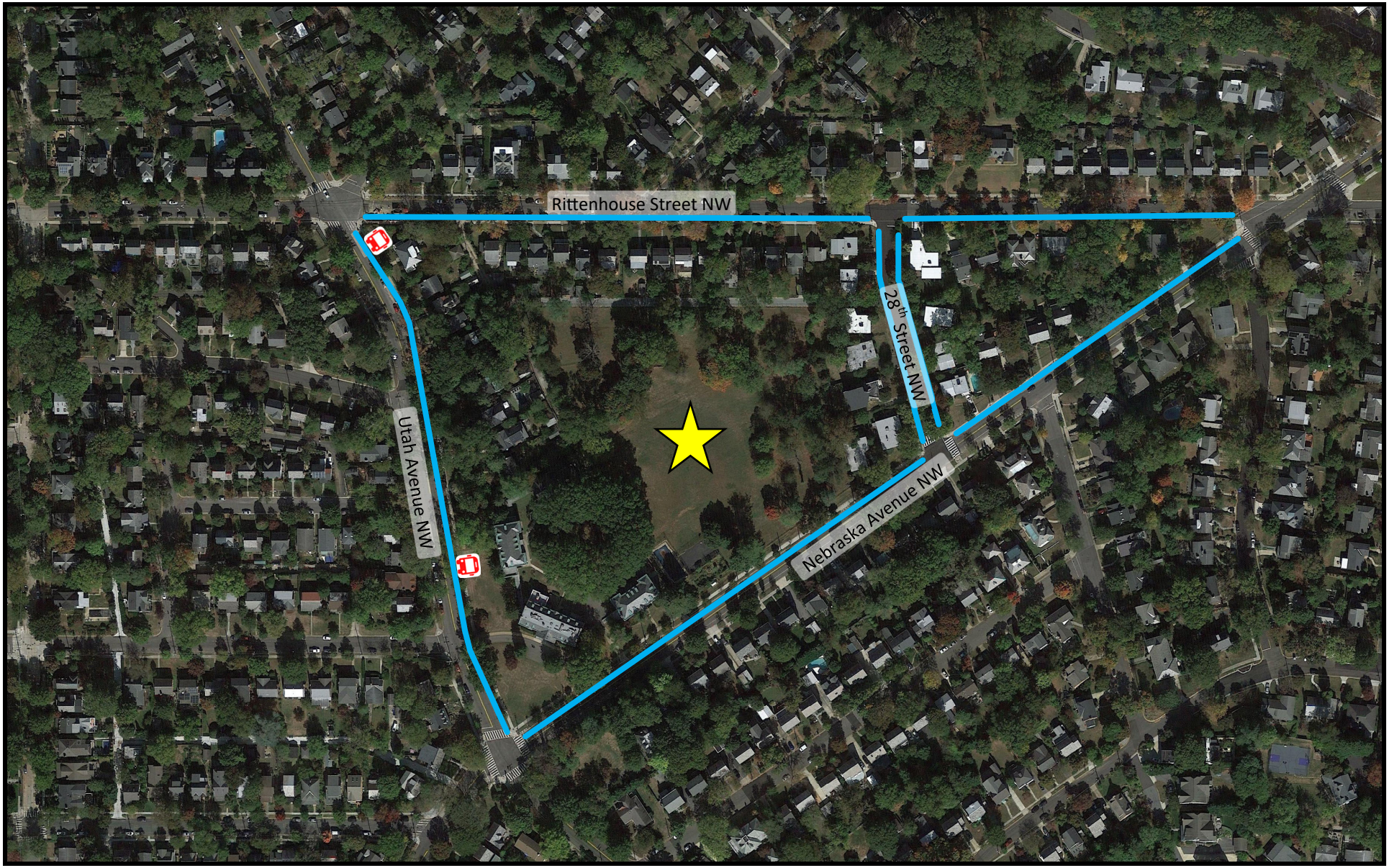
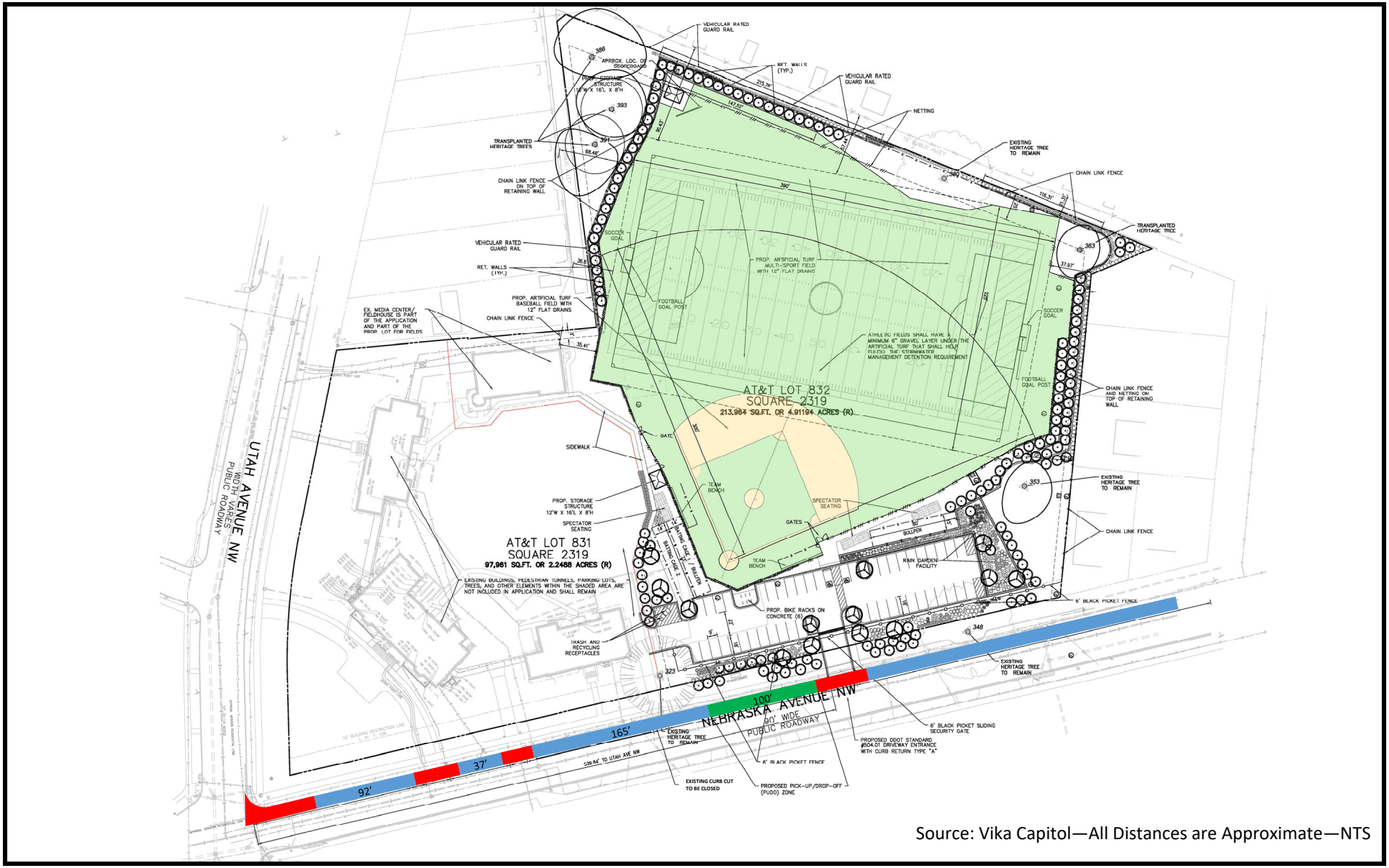


Figure 11A
Existing Curbside Management Plan

Site Location
Bus Stop
Unrestricted Parking

NORTH

Maret Ball Fields
Washington, DC



Source: Vika Capitol—All Distances are Approximate—NTS

Figure 11B
Proposed Curbside Management Plan

- No Parking
- Unrestricted Parking
- Bus Pick-Up/Drop Off Zone (Maret Events Only)
  5 Minute Pick-Up/Drop-Off All Other Times

NORTH

Maret Ball Fields
Washington, DC

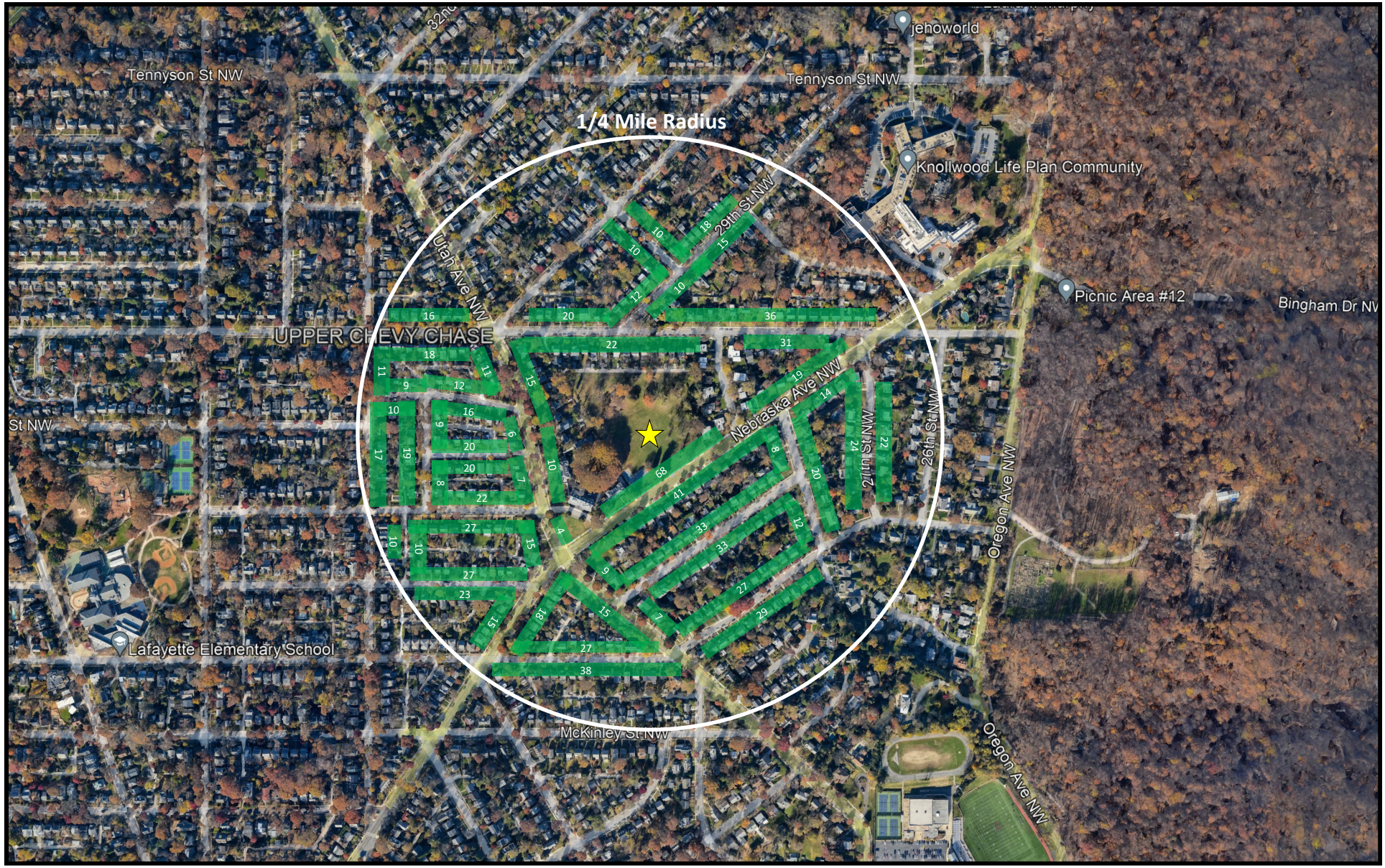


Figure 12
On-Street Parking Inventory

NORTH

Maret Ball Fields
Washington, DC

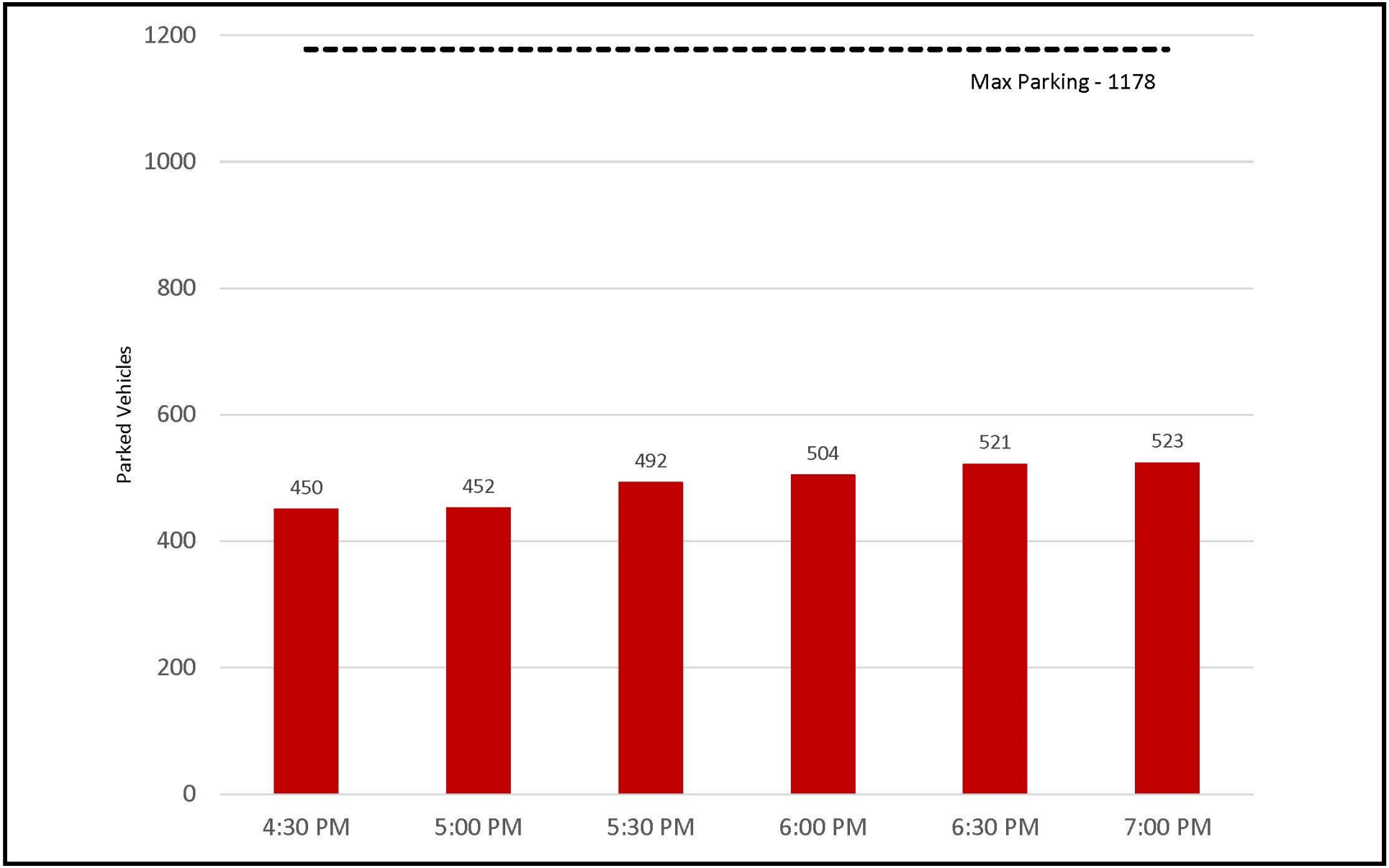


Figure 13
Weekday (Wednesday) Parking Demand
Spaces vs. Time of Day

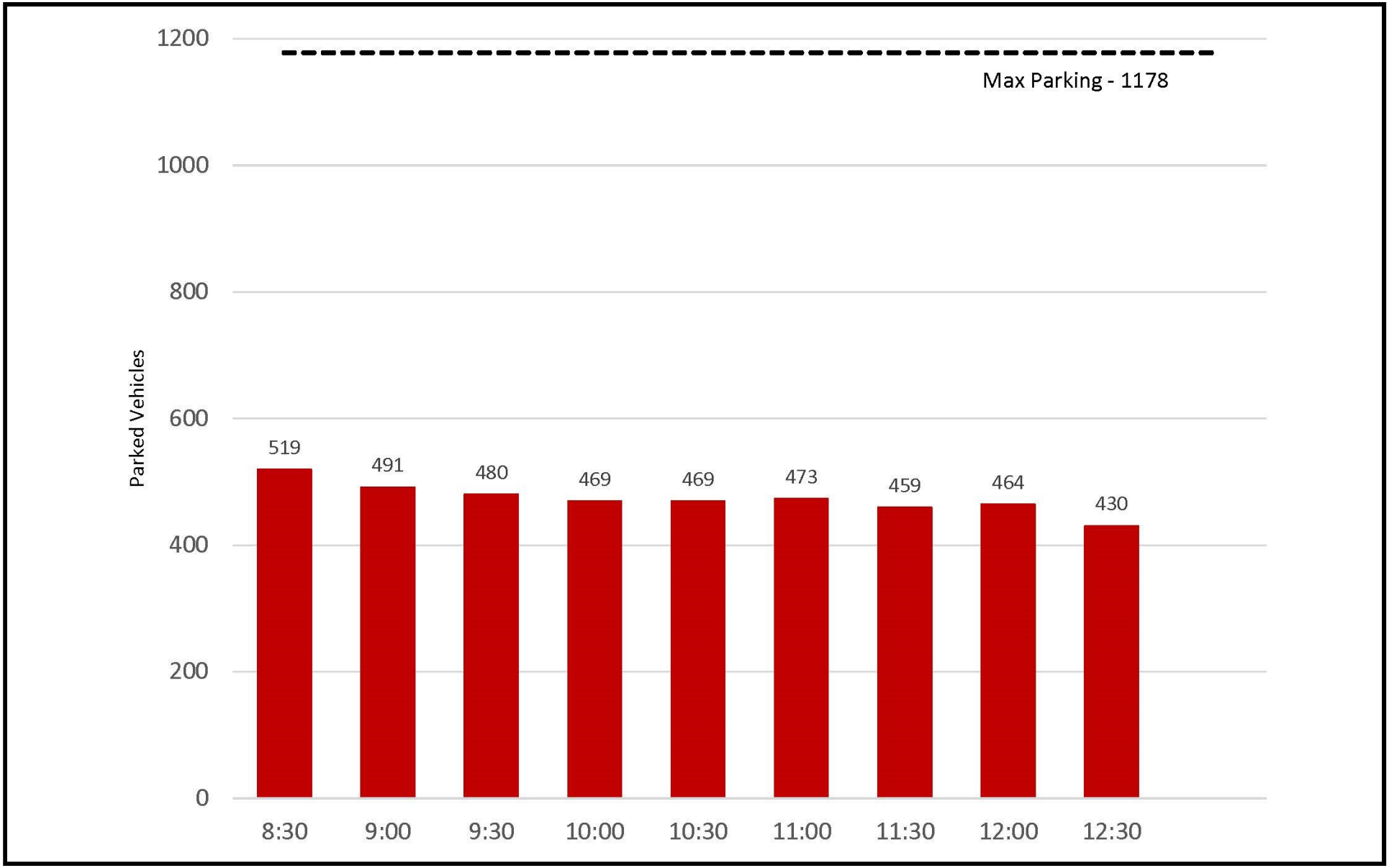


Figure 14
Saturday Parking Demand
Occupied Spaces vs. Time of Day

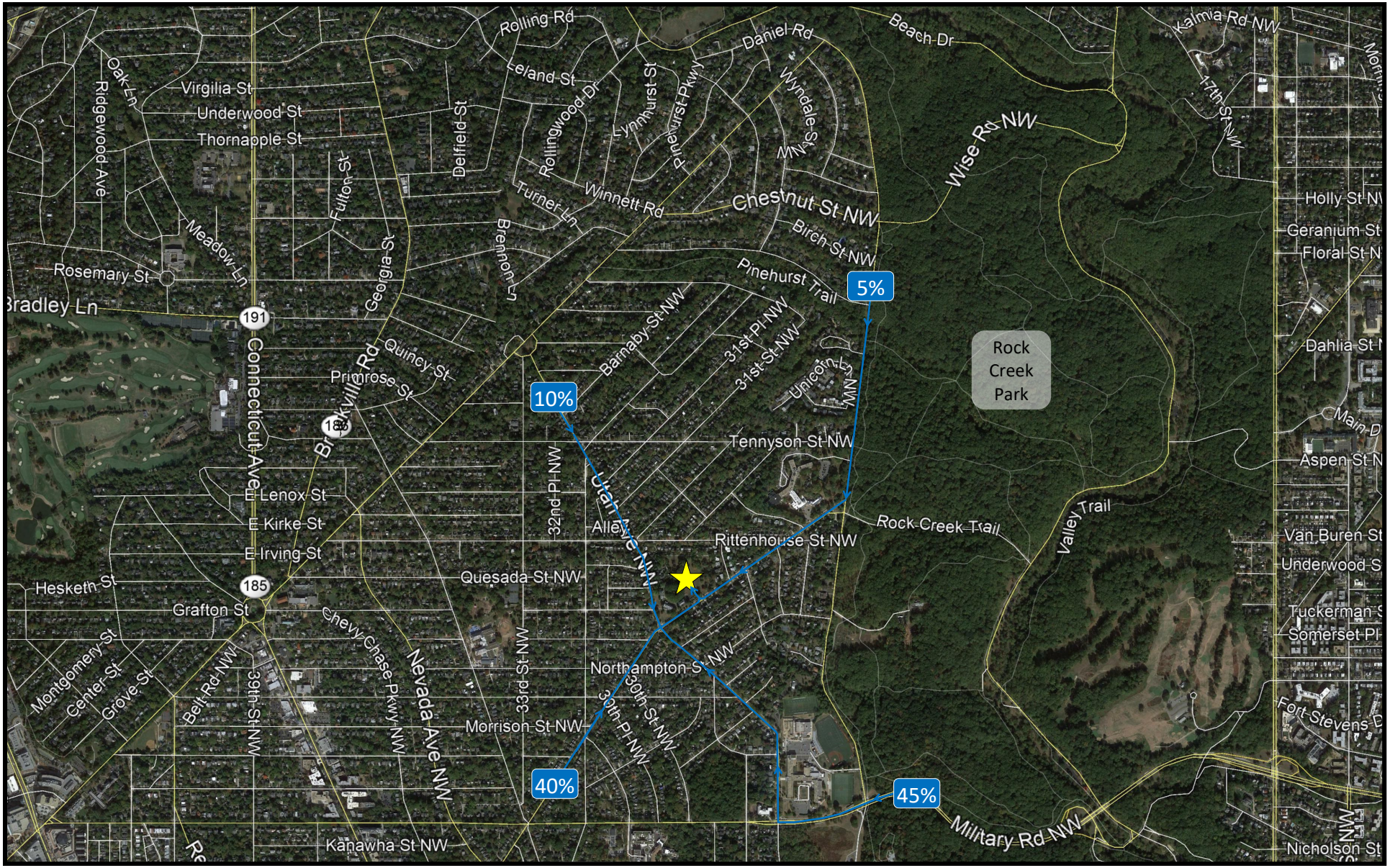


Figure 15A
Site Trip Distributions—Inbound

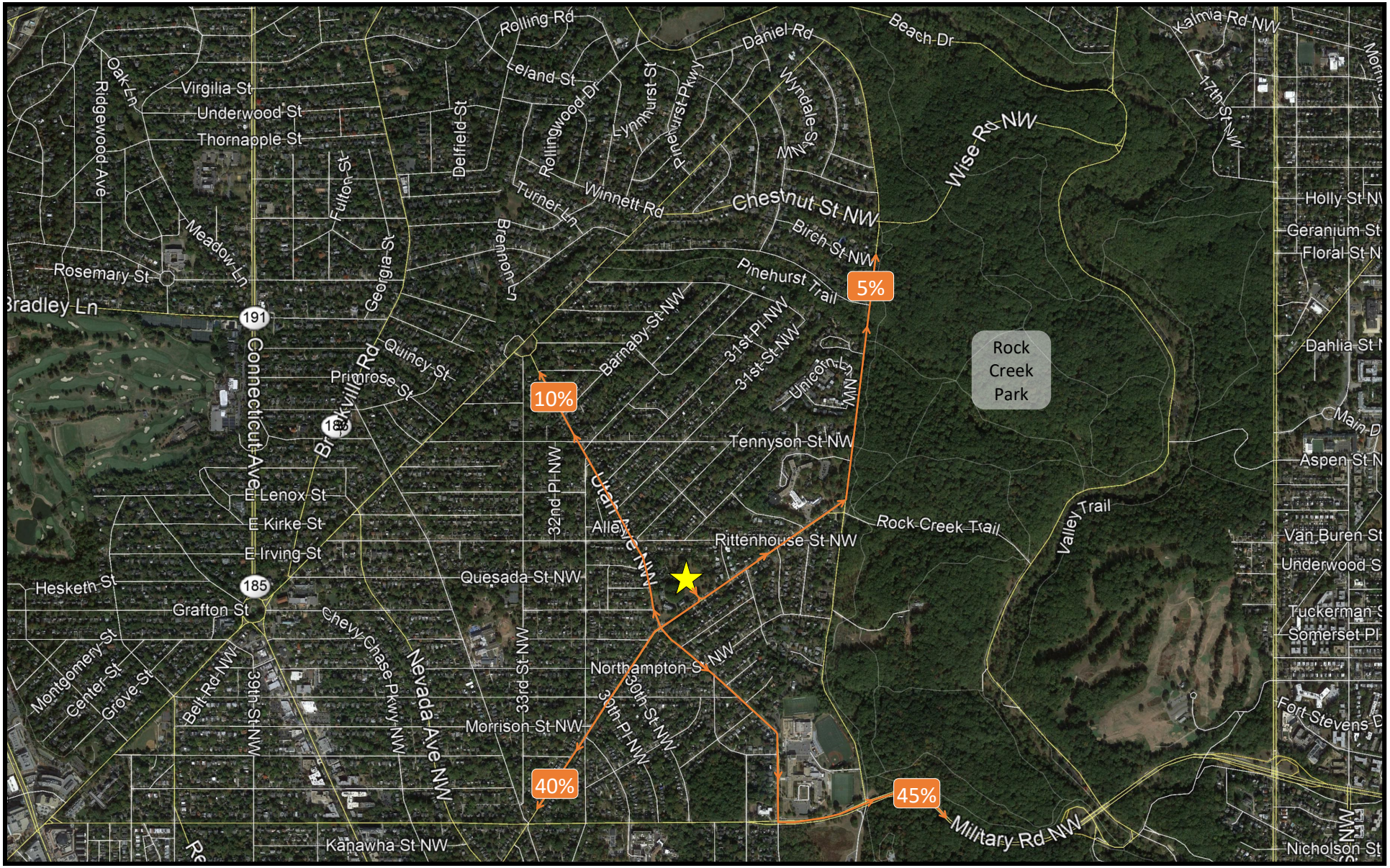


Figure 15B
Site Trip Distributions—Outbound

Site Location

NORTH

Maret Ball Fields
Washington, DC

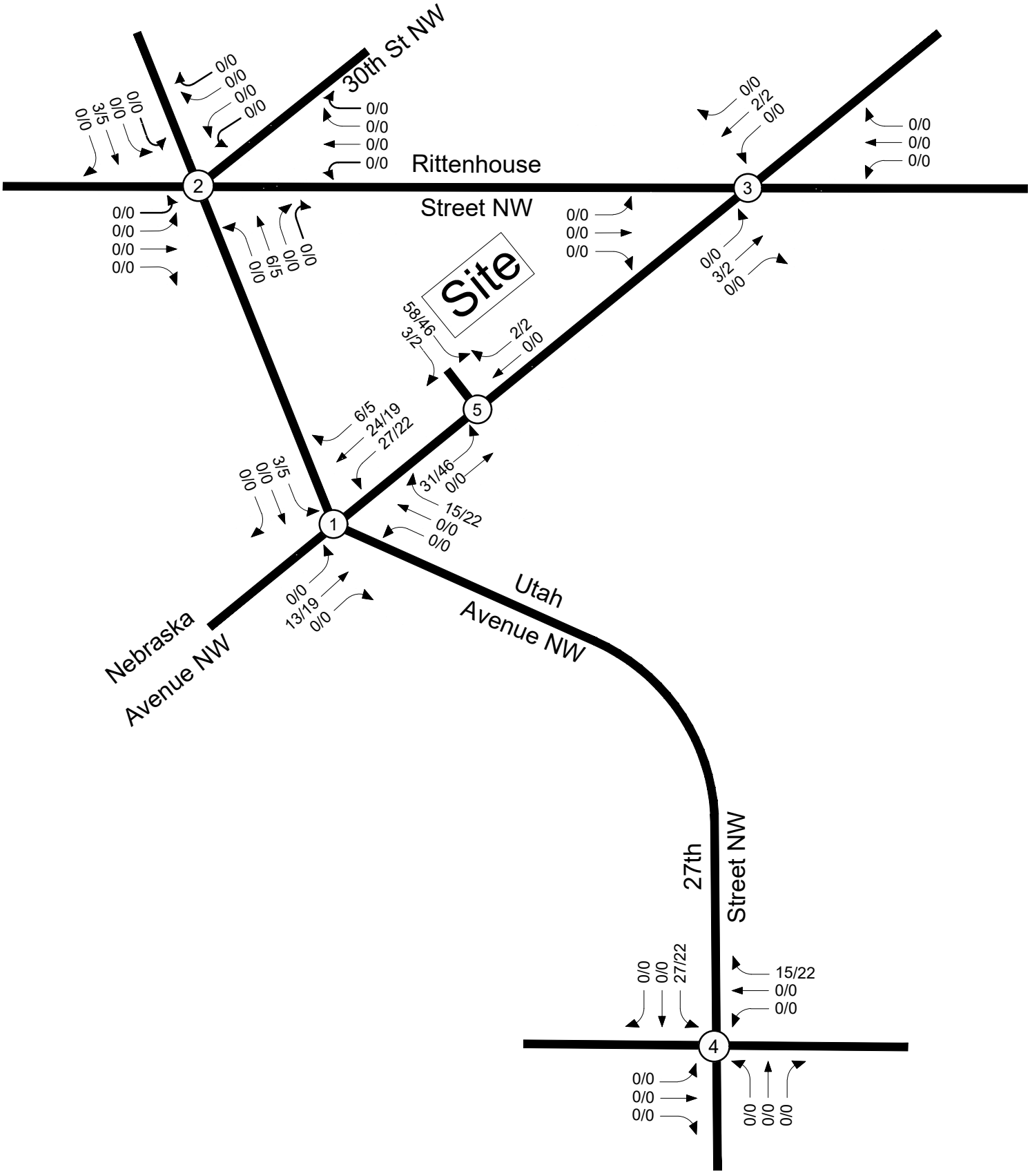


Figure 16
Site Trip Volumes

NORTH
Maret School
Washington, DC

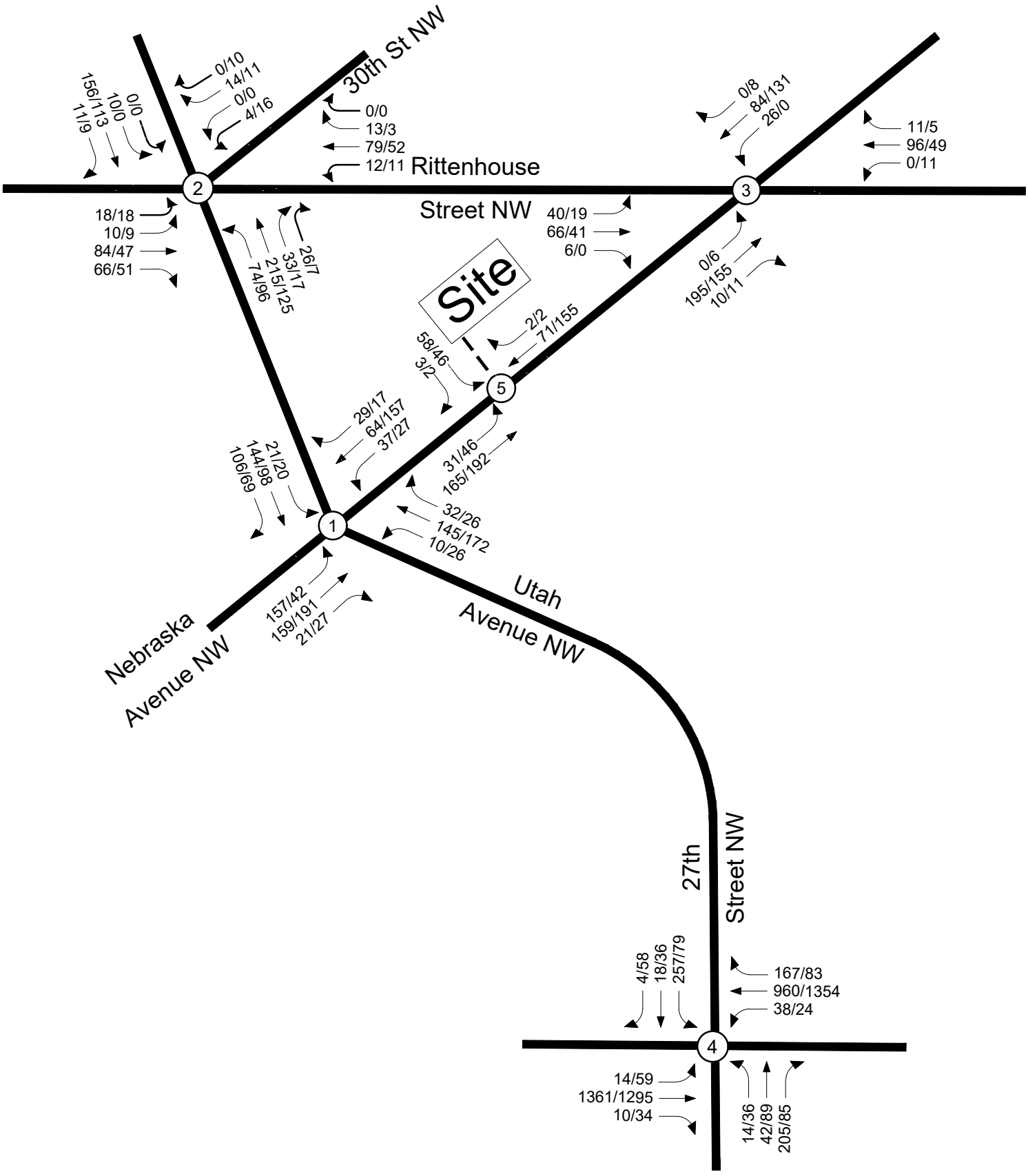


Figure 17

2024 Total Future Traffic Forecasts

NORTH

Maret School

Washington, DC

APPENDIX A
SCOPING DOCUMENT

District Department of Transportation (DDOT)
Comprehensive Transportation Review (CTR) Scoping Form

The purpose of the Comprehensive Transportation Review (CTR) study is to evaluate potential impacts to the transportation network that can be expected to result from an approved action by the Zoning Commission (ZC), Board of Zoning Adjustment (BZA), Public Space Committee (PSC), a Federal or District agency, or an operational change to the transportation network. The Scoping Form accompanies the *Guidance for Comprehensive Transportation Review* and provides the Applicant an opportunity to propose a scope of work to evaluate the potential transportation impacts of the project.

Directions: The CTR Scoping Form contains study elements that an Applicant is expected to complete in order to determine the scope of the analysis. An Applicant should fill out this *Scoping Form* with a proposed scope of analysis commensurate with the requested action and submit to DDOT for review and concurrence. Accordingly, not all elements and figures identified in the *Scoping Form* are required for every action, and there may be situations where additional analyses and figures may be necessary. Once a completed Scoping Form is submitted, DDOT will provide feedback on the initial parameters of an appropriate analysis scope. DDOT's turnaround times are four (4) weeks for CTRs with a Traffic Impact Analysis (TIA) and three (3) weeks for all other lower tier studies. After the *Scoping Form* has been finalized and agreed to by DDOT, the Applicant is required to expand upon the elements outlined in this Form within the study.

Scoping Information
Date(s) Scoping Form Submitted to DDOT: May 21, 2021
DDOT Case Manager: Emma Blondin
Date(s) Scoping Form Comments Returned to Applicant: July 16, 2021
Date Scoping Form Finalized: August 30, 2021

Project Overview	**Proposed Development Program**
Project Name: Maret School Sports Fields	**Use(s)**
Case Type & No. (ZC, BZA, PSC, etc.): BZA Case (no number assigned yet)	**Residential (dwelling units):** NA
ANC/SMD: 3G02	**Retail (square feet):** NA
Applicant/Developer Name: Maret School – Trey Holloway, Dir. of Finance & Operations, tholloway@maret.org,	**Office (square feet):** NA
Transportation Consultant and Contact Info: Wells + Associates, Inc. – Jami Milanovich; jlmilanovich@wellsandassociates.com; 202.556.1113	**Hotel (rooms):** NA
Land Use Counsel and Contact Info: Goulston & Storrs Paul Tummonds, ptummonds@goulstonstorrs.com, (202) 744-2886	**Other:** Ball fields – one multipurpose field and one baseball field
Site Street Address: 5901 Utah Avenue NW 20015	**# of Vehicle Parking Spaces:** 45
Site Square & Block: Square 2319, Lot 0829	**# of Carshare spaces:** NA
Current Zoning and/or Overlay District: R-1-B	**# of Electric Vehicle Stations:** NA
Estimated Date of Hearing: December 2021 or January 2022	**# of Bicycle Parking Spaces (long- and short-term)**
Small Area Plan (if applicable): NA	**Long-term:** 0 spaces

Livability Study (if applicable): NA	**Short-term:** 2 spaces (on Center Block frontage)
Within ½ Mile of Metrorail or ¼ mile of Streetcar/Circulator/Priority Bus?: No	**Loading Berths/Spaces:** NA

Documents to be Submitted to DDOT: *Any action requiring a CTR or some other evaluation of on-site or off-site transportation facilities must submit one of the following documents to DDOT. It must be appropriately scoped for the specific action proposed and document all relevant site operations and transportation analyses.*

☒ **CTR Study** (100 or person total person trips, or 25 or more peak hour vehicle trips in peak direction, or as deemed necessary by DDOT)

☐ **Transportation Statement** (limited scope based on specifics of project or if Low Impact Development Exemption from CTR and TIA is requested)

☐ **Standalone TIA** (project proposes a change to roadway capacity, operations, or directionality, has a site access challenge, or as deemed necessary by DDOT)

☐ **Other, specify:** _____

☐ Include one (1) hard copy of final report, PDF of report w/appendices, traffic analysis files, and traffic counts in DDOT-required spreadsheet format (total size of all digital files under 15 MB, if possible)

Existing Site and Description of Action: *Describe the type(s) of regulatory approval(s) being requested and any background information on the project relevant to the requested action such as the existing uses, amount of vehicle parking, and other notable proposed changes on-site.*

Maret School proposes to construct sports fields at 5901 Utah Avenue NW, Washington, DC. The fields will include one multi-purpose field and a 90-foot baseball diamond and field. The proposed site is located on property owned by the Episcopal Center for Children (ECC). The four existing buildings on the site will be retained. One of the buildings, the Media Center, will be converted to locker room and equipment storage space. The proposed sports fields would be located on the eastern and northern portions of the site that currently are undeveloped. The site is in the R-1-B zone and generally is bordered by Nebraska Avenue on the southeast, the retained ECC buildings and a public alley on the west, a public alley on the north, and single-family homes on the east (as shown on Figure 1). Approximately 45 surface parking spaces and accommodations for a bus drop-off would be provided. Access to the proposed parking will be provided via a new curb cut on Nebraska Avenue.

Because the proposed site is in a residential zone, the proposed project will require the approval of a Special Exception application by the Board of Zoning Adjustment (BZA).

Prior Related Action(s), Conditions, and Commitments: *Note any prior approvals by ZC, BZA, or PSC (Campus Master Plan, First Stage PUD, student/faculty cap, etc.) for the site and list all relevant conditions and proffers still in effect from the previous approval and status of completion. Attach a copy of the Decision section from the previous Zoning Order if still in effect.*

There are no related cases for this project.

Section 1: SITE DESIGN

DDOT reviews the site plan to evaluate consistency with DDOT's standards, policies, and approach to access as documented in the most recent Design and Engineering Manual (DEM). If the proposal for use of public space is found to be inconsistent with the agency approach, DDOT will note this regardless of its relevance to the action. It is DDOT's position that issues regarding public space be addressed at the earliest possible opportunity to ensure the highest quality project design and to minimize project delays and the need to re-design a site in the future.

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS

Site Access
Show site access points for all modes. Include proposed curb cut locations, curb cuts to be closed, access controls (e.g., right-in/out, signalized), sight distances and sight triangles from access points and new intersections, driveway widths and spacing, on- and off-site parking locations, inter-parcel connections, public/private status of driveways, alleys, and streets, and whether easements, dedications, or closures are proposed.
 	
Access must be located off an adjacent existing or "paper" alley, otherwise off the lower volume street. Note any deviations from curb cut policies (DEM 31.5) w/justification and if Conceptual Approval by the Public Space Committee (PSC) has/is being sought. Subtitle I § 600-603 of ZR16 further restricts where curb cuts can be located.
 	
DDOT will not support curb cut design relief unless there is a clear hardship preventing a project from meeting all DDOT standards and other alternatives have been explored.
 	
All proposed private streets connecting to a public street must be built to DDOT standards and have a public access easement. Design of driveways and drive aisles on private property must comply with Subtitle C § 711 of ZR16.
	Access to the vehicular and bicycle parking is provided via a curb cut on Nebraska Avenue.
	
	The site circulation is shown on Figure 2.
	
	☒ *Scoping Graphic: Project Location Map* – See Figure 1
	☒ *Scoping Graphic: Site Circulation Plan* – See Figure 2
	☒ *Scoping Graphic: Plat for Site's Square and Lot from Office of the Surveyor (if official plat not available, provide plans from SURDOCs)* – See Figure 3
		• Per the DEM, the site should be providing vehicle access via the alley. Conceptual approval from PSC is recommended if moving forward with curb cut access off Nebraska Ave
		  ○ WA – Noted. Site access from alley will be evaluated. However, based on preliminary feedback from neighborhood reps and site constraints we anticipate pursuing curb cut on Nebraska Ave. Should Nebraska Ave curb cut move forward, conceptual approval from PSC will be considered.
		  ○ DDOT noted
		• Please show how the curb cut will affect the street parking.
		  ○ WA – Curb cut impacts on street parking will be evaluated as a part of on-street parking study.
		  ○ DDOT noted
		• With anticipated use of on-street parking for overflow, consider the addition of a midblock crosswalk or other pedestrian countermeasures on Nebraska Avenue to

		ensure a safe pedestrian connection ○ WA – Pedestrian countermeasures on Nebraska Ave will be considered ○ DDOT noted

Loading

Discuss and show the quantity and sizes of loading berths/delivery spaces, trash storage locations, on- and off-site loading locations, turnaround design, nearby commercial loading zones, and anticipated demand, operations, and routing of delivery and trash vehicles. Identify the sizes of trucks anticipated to serve the site and design vehicles to be used in truck turning diagrams. Provide truck turning diagrams in the body of the report not the appendix.

DDOT requires head-in and head-out truck movements through public space (DEM 31.5) and that direct internal pedestrian connections be provided between retail bays and loading facilities. Note any proposed deviations or requested relief from ZR16 or DDOT standards with justification. If any relief is being sought then a Loading Management Plan (LMP) is required. A template LMP is provided in Appendix E.

Per §902.1, educational uses with less than 30,000 SF of GFA are not required to provide loading facilities.

☐ *Scoping Graphic: Location of loading area w/ internal building routing*

☐ *Scoping Graphic: Truck Turning Diagrams (to/from the site, alley, truck routes)*

While loading is not required, the anticipated bus traffic should be examined, including providing routing and AutoTurn for bus drop off. If bus drop off is anticipated to use the alley, communicate this routing plan with the ANC. Consider on-street bus drop-off.

- WA – Bus loading is no longer proposed on-site nor is it proposed via the alley. Instead, it is planned to occur curbside. Bus traffic patterns will be discussed in the CTR, but AutoTurn for bus drop off and alley routing will NOT be included as a part of this.
  - DDOT noted

Provide trash storage and routing information.

- WA – Trash storage and routing information will be discussed in the CTR.
  - DDOT noted

Vehicle Parking

Identify all off-street parking locations (on- and off-site) and justify the amount of on-site vehicle parking, including a comparison to the number of spaces required by ZR16 and any previous approvals. Provide parking calculations and parking ratios by land use, including any eligible ZR16 vehicle parking reductions (i.e., within ¼ mile of Priority Bus Route, within ½ mile of Metrorail Station, providing carshare spaces, located within a D zone, etc.).

Review the DDOT Preferred Parking Rates (Table 2). If the total parking provision proposed exceeds the amount calculated using ratios in that table then the number of spaces should be reduced or substantial TDM / non-auto improvements be provided. If parking provision is significantly out of line with appropriate parking ratios, one way or the other, then mode split and trip

Required (per §701.5)†	DDOT Preferred Vehicle Parking	Proposed
Education, private (High School and accessory uses) 2 per 3 teachers and other employees, plus 1 for each 20 classroom seats or 1 for each 10 seats in the largest auditorium, gymnasium or area usable for public assembly, whichever is greater. 200 spectators at largest event + 40 students per team = 280 people assembled. Plus, 4 coaches per team. Estimated parking required = 8*(2/3) + 280/10 = 33 spaces*	"Other Uses" ≤ 90% of §701.5 TBD*	45 spaces

* Required parking to be refined upon finalization of the site plan and will be calculated based number of bleacher seats plus open assembly area/7 SF per person (per DC Fire Code §1004.1.2)

Given the parking requirements, please show calculations how you arrived on the 45 spaces proposed.

- WA – Parking on the site was maximized based on area remaining after incorporation of the fields. It is anticipated that the fields will accommodate 200 spectators (the largest audience anticipated) in the "largest…area for usable public assembly" plus 80 players (the largest number of participants expected at one time). As shown in the adjacent table, we anticipate a minimum parking requirement of 33 spaces.

generations estimates will be adjusted.

Confirm whether ZR16 TDM Mitigations will be required, per Subtitle C § 707.3, for providing more than double the amount of required vehicle parking. Coordinate with the Zoning Administrator as early in the process as possible for an official determination.

A TDM Plan is required for BZA parking reduction cases, per Subtitle C § 703.4. If relief is being requested from 5 or more spaces, then a Parking Occupancy Study is required (see Multi-Modal section).

☒ *Scoping Table: Parking Calculations with Comparison to ZR16 and DDOT's Preferred Vehicle Parking (Table 2)*

☒ *Scoping Graphic: Off-Street Parking Locations* – see Figure 2

- DDOT concurs, just make sure there is adequate green buffer between the parking and the sidewalk.

Please provide any additional information about parking – is the proposed parking to be shared with the Episcopal Center?

- WA – Parking is not anticipated to be shared with the adjacent Episcopal Center.
  - DDOT noted

Bicycle Parking

Identify the locations of proposed bicycle parking and justify the amount of long- and short-term spaces proposed. Provide a calculation of the number of spaces required by ZR16.

Long-term bicycle parking spaces must be easily accessible from building lobby or located in the parking garage level closest to the ground floor. Lockers and showers must be included with non-residential long-term bicycle storage rooms, per Subtitle C § 806. Provide calculations for required lockers and showers.

Short-term bicycle parking must be accommodated by installing inverted U-racks along the perimeter of the site in the 'furniture zone' of public space, near the site entrance(s).

Per §802.1, non-residential uses with more than 4,000 SF of GFA shall provide bicycle parking. The former media center, which will be converted to showers, lockers, and equipment storage totals 4,720 SF. Using the entire SF, two short-term bicycle racks would be required in accordance with §802.1 (1 short-term space is required for every 2,000 SF of GFA).

Since GFA "does not include floor area devoted to off-street parking or loading facilities, including aisles, ramps, and maneuvering space, ***or space devoted exclusively to bicycle storage or support (lockers and showers) facilities"*** [emphasis added] per §803.2 the remaining square footage in the media center would be less than 4,000 SF and no long-term bicycle parking would be required.

Long-term Bicycle Parking		Short-term Bicycle Parking	
Required (per §802.1)	**Provided**	**Required (per §802.1)**	**Provided**
Education, private school 1 per 7,500 sq ft of GFA For non-residential use > 4,000 SF	NA	Education, private school 1 per 2,000 sq ft of GFA 4,720/2,000 = 2	2

† GFA calculated in accordance with §803.2. Gross floor area does not include floor area devoted to off-street parking or loading facilities, including aisles, ramps, and maneuvering space, or space devoted exclusively to bicycle storage or support (lockers and showers) facilities.

☒ *Scoping Graphic: Locations of internal bicycle parking spaces, routing to these spaces, and related support facilities including locker rooms, showers, storage areas, and service repair rooms* – see Figure 2

For a recreation field such as this zoning requires 1 space for each 10,000 sq. ft. (but no less than 6 spaces, or 3 racks). DDOT would prefer to see more than 6 spaces.

- WA – Additional short-term bicycle parking will be provided. The exact number will be determined as the site plan is finalized.
  - DDOT noted

Ensure bike racks are installed according to DDOT's Bike Parking Guide.

- WA – Noted.

Streetscape and Public Realm

Provide a conceptual layout of the streetscape and public realm including at minimum: curb cuts, vaults, sidewalk widths, street trees, grade changes, building projections, short-term bicycle parking, and any existing bus stops. Also provide the

Preliminary streetscape is shown on Figure 2.

See previous notes regarding the curb cut access on Nebraska Avenue. Proposed removal of 1 street tree for the curb cut access on Nebraska Avenue: DDOT Arborists Dan Just and Sam Doan have the

permit tracking numbers and PSC hearing date, if known, for any approved public space designs. *DDOT expects new developments to rehabilitate the streetscape between the curb and property line and meet all public space design standards. Streetscape must meet ADA requirements and ensure nothing impedes accessible curb access or pedestrian circulation.* *Note any non-compliant public space elements requiring a DCRA code modification or PSC approval.* *A summary of public space best practices is provided in Section 1.5. DDOT standards are documented in the DEM, Public Realm Design Manual, and corridor Streetscape Guidelines (if applicable).*	☒ *Scoping Graphic: Preliminary Public Space Concept* – see Figure 2	documentation and the should the Applicant move forward with the proposed curb cut, they should discuss compensation required through payment and planting a new street tree. ○ WA – Noted. As discussed in preliminary meeting, DDOT would like to see the consolidation of curb cuts on Nebraska Avenue with possible removal of the dumpster access curb cut. ○ WA – Noted. This will be discussed with the ECC and evaluated to determine feasibility. ○ DDOT noted To increase the alley connections, consider relocating the Nebraska Avenue curb cut to line up with the alley network  ○ WA – Noted. This will be evaluated. There should be screening between parking and the sidewalk (Subtitle C, section 714) ○ WA – Noted. This location is within one of the high-priority areas identified by our 2019 Capital Bikeshare

		Development Plan. Identify a location and pour a 52'x6' concrete pad for a 19-dock station in the public space. DDOT previously identified the corner of Nebraska and Utah Avenue as a location. ○ WA – Location of a Capital Bikeshare station will be considered as a part of the CTR. ○ DDOT noted
Sustainable Transportation Elements Identify all sustainable transportation elements, such as electric vehicle (EV) charging stations and carshare spaces proposed to be included in the project. Electrical conduit should be installed in parking garage so that additional EV stations can be provided later. *DDOT recommends 1 per 50 vehicle spaces be served by an EV station. DDOT encourages providing car share spaces on-site to reduce the ZR16 parking requirement and support non-car ownership lifestyles.*	NA	DDOT concurs
Heritage, Special, and Street Trees Heritage Trees are defined as having a circumference of 100 inches or more and are typically located on private property. They are protected by the District's Tree Canopy Protection Amendment Act of 2016 and must be preserved if deemed non-hazardous by Urban Forestry Division (UFD). Special Trees are between 44 inches and 99.99 inches in circumference and may be removed with a permit. *Note whether there are existing Heritage Trees on-site or in adjacent public space. The presence of Heritage Trees will impact site design since they may not be cut down.*	Existing tree locations are shown on Figure 4A. The proposed concept plan, showing the conditions of the trees, is shown on Figure 4B. The Applicant team has been working with Earl Eutsler and others at UFA to develop a tree preservation plan. Accordingly, the Applicant intends to transplant Trees 386, 391, 393, and 353. The proposed transplant locations are the area in the northwest corner of the site (to the west of the multipurpose field) — our intent is to place three trees there — and one tree will go in the middle of the proposed traffic circle. As the plans continue to evolve, the Applicant team will continue to work with UFA to any necessary changes to this plan.	Proposed removal of 1 street tree for the curb cut access on Nebraska Avenue: DDOT Arborists Dan Just and Sam Doan have the documentation and the should the Applicant move forward with the proposed curb cut, they should discuss compensation required through payment and planting a new street tree. See attached documents which address permitting for tree removals for street trees and trees located behind the

Work w/the UFD Ward Arborist to determine if there are Heritage or Special Trees on-site that must be preserved and if Tree Preservation or Relocation Plans are required. *Conduct an inventory of existing and missing street trees within a 3-block radius of the site (design standards are in DEM 37.5). Identify any opportunities for UFD or the Applicant (as part of the mitigations package) to install missing treeboxes and street trees.*	☒ *Scoping Graphic: Street Tree Inventory Study Area*	sidewalk. In addition, the DDOT Green Infrastructure Standards address the planting of new street trees which includes, but is not limited to additional soil volume. ○ WA – Noted.

Section 2: TRAVEL ASSUMPTIONS

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS
Mode Split Provide mode split assumptions with sources and justification. Sources of data could include the most recent *Census Transportation Planning Products (CTPP)* the *2005 WMATA Development-Related Ridership Survey,* or previous planning studies and CTRs. Note that the walking mode share will account for internal trip synergies for mixed use developments. *Adjustments to mode split assumptions may be made, as appropriate, if the number of vehicle parking spaces proposed is significantly lower or higher than expected for the context of the neighborhood.* *The agreed upon mode split assumptions may not be revised between scoping and CTR submission without DDOT concurrence.*	The anticipated programming for the sports fields is summarized in Table A (attached). As shown in the programming details, players and coaches for Maret and Maret's opponents will arrive by school buses (one bus per team). For other rental usage, we have assumed that all participants and fans would arrive by automobile. In accordance with DDOT's CTR guidelines, we have assumed an average vehicle occupancy of 2.1 persons/vehicle for recreational trips. ☐ *Scoping Table: Mode Split Assumptions*	We agree – but should make investments in non-automotive modes (additional bike racks, cabi, pedestrian infrastructure) ○ WA – Noted. Non-Automobile access to the site will be addressed in the CTR. ○ DDOT noted

Trip Generation

Provide site-generated person trip generation estimates, utilizing the most recent version of ITE *Trip Generation Manual* or another agreed upon methodology such as manual doorway or driveway counts at similar facilities. Estimates must be provided by mode, type of trip, land use, and development phase during weekday AM and PM commuter peaks, Saturday mid-day peak, and daily totals. CTR must also include existing site trip generation based on observed counts. Modes include transit, bicycle, walk, and automobile.

DDOT TripsDC tool will be used to determine trip generation estimates for residential-over-retail projects (see Section 2.2.4 for parameters).

Auto occupancy rates by travel purpose published in the 2017 National Household Travel Survey should be used when calculating person trips based on suburban vehicle trip data in Trip Generation Manual (see Table 3).

Adjustments to trip generation may be made, as appropriate, if the number of vehicle parking spaces proposed is significantly lower or higher than expected for the context of the neighborhood.

Pass-by rates in the District are minimal and should only apply to major retail-dominant destinations, grocery stores, and gas stations. An adjusted pass-by/diverted trips methodology should be developed if development is not located on a road classified as arterial or higher.

The agreed upon trip generation methodology may not be revised between scoping and CTR submission without DDOT concurrence. Consult the DDOT Case Manager if site plan, development program, land uses, or density changes significantly.

User	AM PEAK HOUR			PM PEAK HOUR			SAT PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Local DC School Rental - Cars‡	0	0	0	33	23	56	48	48	96
Local DC School Rental - Buses‡	1	1	2	0	0	0	0	0	0
Maret Soccer Games - Cars†	0	0	0	0	36	36	0	0	0
Maret Soccer Games - Buses†	0	0	0	0	2	2	0	0	0
Total	**1**	**1**	**2**	**33**	**61**	**94**	**48**	**48**	**96**

† Soccer games occur in Sept., Oct., and 1st 3 weeks of Nov.
‡ AM and PM peak hour trips for local DC School Rental based on anticipate usage in Sept., Oct., and the 1st 3 weeks of Nov. - PM. Saturday peak hour trips for local DC School Rental based on anticipated usage in Sept., Oct., the 1st 3 weeks of Nov., Mar., Apr., and May.

Because summer traffic volumes on the roadway network are lower than traffic volumes the remainder of the year, the trip generation above reflects trips generated during non-summer months.

DDOT concurs

Section 3: MULTI-MODAL NETWORK EVALUATION

A CTR study is required if the project generates at least 100 peak hour person trips or 25 vehicle trips in the peak direction (highest of inbound or outbound) in any study period. Existing site traffic, pass-by, TDM, internal capture or other reductions may not be taken in the calculation to determine if the project meets these thresholds. However, they may be taken in the TIA, as appropriate, if a study is triggered. Analyses in the Multi-Modal Network Evaluation section are required in all CTRs, unless otherwise specified. A Transportation Statement may only require some of the following sections depending on the specifics of the project and zoning action.

The requirement for a CTR may be waived if site is within ½ mile from Metrorail or ¼ mile from Priority Transit, the total vehicle parking supply below level expected within ¼ mile of Metrorail Station (see Table 2), maximum 100 parking spaces, an Enhanced TDM Plan is implemented, site access and loading design are acceptable, there is a complete pedestrian network in the vicinity of the site, and meets all ZR16 bike parking and locker/shower requirements. Additional criteria may be found in the Low Impact Development Exemption section of *Guidance for CTR*.

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS
Strategic Planning Elements Identify relevant planning efforts and demonstrate how the proposed action is consistent with District-wide planning documents, as well as localized studies. Note in scoping form any recommendations from these documents relevant to the development proposal. The evaluation will consider at least the following high level/District-wide documents: • MoveDC and its relevant modal elements • DDOT Livability Study (relevant to the project) • OP Small Area Plans (relevant to the project) • DC Highway Plan (shown on official plat) • District of Columbia Comprehensive Plan • Vision Zero Action Plan • Capital Bikeshare Development Plan • Washington Metropolitan Area Transit Authority's (WMATA) Metrorail and Metrobus Plans • DDOT Corridor studies (e.g., Transit Development Plan, Streetscape Design Plans and Guidelines)	The following documents will be considered part of the Transportation Statement: • Move DC • DDOT Vision Zero Action Plan • DC Comprehensive Plan	DDOT concurs

Details on additional relevant plans and studies may be provided by the DDOT Case Manager.		
Pedestrian Network Evaluate the condition of the existing pedestrian network and forecast the project's impact. Evaluation must include, at a minimum, critical walking routes, sidewalk widths, network completeness, whether facilities meet DDOT and ADA standards, and whether pedestrian signal timings are adequate (within vehicle study area). *Study area will include, at a minimum, all roadway segments and multi-use trails within a ¼ mile radius from the site, with a focus on connectivity to Metrorail, transit stops, schools, and major activity centers.*	A discussion of the existing and proposed pedestrian facilities within and surrounding the project will be discussed in the CTR. ☐ *Scoping Graphic: Pedestrian Study Area w/Walking Routes to Transit, Schools, Activity Centers* - Figure to be included in the CTR.	With anticipated use of on-street parking for overflow, consider the addition of a midblock crosswalk or other pedestrian countermeasures on Nebraska Avenue to ensure a safe pedestrian connection. Work with DDOT to identify best pedestrian countermeasures for Nebraska Ave ○ WA – Noted. Pedestrian countermeasures on Nebraska Ave will be considered. ○ DDOT noted
Bicycle Network Evaluate the condition of the existing bicycle network and forecast the project's impact, including to Capital Bikeshare (CaBi). Evaluation must include, at a minimum, bicycle network completeness, types of facilities, and adequacy of CaBi locations and availability. Bikeshare station demand data can be obtained from the *CaBi Tracker* website. *Study area will include, at a minimum, all roadway segments and multi-use trails within a ½ mile radius from the site, with a focus on connectivity to Metrorail, transit stops, schools, major activity centers, and other bicycle trails or facilities.* *Note where bike lanes conflict with access to the site or on-street loading movements associated with the project.* *If a CaBi station is currently located along the site frontage, the Applicant must assume the station will stay in place after the development has been constructed and must be designed in the public space plans. If it is not physically possible to stay in place,*	A discussion of the existing and proposed bicycle facilities within and surrounding the project will be provided in the CTR. ☐ *Scoping Graphic: Bicycle Study Area w/Bicycling Routes to Transit, Schools, Activity Centers*– Figure to be included in the CTR.	This location is within one of the high-priority areas identified by our 2019 Capital Bikeshare Development Plan. Identify a location and pour a 52'x6' concrete pad for a 19-dock station in the public space. DDOT previously identified the corner of Nebraska and Utah Avenue as a location. ○ WA – Location of a Capital Bikeshare station will be considered as a part of the CTR. ○ DDOT noted

then DDOT expects the Applicant to demonstrate this hardship, propose a viable alternative location, and fund the station relocation. The minimum size of a new CaBi station is 19 docks with 12 bikes.		
Transit Network Evaluate, at a minimum, existing transit stop locations, adjacent bus routes and Metro headways, planned transit improvements, and an assessment of existing transit stop conditions (e.g., ADA compliance, bus shelters, benches, wayfinding, etc.). For Metrorail stations, refer to the 2009 *WMATA Station Site and Access Planning Manual*, as well as various station capacity studies. *Study area is 1.0 mile for Metrorail stations and ½ mile for Streetcar, Circulator, and WMATA buses.* *All existing bus stops and shelters must be accommodated during construction, assumed to be returned to the original location after construction, and designed into the public space plans. If a bus stop and/or shelter must be moved then the Applicant will fund the relocation and obtain approval from DDOT and WMATA for the new location. Applicant must fund the electrification of all new or relocated shelters.*	All bus stops along the perimeter of the project will be graphically shown in the CTR. ☐ *Scoping Graphic: Transit Study Area with Adjacent Routes and Stations* – Figure to be included the CTR. ☒ *Scoping Graphic: Screenshots from DDOT transit maps showing where the site falls within buffers from Metrorail and Priority Transit* – See Figures 5A and 5B.	DDOT concurs
Safety Analysis Qualitatively evaluate safety conditions at intersections and along blocks within the vehicle study area. *Perform a review of DDOT Vision Action Plan. Note whether any study intersections have been identified by DDOT as high crash locations, if any safety studies have been previously conducted, and discuss the recommendations. Depending on the results of the TIA, DDOT may require improvements to nearby intersections previously identified as having known safety issues.*	DDOT's Vision Zero Action Plan will be reviewed and any intersections surrounding the site that have been identified as high crash locations will be noted along with any recommendations in the area.	Please include a qualitative safety analysis ○ WA – Noted. A qualitative safety analysis of the study area will be included in the CTR. ○ DDOT noted

Curbside Management Propose a curbside management plan that is consistent with current DDOT policies and practices. The curbside management plan must delineate existing and proposed on-street parking designations/restrictions, including but not limited to pick-up/drop-off zones, commercial loading zones, multi-space meters, RPP, and net change in number of on-street spaces as a result of the proposal. *Note that the preliminary curbside management plan will not be approved by DDOT during the zoning process. Applicant must submit a more detailed signage and marking plan via TOPS for formal review and approval by DDOT-PGTD during public space permitting. DDOT expects the Applicant to fund the installation of multi-space meters on blocks where meters are required.*	The curbside management plan will be provided in the CTR. ☒ *Scoping Graphic: Existing Curbside Designations (min. 2 block radius of site)* – Existing curbside designations are shown on Figure 6.	Include both existing and proposed conditions. Consider bus drop-off curbside ○ WA – Noted. Both existing and proposed curbside conditions will be addressed in the CTR. Curbside bus drop-off and pick-up is anticipated with this project. ○ DDOT noted
Pick-Up and Drop-Off Plan This plan is required for all schools and daycares with 20 or more students. It may also be required for churches, hotels, or any other use expected to have significant pick-up and drop-off operations, as necessary. The plan will identify pick-up and drop-off locations and demonstrate adequate circulation so that the flow of bicycles and vehicles is not impeded and queueing does not occur through the pedestrian realm. *DDOT will require this plan for schools and daycares currently in operation even if the relief requested from the BZA is not related to a student cap increase.*	Not applicable	Include graphics and narrative of planned pick-up drop-off for both the fields and Episcopal Center ○ WA – Noted. Pick-up and drop-off patterns for buses will be addressed in the CTR in graphic and narrative form. ○ DDOT: please include non-bus pick-up drop-off patterns.
On-Street Parking Occupancy Study This analysis is required if BZA relief from 5 or more on-site vehicle parking spaces is being requested. It	An approximate ¼ mile study area will be included in the on-street parking occupancy study, as shown on Figure 7. The parking occupancy study will be conducted on a typical weekday from 4:30 – 7:30 PM and on a Saturday from 8:30 AM – 12:30 PM.	Consider extending Saturday study hours to capture more of the afternoon. ○ WA – It is anticipated that the greatest demand for on-street parking by

may also be required as part of a ZC or permitting case if DDOT has concerns about site-generated vehicles parking in adjacent residential neighborhoods. *Vehicle parking occupancy counts will be collected hourly during periods of peak demand. These are typically the weekday evening period (6-10 PM) for residential developments, weekday morning period (7-9 AM) if within ¼ mile of Metrorail, and weekend peak periods if there is a commercial component. Parking availability must be assessed a maximum of 2 blocks in each direction from the site, unless otherwise agreed upon. Also include inventory of off-street parking garages in vicinity of site.*		neighborhood users is likely overnight and into the morning hours, with demand decreasing throughout the day. As a result, it was decided to conduct the Saturday on-street parking study through midday. ○ DDOT concurs
Parking Garage Queueing Analysis If site contains 150 or more vehicle parking spaces and direct access to a public street, evaluate on-site vehicle queueing demand and provide analysis demonstrating parking entrance and ramps can properly process vehicles without queuing onto public streets. Provide proposed parking supply, queuing analysis, and physical controls to parking area, if applicable.	Not applicable	DDOT concurs
Motorcoaches Propose methodology for data collection and analysis. Describe and show the parking locations, anticipated demand, existing areas on- and off-site for loading and unloading (and desired loading times restrictions, if any), and potential routes to and from designated truck routes. If on-street motorcoach parking is proposed, a plan for installation of signage and meters is required, subjection to DDOT-PGTD approval. This section is typically only required for uses that generate significant tourist activity (hotels, museums, cruises, etc.).	Not applicable	Please discuss bus parking and movements through site including graphics and AutoTurn analysis. ○ WA – Bus loading is planned to occur curbside. As a result, no AutoTurn analysis will be included in the CTR. As noted in a previous response, pick-up and drop-off patterns for buses will be addressed in the CTR in graphic and narrative form. ○ DDOT concurs

Section 4: TRAFFIC IMPACT ANALYSIS (TIA)

The TIA component of a CTR is required when a development generates 25 or more peak hour vehicle trips in the peak direction (higher of either inbound or outbound vehicles in any study peak period), after mode split is applied. Existing site traffic, pass-by, TDM, internal capture or other reductions may not be applied when calculating whether a TIA is required. Applicable reductions may be used in the multi-modal trip generation summary and assignment of trips within the TIA, as appropriate. A standalone TIA may also be required if the project proposes a change to roadway capacity, operations, or directionality; has a site access challenge; or as otherwise deemed necessary by DDOT.

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS
TIA Study Area and Data Collection Identify study intersections commensurate with the impact of the proposed project and the travel demand it will generate. Study area must include all major signalized and unsignalized intersections, intersections expected to realize large numbers of new traffic, and intersections that may experience changing traffic patterns. Additional guidance on selecting study intersections is provided in DEM 38.3.2. *Turning Movement Counts (TMC) will be collected in 15-minute increments during the weekday morning (6:30 AM to 9:30 AM) and evening (4:00 PM to 7:00 PM) peak periods on Tuesdays through Thursdays during non-holiday weeks, while schools and Congress are in session, the Fed govt is not in a shutdown, and weather is not an issue, unless otherwise agreed upon. Saturday mid-day peak period (generally 11:00 AM to 1:00 PM) will be studied if development program is retail-heavy. TMCs will include vehicles, pedestrians, bicyclists, and % truck traffic. TMCs will be collected at all existing site driveways and reported as existing conditions in trip generation summary.* *Previously collected TMCs may be used if they are less than 2 years old at the time of study submission. DDOT may require counts be refreshed once TMCs reach 3 years old or if a major transportation or land use change occurs. A growth*	Based on the trip generation, the PM weekday and Saturday peak hours will be studied. The following study intersections will be included: 1. Nebraska Avenue/Utah Avenue (historical PM peak hour counts available) 2. Utah Avenue/Rittenhouse Street/30th Street, 3. Nebraska Avenue/Rittenhouse Street/27th Street, and 4. Military Road/27th Street (historical PM Peak hour counts available). We proposed to purchase StreetLight data and will use 2019 data to obtain pre-pandemic turning movement counts during a typical weekday between 4:00 and 7:00 PM and Saturday between 11:00 AM and 2:00 PM. ☒ *Scoping Graphic: Study Intersections* – see Figure 8 ☒ *Provide hard copies of TMCs in CTR appendix and electronic copies in DDOT-required spreadsheet format at time of submission.*	Study intersection comments: • The intersection of Utah Avenue at Rittenhouse Street NW cannot be analyzed using Synchro HCM reporting due to its configuration with all-way stop control and 5 approach legs. Please provide the proposed methodology for intersection capacity analysis. Consider using HCS for this intersection. ○ Noted. Synchro's HCM methodology will be used to analyze the capacity of this intersection on an approach-by-approach basis. As we calculate the level of service at each approach individually, we will shift volumes from a fifth approach to the intersection to adjacent approaches, thereby allowing opposing traffic to be accounted for in each approach's calculation. ○ DDOT concurs • Please include the intersection of the proposed site access driveway with Nebraska Avenue NW as a study area intersection. ○ Noted.

rate will be applied to TMCs older than 12 months to create present year Existing Conditions.		
TIA Study Scenarios Propose an appropriate set of scenarios to analyze. Note the anticipated build-out year and project phasing. Analysis scenarios to be considered: • Existing Conditions (Current Year) • Background Conditions (No-Build) • Total Future Conditions (With Development) • Total Future Conditions (With Development and Mitigation) • Additional Scenarios For Each Phase, as necessary • Total Future Conditions (+5 Years), as required • Long Range +20 Years Planning Scenario, as required	The following scenarios will be analyzed: 1. Existing Conditions (Current Year) 2. 2024 Background Conditions (No-Build) 3. 2024 Total Future Conditions (With Development) 4. 2024 Total Future Conditions (With Development and Mitigation, if necessary)	DDOT concurs
TIA Methodology Propose an appropriate methodology for the capacity analysis including the type of software program to be used. Per DEM 38.3.5.1, HCM methodology will be used to determine Level of Service (LOS), v/c, and vehicle queue lengths. LOS must be reported by intersection approach and v/c by lane group. DDOT prefers Synchro 9 or newer software for capacity and queueing analyses. SimTraffic (10 simulations averaged) should be used to further evaluate an observed queueing issue and determine a solution, as necessary. *DDOT's required standard Synchro and SimTraffic inputs/settings are provided in Appendix H.* *Merge/weave/diverge analysis is required if any of the study intersections include a highway, freeway, or Interstate ramp (DEM*	Synchro v.10 will be used to conduct the AM and PM weekday peak level of service/capacity analyses (HCM 2000 results will be reported) and Synchro files will be provided with the study submittal. Existing signal timings will be requested from DDOT and utilized in the analyses. Synchro v.10 will also be used to determine the expected AM and PM weekday peak queue lengths (the 50th percentile and the 95th percentile queues will be reported). The available storage lengths will be measured from the approach stop bar to the nearest intersection or end of turn lane, as appropriate. ☒ *Will provide copies of Synchro, SimTraffic, and other analysis software printouts in study appendix and electronic copies of analysis files at time of CTR submission.*	Given the low volume on some of the residential streets in the study area, will there be a large enough sample size to get an accurate estimate from Streetlight? • Comment noted. Weekday PM data collected on October 10, 2017 has been made available for the Utah Ave/Nebraska Ave and 27th St/Military Rd intersections. We propose using this data, grown at 1% per year for 3 years (2017>2020) and then balanced into the network with data gathered from Streetlight from the other intersections in the study area. Streetlight data will be used for all intersections for the Saturday analysis. • DDOT Concurs

38.3.5.3). HCS software should be used for this analysis.		
Transportation Network Improvements List and map all roadway, transit, bicycle, and pedestrian projects funded by DDOT or WMATA, or proffered by others, in the vicinity of the study area and expected to open for public use prior to the proposal's anticipated build-out year. Review the STIP, CLRP, and proffers/commitments for other nearby developments.	No improvements are known within the study area. ☐ *Scoping Graphic: Locations of background transportation network improvements*	DDOT concurs
Local Traffic Growth List and map developments to be analyzed as local background growth. This will include known matter-of-right and zoning-approved developments within ¼ mile of site and others more than ¼ mile from site if their traffic is distributed through study intersections. Document the portions of developments anticipated to open by the projected build-out year.	There are no known pipeline developments in the immediate vicinity of the site. ☐ *Scoping Graphic: Background development projects near study area* ☐ *Scoping Table: Completion amounts/portions occupied of background developments*	DDOT concurs

Regional Traffic Growth

Propose a methodology to account for growth in regional travel demand passing through the study area. An appropriate methodology could include reviewing historic AADT traffic counts, MWCOG model growth rates, data from other planning studies, or recently conducted nearby CTRs. These sources should only be used as a guide.

Generally, maximum annually compounding growth rates of 0.5% in peak direction and 2.0% in non-peak direction are acceptable. Growth rates based should be based on DDOT historical data from 10+ years, if available. Adjustments to the rates may be necessary depending on the amount of traffic assumed from local background developments or if there were recent changes to the transportation network.

Roadway	DDOT ADT		
	2018	2017	2016
Nebraska Avenue NW	7,054	7,018	6,952
Utah Avenue NW	4,171	4,150	4,111
Rittenhouse Street NW	NA	2,000	2,000

Source: Open Data DC

Roadway	CALCULATED GROWTH RATE		
	2016 -2018	2017 -2018	2016-2017
Nebraska Avenue NW	0.73%	0.51%	0.95%
Utah Avenue NW	0.73%	0.51%	0.95%
Rittenhouse Street NW	NA	NA	0%

Based on the calculated growth rates summarized above, a growth rate of 0.5% per year will be used for the study area.

☒ *Scoping Table: Projected regional growth assumptions (dependent on methodology), show growth rates by facility, direction, and time of day*

☐ *Scoping Graphic: Projected regional growth assumptions (dependent on methodology), show growth rates by facility, direction, and time of day*

DDOT concurs

Trip Distribution

Provide sources and justification for proposed percentage distribution of site-generated trips. Additionally, document proposed pass-by distributions and the re-routing of existing or future vehicles based on any changes to the transportation network.

Percentage distributions must be shown turning at intersections throughout the transportation network and at site driveways and garage entrances to ensure appropriate routing assumptions.

The agreed upon trip distribution methodology may not be revised between scoping and CTR submission without concurrence by DDOT Case Manager.

Given the District's urban context and grid network, a small portion of trips

The anticipated distribution of trips is shown on Figure 9.

☒ *Scoping Graphic(s): Percentage Distribution by Land Use, Direction, Time of Day* – see Figure 9

Update distribution graphic to show distributions from site. Percentage distributions must be shown turning at intersections throughout the transportation network and at site driveways and garage entrances to ensure appropriate routing assumptions

- WA – Noted. An updated distribution graphic has been attached with these responses.
- DDOT concurs

(up to 5% of trips through an intersection) may be re-routed from their original routes to an alternate route due to traffic congestion.		

Section 5: MITIGATION

The completed CTR must detail all proposed mitigations. The purpose of discussing mitigation at the scoping stage is to highlight DDOT's Significant Impact Policy, DDOT's approach to mitigation, and to give the Applicant an opportunity to gain initial feedback on potential mitigations that may ultimately be proposed. Any mitigation strategies discussed and included in the *Scoping Form* are considered non-binding until formally evaluated in the study and committed to as part of a related action.

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS
DDOT Significant Impact Policy Vehicle Parking Supply DDOT considers a high parking provision as an 'impact' that needs to be mitigated since it is a permanent site feature that encourages additional driving and yield vehicle trips in the future that were not contemplated in the study. Appropriate mitigations include reducing vehicle parking, implementing substantive TDM strategies, off-site non-automotive network upgrades, and making monetary contributions to DDOT for non-auto improvements. See Table 2 to determine if a site is over-parked based on land use and distance to transit. Capacity Impacts at Intersections All site-generated vehicular impacts to the transportation network during study peak hours must be mitigated, per DEM 38.3.5, if any of the following occur: • Degradation of an approach or intersection to LOS E or F or intersection v/c ratio increases to 1.0 or greater from Background to Total Future Conditions. • If an approach or intersection exceeds LOS E or F or movement/lane group exceeds 1.0 v/c ratio under Background Conditions then an increase in delay or v/c ratio by 5% or more under Total Future Conditions. • If 95th percentile vehicle queuing length exceeds available capacity of approach or turn lane under Total Future Conditions. • If 95th percentile queue length of an approach or turn lane increases by 150 feet or more from Background to Total Future Conditions.	☒ *The Applicant acknowledges DDOT's Significant Impact Policy.* ☒ *The study will comply with all other policies in the Guidance for Comprehensive Transportation Review and the Category & Guidelines column of this Scoping Form not explicitly documented in the Consultant Proposal or DDOT Comments columns.* ☒ *The study will include all of the required graphics, tables, and deliverables for the relevant sections determined during scoping, as shown in Table 1 of Guidance for Comprehensive Transportation Review.*	DDOT concurs

DDOT Approach to Mitigation DDOT's approach to mitigation is to first establish optimal site design and operations to support efficient site circulation. When these efforts alone cannot properly mitigate an action's impact, reducing on-site vehicle parking, implementing TDM measures, making upgrades to the pedestrian, bicycle, and transit networks to encourage use of non-automotive modes, or monetary contribution to DDOT for non-auto improvements must be proposed. Only when these options are exhausted will DDOT consider capacity-increasing changes to the roadway network because such changes often have detrimental impacts on non-automotive travel and are often contrary to the District's multi-modal transportation goals.	☒ *The Applicant acknowledges DDOT's approach to mitigation that prioritizes (in order of DDOT preference) optimal site design, reducing vehicle parking, implementing more TDM strategies, making non-automotive network improvements, and making a monetary contribution to DDOT for non-auto improvements before considering options that increase roadway capacity or alter roadway operations.*	DDOT concurs
Transportation Demand Management (TDM) A TDM Plan is typically required to offset site-generated impacts to the transportation network or in situations where a site provides more parking than DDOT determines is practical for the use and surrounding context. TDM strategies are also an integral part of the District's transportation options. As such, a Baseline TDM plan is required in all CTRs regardless of impacts to the network. An Enhanced Plan or greater is required if the site is over-parked per Table 2 or there are roadway impact identified. Sample TDM plans by land use and tier can be found in Appendix C. *Document all existing TDM strategies being implemented on-site (even outside of a formal TDM Plan) and those being proposed and committed to by the Applicant. Elements of the TDM Plan included in CTR must be broken down by land use and user (i.e., employee, faculty, resident, visitor, etc.).*	☐ *The Applicant will include at least a Baseline TDM Plan. The TDM plan will increase to Enhanced Plan or beyond depending on the parking ratio and other impacts identified in the study.*	Traditional TDM plan is not required for sports field use, but DDOT would like to see additional investments in bicycle and pedestrian networks to encourage non-auto travel. • WA - Noted
Performance Monitoring Plan (PMP) DDOT may require a PMP in situations where anticipated vehicle trips are large in magnitude, unpredictable, or necessitate a vehicle trip cap. Typically, this is required for schools expected to have a significant amount of single occupancy vehicle trips or very large developments. The monitoring plan will establish thresholds for new trips a project can generate, define post-completion evaluation criteria and methodology, determine the frequency of reporting, and establish potential	NA	Likely not applicable, but will depend on results of the study • WA - Noted

remediating measures (e.g., adjust trip caps or implement additional TDM strategies). *Document any existing performance monitoring Plans in effect and any proposed changes.*		
Roadway Operational and Geometric Changes Describe all proposed roadway operational and geometric changes in CTR with supporting analysis and warrants in the study appendix. Detail must be provided on any ROW implications of proposed mitigations. All proposed changes in traffic control must be conducted following the procedures outlined in the *Manual of Uniform Traffic Control Devices* (MUTCD). *Note any preliminary ideas being considered.*	If necessary for mitigation, proposed roadway operational and geometric changes will be included in the CTR.	DDOT concurs

Section 6: ADDITIONAL TOPICS FOR DISCUSSION DURING SCOPING

CATEGORY & GUIDELINES	CONSULTANT PROPOSAL	DDOT COMMENTS
ANC Discussions and Feedback Provide an update on the status of Community Benefits Agreement, any ANC concerns, or other concerns expressed by the community.	The Applicant team will be presenting to ANC 3G throughout the duration of the project. Due to the early stage of the project, no substantive discussions have been held yet.	Keep DDOT in the loop regarding any transportation concerns ANC 3G has about proposed development. • WA - Noted
Miscellaneous Items for Discussion These items could include relevant on-going discussions with other agencies and stakeholders or seeking direction other types of analyses to be included (i.e., traffic calming proposal, TOPP, TMP).	Not applicable	DDOT concurs

Table A - Anticipated Field Programming

Event	Day of Week							Time		Players/ Coaches	Fans	School Vehicles	Est. Vehicles (AVO=2.1)	# of Buses
	S	M	T	W	R	F	S	Start	End					
Practice - 2 weeks b/f Labor Day		x	x	x	x	x		8:00 AM	2:00 PM	50	0	Bus drop-off	0	1
Practice - Sep, Oct, and 3 weeks in Nov		x	x		x	x		3:00 PM	6:00 PM	60	0	Bus waits	0	1
Practice - Sep, Oct, and 3 weeks in Nov				x				2:00 PM	6:00 PM	40	0	Bus drop-off	0	1
Soccer games - Sept, Oct, and 3 weeks in Nov			x	x	x	x		3:30 PM	6:00 PM	50	75	Buses for teams Wait	36	2
Football games (5 games per year)						x		3:30 PM	7:00 PM	100	200	Buses for teams Wait	95	2
							x	1:00 PM	5:00 PM	100	200	Buses for teams Wait	95	2
Practice - 3rd week of Feb - mid May		x	x		x	x		3:45 PM	5:45 PM	60	0	Bus waits	0	1
Practice - 3rd week of Feb - mid May				x				2:00 PM	6:00 PM	40	0	Bus drop-off	0	1
Baseball games - 3rd week of Feb - mid May			x		x			3:30 PM	7:00 PM	40	75	Bus waits	36	2
Baseball games - doubleheaders (5 per year)							x	9:00 AM	12:30 PM	40	75	Bus waits	36	2
							x	12:30 PM	4:00 PM	40	75	Bus waits	36	2
Lacross games - 3rd week of Feb - mid May				x		x		3:30 PM	6:30 PM	60	75	Bus waits	36	2
Rental - Jun, Jul, and 2 weeks in Aug		x	x	x	x	x	x	9:00 AM	3:00 PM	100	0	Drop off in cars	48	
		x	x	x	x	x	x	3:00 PM	5:00 PM	50	0	Drop off in cars, 10 cars wait	24	
		x	x	x	x	x	x	5:00 PM	7:00 PM	50	0	Drop off in cars, 10 cars wait	24	
	x							10:00 AM	11:00 AM	50	50	Cars wait	48	
	x							11:00 AM	12:00 PM	50	50	Cars wait	48	
	x							12:00 PM	1:00 PM	50	50	Cars wait	48	
	x							1:00 PM	2:00 PM	50	50	Cars wait	48	
	x							2:00 PM	3:00 PM	50	50	Cars wait	48	
	x							3:00 PM	4:00 PM	50	50	Cars wait	48	
	x							4:00 PM	5:00 PM	50	50	Cars wait	48	
	x							5:00 PM	6:00 PM	50	50	Cars wait	48	
	x							6:00 PM	7:00 PM	50	50	Cars wait	48	
Sept, Oct, Nov (Local DC School)		x	x	x	x	x		6:00 PM	7:00 PM	60	10	Drop off/10 wait	33	
							x	9:00 AM	10:30 AM	50	50	Cars wait	48	
							x	10:30 AM	12:00 PM	50	50	Cars wait	48	
							x	12:00 PM	1:30 PM	50	50	Cars wait	48	
							x	1:30 PM	3:00 PM	50	50	Cars wait	48	
							x	3:00 PM	4:30 PM	50	50	Cars wait	48	
							x	4:30 PM	6:00 PM	50	50	Cars wait	48	
	x							10:00 AM	11:00 AM	50	50	Cars wait	48	
	x							11:00 AM	12:00 PM	50	50	Cars wait	48	
	x							12:00 PM	1:00 PM	50	50	Cars wait	48	
	x							1:00 PM	2:00 PM	50	50	Cars wait	48	
	x							2:00 PM	3:00 PM	50	50	Cars wait	48	
	x							3:00 PM	4:00 PM	50	50	Cars wait	48	

Event	Day of Week							Time		Players/ Coaches	Fans	School Vehicles	Est. Vehicles (AVO=2.1)	# of Buses
	S	M	T	W	R	F	S	Start	End					
	x							4:00 PM	5:00 PM	50	50	Cars wait	48	
	x							5:00 PM	6:00 PM	50	50	Cars wait	48	
Dec, Jan, and 3 weeks in Feb (Local DC School)		x	x	x	x	x		3:00 PM	5:00 PM	60	10	Drop off/10 wait	33	
	x							10:00 AM	11:00 AM	50	50	Cars wait	48	
	x							11:00 AM	12:00 PM	50	50	Cars wait	48	
	x							12:00 PM	1:00 PM	50	50	Cars wait	48	
	x							1:00 PM	2:00 PM	50	50	Cars wait	48	
	x							2:00 PM	3:00 PM	50	50	Cars wait	48	
	x							3:00 PM	4:00 PM	50	50	Cars wait	48	
	x							4:00 PM	5:00 PM	50	50	Cars wait	48	
Mar, Apr, May (Local DC School)		x	x	x	x	x		7:00 PM	8:00 PM	60	10	Drop off/10 wait	33	
							x	9:00 AM	10:00 AM	50	50	Cars wait	48	
							x	10:00 AM	11:00 AM	50	50	Cars wait	48	
							x	11:00 AM	12:00 PM	50	50	Cars wait	48	
							x	12:00 PM	1:00 PM	50	50	Cars wait	48	
							x	1:00 PM	2:00 PM	50	50	Cars wait	48	
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							x	4:00 PM	5:00 PM	50	50	Cars wait	48	
							x	5:00 PM	6:00 PM	50	50	Cars wait	48	
							x	6:00 PM	7:00 PM	50	50	Cars wait	48	
							x	3:00 PM	4:30 PM	50	50	Cars wait	48	
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	x							1:00 PM	2:30 PM	50	50	Cars wait	48	
	x							2:30 PM	4:00 PM	50	50	Cars wait	48	
	x							4:00 PM	5:30 PM	50	50	Cars wait	48	
	x							5:30 PM	7:00 PM	50	50	Cars wait	48	

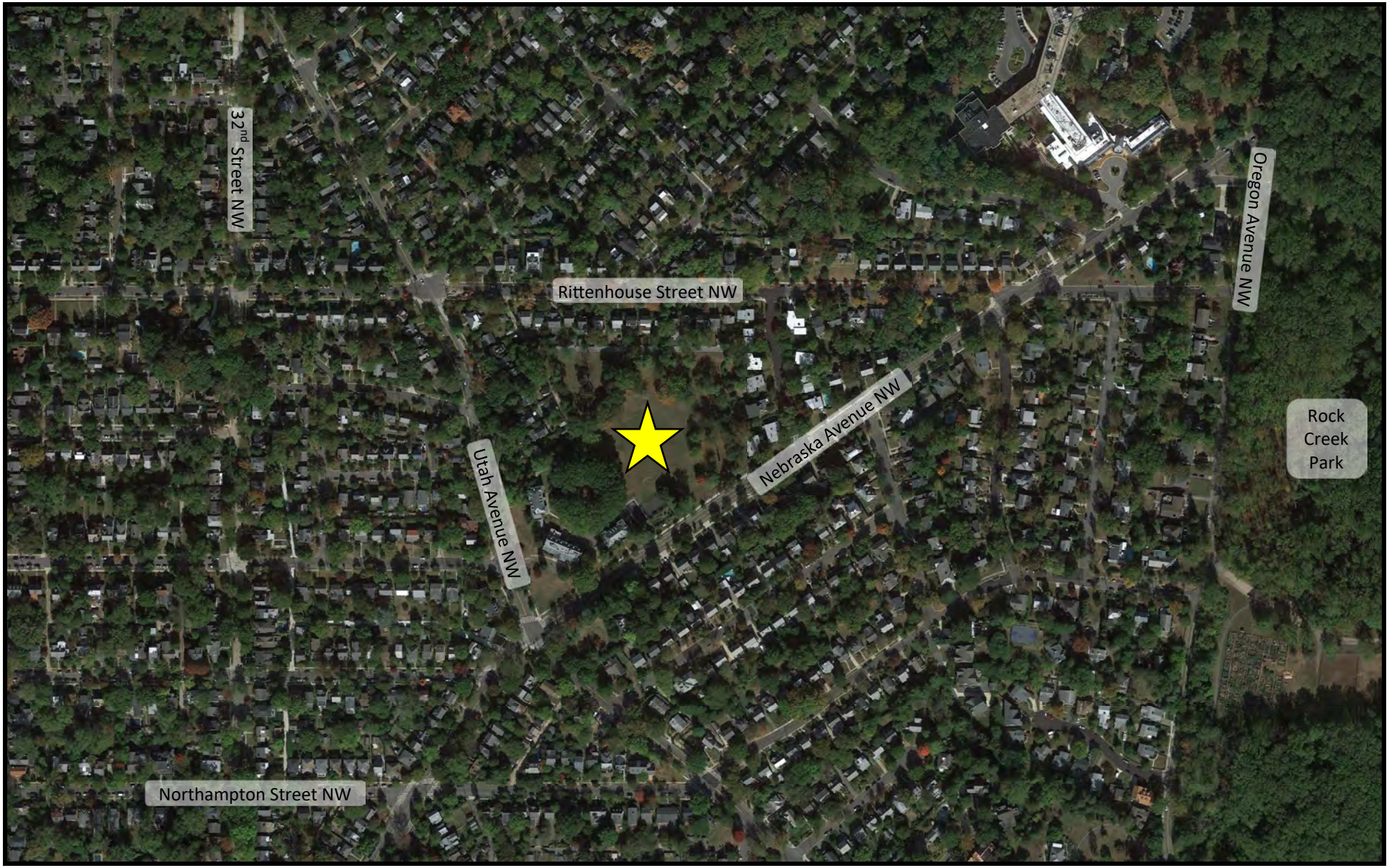


Figure 1
Site Location

Site Location

NORTH

Maret Ball Fields
Washington, DC

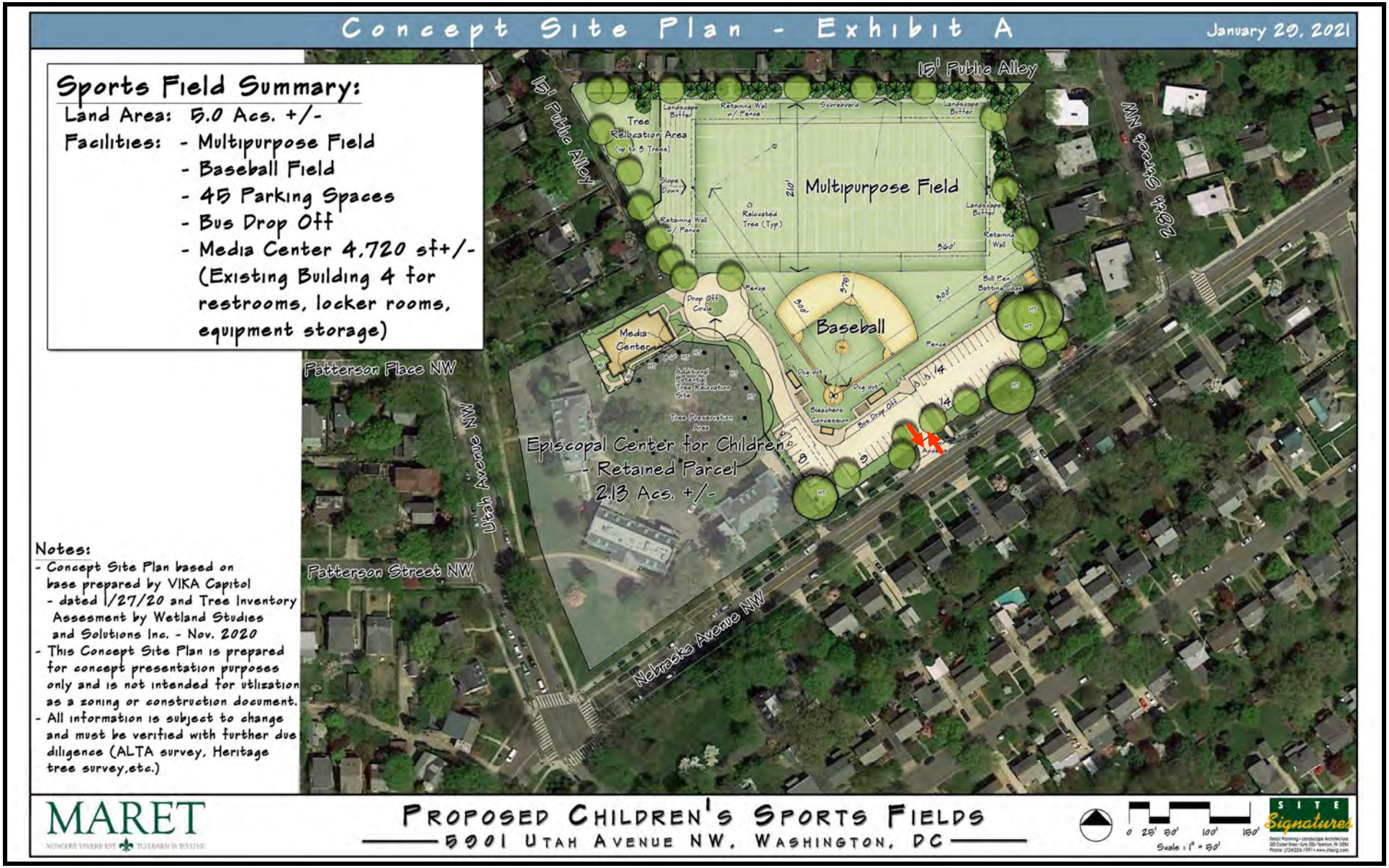


Figure 2
Site Circulation Plan

→ Inbound/Outbound Vehicle Access

NORTH

Maret Sports Fields
Washington, DC

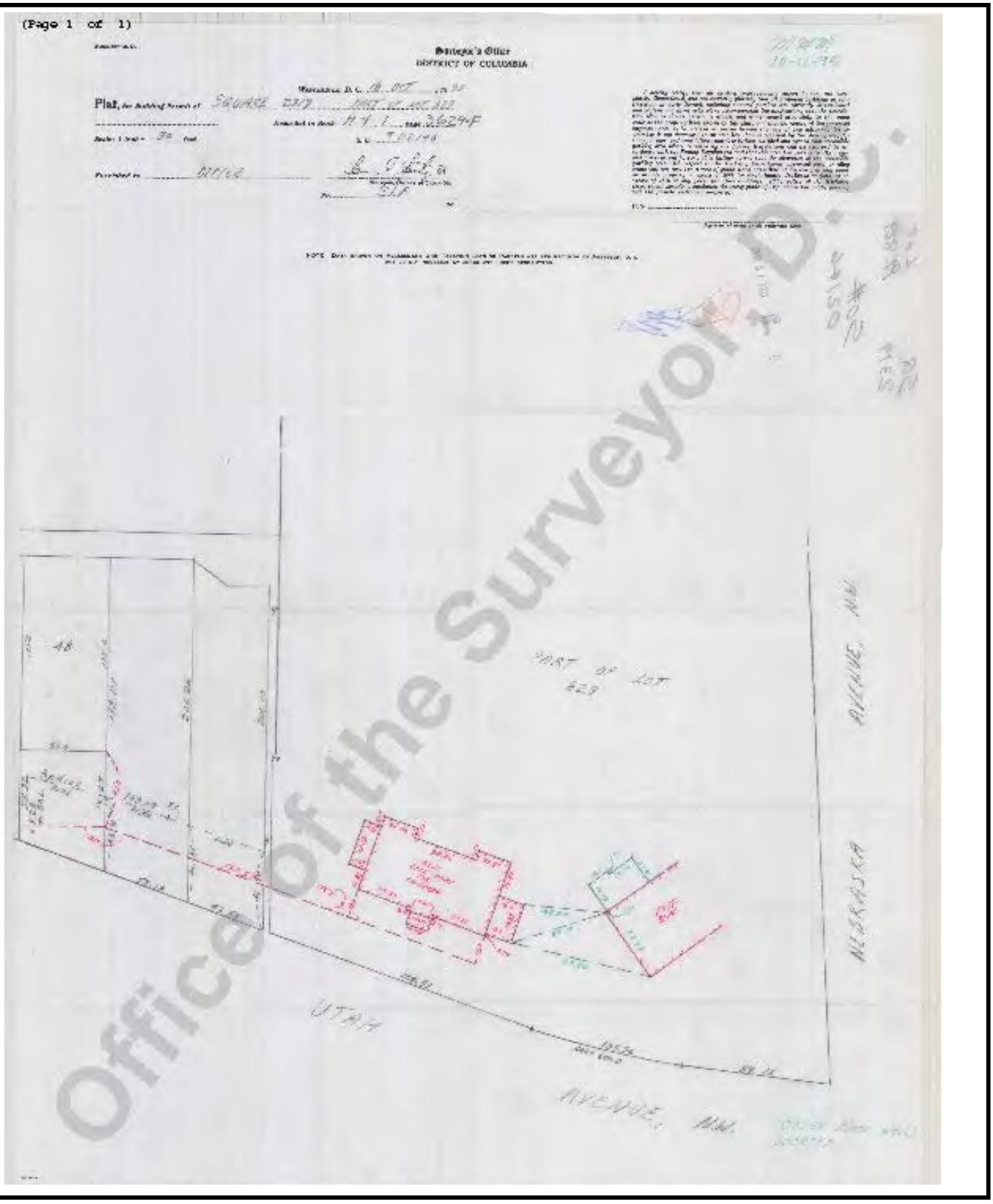


Figure 3
Site Plat

NORTH
Maret Ball Fields
Washington, DC

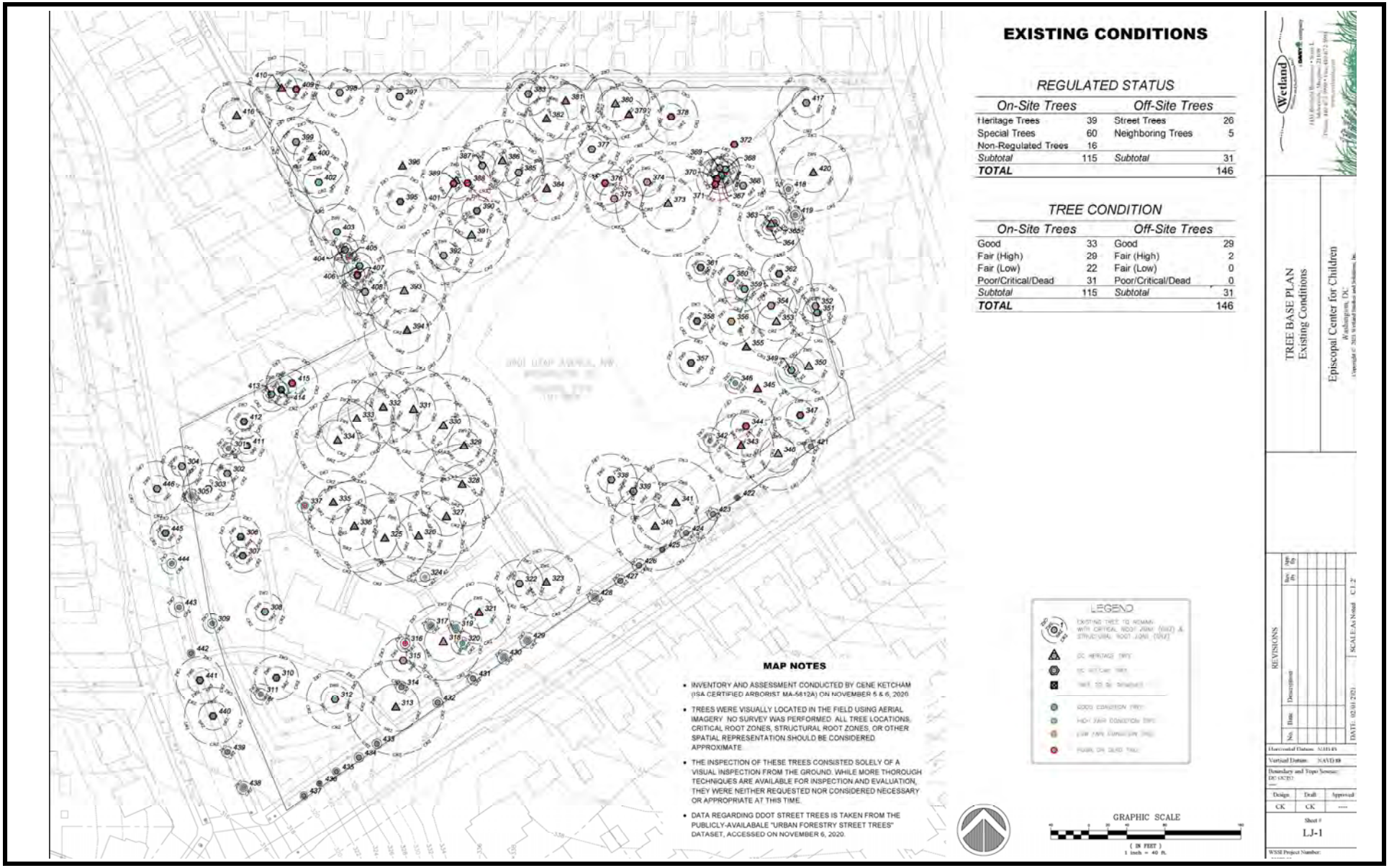


Figure 4A
Existing Tree Locations

NORTH

Maret Ball Fields
Washington, DC

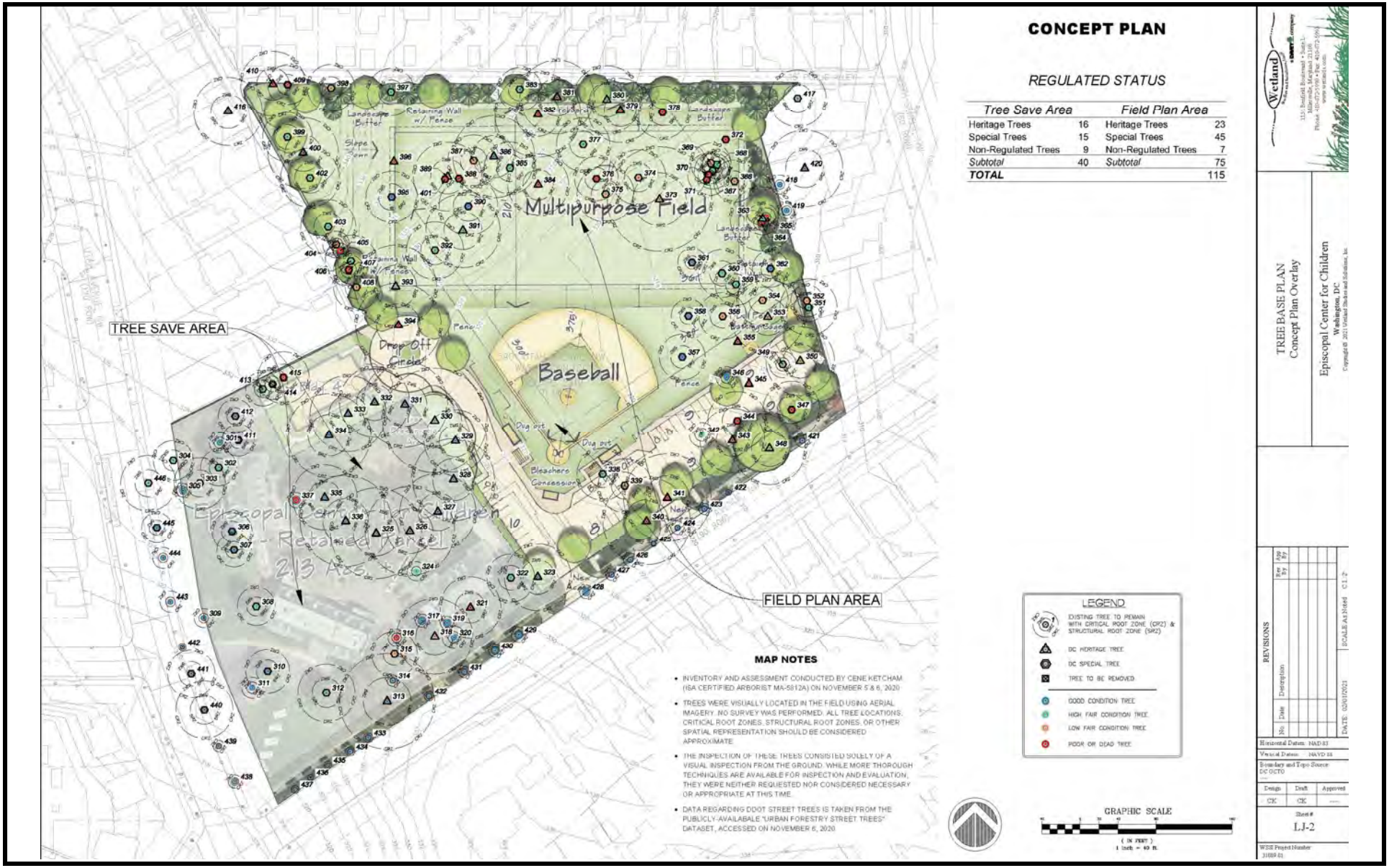


Figure 4B
Tree Conditions

NORTH

Maret Ball Fields
Washington, DC

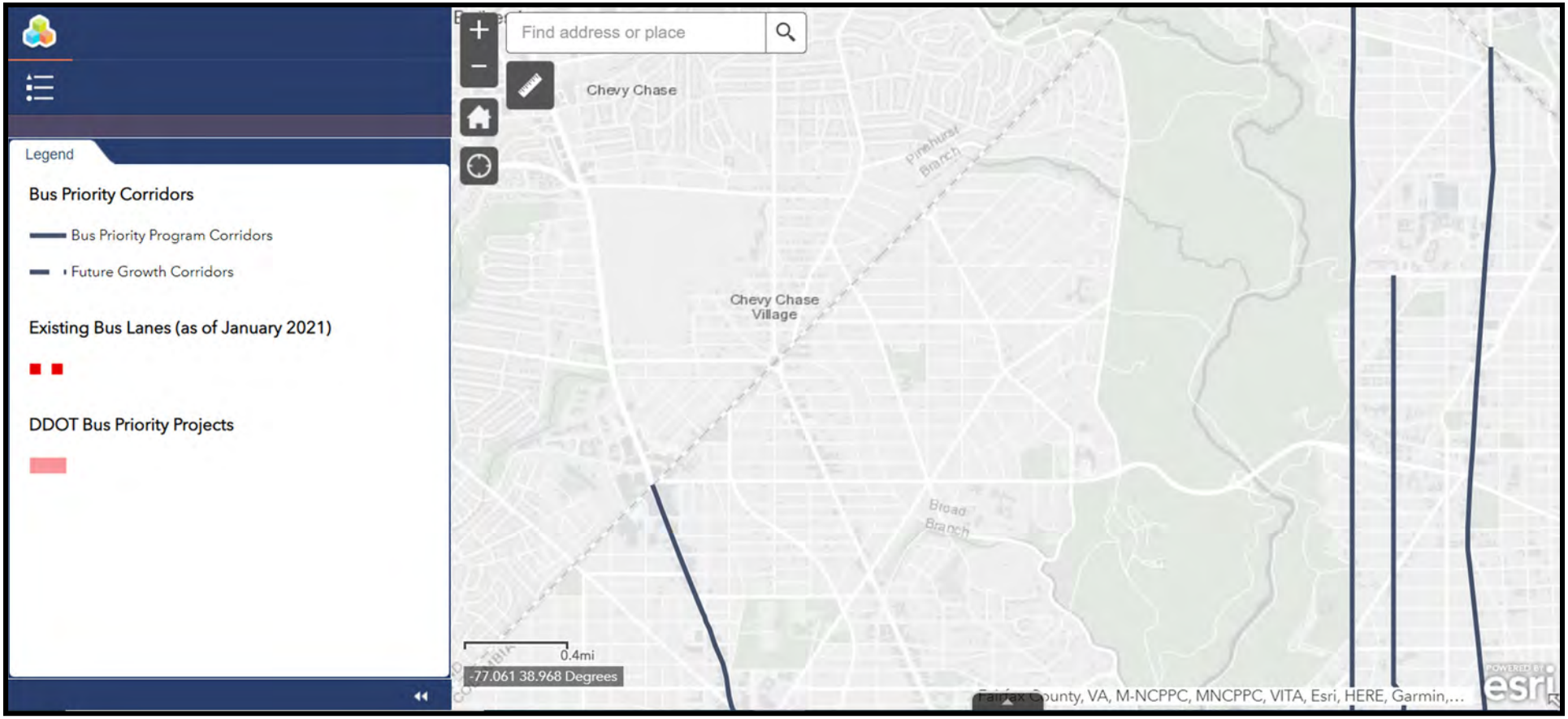


Figure 5A
Metrorail Map

NORTH

Maret Ball Fields
Washington, DC

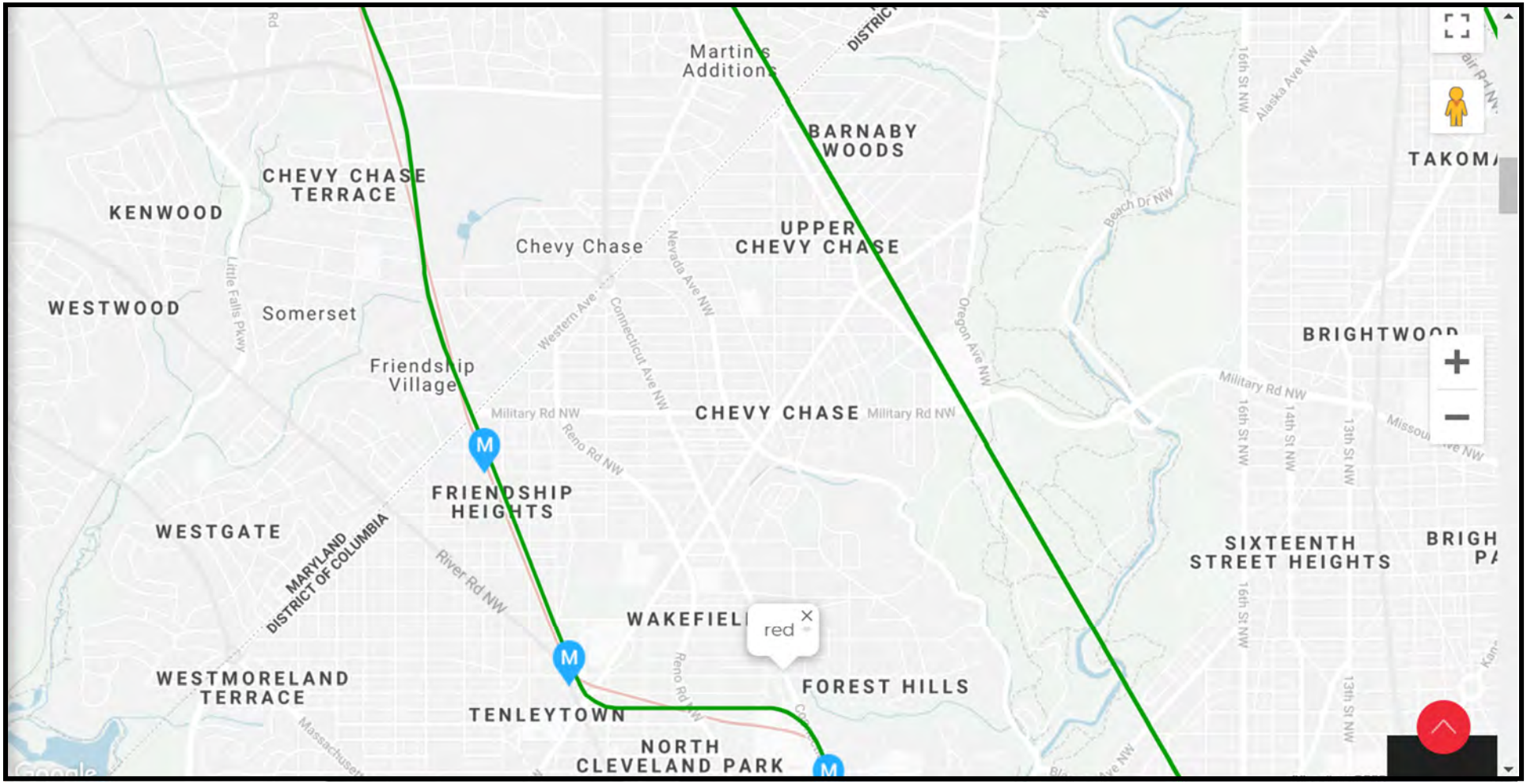


Figure 5B
Transit Priority Map

NORTH
Maret Ball Fields
Washington, DC

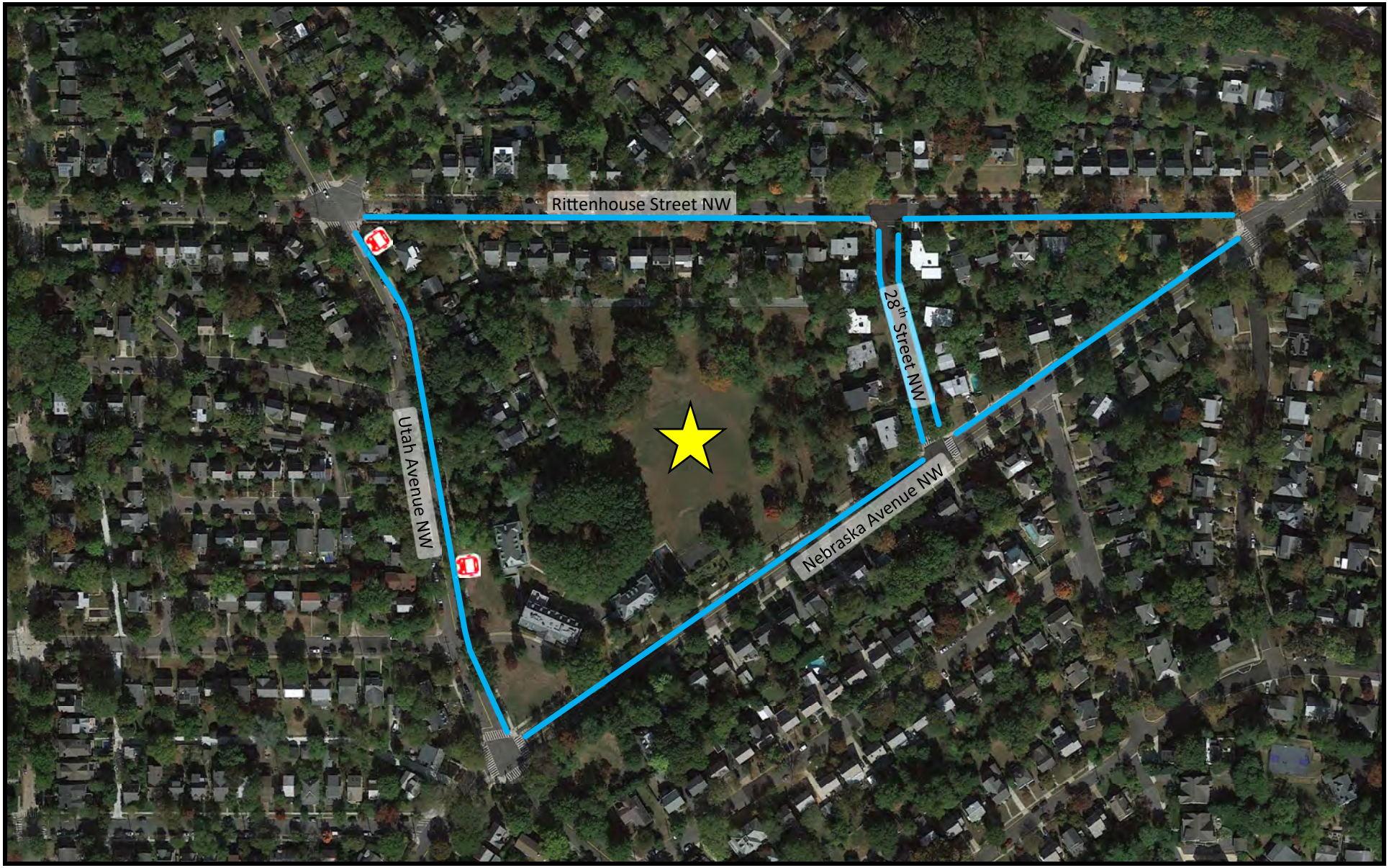


Figure 6
Existing Curbside Management

Site Location
Bus Stop
Unrestricted Parking

NORTH

Maret Ball Fields
Washington, DC

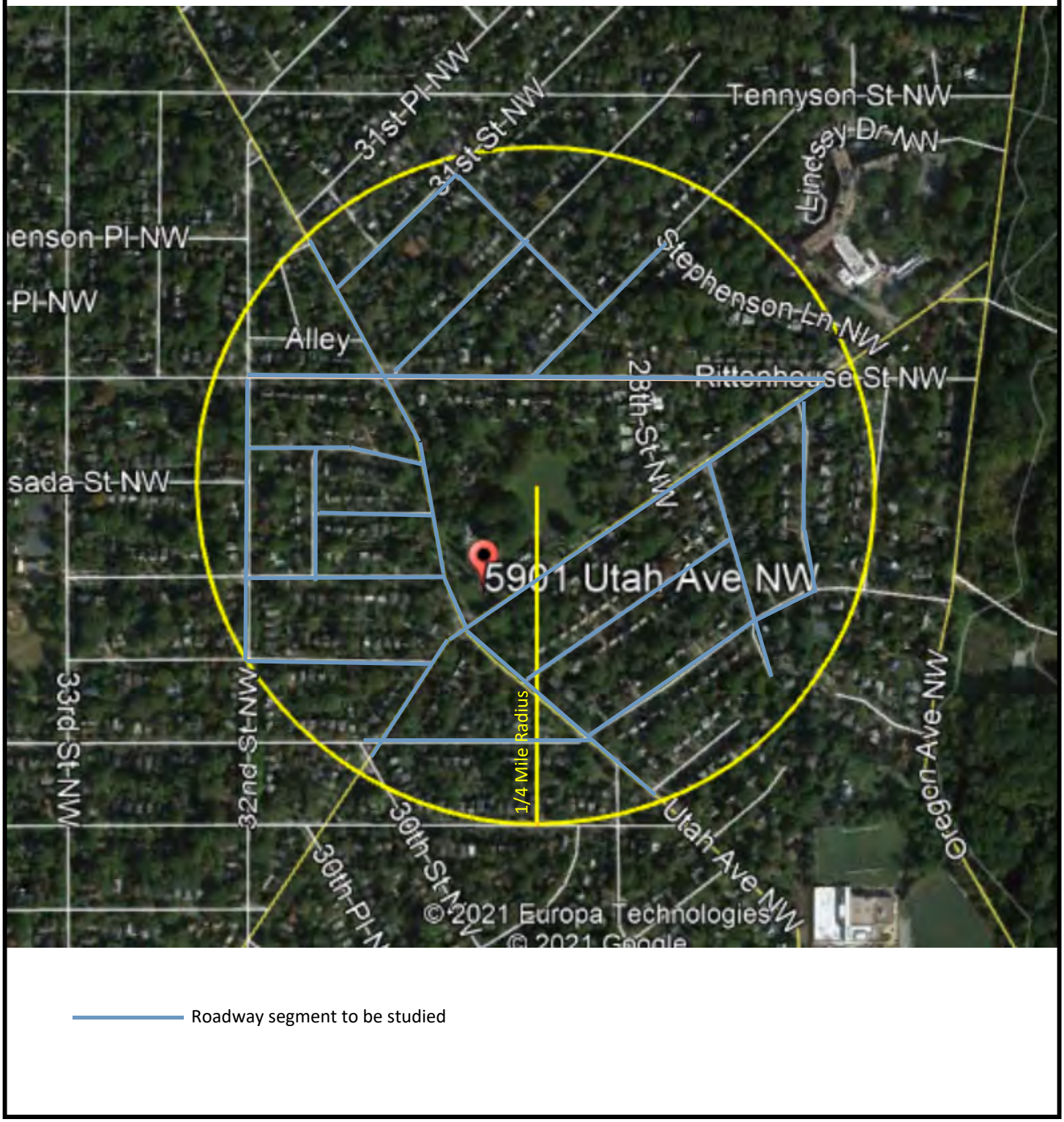


Figure 7
On Street Parking Study Area

NORTH
Maret Ball Fields
Washington, DC

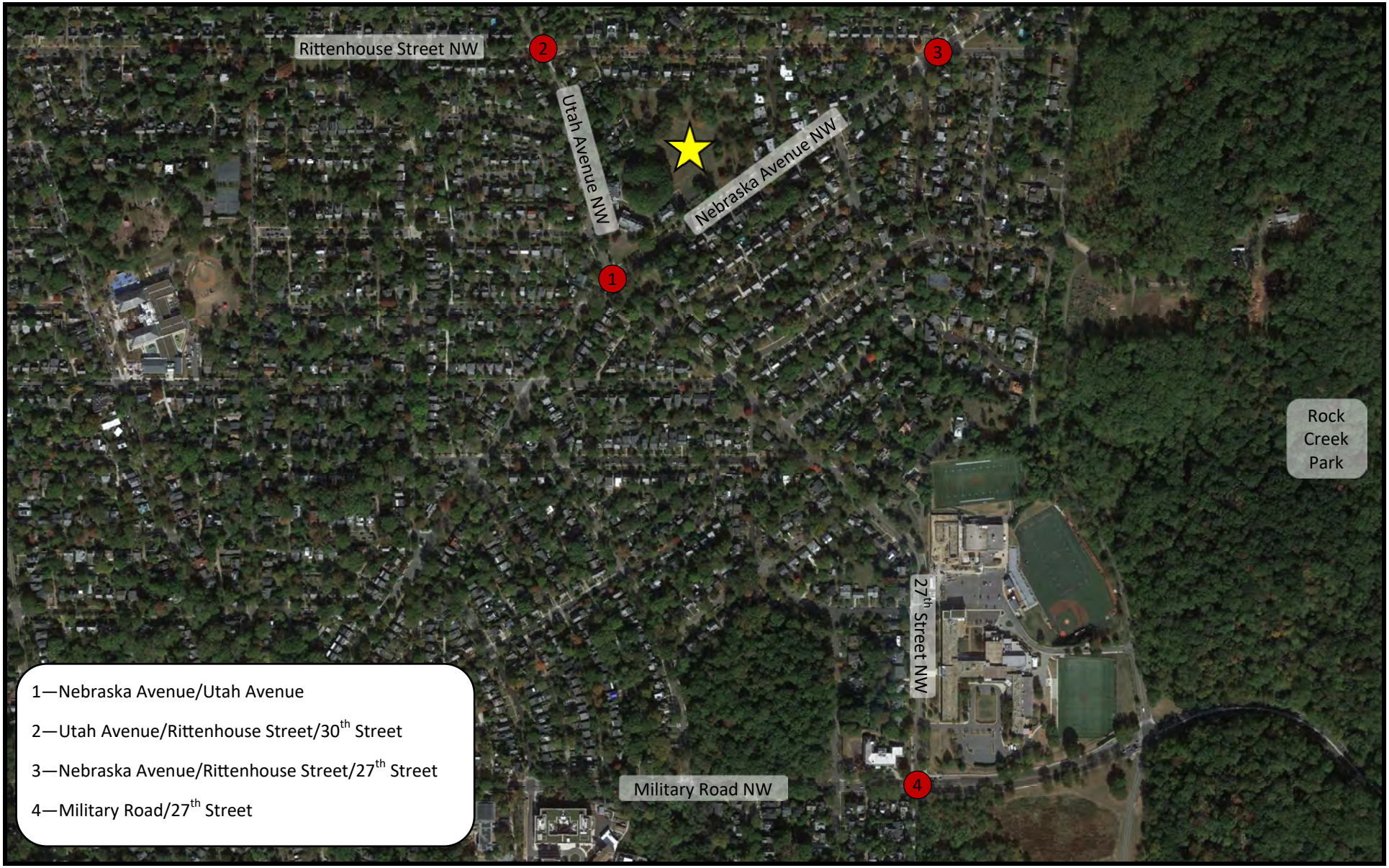


Figure 8
Study Area

★ Site Location

NORTH

Maret Ball Fields
Washington, DC

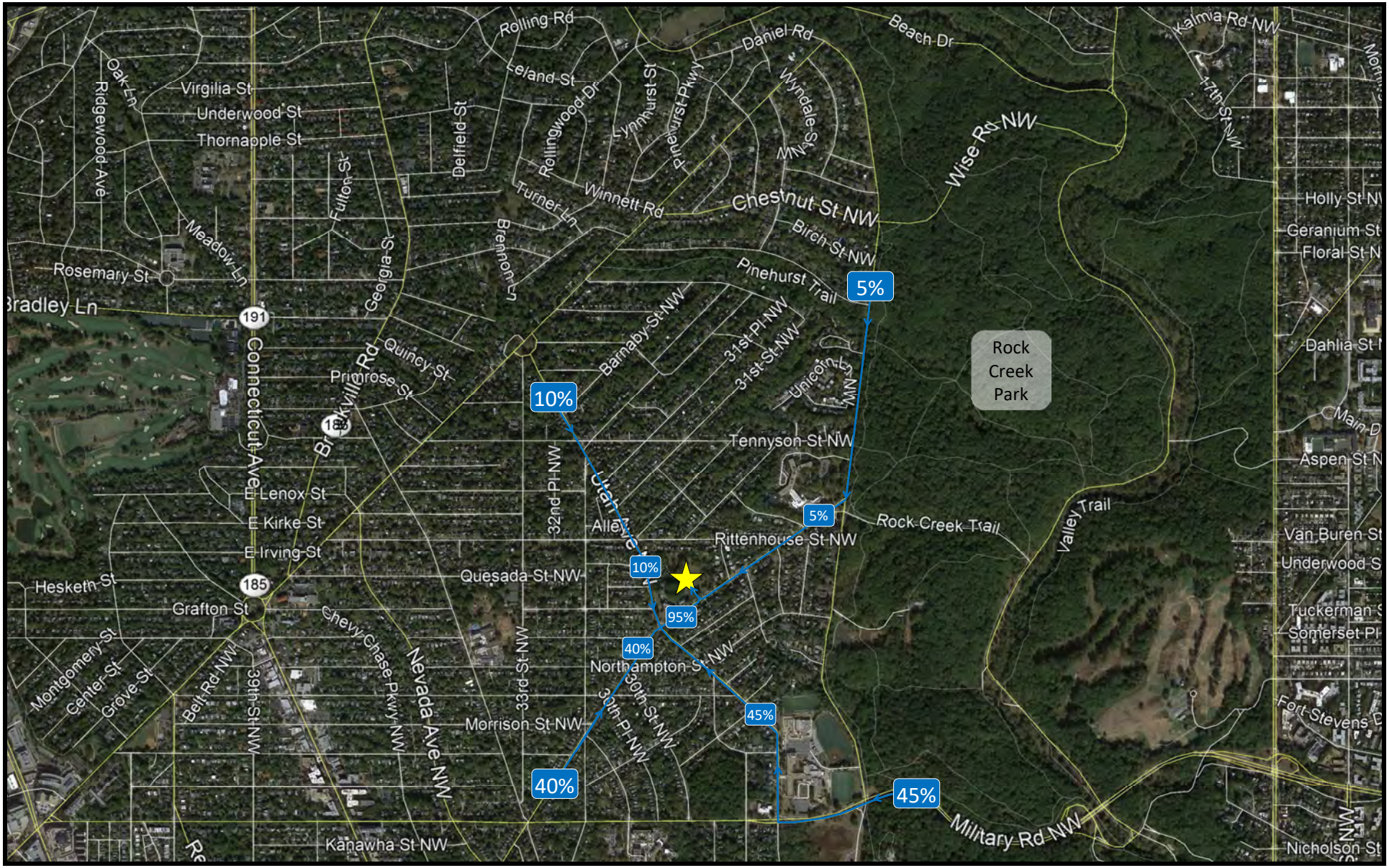


Figure 9A
Site Trip Distributions—Inbound

★ Site Location

NORTH

Maret Ball Fields
Washington, DC

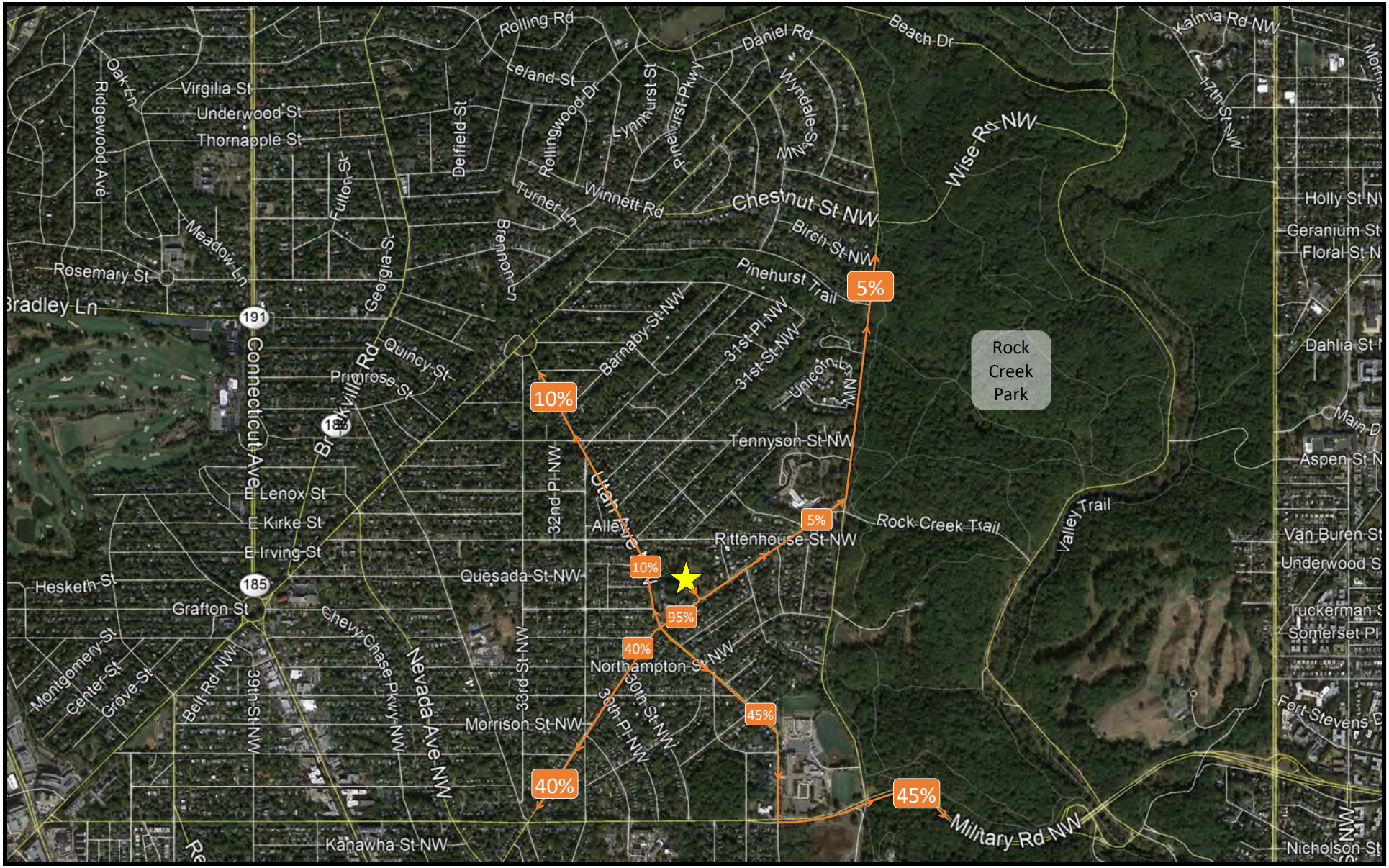


Figure 9B
Site Trip Distributions—Outbound

★ Site Location

NORTH

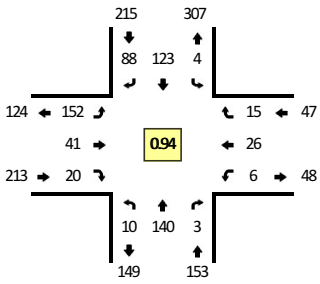
Maret Ball Fields
Washington, DC

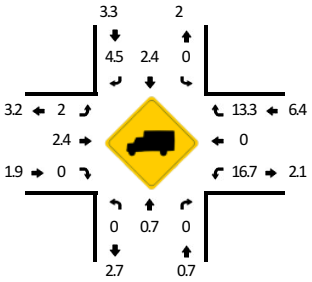
APPENDIX B
TRAFFIC COUNT DATA

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

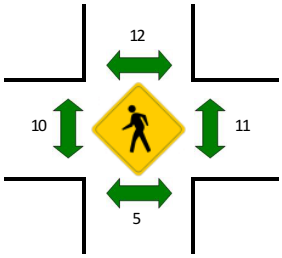
LOCATION: Utah Ave NW -- Nebraska Ave NW | **QC JOB #:** 14530202
CITY/STATE: Washington, DC | **DATE:** Tue, Oct 10 2017

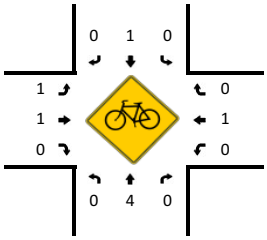
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

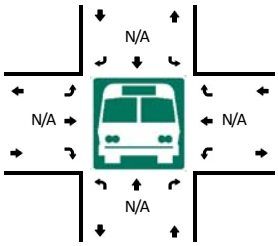


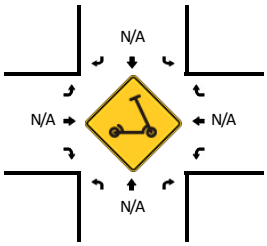


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	Utah Ave NW (Northbound)				Utah Ave NW (Southbound)				Nebraska Ave NW (Eastbound)				Nebraska Ave NW (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	31	2	0	0	21	10	0	29	15	2	0	2	8	2	0	123	
4:15 PM	1	27	1	0	0	21	10	0	31	7	1	0	5	4	4	0	112	
4:30 PM	4	27	1	0	1	28	13	0	29	12	7	0	0	8	1	0	131	
4:45 PM	1	26	0	0	1	29	18	0	48	7	3	0	0	7	3	0	143	509
5:00 PM	0	35	1	0	1	40	17	0	33	8	6	0	1	8	5	0	155	541
5:15 PM	6	42	1	0	0	29	30	0	36	8	2	0	1	5	3	0	163	592
5:30 PM	3	37	1	0	2	25	23	0	35	18	9	0	4	6	4	0	167	628
5:45 PM	1	50	1	0	2	15	15	0	32	9	2	0	0	2	2	0	131	616
6:00 PM	0	49	1	0	2	27	14	0	40	13	4	0	3	4	1	0	158	619
6:15 PM	2	49	0	0	0	24	24	0	52	5	5	0	1	6	4	0	172	628
6:30 PM	0	48	0	0	0	22	19	0	51	7	0	0	0	10	3	0	160	621
6:45 PM	1	42	0	0	2	23	18	0	34	8	2	0	0	4	2	0	136	626

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	148	4	0	8	100	92	0	140	72	36	0	16	24	16	0	668
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	4		8
Buses																	
Pedestrians		4				0				8				12			24
Bicycles	0	4	0		0	0	0		0	4	0		0	4	0		12
Scooters																	

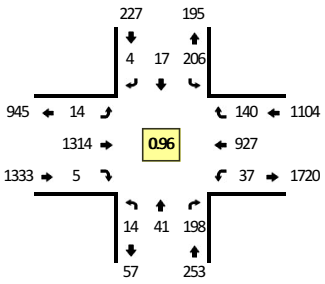
Comments:

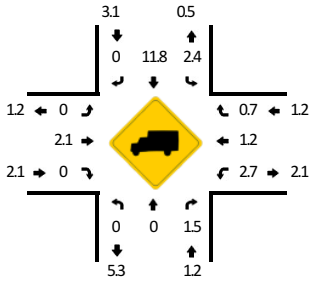
Report generated on 7/19/2021 12:06 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

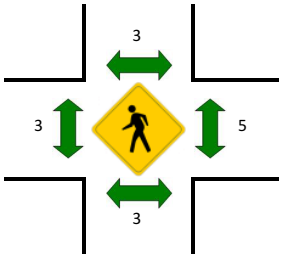
LOCATION: 27th St NW -- Military Rd NW | **QC JOB #:** 14530208
CITY/STATE: Washington, DC | **DATE:** Tue, Oct 10 2017

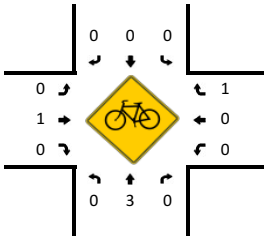
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

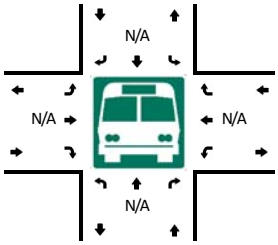


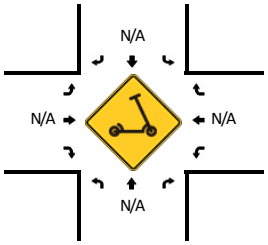


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	27th St NW (Northbound)				27th St NW (Southbound)				Military Rd NW (Eastbound)				Military Rd NW (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	5	47	0	39	5	4	0	1	270	0	0	11	190	28	0	602	
4:15 PM	2	7	47	0	40	2	3	0	2	287	0	0	5	204	23	0	622	
4:30 PM	1	6	38	0	53	3	4	0	2	331	1	0	5	212	30	2	688	
4:45 PM	4	4	55	0	41	2	1	0	3	339	0	0	2	196	33	0	680	2592
5:00 PM	4	11	47	0	66	7	1	0	3	321	2	0	10	249	37	1	759	2749
5:15 PM	5	12	49	0	50	1	1	0	4	332	0	0	6	238	32	0	730	2857
5:30 PM	1	14	47	0	49	7	1	0	4	322	3	0	17	244	38	1	748	2917
5:45 PM	2	11	35	0	37	4	2	0	3	311	1	0	6	218	45	0	675	2912
6:00 PM	3	12	30	0	47	2	5	0	0	309	2	1	5	232	43	0	691	2844
6:15 PM	3	14	34	0	43	3	3	0	3	300	2	0	7	226	56	0	694	2808
6:30 PM	1	13	36	0	23	6	3	0	1	262	1	0	8	219	41	0	614	2674
6:45 PM	1	8	23	0	29	1	1	0	0	197	2	0	5	193	47	0	507	2506

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	44	188	0	264	28	4	0	12	1284	8	0	40	996	148	4	3036
Heavy Trucks	0	0	0		8	8	0		0	44	0		0	16	0		76
Buses																	
Pedestrians		0				0				0				8			8
Bicycles	0	0	0		0	0	0		0	4	0		0	0	4		8
Scooters																	

Comments:

Report generated on 7/22/2021 9:10 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Day Type

1: Weekday (Tu-Th)

TURNING MOVEMENT COUNTS

Day Part	Military Rd NW (EB)			Military Rd NW (WB)			27th St NW (NB)			27th St NW (SB)			Total
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
00: All Day (12am-12am)	749	16,477	114	620	20,175	762	469	957	2,315	860	690	1,673	45,861
02: 7am (7am-8am)	184	858	-	338	2,993	79	71	20	58	34	78	41	4,754
03: 8am (8am-9am)	37	535	-	217	2,204	111	38	33	108	44	185	85	3,597
04: 9am (9am-10am)	-	-	-	-	-	-	-	-	-	-	-	-	-
08: 1pm (1pm-2pm)	-	-	-	-	-	-	-	-	-	-	-	-	-
09: 2pm (2pm-3pm)	83	990	-	38	924	72	-	-	71	44	20	181	2,423
10: 3pm (3pm-4pm)	17	2,011	-	17	1,352	17	82	92	365	87	28	271	4,339
11: 4pm (4pm-5pm)	98	2,032	-	15	958	65	-	104	484	174	-	177	4,107
12: 5pm (5pm-6pm)	33	1,779	28	34	839	58	99	128	662	170	-	166	3,996
13: 6pm (6pm-7pm)	21	1,098	-	61	711	29	47	77	301	153	-	143	2,641
01: 6am (6am-7am)	60	187	-	28	1,653	81	-	18	26	14	-	70	2,137
05: 10am (10am-11am)	-	-	-	-	-	-	-	-	-	-	-	-	-
06: 11am (11am-12noon)	-	-	-	-	-	-	-	-	-	-	-	-	-
07: 12pm (12noon-1pm)	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

1: Weekday (Tu-Th)

TURNING MOVEMENT COUNTS

Day Part	Rittenhouse St NW (EB)			Rittenhouse St NW (WB)			Nebraska Ave NW (NB)			Nebraska Ave NW (SB)			Total
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
00: All Day (12am-12am)	202	361	29	162	579	69	104	1,759	102	70	1,726	59	5,222
01: 6am (6am-7am)	-	-	-	16	-	-	-	20	-	-	89	-	125
02: 7am (7am-8am)	-	44	19	38	38	-	23	-	-	-	175	-	337
03: 8am (8am-9am)	-	-	-	-	-	-	-	-	-	-	-	-	-
04: 9am (9am-10am)	-	-	-	-	-	-	-	-	-	-	-	-	-
05: 10am (10am-11am)	50	-	-	-	61	-	-	137	-	-	191	-	439
06: 11am (11am-12noon)	15	-	-	15	-	-	-	90	15	-	327	-	462
07: 12pm (12noon-1pm)	-	-	-	-	-	-	-	-	-	-	-	-	-
08: 1pm (1pm-2pm)	-	15	-	-	31	-	-	42	-	-	130	-	218
09: 2pm (2pm-3pm)	-	15	-	20	26	-	21	64	-	-	45	-	191
10: 3pm (3pm-4pm)	-	30	-	17	59	12	20	224	14	15	49	-	440
11: 4pm (4pm-5pm)	39	64	6	-	93	11	-	289	15	25	101	-	643
12: 5pm (5pm-6pm)	-	76	-	26	62	-	48	193	14	-	127	-	546
13: 6pm (6pm-7pm)	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

1: Weekday (Tu-Th)

TURNING MOVEMENT COUNTS

Day Part	Nebraska Ave NW EB Left	EB Thru	EB Right	Nebraska Ave NW WB Left	WB Thru	WB Right	Utah Ave NW NB Left	NB Thru	NB Right	Utah Ave NW SB Left	SB Thru	SB Right	Total
00: All Day (12am-12am)	1,073	1,357	123	472	1,340	172	229	1,932	519	142	1,733	1,540	10,632
01: 6am (6am-7am)	37	9	8	-	33	-	9	40	26	-	26	76	264
03: 8am (8am-9am)	35	57	9	56	73	24	12	112	67	27	132	389	993
04: 9am (9am-10am)	32	71	-	-	128	-	-	100	111	-	173	90	705
05: 10am (10am-11am)	40	89	-	-	165	-	12	142	31	-	192	19	690
06: 11am (11am-12noon)	97	53	4	45	175	-	-	117	19	53	56	46	665
07: 12pm (12noon-1pm)	29	36	-	55	42	-	15	130	-	-	73	41	421
08: 1pm (1pm-2pm)	33	37	16	-	111	28	8	103	-	-	69	34	439
09: 2pm (2pm-3pm)	-	-	-	-	-	-	-	-	-	-	-	-	-
10: 3pm (3pm-4pm)	178	136	18	-	70	30	-	189	33	-	103	99	856
11: 4pm (4pm-5pm)	154	178	6	76	57	24	21	102	75	23	109	108	933
12: 5pm (5pm-6pm)	86	176	41	56	67	-	29	224	18	35	171	52	955
13: 6pm (6pm-7pm)	135	201	33	57	33	-	8	115	34	-	176	73	865
02: 7am (7am-8am)	87	-	-	39	323	-	111	90	37	-	235	321	1,243
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

1: Weekday (Tu-Th)

TURNING MOVEMENT COUNTS

	Rittenhouse St NW (EB)				Rittenhouse St NW (WB)				Utah Ave NW (NB)				Utah Ave NW (SB)				30th St NW (SWB)				
Day Part	EB Left	EB Thru	EB Right	EB Left 1	WB Left	WB Thru	WB Right	WB Right 1	NB Left	NB Thru	NB Right	NB Right 2	SB Left	SB Thru	SB Right	SB Left 1	SWB Left 1	SWB Right 2	SWB Right 1	SWB Left 2	Total
00: All Day (12am-12am)	216	713	553	336	228	680	127	-	636	2,012	304	130	148	2,124	123	27	-	271	11	299	8,938
01: 6am (6am-7am)	-	-	-	-	-	-	-	-	-	38	31	13	-	121	-	-	-	-	-	-	203
03: 8am (8am-9am)	-	54	104	25	39	191	7	-	62	133	2	2	-	283	37	-	-	48	6	54	1,047
04: 9am (9am-10am)	31	52	62	-	4	39	-	-	70	57	2	-	30	197	-	-	-	-	-	-	544
05: 10am (10am-11am)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06: 11am (11am-12noon)	-	71	20	33	-	11	-	-	48	151	13	7	-	141	-	-	-	13	-	-	508
07: 12pm (12noon-1pm)	-	-	30	27	11	19	15	-	53	52	4	25	26	72	-	10	-	14	-	-	358
08: 1pm (1pm-2pm)	-	18	22	15	-	25	8	-	24	116	6	11	7	90	39	-	-	-	-	27	408
09: 2pm (2pm-3pm)	31	38	21	-	4	28	-	-	63	103	4	-	-	103	-	-	-	53	-	14	462
10: 3pm (3pm-4pm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11: 4pm (4pm-5pm)	86	69	64	78	9	115	11	-	31	172	47	28	25	119	-	17	-	41	-	25	937
12: 5pm (5pm-6pm)	18	74	55	77	16	25	49	-	15	207	37	7	22	167	-	-	-	37	-	27	833
13: 6pm (6pm-7pm)	29	54	89	14	8	37	14	-	-	255	26	-	-	112	-	-	-	21	-	28	687
02: 7am (7am-8am)	15	17	20	-	79	113	5	-	-	134	20	-	29	217	-	-	-	-	-	66	715
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

2: Weekend Day (Sa-Sa)

TURNING MOVEMENT COUNTS

Day Part	Military Rd NW (EB) EB Left	EB Thru	EB Right	Military Rd NW (WB) WB Left	WB Thru	WB Right	27th St NW (NB) NB Left	NB Thru	NB Right	27th St NW (SB) SB Left	SB Thru	SB Right	Total
00: All Day (12am-12am)	738	15,536	375	280	17,805	755	608	978	658	727	672	559	39,691
01: 6am (6am-7am)	12	136	10	-	421	2	-	8	2	14	19	12	636
02: 7am (7am-8am)	27	357	18	1	603	4	-	13	3	13	21	25	1,085
03: 8am (8am-9am)	44	523	35	15	885	38	10	7	10	44	22	21	1,654
04: 9am (9am-10am)	54	702	30	28	1,020	53	18	39	21	53	54	10	2,082
05: 10am (10am-11am)	42	794	12	19	954	56	53	48	35	50	70	26	2,159
06: 11am (11am-12noon)	77	850	23	25	1,144	48	20	62	66	49	38	60	2,462
07: 12pm (12noon-1pm)	39	1,081	8	25	1,244	51	38	102	67	54	28	49	2,786
08: 1pm (1pm-2pm)	68	1,078	19	16	1,186	72	48	49	41	81	43	37	2,738
09: 2pm (2pm-3pm)	40	1,038	22	25	1,336	59	53	84	67	63	43	26	2,856
10: 3pm (3pm-4pm)	39	1,247	14	30	1,202	52	47	76	56	54	49	48	2,914
11: 4pm (4pm-5pm)	58	1,263	33	23	1,321	60	35	87	83	56	35	57	3,111
12: 5pm (5pm-6pm)	48	1,096	26	11	1,316	67	63	74	50	67	53	29	2,900
13: 6pm (6pm-7pm)	34	1,143	37	29	1,090	24	73	37	28	35	57	12	2,599
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	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

2: Weekend Day (Sa-Sa)

TURNING MOVEMENT COUNTS

Day Part	Rittenhouse St NW (EB)			Rittenhouse St NW (WB)			Nebraska Ave NW (NB)			Nebraska Ave NW (SB)			Total
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
00: All Day (12am-12am)	199	327	48	99	324	22	30	1,648	122	12	1,500	144	4,475
01: 6am (6am-7am)	-	-	-	-	-	-	-	-	-	-	20	-	20
02: 7am (7am-8am)	10	4	-	-	23	4	-	18	-	-	57	-	116
03: 8am (8am-9am)	10	24	-	-	-	-	-	9	10	-	42	4	99
04: 9am (9am-10am)	-	23	-	-	24	-	-	68	5	-	82	2	204
05: 10am (10am-11am)	2	24	-	8	4	-	-	67	9	7	124	3	248
06: 11am (11am-12noon)	3	22	1	17	22	-	1	97	14	-	125	6	308
07: 12pm (12noon-1pm)	27	7	-	4	18	-	-	97	28	-	82	-	263
08: 1pm (1pm-2pm)	18	52	-	-	27	9	-	123	11	-	117	7	364
09: 2pm (2pm-3pm)	35	32	6	4	29	2	3	170	4	-	113	4	402
10: 3pm (3pm-4pm)	7	8	4	11	23	-	4	132	-	-	148	13	350
11: 4pm (4pm-5pm)	19	40	-	11	48	5	6	149	11	-	125	8	422
12: 5pm (5pm-6pm)	9	23	4	15	34	5	4	141	-	4	135	13	387
13: 6pm (6pm-7pm)	9	11	5	7	16	-	3	144	6	-	99	5	305
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
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Day Type

2: Weekend Day (Sa-Sa)

TURNING MOVEMENT COUNTS

Day Part	Nebraska Ave NW EB Left	EB Thru	EB Right	Nebraska Ave NW WB Left	WB Thru	WB Right	Utah Ave NW NB Left	NB Thru	NB Right	Utah Ave NW SB Left	SB Thru	SB Right	Total
00: All Day (12am-12am)	709	1,760	231	87	1,468	193	192	1,699	107	177	1,578	812	9,013
01: 6am (6am-7am)	-	-	10	-	16	-	2	9	-	-	26	5	68
02: 7am (7am-8am)	4	12	2	4	59	-	1	20	-	5	34	38	179
03: 8am (8am-9am)	7	15	9	-	37	8	5	41	4	9	89	33	257
04: 9am (9am-10am)	21	70	1	5	85	16	6	63	8	3	89	58	425
05: 10am (10am-11am)	45	54	15	14	123	9	14	93	3	10	111	45	536
06: 11am (11am-12noon)	38	88	7	16	115	18	10	120	6	13	91	86	608
07: 12pm (12noon-1pm)	75	137	18	6	54	14	7	107	10	5	120	62	615
08: 1pm (1pm-2pm)	48	127	7	3	122	20	3	124	12	7	144	37	654
09: 2pm (2pm-3pm)	39	174	8	7	113	3	17	117	12	9	118	51	668
10: 3pm (3pm-4pm)	53	139	11	-	139	19	13	145	7	10	122	37	695
11: 4pm (4pm-5pm)	42	146	26	5	118	15	10	167	3	28	124	48	732
12: 5pm (5pm-6pm)	41	168	26	5	134	12	25	168	4	15	96	67	761
13: 6pm (6pm-7pm)	70	138	19	4	87	21	35	56	-	7	101	73	611
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-

Day Type

2: Weekend Day (Sa-Sa)

TURNING MOVEMENT COUNTS

	Rittenhouse St NW (EB)				Rittenhouse St NW (WB)				Utah Ave NW (NB)				Utah Ave NW (SB)				30th St NW (SWB)				
Day Part	EB Left	EB Thru	EB Right	EB Left 1	WB Left	WB Thru	WB Right	WB Right 1	NB Left	NB Thru	NB Right	NB Right 2	SB Left	SB Thru	SB Right	SB Left 1	SWB Left 1	SWB Right 2	SWB Right 1	SWB Left 2	Total
00: All Day (12am-12am)	133	732	675	189	133	666	98	15	716	1,573	180	186	137	1,440	171	88	-	178	70	134	7,514
01: 6am (6am-7am)	1	-	7	12	6	-	-	-	3	6	-	-	3	21	2	-	-	6	-	-	67
02: 7am (7am-8am)	-	18	13	-	4	51	-	-	14	8	3	-	-	66	3	-	-	-	-	-	180
03: 8am (8am-9am)	-	30	68	-	1	12	4	-	23	38	1	-	6	51	7	-	-	-	-	-	241
04: 9am (9am-10am)	9	23	34	-	13	34	3	-	33	62	-	6	3	84	9	6	-	10	-	9	338
05: 10am (10am-11am)	3	56	41	24	11	31	-	-	34	105	9	11	7	87	21	-	-	-	-	7	447
06: 11am (11am-12noon)	22	29	45	10	17	29	8	-	51	87	8	25	24	93	10	-	-	13	5	24	500
07: 12pm (12noon-1pm)	-	56	49	-	7	37	18	-	32	117	7	18	6	104	33	12	-	36	-	-	532
08: 1pm (1pm-2pm)	19	46	50	18	3	60	-	-	64	120	18	12	13	106	16	-	-	21	-	14	580
09: 2pm (2pm-3pm)	5	107	62	16	4	51	12	11	61	95	18	20	13	113	7	16	-	14	-	-	625
10: 3pm (3pm-4pm)	14	38	53	7	2	49	9	-	53	126	9	5	-	107	16	-	-	13	39	8	548
11: 4pm (4pm-5pm)	9	46	50	18	11	51	3	-	94	117	17	7	-	106	9	-	-	11	10	16	575
12: 5pm (5pm-6pm)	18	41	40	-	12	58	12	-	86	110	12	-	6	96	6	6	-	13	-	5	521
13: 6pm (6pm-7pm)	12	31	29	14	7	31	16	-	28	106	18	17	13	112	15	12	-	6	-	18	485
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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APPENDIX C
LEVEL OF SERVICE DESCRIPTIONS

Level of Service Criteria for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 1. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 1. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Exhibit 2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Exhibit 2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

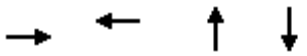
LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

APPENDIX D
EXISTING LEVEL OF SERVICE AND QUEUE REPORTS

Queues
1: Utah Avenue & Nebraska Ave NW

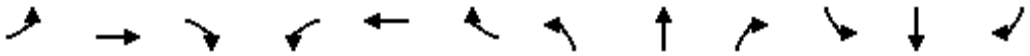
01/18/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	347	77	181	255
v/c Ratio	0.99	0.18	0.36	0.49
Control Delay	69.4	11.1	14.4	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	69.4	11.1	14.4	13.2
Queue Length 50th (ft)	98	11	37	40
Queue Length 95th (ft)	#241	35	78	93
Internal Link Dist (ft)	1002	2085	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	350	419	509	519
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.99	0.18	0.36	0.49

Intersection Summary

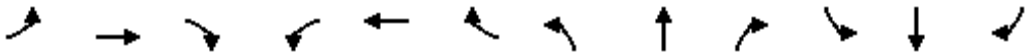
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	138	20	9	39	22	10	143	10	14	125	90
Future Volume (vph)	155	138	20	9	39	22	10	143	10	14	125	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.99			0.95	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1400			1433			1521			1424	
Flt Permitted		0.80			0.93			0.97			0.97	
Satd. Flow (perm)		1153			1342			1484			1392	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	172	153	22	10	43	24	11	159	11	16	139	100
RTOR Reduction (vph)	0	5	0	0	17	0	0	5	0	0	46	0
Lane Group Flow (vph)	0	342	0	0	60	0	0	176	0	0	209	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		345			402			504			473	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.04			0.12			c0.15	
v/c Ratio		0.99			0.15			0.35			0.44	
Uniform Delay, d1		17.4			12.8			12.4			12.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		46.4			0.8			1.9			3.0	
Delay (s)		63.8			13.6			14.3			15.8	
Level of Service		E			B			B			B	
Approach Delay (s)		63.8			13.6			14.3			15.8	
Approach LOS		E			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

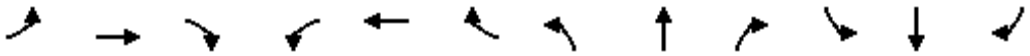
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	83	65	12	78	13	86	202	63	10	149	11
Future Volume (vph)	27	83	65	12	78	13	86	202	63	10	149	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	90	71	13	85	14	93	220	68	11	162	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	190	112	381	185
Volume Left (vph)	29	13	93	11
Volume Right (vph)	71	14	68	12
Hadj (s)	-0.16	-0.02	-0.02	0.01
Departure Headway (s)	5.4	5.7	5.0	5.3
Degree Utilization, x	0.29	0.18	0.53	0.27
Capacity (veh/h)	599	553	679	621
Control Delay (s)	10.6	10.0	13.6	10.3
Approach Delay (s)	10.6	10.0	13.6	10.3
Approach LOS	B	A	B	B

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	83	65	161	89	23	72	202	59	4	0	14
Future Volume (vph)	27	83	65	161	89	23	72	202	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	90	71	175	97	25	78	220	64	4	0	15

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	190	297	362	19
Volume Left (vph)	29	175	78	4
Volume Right (vph)	71	25	64	15
Hadj (s)	-0.16	0.10	-0.03	-0.40
Departure Headway (s)	5.3	5.4	5.2	5.5
Degree Utilization, x	0.28	0.44	0.52	0.03
Capacity (veh/h)	626	633	649	543
Control Delay (s)	10.3	12.5	13.8	8.6
Approach Delay (s)	10.3	12.5	13.8	8.6
Approach LOS	B	B	B	A

Intersection Summary				
Delay	12.5			
Level of Service	B			
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Traffic Vol, veh/h	27	83	65	161	89	23	72	202	59	4	0	14
Future Vol, veh/h	27	83	65	161	89	23	72	202	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	90	71	175	97	25	78	220	64	4	0	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.3	12.6	13.8	8.7
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	22%	15%	59%	22%
Vol Thru, %	61%	47%	33%	0%
Vol Right, %	18%	37%	8%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	333	175	273	18
LT Vol	72	27	161	4
Through Vol	202	83	89	0
RT Vol	59	65	23	14
Lane Flow Rate	362	190	297	20
Geometry Grp	1	1	1	1
Degree of Util (X)	0.523	0.278	0.441	0.03
Departure Headway (Hd)	5.202	5.257	5.346	5.44
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	695	683	674	656
Service Time	3.233	3.293	3.379	3.49
HCM Lane V/C Ratio	0.521	0.278	0.441	0.03
HCM Control Delay	13.8	10.3	12.6	8.7
HCM Lane LOS	B	B	B	A
HCM 95th-tile Q	3.1	1.1	2.3	0.1

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	83	65	12	78	13	86	202	63	10	149	11
Future Vol, veh/h	27	83	65	12	78	13	86	202	63	10	149	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	90	71	13	85	14	93	220	68	11	162	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.6	10	13.6	10.4
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	15%	12%	6%
Vol Thru, %	58%	47%	76%	88%
Vol Right, %	18%	37%	13%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	351	175	103	170
LT Vol	86	27	12	10
Through Vol	202	83	78	149
RT Vol	63	65	13	11
Lane Flow Rate	382	190	112	185
Geometry Grp	1	1	1	1
Degree of Util (X)	0.531	0.286	0.177	0.273
Departure Headway (Hd)	5.012	5.41	5.691	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	721	664	629	674
Service Time	3.043	3.449	3.735	3.355
HCM Lane V/C Ratio	0.53	0.286	0.178	0.274
HCM Control Delay	13.6	10.6	10	10.4
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	3.2	1.2	0.6	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	65	6	0	95	11	0	188	10	26	81	0
Future Volume (vph)	40	65	6	0	95	11	0	188	10	26	81	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	72	7	0	106	12	0	209	11	29	90	0

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	123	118	220	119
Volume Left (vph)	44	0	0	29
Volume Right (vph)	7	12	11	0
Hadj (s)	0.07	-0.03	0.00	0.08
Departure Headway (s)	5.0	4.9	4.7	4.9
Degree Utilization, x	0.17	0.16	0.29	0.16
Capacity (veh/h)	667	679	730	687
Control Delay (s)	9.0	8.8	9.5	8.8
Approach Delay (s)	9.0	8.8	9.5	8.8
Approach LOS	A	A	A	A

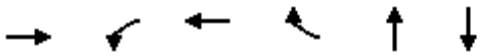
Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	65	6	0	95	11	0	188	10	26	81	0
Future Vol, veh/h	40	65	6	0	95	11	0	188	10	26	81	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	72	7	0	106	12	0	209	11	29	90	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	8.8	9.5	8.8
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	0%	36%	0%	24%
Vol Thru, %	95%	59%	90%	76%
Vol Right, %	5%	5%	10%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	198	111	106	107
LT Vol	0	40	0	26
Through Vol	188	65	95	81
RT Vol	10	6	11	0
Lane Flow Rate	220	123	118	119
Geometry Grp	1	1	1	1
Degree of Util (X)	0.284	0.169	0.158	0.16
Departure Headway (Hd)	4.64	4.929	4.836	4.838
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	772	724	737	738
Service Time	2.686	2.982	2.891	2.89
HCM Lane V/C Ratio	0.285	0.17	0.16	0.161
HCM Control Delay	9.5	9	8.8	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.6	0.6	0.6



Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1516	42	1051	159	287	256
v/c Ratio	1.39	0.53	1.22	0.23	0.58	1.12
Control Delay	204.9	41.4	130.8	10.9	29.2	125.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	204.9	41.4	130.8	10.9	29.2	125.4
Queue Length 50th (ft)	~540	13	~655	39	120	~149
Queue Length 95th (ft)	#671	#67	#884	73	200	#291
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	1087	80	862	684	498	229
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.39	0.53	1.22	0.23	0.58	1.12

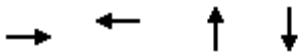
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1340	10	38	946	143	14	42	202	210	17	4
Future Volume (vph)	14	1340	10	38	946	143	14	42	202	210	17	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.89			1.00	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (prot)		2832		1525	1605	1274		1704			1475	
Flt Permitted		0.71		0.09	1.00	1.00		0.97			0.50	
Satd. Flow (perm)		2023		149	1605	1274		1661			764	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	1489	11	42	1051	159	16	47	224	233	19	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1516	0	42	1051	159	0	287	0	0	256	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)										1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Effective Green, g (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Actuated g/C Ratio		0.54		0.54	0.54	0.54		0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1087		80	862	684		498			229	
v/s Ratio Prot					0.65							
v/s Ratio Perm		c0.75		0.28		0.12		0.17			c0.33	
v/c Ratio		1.39		0.53	1.22	0.23		0.58			1.12	
Uniform Delay, d1		18.5		11.9	18.5	9.8		23.7			28.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		183.3		22.5	109.2	0.8		1.6			94.8	
Delay (s)		201.8		34.4	127.7	10.6		25.3			122.8	
Level of Service		F		C	F	B		C			F	
Approach Delay (s)		201.8			109.7			25.3			122.8	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	145.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	264	169	221	201
v/c Ratio	0.66	0.38	0.45	0.39
Control Delay	25.0	16.1	16.4	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	16.1	16.4	11.3
Queue Length 50th (ft)	63	36	48	28
Queue Length 95th (ft)	#153	78	98	71
Internal Link Dist (ft)	1002	2085	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	398	446	491	511
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.38	0.45	0.39

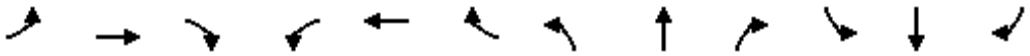
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	170	26	5	135	12	25	170	4	15	97	68
Future Volume (vph)	41	170	26	5	135	12	25	170	4	15	97	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			1.00			0.95	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		1413			1488			1525			1425	
Flt Permitted		0.91			0.98			0.94			0.96	
Satd. Flow (perm)		1299			1467			1443			1377	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	189	29	6	150	13	28	189	4	17	108	76
RTOR Reduction (vph)	0	9	0	0	6	0	0	1	0	0	44	0
Lane Group Flow (vph)	0	255	0	0	163	0	0	220	0	0	157	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		389			440			490			468	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.11			c0.15			0.11	
v/c Ratio		0.66			0.37			0.45			0.34	
Uniform Delay, d1		15.2			13.8			12.8			12.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.3			2.4			3.0			1.9	
Delay (s)		23.6			16.2			15.8			14.2	
Level of Service		C			B			B			B	
Approach Delay (s)		23.6			16.2			15.8			14.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

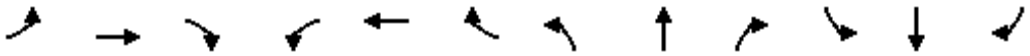
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	46	51	11	52	3	105	129	40	0	109	9
Future Volume (vph)	27	46	51	11	52	3	105	129	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	50	55	12	57	3	114	140	43	0	118	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	134	72	297	128
Volume Left (vph)	29	12	114	0
Volume Right (vph)	55	3	43	10
Hadj (s)	-0.17	0.04	0.02	-0.01
Departure Headway (s)	4.9	5.2	4.6	4.8
Degree Utilization, x	0.18	0.10	0.38	0.17
Capacity (veh/h)	674	628	748	703
Control Delay (s)	8.9	8.8	10.4	8.8
Approach Delay (s)	8.9	8.8	10.4	8.8
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.6			
Level of Service	A			
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	46	51	120	61	3	95	135	7	16	11	10
Future Volume (vph)	27	46	51	120	61	3	95	135	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	50	55	130	66	3	103	147	8	17	12	11

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	134	199	258	40
Volume Left (vph)	29	130	103	17
Volume Right (vph)	55	3	8	11
Hadj (s)	-0.17	0.16	0.10	-0.05
Departure Headway (s)	4.8	5.0	4.9	5.1
Degree Utilization, x	0.18	0.28	0.35	0.06
Capacity (veh/h)	692	675	697	639
Control Delay (s)	8.8	9.9	10.5	8.4
Approach Delay (s)	8.8	9.9	10.5	8.4
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.8			
Level of Service	A			
Intersection Capacity Utilization	42.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	46	51	11	52	3	105	129	40	0	109	9
Future Vol, veh/h	27	46	51	11	52	3	105	129	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	50	55	12	57	3	114	140	43	0	118	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.9	8.8	10.4	8.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	22%	17%	0%
Vol Thru, %	47%	37%	79%	92%
Vol Right, %	15%	41%	5%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	274	124	66	118
LT Vol	105	27	11	0
Through Vol	129	46	52	109
RT Vol	40	51	3	9
Lane Flow Rate	298	135	72	128
Geometry Grp	1	1	1	1
Degree of Util (X)	0.379	0.18	0.102	0.169
Departure Headway (Hd)	4.584	4.82	5.114	4.744
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	783	741	697	753
Service Time	2.628	2.874	3.174	2.797
HCM Lane V/C Ratio	0.381	0.182	0.103	0.17
HCM Control Delay	10.4	8.9	8.8	8.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.8	0.7	0.3	0.6

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	46	51	120	61	3	95	135	7	16	11	10
Future Vol, veh/h	27	46	51	120	61	3	95	135	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	50	55	130	66	3	103	147	8	17	12	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	9.9	10.5	8.4
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	40%	22%	65%	43%
Vol Thru, %	57%	37%	33%	30%
Vol Right, %	3%	41%	2%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	237	124	184	37
LT Vol	95	27	120	16
Through Vol	135	46	61	11
RT Vol	7	51	3	10
Lane Flow Rate	258	135	200	40
Geometry Grp	1	1	1	1
Degree of Util (X)	0.347	0.177	0.275	0.056
Departure Headway (Hd)	4.856	4.728	4.958	5.01
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	737	753	720	709
Service Time	2.91	2.788	3.014	3.084
HCM Lane V/C Ratio	0.35	0.179	0.278	0.056
HCM Control Delay	10.5	8.8	9.9	8.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.6	0.6	1.1	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	40	0	11	48	5	6	150	11	0	126	8
Future Volume (vph)	19	40	0	11	48	5	6	150	11	0	126	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	44	0	12	53	6	7	167	12	0	140	9

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	65	71	186	149
Volume Left (vph)	21	12	7	0
Volume Right (vph)	0	6	12	9
Hadj (s)	0.10	0.02	0.00	0.00
Departure Headway (s)	4.9	4.8	4.4	4.5
Degree Utilization, x	0.09	0.09	0.23	0.18
Capacity (veh/h)	680	693	783	769
Control Delay (s)	8.3	8.3	8.7	8.5
Approach Delay (s)	8.3	8.3	8.7	8.5
Approach LOS	A	A	A	A

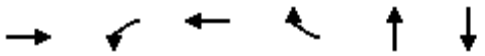
Intersection Summary				
Delay	8.5			
Level of Service	A			
Intersection Capacity Utilization	27.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	19	40	0	11	48	5	6	150	11	0	126	8
Future Vol, veh/h	19	40	0	11	48	5	6	150	11	0	126	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	44	0	12	53	6	7	167	12	0	140	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.3	8.7	8.5
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	4%	32%	17%	0%
Vol Thru, %	90%	68%	75%	94%
Vol Right, %	7%	0%	8%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	167	59	64	134
LT Vol	6	19	11	0
Through Vol	150	40	48	126
RT Vol	11	0	5	8
Lane Flow Rate	186	66	71	149
Geometry Grp	1	1	1	1
Degree of Util (X)	0.227	0.088	0.094	0.183
Departure Headway (Hd)	4.4	4.842	4.759	4.435
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	816	739	753	810
Service Time	2.421	2.873	2.789	2.458
HCM Lane V/C Ratio	0.228	0.089	0.094	0.184
HCM Control Delay	8.7	8.3	8.3	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.3	0.7



Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1521	26	1482	68	230	166
v/c Ratio	8.64	0.16	1.48	0.09	0.65	0.74
Control Delay	3456.8	11.6	241.8	7.9	36.7	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3456.8	11.6	241.8	7.9	36.7	47.8
Queue Length 50th (ft)	~1460	5	~1037	12	106	78
Queue Length 95th (ft)	#1742	22	#1357	35	158	131
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	176	160	1001	794	445	285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	8.64	0.16	1.48	0.09	0.52	0.58

Intersection Summary

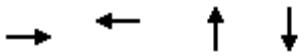
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1276	33	23	1334	61	35	88	84	57	35	58
Future Volume (vph)	59	1276	33	23	1334	61	35	88	84	57	35	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.95			0.95	
Flt Protected		1.00		0.95	1.00	1.00		0.99			0.98	
Satd. Flow (prot)		1313		1525	1605	1274		1790			1438	
Flt Permitted		0.21		0.16	1.00	1.00		0.92			0.72	
Satd. Flow (perm)		282		256	1605	1274		1654			1056	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	1418	37	26	1482	68	39	98	93	63	39	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1521	0	26	1482	68	0	230	0	0	166	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)	1	1	1							1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		49.9		49.9	49.9	49.9		17.1			17.1	
Effective Green, g (s)		49.9		49.9	49.9	49.9		17.1			17.1	
Actuated g/C Ratio		0.62		0.62	0.62	0.62		0.21			0.21	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		175		159	1001	794		353			225	
v/s Ratio Prot					0.92							
v/s Ratio Perm		c5.39		0.10		0.05		0.14			c0.16	
v/c Ratio		8.69		0.16	1.48	0.09		0.65			0.74	
Uniform Delay, d1		15.1		6.3	15.1	6.0		28.7			29.4	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		3472.7		2.2	221.6	0.2		4.3			11.9	
Delay (s)		3487.8		8.5	236.7	6.2		33.0			41.3	
Level of Service		F		A	F	A		C			D	
Approach Delay (s)		3487.8			223.0			33.0			41.3	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	1623.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	7.05		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	159.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E
BACKGROUND LEVELS OF SERVICE AND QUEUE REPORTS

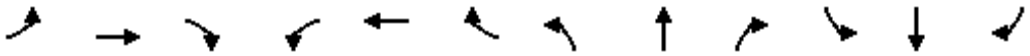


Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	359	79	191	298
v/c Ratio	1.02	0.19	0.38	0.57
Control Delay	77.5	11.0	14.3	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	77.5	11.0	14.3	15.4
Queue Length 50th (ft)	~106	11	38	51
Queue Length 95th (ft)	#250	36	81	115
Internal Link Dist (ft)	1002	2085	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	351	419	509	519
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.19	0.38	0.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

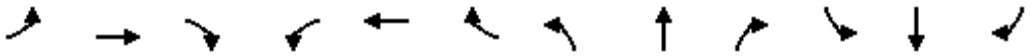
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	146	21	9	39	23	10	145	17	18	144	106
Future Volume (vph)	157	146	21	9	39	23	10	145	17	18	144	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.99			0.95	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1400			1430			1513			1423	
Flt Permitted		0.81			0.93			0.97			0.97	
Satd. Flow (perm)		1156			1339			1475			1385	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	174	162	23	10	43	26	11	161	19	20	160	118
RTOR Reduction (vph)	0	5	0	0	18	0	0	8	0	0	48	0
Lane Group Flow (vph)	0	354	0	0	61	0	0	183	0	0	250	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		346			401			501			470	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.05			0.12			c0.18	
v/c Ratio		1.02			0.15			0.37			0.53	
Uniform Delay, d1		17.5			12.8			12.4			13.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		54.5			0.8			2.1			4.3	
Delay (s)		72.0			13.6			14.5			17.6	
Level of Service		E			B			B			B	
Approach Delay (s)		72.0			13.6			14.5			17.6	
Approach LOS		E			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	83	65	12	78	13	86	202	63	10	149	11
Future Volume (vph)	27	83	65	12	78	13	86	202	63	10	149	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	90	71	13	85	14	93	220	68	11	162	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	190	112	381	185
Volume Left (vph)	29	13	93	11
Volume Right (vph)	71	14	68	12
Hadj (s)	-0.16	-0.02	-0.02	0.01
Departure Headway (s)	5.4	5.7	5.0	5.3
Degree Utilization, x	0.29	0.18	0.53	0.27
Capacity (veh/h)	599	553	679	621
Control Delay (s)	10.6	10.0	13.6	10.3
Approach Delay (s)	10.6	10.0	13.6	10.3
Approach LOS	B	A	B	B

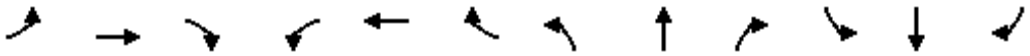
Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	83	65	12	78	13	86	202	63	10	149	11
Future Vol, veh/h	27	83	65	12	78	13	86	202	63	10	149	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	90	71	13	85	14	93	220	68	11	162	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.6	10	13.6	10.4
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	15%	12%	6%
Vol Thru, %	58%	47%	76%	88%
Vol Right, %	18%	37%	13%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	351	175	103	170
LT Vol	86	27	12	10
Through Vol	202	83	78	149
RT Vol	63	65	13	11
Lane Flow Rate	382	190	112	185
Geometry Grp	1	1	1	1
Degree of Util (X)	0.531	0.286	0.177	0.273
Departure Headway (Hd)	5.012	5.41	5.691	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	721	664	629	674
Service Time	3.043	3.449	3.735	3.355
HCM Lane V/C Ratio	0.53	0.286	0.178	0.274
HCM Control Delay	13.6	10.6	10	10.4
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	3.2	1.2	0.6	1.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	83	65	161	89	23	72	202	59	4	0	14
Future Volume (vph)	27	83	65	161	89	23	72	202	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	90	71	175	97	25	78	220	64	4	0	15

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	190	297	362	19
Volume Left (vph)	29	175	78	4
Volume Right (vph)	71	25	64	15
Hadj (s)	-0.16	0.10	-0.03	-0.40
Departure Headway (s)	5.3	5.4	5.2	5.5
Degree Utilization, x	0.28	0.44	0.52	0.03
Capacity (veh/h)	626	633	649	543
Control Delay (s)	10.3	12.5	13.8	8.6
Approach Delay (s)	10.3	12.5	13.8	8.6
Approach LOS	B	B	B	A

Intersection Summary				
Delay	12.5			
Level of Service	B			
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Traffic Vol, veh/h	27	83	65	161	89	23	72	202	59	4	0	14
Future Vol, veh/h	27	83	65	161	89	23	72	202	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	90	71	175	97	25	78	220	64	4	0	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.3	12.6	13.8	8.7
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	22%	15%	59%	22%
Vol Thru, %	61%	47%	33%	0%
Vol Right, %	18%	37%	8%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	333	175	273	18
LT Vol	72	27	161	4
Through Vol	202	83	89	0
RT Vol	59	65	23	14
Lane Flow Rate	362	190	297	20
Geometry Grp	1	1	1	1
Degree of Util (X)	0.523	0.278	0.441	0.03
Departure Headway (Hd)	5.202	5.257	5.346	5.44
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	695	683	674	656
Service Time	3.233	3.293	3.379	3.49
HCM Lane V/C Ratio	0.521	0.278	0.441	0.03
HCM Control Delay	13.8	10.3	12.6	8.7
HCM Lane LOS	B	B	B	A
HCM 95th-tile Q	3.1	1.1	2.3	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	66	6	0	96	11	0	192	10	26	83	0
Future Volume (vph)	40	66	6	0	96	11	0	192	10	26	83	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	73	7	0	107	12	0	213	11	29	92	0

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	124	119	224	121
Volume Left (vph)	44	0	0	29
Volume Right (vph)	7	12	11	0
Hadj (s)	0.07	-0.03	0.00	0.08
Departure Headway (s)	5.0	4.9	4.7	4.9
Degree Utilization, x	0.17	0.16	0.29	0.16
Capacity (veh/h)	664	676	729	685
Control Delay (s)	9.0	8.8	9.6	8.9
Approach Delay (s)	9.0	8.8	9.6	8.9
Approach LOS	A	A	A	A

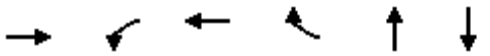
Intersection Summary				
Delay	9.2			
Level of Service	A			
Intersection Capacity Utilization	41.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	66	6	0	96	11	0	192	10	26	83	0
Future Vol, veh/h	40	66	6	0	96	11	0	192	10	26	83	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	73	7	0	107	12	0	213	11	29	92	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	8.8	9.6	8.9
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	0%	36%	0%	24%
Vol Thru, %	95%	59%	90%	76%
Vol Right, %	5%	5%	10%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	112	107	109
LT Vol	0	40	0	26
Through Vol	192	66	96	83
RT Vol	10	6	11	0
Lane Flow Rate	224	124	119	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0.29	0.171	0.16	0.163
Departure Headway (Hd)	4.652	4.948	4.856	4.851
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	770	722	735	736
Service Time	2.698	3.001	2.911	2.903
HCM Lane V/C Ratio	0.291	0.172	0.162	0.164
HCM Control Delay	9.6	9	8.8	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.6	0.6	0.6

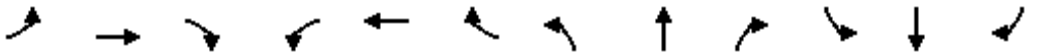


Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1539	42	1067	169	291	280
v/c Ratio	1.42	0.53	1.24	0.25	0.59	1.24
Control Delay	214.3	41.4	138.6	11.1	29.5	168.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	214.3	41.4	138.6	11.1	29.5	168.3
Queue Length 50th (ft)	~553	13	~671	42	123	~176
Queue Length 95th (ft)	#684	#67	#901	78	202	#323
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	1087	80	862	684	497	226
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.42	0.53	1.24	0.25	0.59	1.24

Intersection Summary

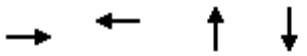
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1361	10	38	960	152	14	42	205	230	18	4
Future Volume (vph)	14	1361	10	38	960	152	14	42	205	230	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.89			1.00	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (prot)		2833		1525	1605	1274		1703			1475	
Flt Permitted		0.71		0.09	1.00	1.00		0.97			0.49	
Satd. Flow (perm)		2023		149	1605	1274		1658			755	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	1512	11	42	1067	169	16	47	228	256	20	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1539	0	42	1067	169	0	291	0	0	280	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)										1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Effective Green, g (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Actuated g/C Ratio		0.54		0.54	0.54	0.54		0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1087		80	862	684		497			226	
v/s Ratio Prot					0.66							
v/s Ratio Perm		c0.76		0.28		0.13		0.18			c0.37	
v/c Ratio		1.42		0.53	1.24	0.25		0.59			1.24	
Uniform Delay, d1		18.5		11.9	18.5	9.9		23.8			28.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		192.6		22.5	117.0	0.9		1.8			139.4	
Delay (s)		211.1		34.4	135.5	10.7		25.5			167.4	
Level of Service		F		C	F	B		C			F	
Approach Delay (s)		211.1			115.6			25.5			167.4	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	155.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	268	171	224	203
v/c Ratio	0.67	0.38	0.46	0.40
Control Delay	25.6	16.3	16.5	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	16.3	16.5	11.3
Queue Length 50th (ft)	64	37	49	28
Queue Length 95th (ft)	#157	80	100	71
Internal Link Dist (ft)	1002	2085	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	398	445	490	512
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.38	0.46	0.40

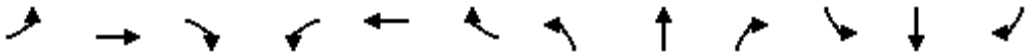
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	172	27	5	137	12	26	172	4	15	98	69
Future Volume (vph)	42	172	27	5	137	12	26	172	4	15	98	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			1.00			0.95	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		1413			1488			1524			1425	
Flt Permitted		0.91			0.98			0.94			0.96	
Satd. Flow (perm)		1297			1467			1440			1377	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	191	30	6	152	13	29	191	4	17	109	77
RTOR Reduction (vph)	0	9	0	0	6	0	0	1	0	0	44	0
Lane Group Flow (vph)	0	259	0	0	165	0	0	223	0	0	159	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		389			440			489			468	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.11			c0.15			0.12	
v/c Ratio		0.67			0.38			0.46			0.34	
Uniform Delay, d1		15.3			13.8			12.9			12.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.7			2.4			3.0			2.0	
Delay (s)		24.0			16.2			15.9			14.3	
Level of Service		C			B			B			B	
Approach Delay (s)		24.0			16.2			15.9			14.3	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

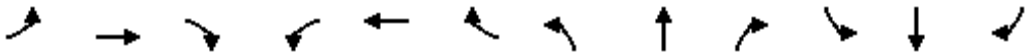
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	47	51	11	52	3	106	131	40	0	109	9
Future Volume (vph)	27	47	51	11	52	3	106	131	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	51	55	12	57	3	115	142	43	0	118	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	135	72	300	128
Volume Left (vph)	29	12	115	0
Volume Right (vph)	55	3	43	10
Hadj (s)	-0.17	0.04	0.02	-0.01
Departure Headway (s)	4.9	5.2	4.6	4.8
Degree Utilization, x	0.18	0.10	0.39	0.17
Capacity (veh/h)	672	626	747	702
Control Delay (s)	9.0	8.8	10.5	8.8
Approach Delay (s)	9.0	8.8	10.5	8.8
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.6			
Level of Service	A			
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	47	51	120	61	3	96	137	7	16	11	10
Future Volume (vph)	27	47	51	120	61	3	96	137	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	51	55	130	66	3	104	149	8	17	12	11

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	135	199	261	40
Volume Left (vph)	29	130	104	17
Volume Right (vph)	55	3	8	11
Hadj (s)	-0.17	0.16	0.10	-0.05
Departure Headway (s)	4.8	5.0	4.9	5.1
Degree Utilization, x	0.18	0.28	0.36	0.06
Capacity (veh/h)	691	673	697	638
Control Delay (s)	8.8	9.9	10.6	8.4
Approach Delay (s)	8.8	9.9	10.6	8.4
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.9			
Level of Service	A			
Intersection Capacity Utilization	42.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	47	51	11	52	3	106	131	40	0	109	9
Future Vol, veh/h	27	47	51	11	52	3	106	131	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	51	55	12	57	3	115	142	43	0	118	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	8.8	10.5	8.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	22%	17%	0%
Vol Thru, %	47%	38%	79%	92%
Vol Right, %	14%	41%	5%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	277	125	66	118
LT Vol	106	27	11	0
Through Vol	131	47	52	109
RT Vol	40	51	3	9
Lane Flow Rate	301	136	72	128
Geometry Grp	1	1	1	1
Degree of Util (X)	0.384	0.182	0.102	0.169
Departure Headway (Hd)	4.588	4.829	5.124	4.752
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	783	739	695	752
Service Time	2.633	2.886	3.186	2.806
HCM Lane V/C Ratio	0.384	0.184	0.104	0.17
HCM Control Delay	10.5	9	8.8	8.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.8	0.7	0.3	0.6

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	47	51	120	61	3	96	137	7	16	11	10
Future Vol, veh/h	27	47	51	120	61	3	96	137	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	51	55	130	66	3	104	149	8	17	12	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	9.9	10.6	8.4
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	40%	22%	65%	43%
Vol Thru, %	57%	38%	33%	30%
Vol Right, %	3%	41%	2%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	240	125	184	37
LT Vol	96	27	120	16
Through Vol	137	47	61	11
RT Vol	7	51	3	10
Lane Flow Rate	261	136	200	40
Geometry Grp	1	1	1	1
Degree of Util (X)	0.352	0.179	0.276	0.056
Departure Headway (Hd)	4.861	4.741	4.97	5.021
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	736	751	720	707
Service Time	2.915	2.801	3.026	3.095
HCM Lane V/C Ratio	0.355	0.181	0.278	0.057
HCM Control Delay	10.6	8.8	9.9	8.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.6	0.6	1.1	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	41	0	11	49	5	6	153	11	0	128	8
Future Volume (vph)	19	41	0	11	49	5	6	153	11	0	128	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	46	0	12	54	6	7	170	12	0	142	9

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	67	72	189	151
Volume Left (vph)	21	12	7	0
Volume Right (vph)	0	6	12	9
Hadj (s)	0.10	0.02	0.00	0.00
Departure Headway (s)	4.9	4.8	4.4	4.5
Degree Utilization, x	0.09	0.10	0.23	0.19
Capacity (veh/h)	678	690	780	767
Control Delay (s)	8.4	8.3	8.8	8.5
Approach Delay (s)	8.4	8.3	8.8	8.5
Approach LOS	A	A	A	A

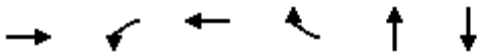
Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	19	41	0	11	49	5	6	153	11	0	128	8
Future Vol, veh/h	19	41	0	11	49	5	6	153	11	0	128	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	46	0	12	54	6	7	170	12	0	142	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.3	8.8	8.5
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	4%	32%	17%	0%
Vol Thru, %	90%	68%	75%	94%
Vol Right, %	6%	0%	8%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	170	60	65	136
LT Vol	6	19	11	0
Through Vol	153	41	49	128
RT Vol	11	0	5	8
Lane Flow Rate	189	67	72	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.231	0.09	0.096	0.187
Departure Headway (Hd)	4.409	4.857	4.776	4.446
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	814	737	750	807
Service Time	2.433	2.889	2.806	2.47
HCM Lane V/C Ratio	0.232	0.091	0.096	0.187
HCM Control Delay	8.8	8.4	8.3	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.3	0.7



Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1543	27	1504	69	233	167
v/c Ratio	8.77	0.17	1.50	0.09	0.66	0.74
Control Delay	3512.9	12.0	252.1	7.9	37.1	48.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3512.9	12.0	252.1	7.9	37.1	48.1
Queue Length 50th (ft)	~1484	5	~1061	12	107	78
Queue Length 95th (ft)	#1766	24	#1381	35	160	132
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	176	155	1000	794	445	284
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	8.77	0.17	1.50	0.09	0.52	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

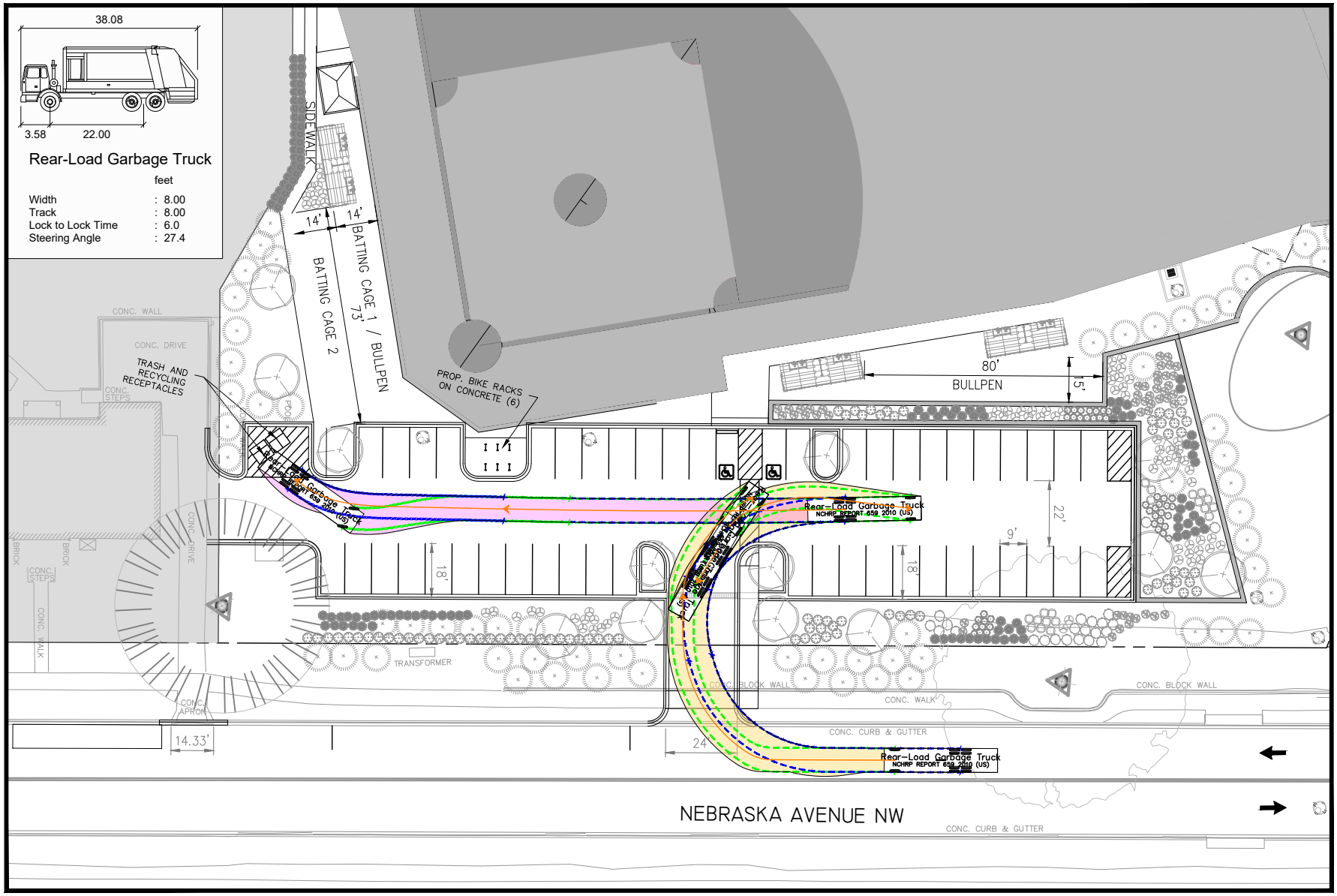
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1295	34	24	1354	62	36	89	85	57	36	58
Future Volume (vph)	59	1295	34	24	1354	62	36	89	85	57	36	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.95			0.95	
Flt Protected		1.00		0.95	1.00	1.00		0.99			0.98	
Satd. Flow (prot)		1313		1525	1605	1274		1790			1438	
Flt Permitted		0.21		0.16	1.00	1.00		0.91			0.72	
Satd. Flow (perm)		282		251	1605	1274		1650			1052	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	1439	38	27	1504	69	40	99	94	63	40	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1543	0	27	1504	69	0	233	0	0	167	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)	1	1	1							1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		49.9		49.9	49.9	49.9		17.1			17.1	
Effective Green, g (s)		49.9		49.9	49.9	49.9		17.1			17.1	
Actuated g/C Ratio		0.62		0.62	0.62	0.62		0.21			0.21	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		175		156	1001	794		352			224	
v/s Ratio Prot					0.94							
v/s Ratio Perm		c5.47		0.11		0.05		0.14			c0.16	
v/c Ratio		8.82		0.17	1.50	0.09		0.66			0.75	
Uniform Delay, d1		15.1		6.3	15.1	6.0		28.8			29.4	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		3529.3		2.4	231.4	0.2		4.6			12.6	
Delay (s)		3544.3		8.7	246.4	6.2		33.4			42.1	
Level of Service		F		A	F	A		C			D	
Approach Delay (s)		3544.3			232.1			33.4			42.1	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	1652.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	7.15		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	160.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F
SWEPT AREA DIAGRAMS

S:\PROJECTS - S DRIVE\8500-8999\8500 MARET SCHOOL SPORTS FIELDS\GRAPHICS\AUTOTURN\22.0119 MARET SCHOOL AUTOTURN EXHIBIT.DWG



AUTOTURN LEGEND

- Vehicle Body
- Front Tire Tread
- Rear Tire Tread
- Directional Path
- Vehicle Path
- Reverse Vehicle Path

NORTH

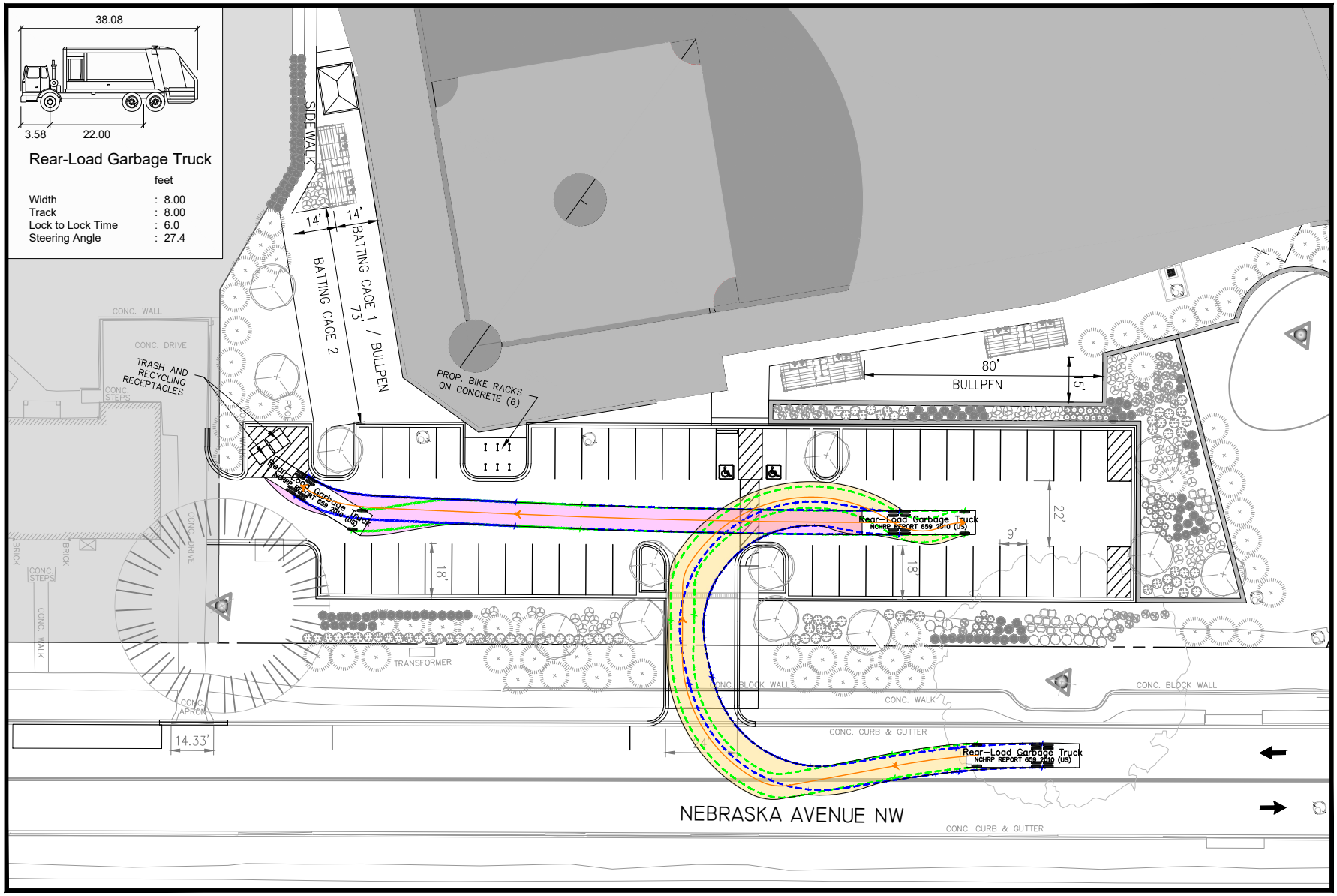
Maret School
Washington, DC

Figure 1

Trash Pickup - Ground Level Parking - Autoturn

Vehicle: Rear-Load Garbage Truck - Inbound- Option 1

S:\PROJECTS - S DRIVE\8500-8999\8500 MARET SCHOOL SPORTS FIELDS\GRAPHICS\AUTOTURN\22.0119 MARET SCHOOL AUTOTURN EXHIBIT.DWG



AUTOTURN LEGEND

- Vehicle Body
- Front Tire Tread
- Rear Tire Tread
- Directional Path
- Vehicle Path
- Reverse Vehicle Path

NORTH

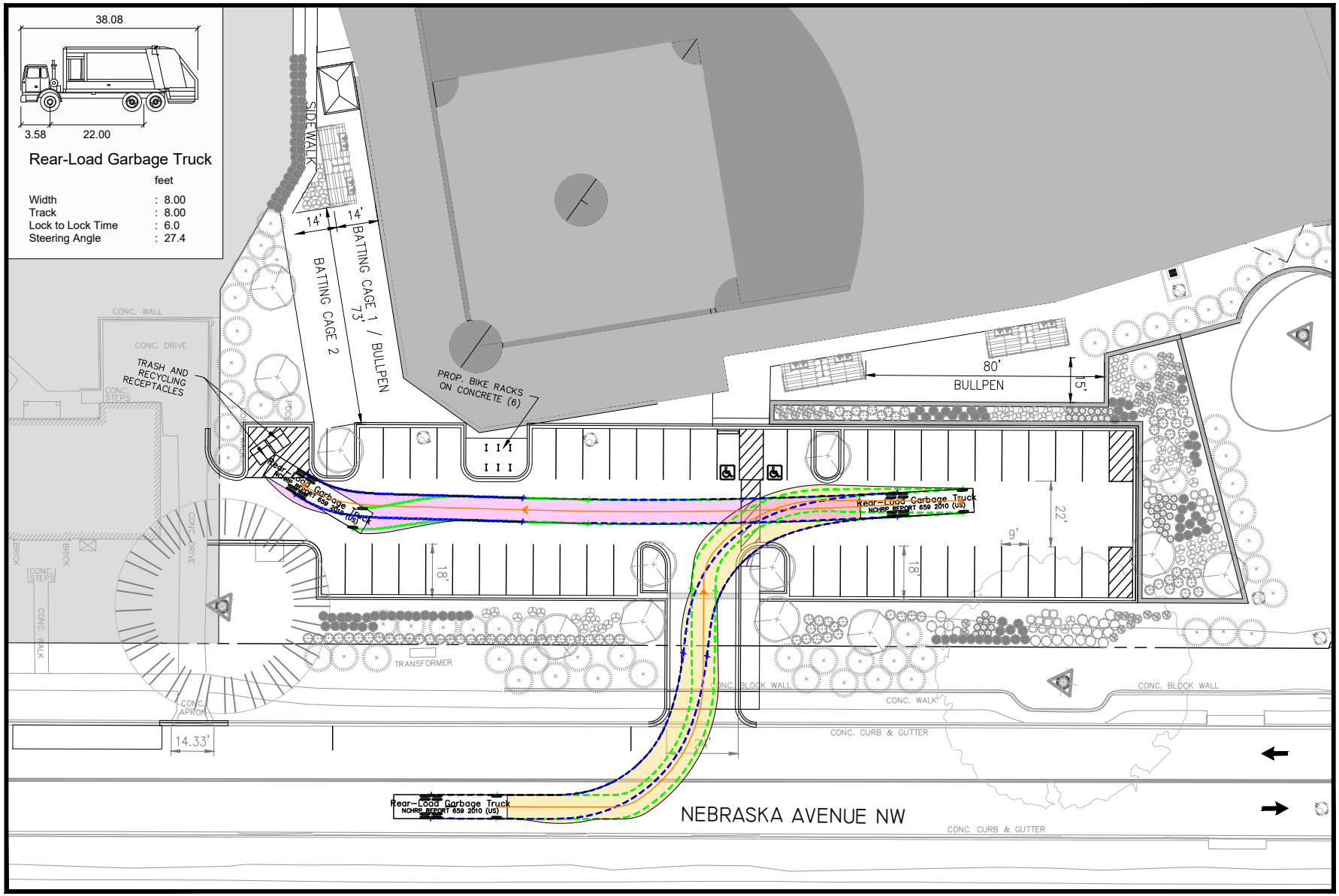
Maret School
Washington, DC

Figure 2

Trash Pickup - Ground Level Parking - Autoturn

Vehicle: Rear-Load Garbage Truck - Inbound- Option 2

S:\PROJECTS - S DRIVE\8500-8999\8500 MARET SCHOOL SPORTS FIELDS\GRAPHICS\AUTOTURN\22.0119 MARET SCHOOL AUTOTURN EXHIBIT.DWG



AUTOTURN LEGEND

- Vehicle Body
- Front Tire Tread
- Rear Tire Tread
- Directional Path
- Vehicle Path
- Reverse Vehicle Path

NORTH

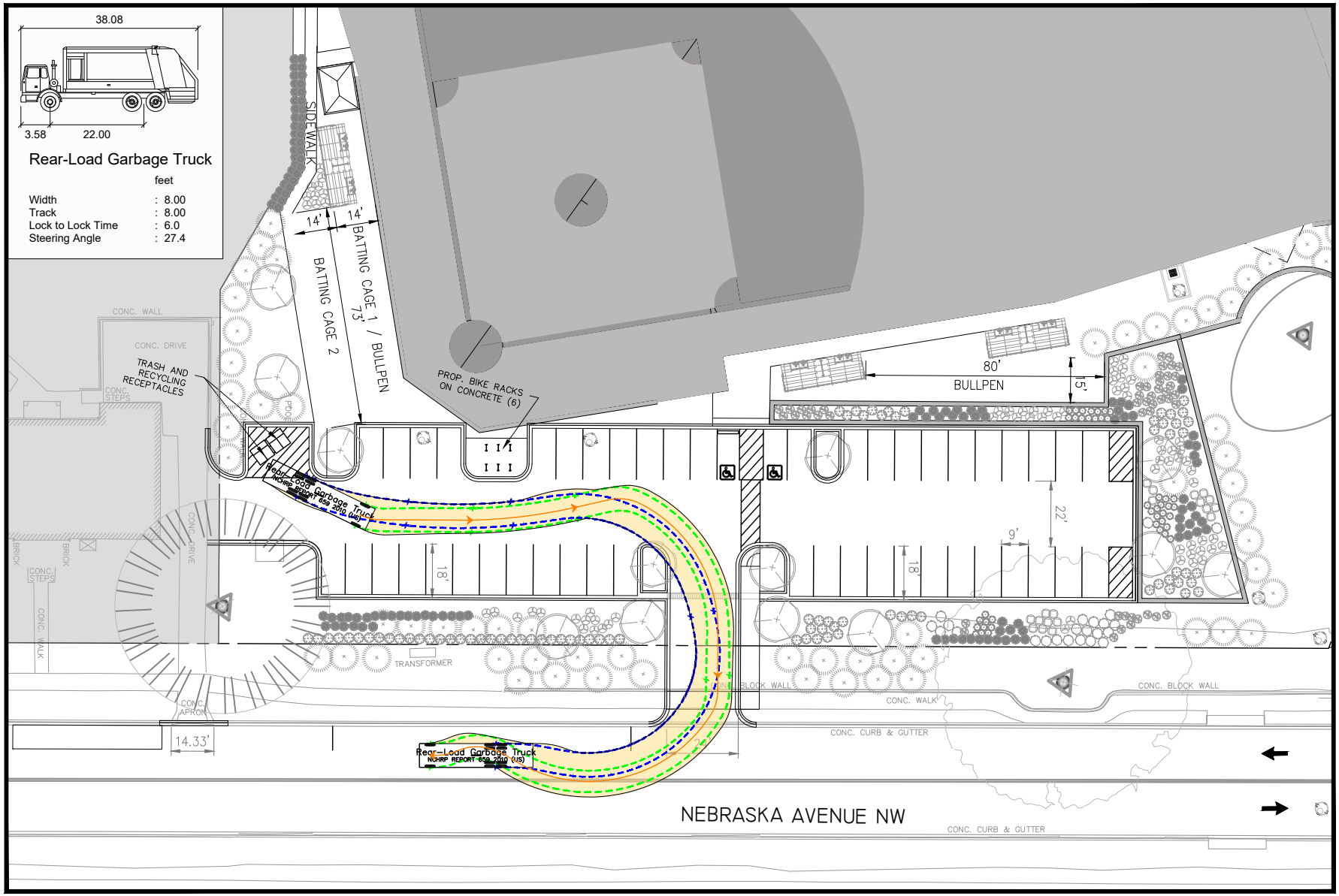
Maret School
Washington, DC

Figure 3

Trash Pickup - Ground Level Parking - Autoturn

Vehicle: Rear-Load Garbage Truck - Inbound- Option 3

S:\PROJECTS - S DRIVE\8500-8999\8500 MARET SCHOOL SPORTS FIELDS\GRAPHICS\AUTOTURN\22.0119 MARET SCHOOL AUTOTURN EXHIBIT.DWG



AUTOTURN LEGEND

- Vehicle Body
- Front Tire Tread
- Rear Tire Tread
- Directional Path
- Vehicle Path
- Reverse Vehicle Path

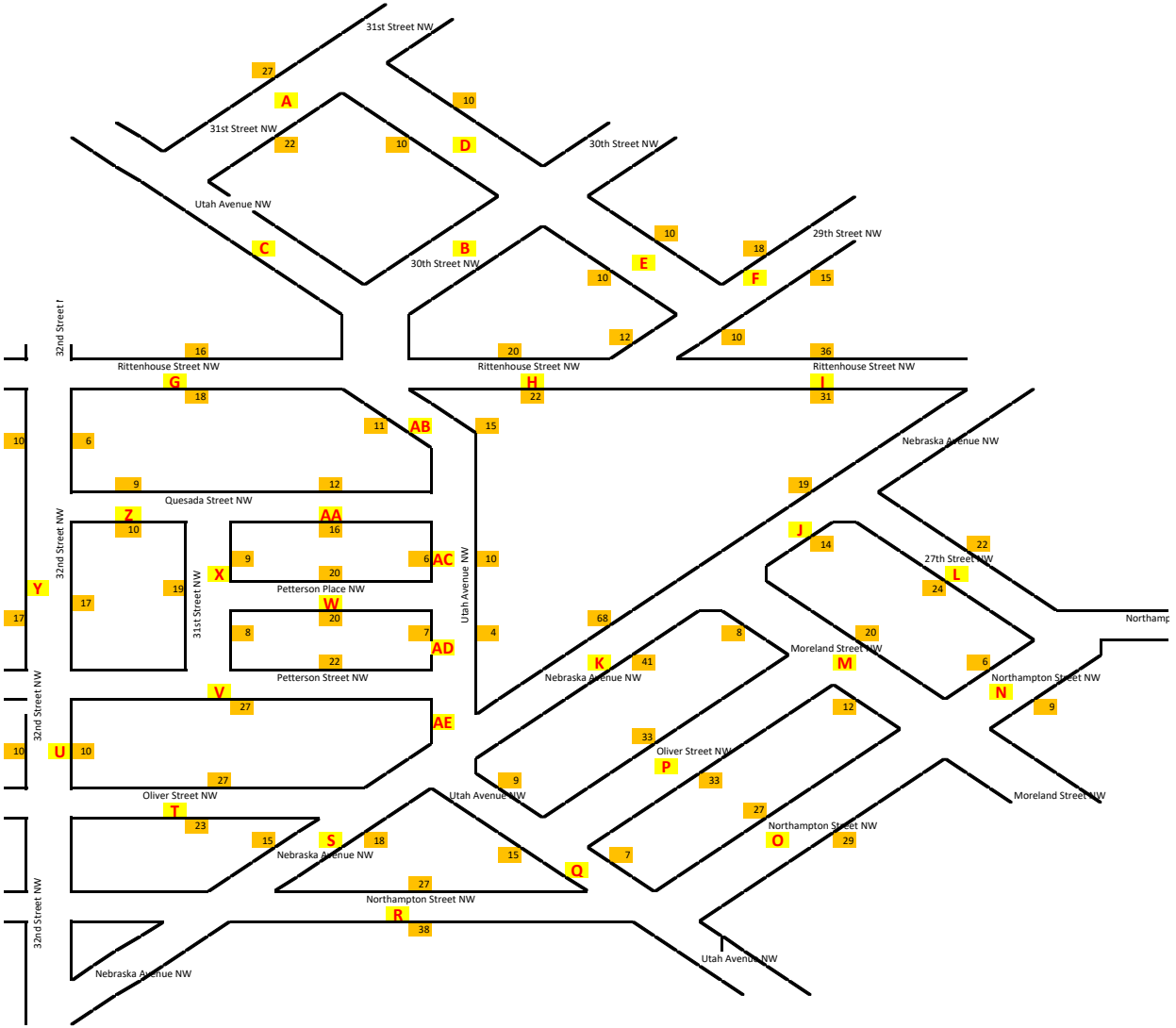
NORTH

Maret School
Washington, DC

Figure 4

Trash Pickup - Ground Level Parking - Autoturn
Vehicle: Rear-Load Garbage Truck - Outbound

APPENDIX G
PARKING OCCUPANCY COUNTS


31st Street NW
27
A
10
31st Street NW
22
10
D
30th Street NW
Utah Avenue NW
C
B
30th Street NW
10
E
10
18
29th Street NW
F
15
32nd Street NW
10
12
16
Rittenhouse Street NW
20
Rittenhouse Street NW
10
36
Rittenhouse Street NW
G
18
H
22
I
31
10
6
11
AB
15
Nebraska Avenue NW
9
12
Quesada Street NW
19
Z
10
AA
16
J
14
22
27th Street NW
L
24
32nd Street NW
Y
17
9
X
20
Petterson Place NW
6
AC
10
Utah Avenue NW
19
31st Street NW
17
W
20
68
8
20
Moreland Street NW
8
7
4
AD
Petterson Street NW
K
41
Nebraska Avenue NW
M
6
Northampton Street NW
V
27
N
9
12
AE
32nd Street NW
10
U
10
33
Oliver Street NW
P
33
27
Oliver Street NW
9
Utah Avenue NW
Moreland Street NW
T
23
27
Northampton Street NW
O
29
15
S
18
Nebraska Avenue NW
15
7
Q
27
Northampton Street NW
32nd Street NW
R
38
Nebraska Avenue NW
Utah Avenue NW

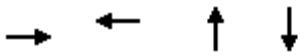
Wednesday 09/15/2021

Block/Time	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	Capacity	Max Occupancy By Block
Block A	24	22	23	23	22	24	**49**	49.0%
Block B	20	20	19	21	21	23	**44**	52.3%
Block C	8	10	16	14	15	14	**25**	64.0%
Block D	13	14	13	11	14	14	**20**	70.0%
Block E	9	9	10	11	11	12	**20**	60.0%
Block F	44	44	46	48	48	46	**55**	87.3%
Block G	16	16	18	18	19	19	**34**	55.9%
Block H	12	14	17	16	16	17	**42**	40.5%
Block I	37	32	35	35	37	38	**67**	56.7%
Block J	8	7	6	6	6	8	**33**	24.2%
Block K	11	12	13	13	12	13	**79**	16.5%
Block L	14	13	14	14	14	14	**46**	30.4%
Block M	10	11	13	11	12	12	**40**	32.5%
Block N	0	1	0	0	1	1	**15**	6.7%
Block O	10	11	13	14	13	12	**56**	25.0%
Block P	25	27	29	31	33	31	**66**	50.0%
Block Q	6	3	5	7	7	6	**31**	22.6%
Block R	8	9	8	8	9	10	**65**	15.4%
Block S	12	12	13	13	12	11	**33**	39.4%
Block T	31	31	30	32	30	32	**50**	64.0%
Block U	9	10	8	10	10	10	**20**	50.0%
Block V	32	32	33	33	34	33	**47**	72.3%
Block W	15	16	15	16	16	16	**40**	40.0%
Block X	27	22	28	30	33	33	**36**	91.7%
Block Y	11	22	24	25	28	28	**50**	56.0%
Block Z	8	9	8	6	7	8	**19**	47.4%
Block AA	19	11	15	15	16	16	**28**	67.9%
Block AB	6	6	10	10	12	12	**26**	46.2%
Block AC	2	4	5	6	6	1	**16**	37.5%
Block AD	2	1	3	4	4	6	**11**	54.5%
Block AE	1	1	2	3	3	3	**15**	20.0%
Total	**450**	**452**	**492**	**504**	**521**	**523**	**1178**	**44.4%**
Max Occupancy by Time of Day	**38.2%**	**38.4%**	**41.8%**	**42.8%**	**44.2%**	**44.4%**		

Saturday, 09/25/2021

Block/Time	8:30 AM	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	Capacity	Max Occupancy By Block
Block A	28	29	28	27	27	27	21	23	23	**49**	59.2%
Block B	23	21	22	23	22	22	21	20	20	**44**	52.3%
Block C	14	12	12	12	12	12	10	11	14	**25**	56.0%
Block D	11	10	10	12	11	11	12	11	11	**20**	60.0%
Block E	13	13	13	15	15	15	14	14	14	**20**	75.0%
Block F	31	26	30	30	30	30	23	23	23	**55**	56.4%
Block G	22	21	22	22	22	22	19	18	18	**34**	64.7%
Block H	22	17	12	12	12	12	17	16	15	**42**	52.4%
Block I	33	32	34	34	38	38	40	40	40	**67**	59.7%
Block J	6	6	6	6	6	6	5	4	5	**33**	18.2%
Block K	10	8	7	7	7	7	7	7	6	**79**	12.7%
Block L	17	16	18	17	17	17	14	14	15	**46**	39.1%
Block M	12	11	10	9	9	9	9	9	11	**40**	30.0%
Block N	1	1	1	1	1	1	1	1	1	**15**	6.7%
Block O	13	13	12	11	12	17	9	10	10	**56**	30.4%
Block P	32	32	31	31	31	31	29	27	27	**66**	48.5%
Block Q	2	2	2	2	2	2	2	2	2	**31**	6.5%
Block R	28	19	18	17	17	17	17	19	19	**65**	43.1%
Block S	17	17	16	14	14	14	13	14	16	**33**	51.5%
Block T	30	30	27	25	25	25	30	30	32	**50**	64.0%
Block U	13	15	12	10	10	10	10	11	15	**20**	75.0%
Block V	34	35	35	33	31	31	31	33	33	**47**	74.5%
Block W	20	19	17	15	15	15	15	15	15	**40**	50.0%
Block X	11	11	11	11	12	12	11	10	11	**36**	33.3%
Block Y	33	34	34	34	34	34	35	37		**50**	74.0%
Block Z	7	7	6	5	5	5	5	6		**19**	36.8%
Block AA	16	15	15	14	12	11	18	22	19	**28**	78.6%
Block AB	10	8	9	9	9	9	10	8	7	**26**	38.5%
Block AC	7	7	6	6	6	6	6	4	3	**16**	43.8%
Block AD	3	4	4	4	4	4	4	4	4	**11**	36.4%
Block AE	0	0	0	1	1	1	1	1	1	**15**	6.7%
Total	**519**	**491**	**480**	**469**	**469**	**473**	**459**	**464**	**430**	**1178**	44.1%
Max Occupancy by Time of Day	**44.1%**	**41.7%**	**40.7%**	**39.8%**	**39.8%**	**40.2%**	**39.0%**	**39.4%**	**36.5%**		

APPENDIX H
TOTAL FUTURE LEVELS OF SERVICE AND QUEUE REPORTS

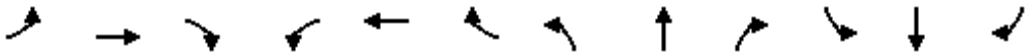


Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	374	144	208	301
v/c Ratio	1.10	0.37	0.41	0.59
Control Delay	100.7	14.6	14.1	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	100.7	14.6	14.1	15.8
Queue Length 50th (ft)	~129	26	40	52
Queue Length 95th (ft)	#267	64	85	117
Internal Link Dist (ft)	1002	867	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	341	385	512	514
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.10	0.37	0.41	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

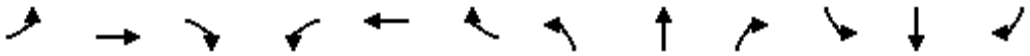
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	159	21	37	64	29	10	145	32	21	144	106
Future Volume (vph)	157	159	21	37	64	29	10	145	32	21	144	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.95	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1402			1440			1498			1423	
Flt Permitted		0.78			0.83			0.97			0.96	
Satd. Flow (perm)		1121			1218			1463			1377	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	174	177	23	41	71	32	11	161	36	23	160	118
RTOR Reduction (vph)	0	5	0	0	20	0	0	15	0	0	46	0
Lane Group Flow (vph)	0	369	0	0	124	0	0	193	0	0	255	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		336			365			497			468	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.10			0.13			c0.19	
v/c Ratio		1.10			0.34			0.39			0.54	
Uniform Delay, d1		17.5			13.6			12.5			13.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		78.2			2.5			2.3			4.5	
Delay (s)		95.7			16.1			14.8			17.9	
Level of Service		F			B			B			B	
Approach Delay (s)		95.7			16.1			14.8			17.9	
Approach LOS		F			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

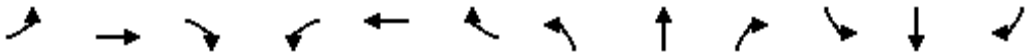
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	28	84	66	12	79	13	88	209	63	10	153	11
Future Volume (vph)	28	84	66	12	79	13	88	209	63	10	153	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	91	72	13	86	14	96	227	68	11	166	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	193	113	391	189
Volume Left (vph)	30	13	96	11
Volume Right (vph)	72	14	68	12
Hadj (s)	-0.16	-0.02	-0.02	0.01
Departure Headway (s)	5.5	5.8	5.1	5.4
Degree Utilization, x	0.29	0.18	0.55	0.28
Capacity (veh/h)	591	545	676	616
Control Delay (s)	10.7	10.1	14.1	10.5
Approach Delay (s)	10.7	10.1	14.1	10.5
Approach LOS	B	B	B	B

Intersection Summary			
Delay	12.1		
Level of Service	B		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	28	84	66	165	90	23	74	209	59	4	0	14
Future Volume (vph)	28	84	66	165	90	23	74	209	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	91	72	179	98	25	80	227	64	4	0	15

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	193	302	371	19
Volume Left (vph)	30	179	80	4
Volume Right (vph)	72	25	64	15
Hadj (s)	-0.16	0.10	-0.03	-0.40
Departure Headway (s)	5.3	5.4	5.2	5.5
Degree Utilization, x	0.29	0.45	0.54	0.03
Capacity (veh/h)	620	628	646	536
Control Delay (s)	10.4	12.8	14.3	8.7
Approach Delay (s)	10.4	12.8	14.3	8.7
Approach LOS	B	B	B	A

Intersection Summary				
Delay	12.8			
Level of Service	B			
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	12.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Traffic Vol, veh/h	28	84	66	165	90	23	74	209	59	4	0	14
Future Vol, veh/h	28	84	66	165	90	23	74	209	59	4	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	91	72	179	98	25	80	227	64	4	0	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	12.8	14.3	8.7
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	22%	16%	59%	22%
Vol Thru, %	61%	47%	32%	0%
Vol Right, %	17%	37%	8%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	342	178	278	18
LT Vol	74	28	165	4
Through Vol	209	84	90	0
RT Vol	59	66	23	14
Lane Flow Rate	372	193	302	20
Geometry Grp	1	1	1	1
Degree of Util (X)	0.541	0.285	0.453	0.03
Departure Headway (Hd)	5.238	5.307	5.391	5.502
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	688	677	668	649
Service Time	3.269	3.346	3.425	3.553
HCM Lane V/C Ratio	0.541	0.285	0.452	0.031
HCM Control Delay	14.3	10.5	12.8	8.7
HCM Lane LOS	B	B	B	A
HCM 95th-tile Q	3.3	1.2	2.4	0.1

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	84	66	12	79	13	88	209	63	10	153	11
Future Vol, veh/h	28	84	66	12	79	13	88	209	63	10	153	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	91	72	13	86	14	96	227	68	11	166	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.8	10.1	14.1	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	24%	16%	12%	6%
Vol Thru, %	58%	47%	76%	88%
Vol Right, %	17%	37%	12%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	178	104	174
LT Vol	88	28	12	10
Through Vol	209	84	79	153
RT Vol	63	66	13	11
Lane Flow Rate	391	193	113	189
Geometry Grp	1	1	1	1
Degree of Util (X)	0.548	0.293	0.18	0.282
Departure Headway (Hd)	5.045	5.46	5.748	5.359
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	716	658	623	670
Service Time	3.076	3.502	3.795	3.395
HCM Lane V/C Ratio	0.546	0.293	0.181	0.282
HCM Control Delay	14.1	10.8	10.1	10.5
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	3.4	1.2	0.7	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	66	6	0	96	11	0	195	10	26	84	0
Future Volume (vph)	40	66	6	0	96	11	0	195	10	26	84	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	73	7	0	107	12	0	217	11	29	93	0

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	124	119	228	122
Volume Left (vph)	44	0	0	29
Volume Right (vph)	7	12	11	0
Hadj (s)	0.07	-0.03	0.01	0.08
Departure Headway (s)	5.0	4.9	4.7	4.9
Degree Utilization, x	0.17	0.16	0.30	0.17
Capacity (veh/h)	662	673	728	684
Control Delay (s)	9.0	8.9	9.7	8.9
Approach Delay (s)	9.0	8.9	9.7	8.9
Approach LOS	A	A	A	A

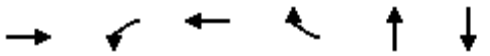
Intersection Summary				
Delay	9.2			
Level of Service	A			
Intersection Capacity Utilization	42.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	66	6	0	96	11	0	195	10	26	84	0
Future Vol, veh/h	40	66	6	0	96	11	0	195	10	26	84	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	73	7	0	107	12	0	217	11	29	93	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	8.9	9.7	8.9
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	0%	36%	0%	24%
Vol Thru, %	95%	59%	90%	76%
Vol Right, %	5%	5%	10%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	112	107	110
LT Vol	0	40	0	26
Through Vol	195	66	96	84
RT Vol	10	6	11	0
Lane Flow Rate	228	124	119	122
Geometry Grp	1	1	1	1
Degree of Util (X)	0.295	0.171	0.161	0.165
Departure Headway (Hd)	4.656	4.959	4.869	4.856
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	770	719	732	735
Service Time	2.702	3.016	2.925	2.91
HCM Lane V/C Ratio	0.296	0.172	0.163	0.166
HCM Control Delay	9.7	9	8.9	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.6	0.6	0.6

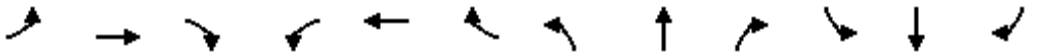


Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1539	42	1067	186	291	310
v/c Ratio	1.42	0.53	1.24	0.27	0.59	1.38
Control Delay	214.3	41.4	138.6	11.4	29.5	222.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	214.3	41.4	138.6	11.4	29.5	222.8
Queue Length 50th (ft)	~553	13	~671	47	123	~208
Queue Length 95th (ft)	#684	#67	#901	85	203	#360
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	1087	80	862	684	496	225
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.42	0.53	1.24	0.27	0.59	1.38

Intersection Summary

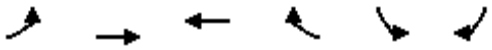
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1361	10	38	960	167	14	42	205	257	18	4
Future Volume (vph)	14	1361	10	38	960	167	14	42	205	257	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.89			1.00	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (prot)		2833		1525	1605	1274		1703			1475	
Flt Permitted		0.71		0.09	1.00	1.00		0.97			0.49	
Satd. Flow (perm)		2023		149	1605	1274		1655			752	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	1512	11	42	1067	186	16	47	228	286	20	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1539	0	42	1067	186	0	291	0	0	310	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)										1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Effective Green, g (s)		43.0		43.0	43.0	43.0		24.0			24.0	
Actuated g/C Ratio		0.54		0.54	0.54	0.54		0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1087		80	862	684		496			225	
v/s Ratio Prot					0.66							
v/s Ratio Perm		c0.76		0.28		0.15		0.18			c0.41	
v/c Ratio		1.42		0.53	1.24	0.27		0.59			1.38	
Uniform Delay, d1		18.5		11.9	18.5	10.0		23.8			28.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		192.6		22.5	117.0	1.0		1.8			195.4	
Delay (s)		211.1		34.4	135.5	11.0		25.6			223.4	
Level of Service		F		C	F	B		C			F	
Approach Delay (s)		211.1			114.3			25.6			223.4	
Approach LOS		F			F			C			F	

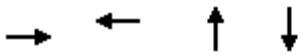
Intersection Summary			
HCM 2000 Control Delay	160.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	165	71	2	3	58
Future Volume (Veh/h)	31	165	71	2	3	58
Sign Control		Free	Free		Stop	
Grade		-5%	-4%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	179	77	2	3	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		947				
pX, platoon unblocked						
vC, conflicting volume	79				325	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	79				325	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	94
cM capacity (veh/h)	1519				654	983

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	213	79	66
Volume Left	34	0	3
Volume Right	0	2	63
cSH	1519	1700	961
Volume to Capacity	0.02	0.05	0.07
Queue Length 95th (ft)	2	0	6
Control Delay (s)	1.3	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	1.3	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	289	223	249	208
v/c Ratio	0.73	0.53	0.50	0.41
Control Delay	28.9	19.4	16.7	11.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	19.4	16.7	11.8
Queue Length 50th (ft)	71	51	53	30
Queue Length 95th (ft)	#175	105	108	75
Internal Link Dist (ft)	1002	746	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	397	420	495	503
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.53	0.50	0.41

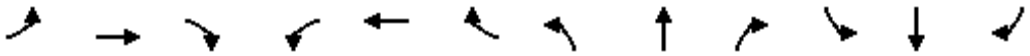
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	191	27	27	157	17	26	172	26	20	98	69
Future Volume (vph)	42	191	27	27	157	17	26	172	26	20	98	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1415			1479			1505			1425	
Flt Permitted		0.91			0.93			0.94			0.95	
Satd. Flow (perm)		1298			1379			1428			1357	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	212	30	30	174	19	29	191	29	22	109	77
RTOR Reduction (vph)	0	8	0	0	7	0	0	9	0	0	42	0
Lane Group Flow (vph)	0	281	0	0	216	0	0	240	0	0	166	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		15.0			15.0			17.0			17.0	
Effective Green, g (s)		15.0			15.0			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		389			413			485			461	
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.16			c0.17			0.12	
v/c Ratio		0.72			0.52			0.49			0.36	
Uniform Delay, d1		15.6			14.5			13.1			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.0			4.7			3.6			2.2	
Delay (s)		26.6			19.2			16.7			14.6	
Level of Service		C			B			B			B	
Approach Delay (s)		26.6			19.2			16.7			14.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

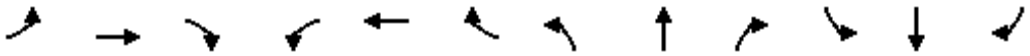
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	46	51	11	52	3	105	129	40	0	109	9
Future Volume (vph)	27	46	51	11	52	3	105	129	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	50	55	12	57	3	114	140	43	0	118	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	134	72	297	128
Volume Left (vph)	29	12	114	0
Volume Right (vph)	55	3	43	10
Hadj (s)	-0.17	0.04	0.02	-0.01
Departure Headway (s)	4.9	5.2	4.6	4.8
Degree Utilization, x	0.18	0.10	0.38	0.17
Capacity (veh/h)	674	628	748	703
Control Delay (s)	8.9	8.8	10.4	8.8
Approach Delay (s)	8.9	8.8	10.4	8.8
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.6			
Level of Service	A			
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	46	51	120	61	3	95	135	7	16	11	10
Future Volume (vph)	27	46	51	120	61	3	95	135	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	50	55	130	66	3	103	147	8	17	12	11

Direction, Lane #	EB 1	WB 1	NB 1	SWB 1
Volume Total (vph)	134	199	258	40
Volume Left (vph)	29	130	103	17
Volume Right (vph)	55	3	8	11
Hadj (s)	-0.17	0.16	0.10	-0.05
Departure Headway (s)	4.8	5.0	4.9	5.1
Degree Utilization, x	0.18	0.28	0.35	0.06
Capacity (veh/h)	692	675	697	639
Control Delay (s)	8.8	9.9	10.5	8.4
Approach Delay (s)	8.8	9.9	10.5	8.4
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.8			
Level of Service	A			
Intersection Capacity Utilization	42.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	46	51	11	52	3	105	129	40	0	109	9
Future Vol, veh/h	27	46	51	11	52	3	105	129	40	0	109	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	50	55	12	57	3	114	140	43	0	118	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.9	8.8	10.4	8.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	22%	17%	0%
Vol Thru, %	47%	37%	79%	92%
Vol Right, %	15%	41%	5%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	274	124	66	118
LT Vol	105	27	11	0
Through Vol	129	46	52	109
RT Vol	40	51	3	9
Lane Flow Rate	298	135	72	128
Geometry Grp	1	1	1	1
Degree of Util (X)	0.379	0.18	0.102	0.169
Departure Headway (Hd)	4.584	4.82	5.114	4.744
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	783	741	697	753
Service Time	2.628	2.874	3.174	2.797
HCM Lane V/C Ratio	0.381	0.182	0.103	0.17
HCM Control Delay	10.4	8.9	8.8	8.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.8	0.7	0.3	0.6

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWBL	SWBT	SWBR
Lane Configurations												
Traffic Vol, veh/h	27	46	51	120	61	3	95	135	7	16	11	10
Future Vol, veh/h	27	46	51	120	61	3	95	135	7	16	11	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	50	55	130	66	3	103	147	8	17	12	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SWB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	9.9	10.5	8.4
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SWBLn1
Vol Left, %	40%	22%	65%	43%
Vol Thru, %	57%	37%	33%	30%
Vol Right, %	3%	41%	2%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	237	124	184	37
LT Vol	95	27	120	16
Through Vol	135	46	61	11
RT Vol	7	51	3	10
Lane Flow Rate	258	135	200	40
Geometry Grp	1	1	1	1
Degree of Util (X)	0.347	0.177	0.275	0.056
Departure Headway (Hd)	4.856	4.728	4.958	5.01
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	737	753	720	709
Service Time	2.91	2.788	3.014	3.084
HCM Lane V/C Ratio	0.35	0.179	0.278	0.056
HCM Control Delay	10.5	8.8	9.9	8.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.6	0.6	1.1	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	41	0	11	49	5	6	155	11	0	131	8
Future Volume (vph)	19	41	0	11	49	5	6	155	11	0	131	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	46	0	12	54	6	7	172	12	0	146	9

Direction, Lane #	EB 1	WB 1	NE 1	SW 1
Volume Total (vph)	67	72	191	155
Volume Left (vph)	21	12	7	0
Volume Right (vph)	0	6	12	9
Hadj (s)	0.10	0.02	0.00	0.00
Departure Headway (s)	4.9	4.8	4.4	4.5
Degree Utilization, x	0.09	0.10	0.24	0.19
Capacity (veh/h)	675	688	779	766
Control Delay (s)	8.4	8.3	8.8	8.5
Approach Delay (s)	8.4	8.3	8.8	8.5
Approach LOS	A	A	A	A

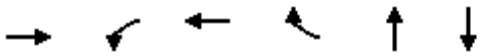
Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	28.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	19	40	0	11	48	5	6	150	11	0	126	8
Future Vol, veh/h	19	40	0	11	48	5	6	150	11	0	126	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	44	0	12	53	6	7	167	12	0	140	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NE	SW
Opposing Approach	WB	EB	SW	NE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SW	NE	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SW	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.3	8.7	8.5
HCM LOS	A	A	A	A

Lane	NELn1	EBLn1	WBLn1	SWLn1
Vol Left, %	4%	32%	17%	0%
Vol Thru, %	90%	68%	75%	94%
Vol Right, %	7%	0%	8%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	167	59	64	134
LT Vol	6	19	11	0
Through Vol	150	40	48	126
RT Vol	11	0	5	8
Lane Flow Rate	186	66	71	149
Geometry Grp	1	1	1	1
Degree of Util (X)	0.227	0.088	0.094	0.183
Departure Headway (Hd)	4.4	4.842	4.759	4.435
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	816	739	753	810
Service Time	2.421	2.873	2.789	2.458
HCM Lane V/C Ratio	0.228	0.089	0.094	0.184
HCM Control Delay	8.7	8.3	8.3	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.3	0.7



Lane Group	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1527	26	1490	92	231	191
v/c Ratio	9.20	0.18	1.55	0.12	0.59	0.77
Control Delay	3712.6	13.0	274.2	8.9	32.3	48.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3712.6	13.0	274.2	8.9	32.3	48.6
Queue Length 50th (ft)	~1481	5	~1077	19	101	88
Queue Length 95th (ft)	#1751	23	#1365	45	159	#154
Internal Link Dist (ft)	1658		1325		474	2134
Turn Bay Length (ft)		170				
Base Capacity (vph)	166	146	960	762	455	285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	9.20	0.18	1.55	0.12	0.51	0.67

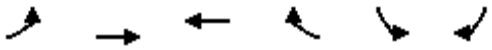
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1282	33	23	1341	83	36	88	84	78	36	58
Future Volume (vph)	59	1282	33	23	1341	83	36	88	84	78	36	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		1.00		1.00	1.00	0.85		0.95			0.95	
Flt Protected		1.00		0.95	1.00	1.00		0.99			0.98	
Satd. Flow (prot)		1320		1525	1605	1274		1790			1443	
Flt Permitted		0.21		0.15	1.00	1.00		0.91			0.70	
Satd. Flow (perm)		277		244	1605	1274		1649			1033	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	1424	37	26	1490	92	40	98	93	87	40	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1527	0	26	1490	92	0	231	0	0	191	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)	0	0	0							1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		47.9		47.9	47.9	47.9		19.1			19.1	
Effective Green, g (s)		47.9		47.9	47.9	47.9		19.1			19.1	
Actuated g/C Ratio		0.60		0.60	0.60	0.60		0.24			0.24	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		165		146	960	762		393			246	
v/s Ratio Prot					0.93							
v/s Ratio Perm		c5.51		0.11		0.07		0.14			c0.18	
v/c Ratio		9.25		0.18	1.55	0.12		0.59			0.78	
Uniform Delay, d1		16.1		7.2	16.1	6.9		27.0			28.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		3726.7		2.7	253.6	0.3		2.2			14.2	
Delay (s)		3742.8		9.9	269.7	7.3		29.2			42.7	
Level of Service		F		A	F	A		C			D	
Approach Delay (s)		3742.8			250.4			29.2			42.7	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	1724.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	7.23		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	165.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

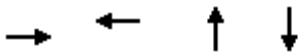


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	192	155	2	2	46
Future Volume (Veh/h)	46	192	155	2	2	46
Sign Control		Free	Free		Stop	
Grade		-5%	-4%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	209	168	2	2	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		826				
pX, platoon unblocked						
vC, conflicting volume	170				478	169
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170				478	169
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	94
cM capacity (veh/h)	1407				527	875

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	259	170	52
Volume Left	50	0	2
Volume Right	0	2	50
cSH	1407	1700	853
Volume to Capacity	0.04	0.10	0.06
Queue Length 95th (ft)	3	0	5
Control Delay (s)	1.7	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	1.7	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

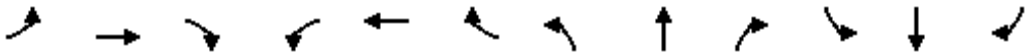
APPENDIX I
TOTAL FUTURE IMPROVEMENTS LEVEL OF SERVICE AND QUEUE REPORTS



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	374	144	208	301
v/c Ratio	0.94	0.32	0.40	0.58
Control Delay	55.3	14.1	16.1	17.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	55.3	14.1	16.1	17.8
Queue Length 50th (ft)	126	30	50	67
Queue Length 95th (ft)	#282	69	100	139
Internal Link Dist (ft)	1002	867	1495	1343
Turn Bay Length (ft)				
Base Capacity (vph)	398	448	525	521
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	0.32	0.40	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	159	21	37	64	29	10	145	32	21	144	106
Future Volume (vph)	157	159	21	37	64	29	10	145	32	21	144	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-4%			-5%			-1%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.95	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1402			1440			1498			1423	
Flt Permitted		0.79			0.85			0.98			0.97	
Satd. Flow (perm)		1128			1235			1466			1379	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	174	177	23	41	71	32	11	161	36	23	160	118
RTOR Reduction (vph)	0	4	0	0	17	0	0	12	0	0	39	0
Lane Group Flow (vph)	0	370	0	0	127	0	0	196	0	0	262	0
Bus Blockages (#/hr)	4	4	4	4	4	4	0	0	0	0	0	0
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		21.0			21.0			21.0			21.0	
Effective Green, g (s)		21.0			21.0			21.0			21.0	
Actuated g/C Ratio		0.35			0.35			0.35			0.35	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		394			432			513			482	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.10			0.13			c0.19	
v/c Ratio		0.94			0.29			0.38			0.54	
Uniform Delay, d1		18.9			14.1			14.6			15.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		32.4			1.7			2.1			4.4	
Delay (s)		51.3			15.9			16.8			20.0	
Level of Service		D			B			B			C	
Approach Delay (s)		51.3			15.9			16.8			20.0	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

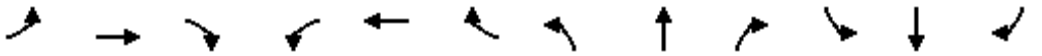
c Critical Lane Group

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	1539	42	1067	186	291	286	24
v/c Ratio	1.42	0.53	1.24	0.27	0.58	1.24	0.05
Control Delay	214.3	41.4	138.6	11.4	29.2	167.4	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	214.3	41.4	138.6	11.4	29.2	167.4	20.5
Queue Length 50th (ft)	~553	13	~671	47	122	~180	9
Queue Length 95th (ft)	#684	#67	#901	85	201	#328	26
Internal Link Dist (ft)	1658		1325		474		2134
Turn Bay Length (ft)		170					
Base Capacity (vph)	1087	80	862	684	504	231	452
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.42	0.53	1.24	0.27	0.58	1.24	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1361	10	38	960	167	14	42	205	257	18	4
Future Volume (vph)	14	1361	10	38	960	167	14	42	205	257	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0		7.0	7.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		1.00		1.00	1.00	0.85		0.89		1.00	0.97	
Flt Protected		1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2833		1525	1605	1274		1703		1468	1507	
Flt Permitted		0.71		0.09	1.00	1.00		0.99		0.50	1.00	
Satd. Flow (perm)		2023		149	1605	1274		1683		773	1507	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	1512	11	42	1067	186	16	47	228	286	20	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1539	0	42	1067	186	0	291	0	286	24	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)										1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		43.0		43.0	43.0	43.0		24.0		24.0	24.0	
Effective Green, g (s)		43.0		43.0	43.0	43.0		24.0		24.0	24.0	
Actuated g/C Ratio		0.54		0.54	0.54	0.54		0.30		0.30	0.30	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		1087		80	862	684		504		231	452	
v/s Ratio Prot					0.66						0.02	
v/s Ratio Perm		c0.76		0.28		0.15		0.17		c0.37		
v/c Ratio		1.42		0.53	1.24	0.27		0.58		1.24	0.05	
Uniform Delay, d1		18.5		11.9	18.5	10.0		23.7		28.0	19.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		192.6		22.5	117.0	1.0		1.6		138.5	0.0	
Delay (s)		211.1		34.4	135.5	11.0		25.3		166.5	20.0	
Level of Service		F		C	F	B		C		F	B	
Approach Delay (s)		211.1			114.3			25.3			155.1	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	153.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	1527	26	1490	92	231	87	104
v/c Ratio	1.62	0.23	1.46	0.11	0.69	0.54	0.37
Control Delay	303.4	14.5	232.5	7.3	40.1	40.2	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	303.4	14.5	232.5	7.3	40.1	40.2	29.9
Queue Length 50th (ft)	~586	5	~1036	16	108	39	45
Queue Length 95th (ft)	#747	26	#1344	42	166	79	82
Internal Link Dist (ft)	1658		1325		474		2134
Turn Bay Length (ft)		170					
Base Capacity (vph)	943	113	1020	809	438	211	371
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.62	0.23	1.46	0.11	0.53	0.41	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1282	33	23	1341	83	36	88	84	78	36	58
Future Volume (vph)	59	1282	33	23	1341	83	36	88	84	78	36	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	10	16	16	16	12	12	12
Grade (%)		8%			-2%			-1%			-6%	
Total Lost time (s)		6.0		6.0	6.0	6.0		7.0		7.0	7.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		1.00		1.00	1.00	0.85		0.95		1.00	0.91	
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2680		1525	1605	1274		1790		1468	1403	
Flt Permitted		0.55		0.11	1.00	1.00		0.92		0.52	1.00	
Satd. Flow (perm)		1484		178	1605	1274		1655		799	1403	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	1424	37	26	1490	92	40	98	93	87	40	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1527	0	26	1490	92	0	231	0	87	104	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	6	6	6	6	6	6	0	0	0	0	0	0
Parking (#/hr)	0	0	0							1	1	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2		2	8			4		
Actuated Green, G (s)		50.9		50.9	50.9	50.9		16.1		16.1	16.1	
Effective Green, g (s)		50.9		50.9	50.9	50.9		16.1		16.1	16.1	
Actuated g/C Ratio		0.64		0.64	0.64	0.64		0.20		0.20	0.20	
Clearance Time (s)		6.0		6.0	6.0	6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		944		113	1021	810		333		160	282	
v/s Ratio Prot					0.93						0.07	
v/s Ratio Perm		c1.03		0.15		0.07		c0.14		0.11		
v/c Ratio		1.62		0.23	1.46	0.11		0.69		0.54	0.37	
Uniform Delay, d1		14.6		6.2	14.6	5.7		29.7		28.7	27.6	
Progression Factor		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		282.8		4.7	212.2	0.3		6.1		3.7	0.8	
Delay (s)		297.4		10.9	226.7	6.0		35.8		32.4	28.4	
Level of Service		F		B	F	A		D		C	C	
Approach Delay (s)		297.4			210.6			35.8			30.2	
Approach LOS		F			F			D			C	

Intersection Summary			
HCM 2000 Control Delay	226.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			