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MEMORANDUM



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TO: District of Columbia Zoning Commission

FROM: Jami L. Milanovich, P.E.

COPY: Jon Cummings – Westbrook Partners
David Avitabile – Goulston & Storrs

RE: 2300 16th Street NW – BZA Case No.: 19689

DATE: June 12, 2018

The Applicant in the above-referenced case proposes to construct a residential building at 2300 16th Street NW adjacent to the Meridian International Center (MIC). The proposed project would include a nine-story building (including penthouse) with approximately 110 condominium units and approximately 6,000 SF of meeting/office space, which would be used by the MIC. Over the last several years, the Applicant has been worked closely with the surrounding community to address their concerns regarding the traffic associated with the project.

The Comprehensive Transportation Report (CTR) conducted for the project (dated January 2018) concluded that the proposed project would have no adverse traffic impact on the surrounding community; a finding that DDOT concurred with in its report dated June 1, 2018. Despite the finding of no impact, the Applicant proposed several improvements, specifically to address concerns raised by the community. Those improvements include the following:

- Conduct a traffic signal warrant study at the 16th and Belmont upon 85 percent occupancy of the new building.
 - Pay for the cost of future installation of a traffic signal at the 16th and Belmont St intersection if the warrant study indicates a traffic signal is warranted and DDOT approves signalization.
- If signal warrants are not met then, subject to DDOT approval, install a signal detector on Belmont Street that is linked to the Crescent signal to provide gaps in 16th Street traffic.
- Install “Don’t Block the Box” signs and markings at both the Belmont and Crescent intersection.
- Install “Turning Vehicles Yield to Pedestrians” sign at 16th and Belmont.
- Install/upgrade crosswalk markings at 16th and Belmont.
- Extend double yellow line on Belmont Street to Beekman Place to make a clear two-lane road.

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- Remove 3 Residential Permit Parking (RPP) spaces on south side of Belmont Street to better facilitate two-way traffic.
- Upgrade ADA curb ramps at the 16th Street/Crescent Place intersection to bring them into compliance with current standards.

In addition to the improvements listed above, the community also sought two driveways to the development in order to more evenly distribute traffic between Belmont Street and Crescent Place. As originally proposed, one curb cut was to provide access to and egress from the site via Belmont Street. As shown on Figures 1A, all entering traffic to the site would enter by turning from 16th Street onto Belmont Street. As shown on Figure 1B, exiting traffic would have the option of turning left out of the site to access 16th Street via Belmont Street at an unsignalized intersection or turning right out of the site to access 16th Street via Crescent Place with the aid of a traffic signal. Alternatively, right-turning traffic exiting the site also could head north on 17th Street to Kalorama Road.

Under the access scenario proposed by the community, one driveway would be provided on Belmont Street and one driveway would be provided on Crescent Place. Under this scenario, all inbound traffic would enter via Belmont Street, as shown on Figure 2A (note that this is the only way to access the site since Crescent Place is one-way eastbound). The majority of the traffic would exit the site via Crescent Place, as shown on Figure 2B. This would reduce the volume of site traffic using Belmont Street and would eliminate traffic circling the “loop” through the neighborhood. Trucks, shuttle buses, and valet traffic during Meridian events would egress via the Belmont Street driveway.

To ensure that the reconfigured circulation would not have an adverse impact on the surrounding roadway network, a level of service and queueing analysis was conducted for the 16th Street/Belmont Street intersection and the 16th Street/Crescent Place intersection. The level of service and queue results are shown on Tables 1 and 2, respectively.

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Table 1
Level of Service Summary

Approach	Existing Conditions		Background Conditions		Total Future Conditions With Two Driveways	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
16th Street/Belmont Street						
EB	A	E [46.5]	A	F [52.5]	A	C ¹
NB	A	A	A	A	A	A
SB	A	A	A	A	A	A
16th Street/Crescent Place						
EB	D	D	D	D	D	D
NB	A	A	A	B	A	B
SB	A	A	A	A	A	A
Overall	A	A	A	A	A	A
1. Synchro reports the approach delay as the weighted average of the volumes at the intersection. At 16 th Street/Belmont Street for the total future conditions eastbound right turns are added to the intersection. Therefore, at the intersection the delay decreases from LOS F to LOS C even when the volumes are higher for the total future conditions.						

Table 2
Synchro 95th Percentile Queue Summary (in feet)

Approach	Available Storage ⁺	Existing Conditions		Background Conditions		Total Future Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
16th Street/Belmont Street							
EBLR	125'	2	1	2	1	2	2
NBLT	370'	7	11	9	12	10	16
SBTR	165'	0	0	0	0	0	0
16th Street/Crescent Place							
EBLR	665'	35	17	35	17	61	26
NBT	165'	93	295	102	350	102	350
SBT	560'	177	99	200	109	201	110

As shown in Tables 1 and 2, the 16th Street/Crescent Place intersection can accommodate the additional traffic projected at the intersection under the two-driveway scenario without a negative impact to the levels of service or queues at the intersection. Likewise, the 16th Street/Belmont Street intersection is projected to operate at acceptable levels of service with minimal queues under the two-driveway scenario. Details of the analysis are included in Attachment A.

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Please do not hesitate to contact me at jlmlanovich@wellsandassociates.com or (703) 917-6620 should you require additional information or have any questions or regarding the information presented herein.

O:\Projects\5501-6000\5969 Meridian International Center\Documents\Meridian Addendum (Revised Access) 6-12-18.docx

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FIGURES

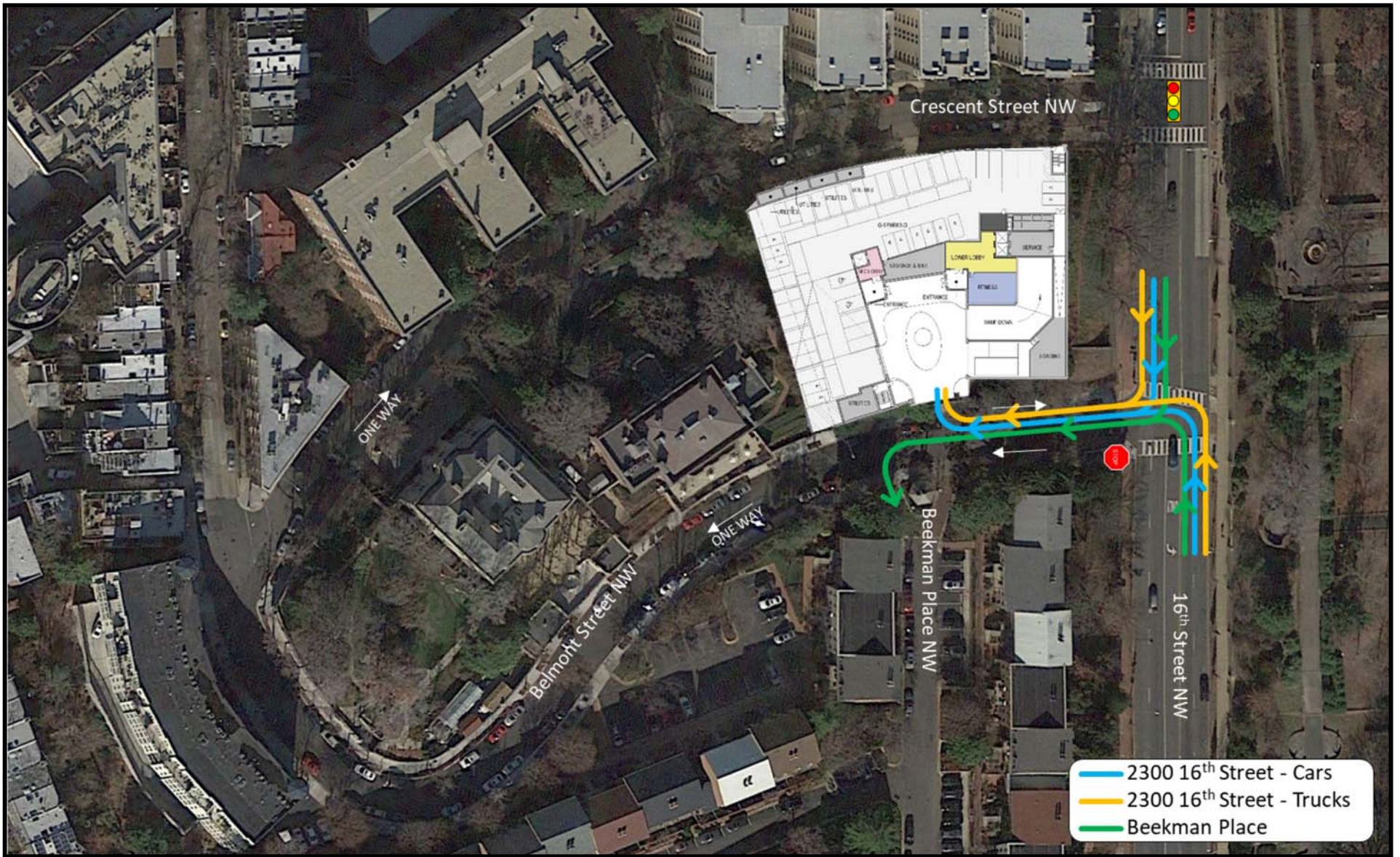


Figure 1A
Proposed Traffic Circulation—Inbound
One Driveway



NORTH

2300 16th Street NW
Washington, DC



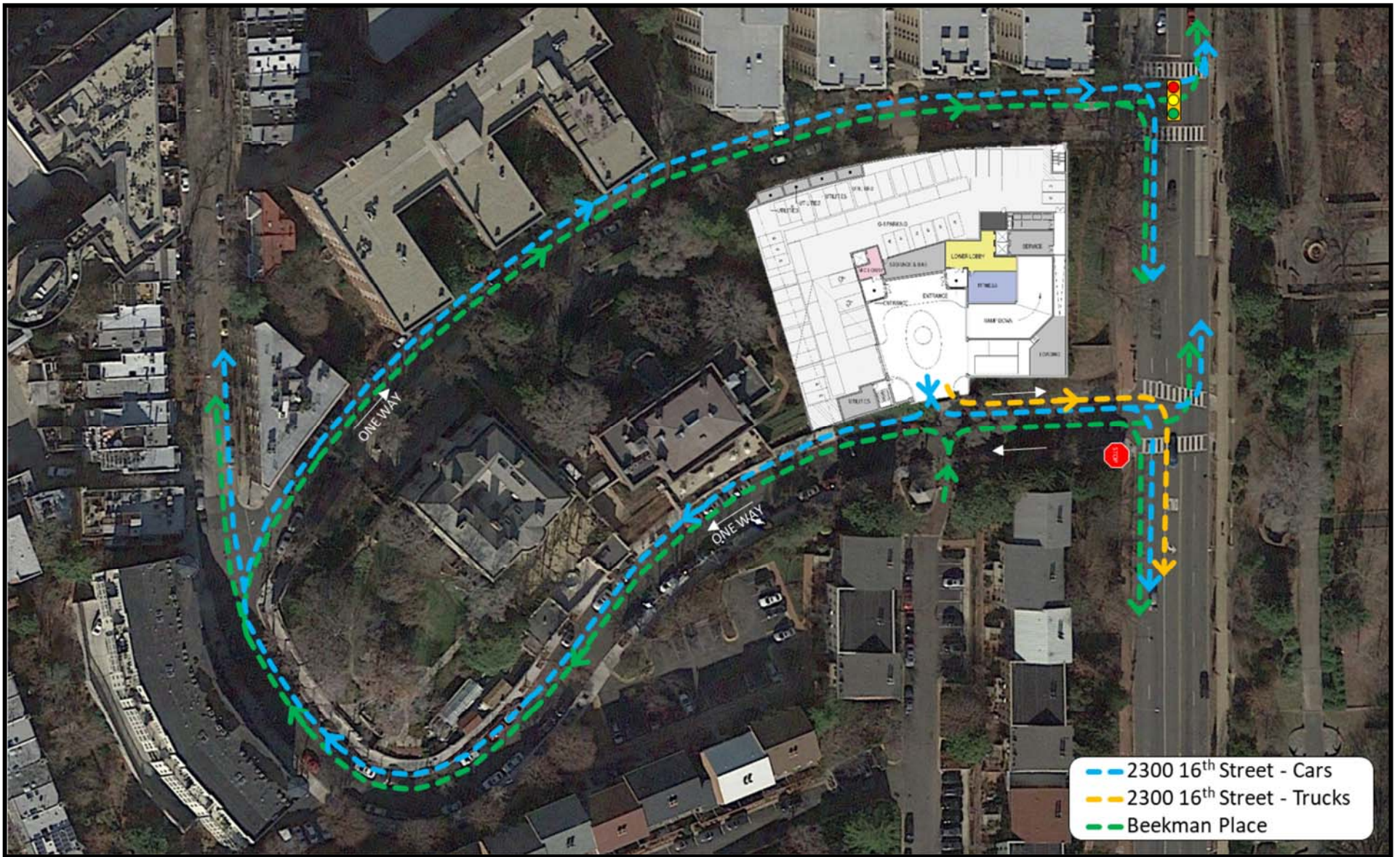


Figure 1B
Proposed Traffic Circulation—Outbound
One Driveway



NORTH

2300 16th Street NW
Washington, DC



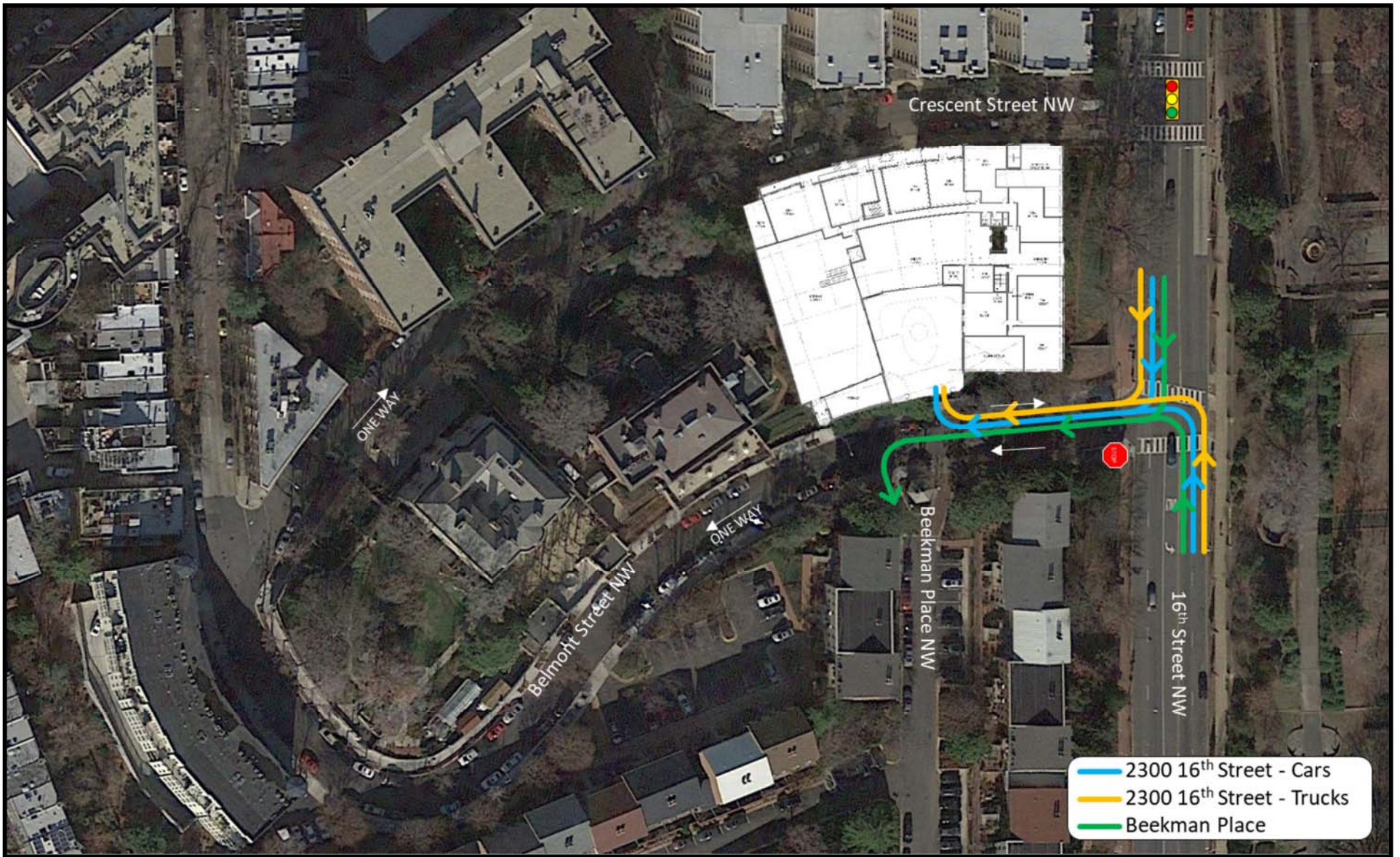


Figure 2A
Proposed Traffic Circulation—Inbound
Two Driveways



NORTH

2300 16th Street NW
Washington, DC



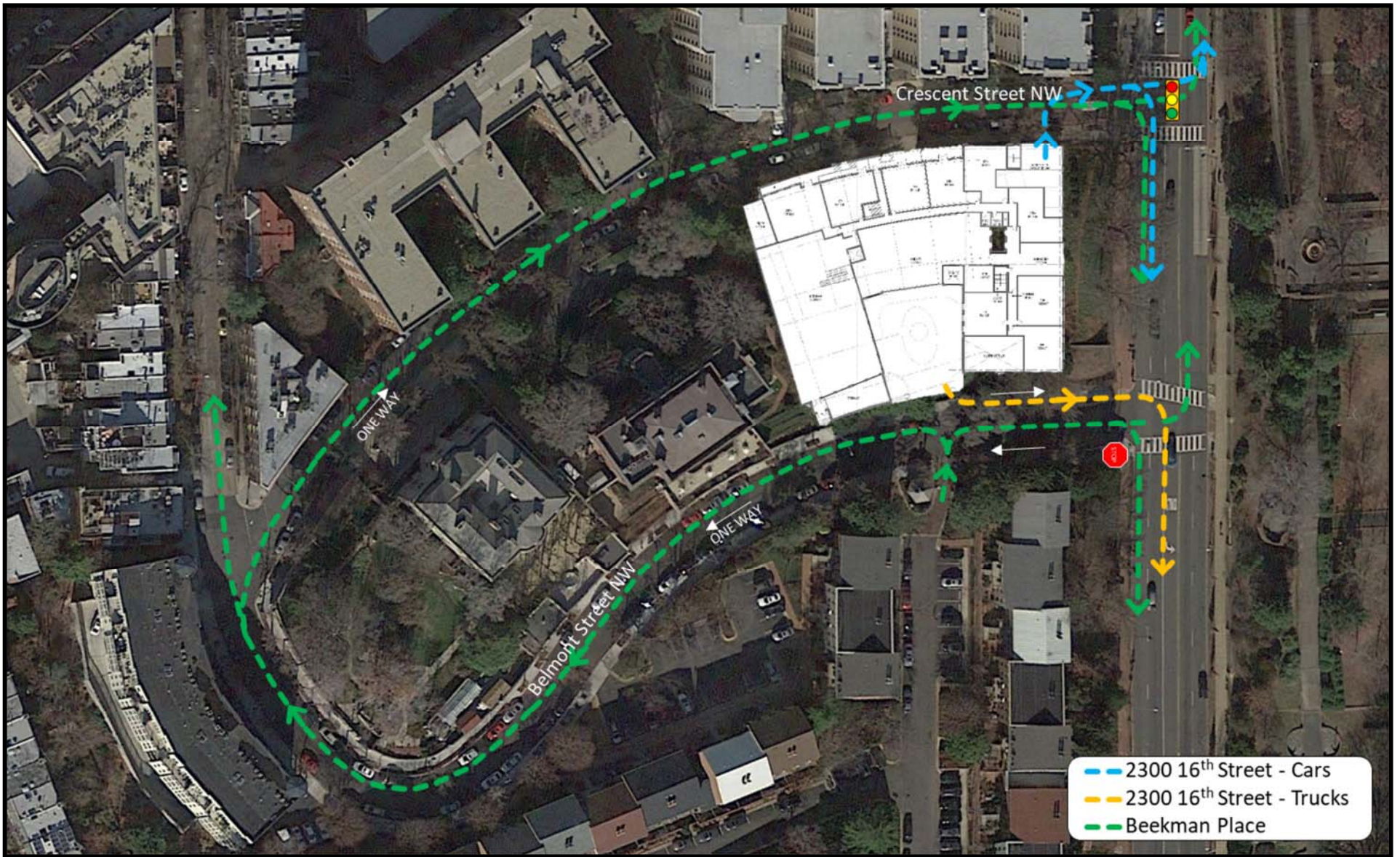


Figure 2B
Proposed Traffic Circulation—Outbound
Two Driveways



NORTH

2300 16th Street NW
Washington, DC



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ATTACHMENT A
Synchro Worksheets



HCM Unsignalized Intersection Capacity Analysis

3: 16th Street NW & Belmont Street NW

06/12/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	17	39	560	1697	27
Future Volume (Veh/h)	0	17	39	560	1697	27
Sign Control	Stop			Free	Free	
Grade	-8%			6%	-6%	
Peak Hour Factor	0.75	0.75	0.87	0.87	0.98	0.98
Hourly flow rate (vph)	0	23	45	644	1732	28
Pedestrians	119			4		
Lane Width (ft)	10.0			10.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	8			0		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				457	221	
pX, platoon unblocked	0.88	0.83	0.83			
vC, conflicting volume	2277	714	1879			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1368	0	1340			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	88			
cM capacity (veh/h)	101	828	384			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	260	429	693	693	374
Volume Left	0	45	0	0	0	0
Volume Right	23	0	0	0	0	28
cSH	828	384	1700	1700	1700	1700
Volume to Capacity	0.03	0.12	0.25	0.41	0.41	0.22
Queue Length 95th (ft)	2	10	0	0	0	0
Control Delay (s)	9.5	4.4	0.0	0.0	0.0	0.0
Lane LOS	A	A				
Approach Delay (s)	9.5	1.7		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	61.2%			ICU Level of Service	B	
Analysis Period (min)	15					

Queues

4: 16th Street NW & Crescent Place NW

06/12/2018



Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	84	719	1706
v/c Ratio	0.35	0.37	0.55
Control Delay	29.6	5.9	7.3
Queue Delay	0.0	0.0	0.0
Total Delay	29.6	5.9	7.3
Queue Length 50th (ft)	31	83	168
Queue Length 95th (ft)	61	102	201
Internal Link Dist (ft)	150	141	763
Turn Bay Length (ft)			
Base Capacity (vph)	243	1953	3078
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.35	0.37	0.55

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: 16th Street NW & Crescent Place NW

06/12/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑	↑↑↑	
Traffic Volume (vph)	23	40	0	618	1655	0
Future Volume (vph)	23	40	0	618	1655	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10
Grade (%)	-7%			5%	-5%	
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.91	
Frbp, ped/bikes	0.98			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.91			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1248			2653	4180	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1248			2653	4180	
Peak-hour factor, PHF	0.75	0.75	0.86	0.86	0.97	0.97
Adj. Flow (vph)	31	53	0	719	1706	0
RTOR Reduction (vph)	27	0	0	0	0	0
Lane Group Flow (vph)	57	0	0	719	1706	0
Confl. Peds. (#/hr)	3	10	103			103
Confl. Bikes (#/hr)						23
Heavy Vehicles (%)	0%	0%	0%	7%	4%	0%
Bus Blockages (#/hr)	0	0	0	20	20	20
Parking (#/hr)	8	8				
Turn Type	Perm			NA	NA	
Protected Phases				2	6	
Permitted Phases	8					
Actuated Green, G (s)	19.0			81.0	81.0	
Effective Green, g (s)	19.0			81.0	81.0	
Actuated g/C Ratio	0.17			0.74	0.74	
Clearance Time (s)	5.0			5.0	5.0	
Lane Grp Cap (vph)	215			1953	3078	
v/s Ratio Prot				0.27	c0.41	
v/s Ratio Perm	c0.05					
v/c Ratio	0.26			0.37	0.55	
Uniform Delay, d1	39.4			5.2	6.5	
Progression Factor	0.99			1.00	1.00	
Incremental Delay, d2	3.0			0.5	0.7	
Delay (s)	41.9			5.8	7.2	
Level of Service	D			A	A	
Approach Delay (s)	41.9			5.8	7.2	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	10.0
Intersection Capacity Utilization			58.0%		ICU Level of Service	B
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: 16th Street NW & Belmont Street NW

06/12/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	2	86	1501	1085	44
Future Volume (Veh/h)	1	2	86	1501	1085	44
Sign Control	Stop			Free	Free	
Grade	-8%			6%	-6%	
Peak Hour Factor	0.75	0.75	0.94	0.94	0.86	0.86
Hourly flow rate (vph)	1	3	91	1597	1262	51
Pedestrians	136			6		
Lane Width (ft)	10.0			10.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	9			0		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				457	221	
pX, platoon unblocked	0.69	0.92	0.92			
vC, conflicting volume	2404	588	1449			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1422	235	1173			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	82			
cM capacity (veh/h)	67	640	500			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	623	1065	505	505	303
Volume Left	1	91	0	0	0	0
Volume Right	3	0	0	0	0	51
cSH	203	500	1700	1700	1700	1700
Volume to Capacity	0.02	0.18	0.63	0.30	0.30	0.18
Queue Length 95th (ft)	2	16	0	0	0	0
Control Delay (s)	23.0	5.1	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	23.0	1.9		0.0		
Approach LOS	C					

Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			88.7%	ICU Level of Service	E	
Analysis Period (min)			15			

Queues

4: 16th Street NW & Crescent Place NW

06/12/2018



Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	31	1489	1126
v/c Ratio	0.14	0.73	0.37
Control Delay	22.7	10.9	5.6
Queue Delay	0.0	0.6	0.0
Total Delay	22.7	11.5	5.6
Queue Length 50th (ft)	7	269	90
Queue Length 95th (ft)	26	350	110
Internal Link Dist (ft)	134	141	763
Turn Bay Length (ft)			
Base Capacity (vph)	229	2049	3078
Starvation Cap Reductn	0	233	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.82	0.37
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

4: 16th Street NW & Crescent Place NW

06/12/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑	↑↑↑	
Traffic Volume (vph)	8	15	0	1355	1058	0
Future Volume (vph)	8	15	0	1355	1058	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10
Grade (%)	-7%			5%	-5%	
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.91	
Frbp, ped/bikes	0.98			1.00	1.00	
Flpb, ped/bikes	0.99			1.00	1.00	
Frt	0.91			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1229			2783	4180	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1229			2783	4180	
Peak-hour factor, PHF	0.75	0.75	0.91	0.91	0.94	0.94
Adj. Flow (vph)	11	20	0	1489	1126	0
RTOR Reduction (vph)	17	0	0	0	0	0
Lane Group Flow (vph)	14	0	0	1489	1126	0
Confl. Peds. (#/hr)	20	11	97			97
Confl. Bikes (#/hr)		1				16
Heavy Vehicles (%)	0%	0%	0%	2%	4%	0%
Bus Blockages (#/hr)	0	0	0	20	20	20
Parking (#/hr)	8	8				
Turn Type	Perm			NA	NA	
Protected Phases				2	6	
Permitted Phases	8					
Actuated Green, G (s)	19.0			81.0	81.0	
Effective Green, g (s)	19.0			81.0	81.0	
Actuated g/C Ratio	0.17			0.74	0.74	
Clearance Time (s)	5.0			5.0	5.0	
Lane Grp Cap (vph)	212			2049	3078	
v/s Ratio Prot				0.54	0.27	
v/s Ratio Perm	0.01					
v/c Ratio	0.07			0.73	0.37	
Uniform Delay, d1	38.1			8.2	5.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.6			2.3	0.3	
Delay (s)	38.7			10.5	5.6	
Level of Service	D			B	A	
Approach Delay (s)	38.7			10.5	5.6	
Approach LOS	D			B	A	
Intersection Summary						
HCM 2000 Control Delay			8.7	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			110.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization			64.1%	ICU Level of Service		C
Analysis Period (min)			15			

c Critical Lane Group