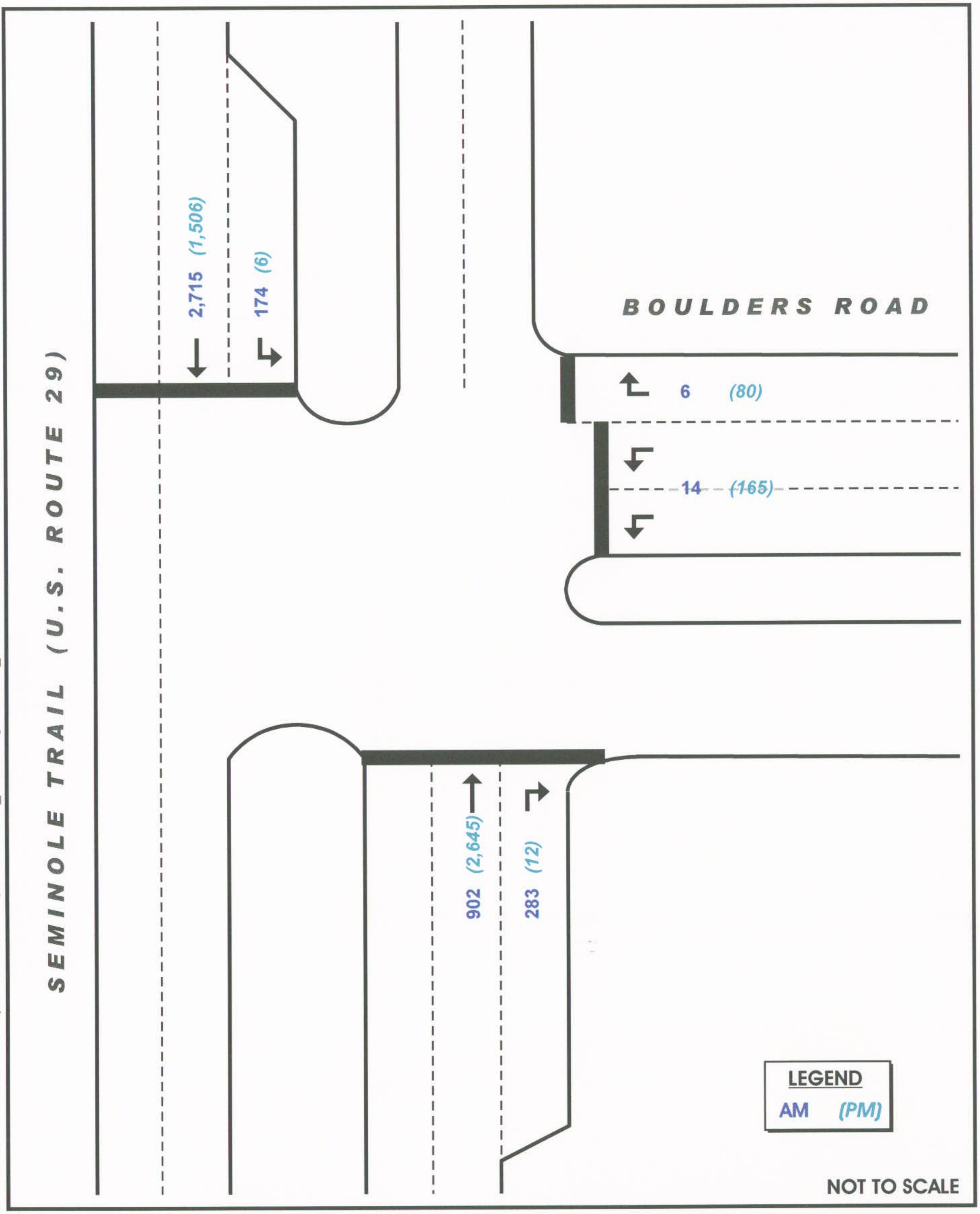

EXHIBIT E

JUIAF Traffic Analysis
2015 No-Build Conditions

ALBEMARLE COUNTY, VIRGINIA

LANDMARK DESIGN GROUP
Engineers • Planners • Surveyors
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VIRGINIA BEACH, VA • WILLIAMSBURG, VA • SUFFOLK, VA

L:/ Projects 2006014-005.03 JUIAF Traffic Analysis CO#2 / Graphics / JUIAF_Traffic Figs 03 etc_Analysis.cdr June 6, 2007

Table 2
Trip Generation

Land Use			A.M. Peak Hour				P.M. Peak Hour			
	Size	Units	Entering Rate	VPH	Exiting Rate	VPH	Entering Rate	VPH	Exiting Rate	VPH
Military Office	2332	Emp	0.288	671	0.021	50	0.019	44	0.318	742

Traffic distribution to and from the NGIC / JUIAF facility is expected to continue along similar patterns. The March 2007 counts show slightly different A.M. and P.M. patterns. During the morning 64% of the site traffic arrives from the south, yet during the afternoon 70% of the traffic exits in that direction. These traffic distributions were applied to the trip generation figure present above to determine the 2015 site traffic volumes. These are mapped on Exhibit F.

NGIC expects to continue to host significant events attracting approximately 100 visitors to the site on an almost weekly basis. The 2015 site traffic on event days is mapped on Exhibit G.

The 2015 site traffic volumes were combined with the 2015 through background traffic volumes from Exhibit D to determine the future with development scenario volumes shown on Exhibits H and I. These volumes were analyzed with HCM-plus Software to estimate future operating conditions at the intersection. Report printouts from the software are included in the appendix. Summaries of the expected delays and levels of service for each movement are listed in the following tables.

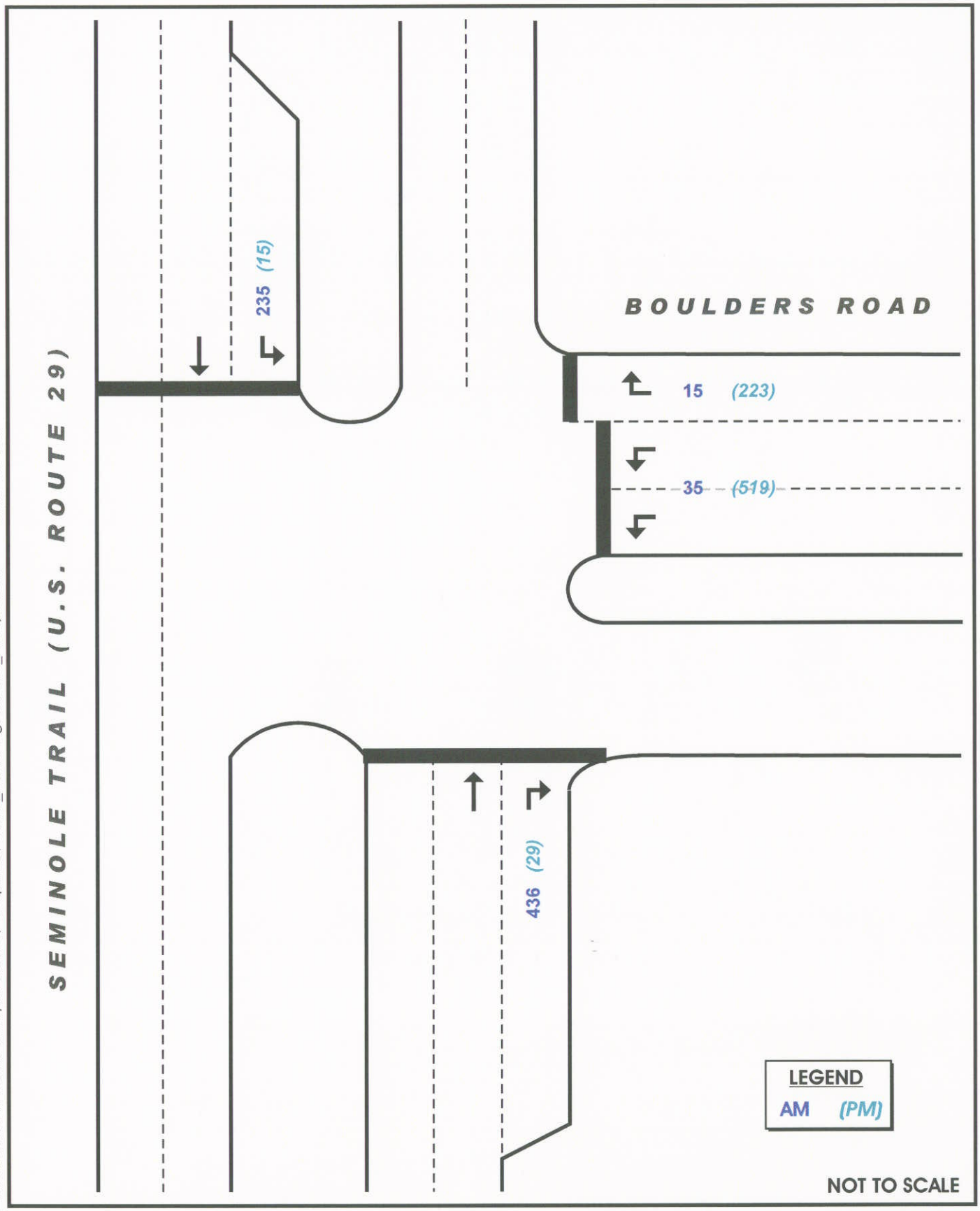

EXHIBIT F

JUIAF Traffic Analysis
2015 Additional Site Traffic

ALBEMARLE COUNTY, VIRGINIA

LANDMARK DESIGN GROUP
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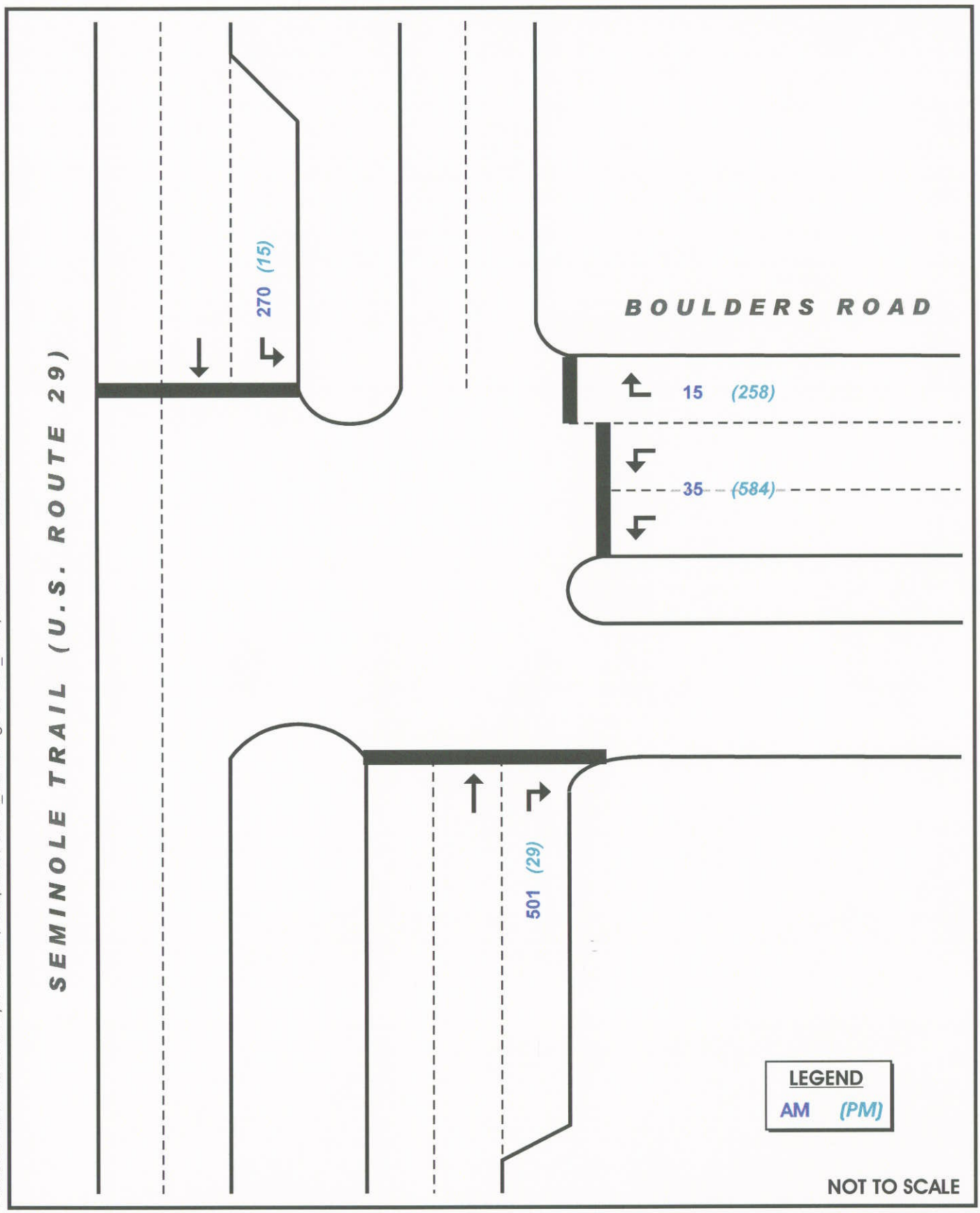
L:/ Projects 2006014-005.03 JUIAF Traffic Analysis CO#2 / Graphics / JUIAF_Traffic Figs 03 etc_Analysis.cdr June 6, 2007



L:/ Projects 20060014-005.03 JUIAF Traffic Analysis CO#2 / Graphics / JUIAF_Traffic Figs 03 etc_Analysis.cdr June 6, 2007

EXHIBIT G

JUIAF Traffic Analysis
2015 Additional Site Traffic - Event Days

ALBEMARLE COUNTY, VIRGINIA

LANDMARK DESIGN GROUP
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Table 3
Summary of Intersection Capacity Analysis
Year 2015 Conditions - Normal NGIC/JUIAF Operations
Seminole Trail and Boulders Road

APPROACH	MOVEMENT	A.M. PEAK		P.M. PEAK		ALT P.M. PEAK	
		DELAY	LOS	DELAY	LOS	DELAY	LOS
Westbound	Left	41.1	D	53.8	D	179.6	F
Westbound	Right	40.8	D	37.2	D	58.0	E
Northbound	Through	8.8	A	162.4	F	36.1	F
Northbound	Right	8.9	A	8.7	A	5.8	A
Southbound	Left	4.4	A	30.1	C	41.1	D
Southbound	Through	28.1	C	9.7	A	6.0	A
INTERSECTION		21.1	C	97.9	F	69.7	E

Table 4
Summary of Intersection Capacity Analysis
Year 2015 Conditions – Event Day Operations
Seminole Trail and Boulders Road

APPROACH	MOVEMENT	A.M. PEAK		P.M. PEAK	
		DELAY	LOS	DELAY	LOS
Westbound	Left	41.1	D	65.4	E
Westbound	Right	40.8	D	39.3	D
Northbound	Through	8.8	A	162.4	F
Northbound	Right	9.5	A	8.7	A
Southbound	Left	5.6	A	30.1	C
Southbound	Through	28.1	C	9.7	A
INTERSECTION		20.9	C	98.3	F

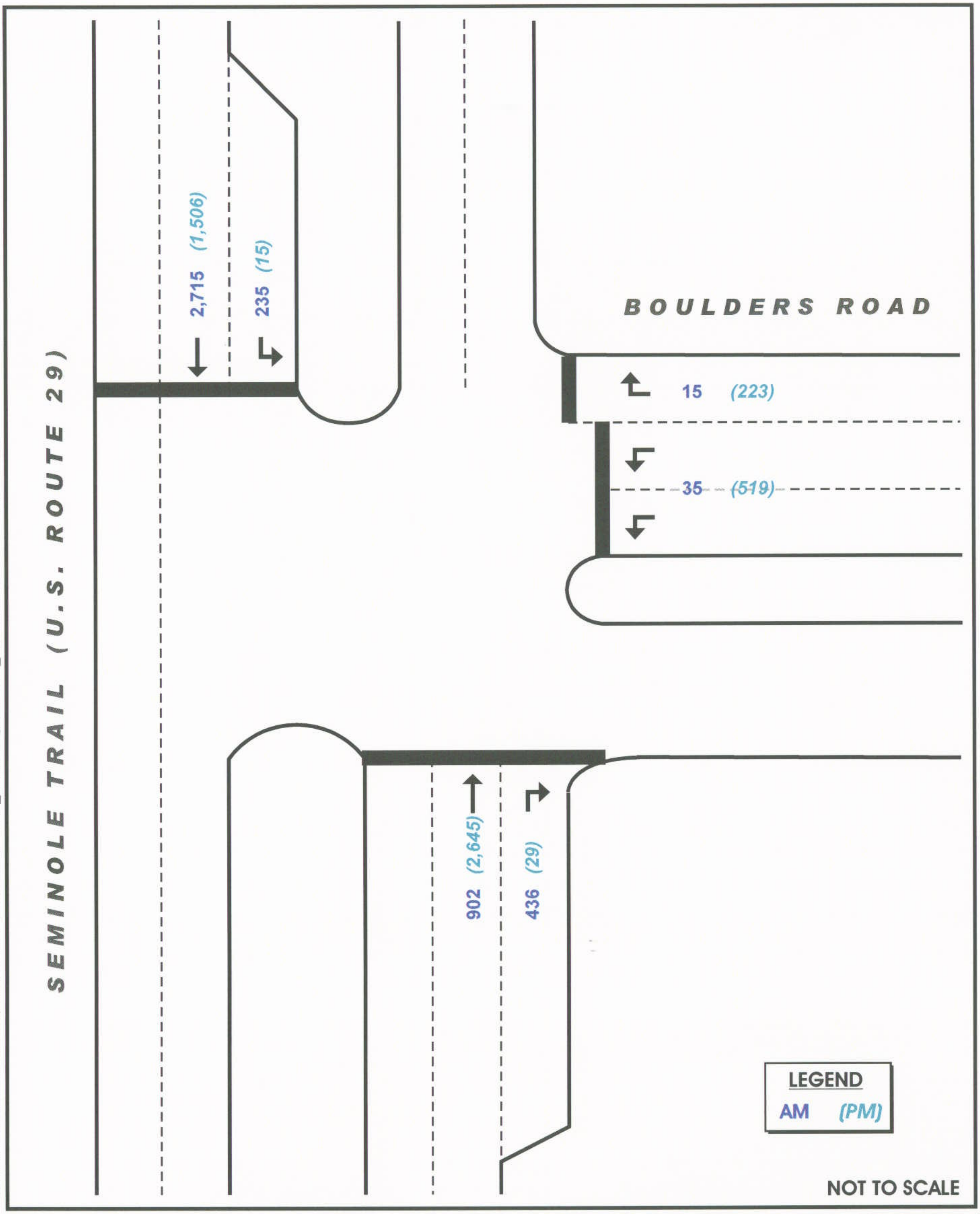

EXHIBIT H

JUIAF Traffic Analysis
2015 Volumes with
Proposed NGIC & JUIAF Expansions

ALBEMARLE COUNTY, VIRGINIA

LANDMARK DESIGN GROUP
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L:/ Projects 2006014-005.03 JUIAF Traffic Analysis CO#2 / Graphics / JUIAF_Traffic Figs 03 etc_Analysis.cdr June 6, 2007

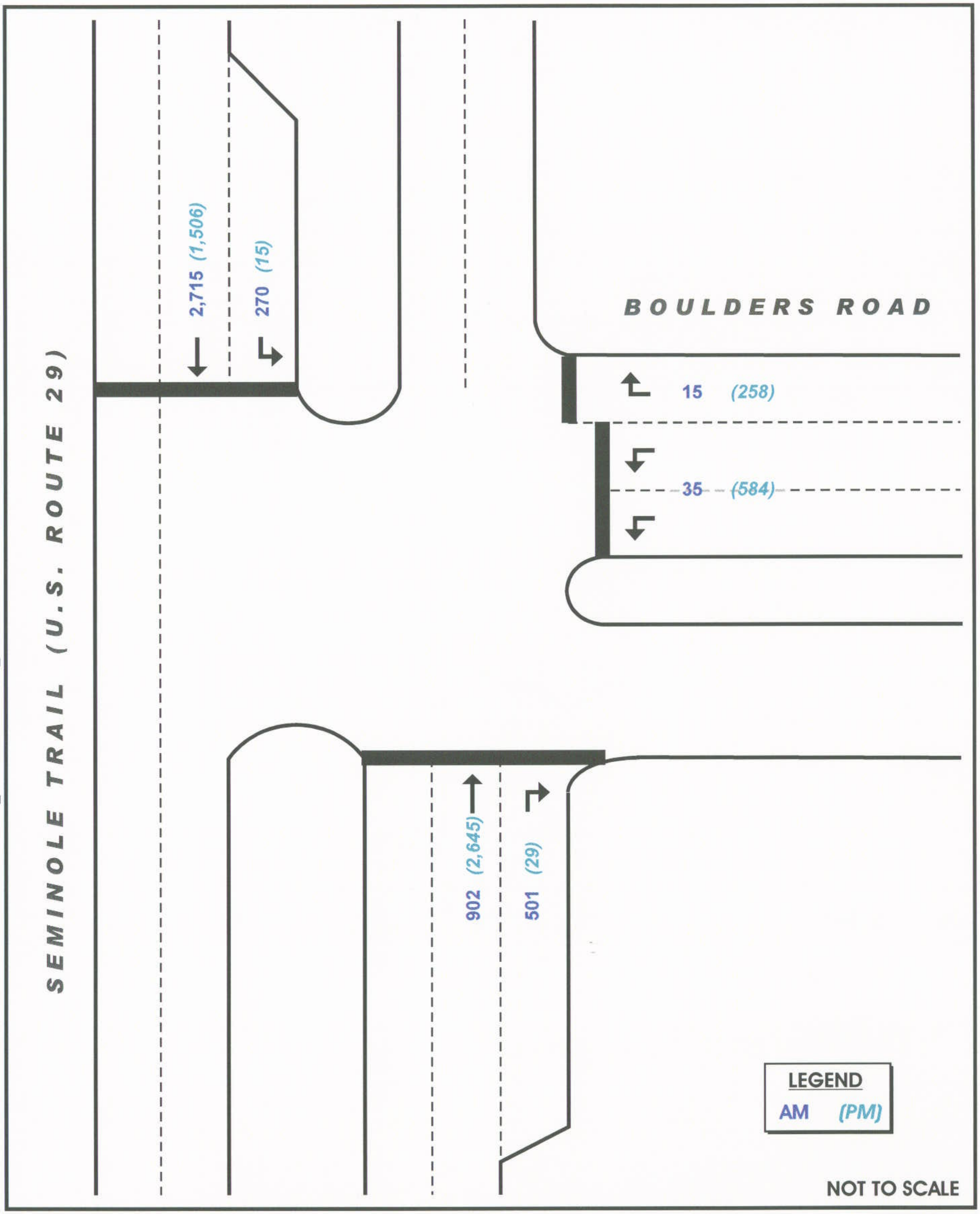

EXHIBIT I

JUIAF Traffic Analysis
2015 Volumes with
Proposed NGIC & JUIAF Expansions - Event Days

ALBEMARLE COUNTY, VIRGINIA

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L:/ Projects 2006014-005.03 JUIAF Traffic Analysis CO#2 / Graphics / JUIAF_Traffic Figs 03 etc_Analysis.cdr June 6, 2007

By 2015, the P.M. peak hour through traffic will increase to exceed the capacity of Seminole Trail as a four lane divided arterial. This will increase demand for green time on Seminole Trail, benefiting traffic entering Boulders Road, but hampering exiting traffic. In Table 3, the first column of "P.M. Peak" delays shows the impact of setting signal timings to allow exiting traffic to operate at level of service D. By doing so, the average delay per vehicle through the intersection would increase by almost 30 seconds over the alternative timing, which optimizes the intersection for through traffic movements. The timings used in these analyses continue to utilize long green times for the through movements on Seminole Trail and permissive lefts for traffic entering Boulders Road. This produces an A.M. peak period model in which the entering left movement can take advantage of the lighter northbound flow and utilize frequent gaps in this flow to enter Boulders Road without significant delays or queuing.

Capacity at the intersection will increase when Seminole Trail is widened to six lanes. Capacity for exiting traffic can be increased by providing a third left turn lane on Boulders Road. Table 5 presents the results of analysis with six lanes on Seminole Trail and three exiting left turn lanes on Boulders Road.

Table 5
Summary of Intersection Capacity Analysis
Year 2015 Conditions – With Six Lane Route 29
Seminole Trail and Boulders Road

APPROACH	MOVEMENT	A.M. PEAK		P.M. PEAK	
		DELAY	LOS	DELAY	LOS
Westbound	Left	45.8	D	52.1	D
Westbound	Right	45.9	D	37.2	D
Northbound	Through	4.2	A	16.8	B
Northbound	Right	4.8	A	6.2	A
Southbound	Left	3.8	A	17.4	B
Southbound	Through	3.6	A	4.6	A
INTERSECTION		4.2	A	17.5	B

Conclusions

The normal rules of thumb used by traffic planners indicate that left turn lanes reach capacity as left turn volumes approach 300 vehicles per hour. However, favorable through traffic flows and permissive signal timings allow the southbound left turn movement from Seminole Trail to Boulders Road to operate at high levels of service with minimal back ups. Traffic forecasts for 2,332 employees and 100 visitors at JUIAF and the expanded NGIC facilities, estimate that this movement will grow to 270 vehicles per hour during the A.M. peak hour in 2015. Anticipated growth in the through traffic will continue to benefit the A.M. entering traffic and maintain high levels of service and minimal queues for this movement.

Traffic exiting Boulders Road will not benefit from the background traffic growth. Delays exiting JUIAF and NGIC will continue to increase as the facilities grow and through traffic on Seminole Trail demands more of the green time at the signal. The signal timing could be manipulated to give greater priority to side street traffic, and thereby minimize the delay increases on Boulders Road, but this would increase overall intersection delays. The anticipated widening of Seminole Trail will eventually bring relief to P.M. peak hour traffic and provide opportunities to increase capacity of the exiting lanes on Boulders Road as well.

TECHNICAL APPENDIX

TRAFFIC COUNT
PEAK PERIOD
US Route 29 and Boulders Road
Albemarle County
Date: March 27, 2007
Weather:
Job Number: 2006014-005.03

	US Route 29							Boulders Road						
TIME	NORTHBOUND				SOUTHBOUND			WESTBOUND						
A.M.	U-turns	THRU L	THRU R	RIGHT	LEFT	THRU L	THRU R	LEFT L	LEFT R	RIGHT				TOTAL
														0
6:30 - 6:45	0	27	71	37	16	172	155	1	0	2				481
6:45 - 7:00	0	52	49	43	27	202	126	0	1	0				500
7:00 - 7:15	2	73	52	64	41	259	177	0	4	0				672
7:15 - 7:30	0	115	90	89	38	287	225	0	3	2				849
7:30 - 7:45	1	97	68	69	53	311	269	1	0	2				871
7:45 - 8:00	0	119	98	61	42	337	278	4	2	2				943
8:00 - 8:15	0	101	76	34	24	195	159	2	4	0				595
8:15 - 8:30	0	109	112	31	23	275	217	3	1	0				771
8:30 - 8:45	0	86	89	25	14	231	214	0	1	0				660
8:45 - 9:00	0	147	49	17	5	247	208	3	1	0				677
PEAK HOUR		404	308	283	174	1194	949	5	9	6				3335
PEAK 15 MIN.		119	98	89	53	337	278	4	4	2				943
PHF				0.48			0.87			0.50				0.88
%		68%	52%	48%	8%	52%	41%	25%	45%	30%				
3:00 - 3:15	1	153	158	4	1	132	112	16	11	11				599
3:15 - 3:30	1	190	180	4	0	126	122	16	7	8				654
3:30 - 3:45	0	207	153	4	3	112	118	15	13	17				642
3:45 - 4:00	2	236	172	5	3	113	109	25	16	21				702
4:00 - 4:15	4	281	201	5	1	138	136	26	18	25				835
4:15 - 4:30	4	252	191	2	1	121	125	29	26	23				774
4:30 - 4:45	7	304	315	3	1	146	163	37	28	33				1037
4:45 - 5:00	6	264	102	2	3	108	119	35	25	42				706
5:00 - 5:15	10	268	212	1	2	140	135	42	30	36				876
5:15 - 5:30	9	300	234	4	1	156	156	21	22	21				924
5:30 - 5:45	8	316	236	2	0	173	147	16	7	13				918
5:45 - 6:00	4	278	244	5	3	142	140	16	11	10				853
PEAK HOUR	31	1162	926	12	6	611	578	95	70	80				3571
PEAK 15 MIN.	10	316	244	5	3	173	156	42	30	36				3335
PHF				0.42			0.90			0.57				0.27
%	3%	120%	96%	1%	1%	51%	48%	39%	29%	33%				

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*4/19/2007*	Jurisdiction	*VDOT*
Time Period	*am peak*	Analysis Year	*2007*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*1*		*2*	*0*	*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Volume, V (vph)				*14*		*6*	*0*	*712*	*283*	*174*	*2143*	
% Heavy Vehicles, %HV				*0*		*0*	*0*	*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.50*		*0.50*	*0.80*	*0.80*	*0.80*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*P*		*P*	*P*	*P*	*P*	*P*	*P*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*2*	*0*	*0*	*20*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*			*3.2*			*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *8.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *8.5*	G = *66.5*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *100.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*28*		*8*		*890*	*329*	*193*	*2381*	
Lane Group Capacity, c				*144*		*229*		*2406*	*1074*	*523*	*2931*	
v/c Ratio, X				*0.19*		*0.03*		*0.37*	*0.31*	*0.37*	*0.81*	
Total Green Ratio, g/C				*0.08*		*0.08*		*0.67*	*0.67*	*0.81*	*0.81*	
Uniform Delay, d_1				*43.0*		*42.4*		*7.4*	*7.0*	*3.0*	*5.3*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.50*		*0.50*		*0.50*	*0.50*	*0.50*	*0.50*	
Incremental Delay, d_2				*3.0*		*0.3*		*0.4*	*0.7*	*2.0*	*2.6*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*46.0*		*42.7*		*7.9*	*7.8*	*5.0*	*7.9*	
Lane Group LOS				*D*		*D*		*A*	*A*	*A*	*A*	

Approach Delay		45.3	7.9	7.6
Approach LOS		D	A	A
Intersection Delay	8.1	X_c = 0.76	Intersection LOS	A

INITIAL QUEUE DELAY WORKSHEET

General Information

Project Description *JUAIF*

Input Parameters

Period (i) *am peak*

Duration, T *0.25 h*

Cycle Length, C *100.0 s*

	EB			WB			NB			SB		
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Initial Queue, Q_b (veh)				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Green Ratio, g/C				*0.08*		*0.08*		*0.67*	*0.67*	*0.81*	*0.81*	
v/c Ratio, X (X = v/c)				*0.19*		*0.03*		*0.37*	*0.31*	*0.37*	*0.81*	
Adjusted Lane Group Capacity, c (veh/h)				*144*		*229*		*2406*	*1074*	*523*	*2931*	
Duration of Unmet Demand in T (h)				*0.00*		*0.00*		*0.00*	*0.00*	*0.00*	*0.00*	
Case				*I*		*I*		*I*	*I*	*I*	*I*	
Cases I and II (Q_b = 0)												
Initial Queue Delay, d_3 = 0, and Uniform Delay, d_1, is as shown on Capacity and LOS Worksheet												
Case III (Q_b > 0) (X <= 1.0) (t < T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												
Case IV (Q_b > 0) (X <= 1.0) (t = T)												
Delay Parameter, u												
Initial Queue Delay, d_3 (s)												
Uniform Delay												
Case V (Q_b > 0) (X > 1.0) (t = T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *JUAIF*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Initial Queue/Lane				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group				*28*		*8*		*890*	*329*	*193*	*2381*	
Satflow/Lane				*1805*		*1615*		*1900*	*1615*	*646*	*1900*	
Capacity/Lane Group				*144*		*229*		*2406*	*1074*	*523*	*2931*	
Flow Ratio				*0.0*		*0.0*		*0.2*	*0.2*	*0.3*	0.7	
v/c Ratio				*0.19*		*0.03*		*0.37*	*0.31*	*0.37*	*0.81*	
I Factor				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Arrival Type				*3*		*3*		*3*	*3*	*3*	*3*	
Platoon Ratio				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
Q_1				*0.7*		*0.1*		*5.8*	*3.8*	*1.1*	*19.3*	
k_B				*0.3*		*0.3*		*1.4*	*1.3*	*0.8*	*1.7*	
Q_2				*0.1*		*0.0*		*0.8*	*0.6*	*0.5*	*6.1*	
Q Average				*0.8*		*0.1*		*6.6*	*4.4*	*1.5*	*25.4*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$				*2.5*		*2.6*		*1.9*	*2.0*	*2.3*	*1.6*	
Back of Queue				*2.0*		*0.3*		*12.3*	*8.9*	*3.5*	*40.8*	
Queue Storage Ratio												
Queue Spacing				*25.0*		*25.0*		*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage				*0*		*0*		*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*4/19/2007*	Jurisdiction	*VDOT*
Time Period	*pm peak*	Analysis Year	*2007*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*	*0*	*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Volume, V (vph)				*165*		*80*	*0*	*2080*	*12*	*6*	*2143*	
% Heavy Vehicles, %HV				*0*		*0*	*0*	*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*	*A*	*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*8*	*0*	*0*	*5*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*			*3.2*			*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *11.9*	G = *0.0*	G = *0.0*	G = *0.0*	G = *10.5*	G = *80.6*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *120.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*183*		*80*		*2311*	*8*	*7*	*2381*	
Lane Group Capacity, c				*348*		*160*		*2430*	*1085*	*222*	*2928*	
v/c Ratio, X				*0.53*		*0.50*		*0.95*	*0.01*	*0.03*	*0.81*	
Total Green Ratio, g/C				*0.10*		*0.10*		*0.67*	*0.67*	*0.81*	*0.81*	
Uniform Delay, d_1				*51.4*		*51.2*		*17.9*	*6.5*	*30.0*	*6.4*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.13*		*0.11*		*0.46*	*0.11*	*0.11*	*0.35*	
Incremental Delay, d_2				*1.5*		*2.4*		*9.3*	*0.0*	*0.0*	*0.6*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*52.9*		*53.7*		*27.2*	*6.5*	*30.1*	*7.0*	
Lane Group LOS				*D*		*D*		*C*	*A*	*C*	*A*	

Approach Delay		53.1	27.2	7.0
Approach LOS		D	C	A
Intersection Delay	18.9	X_C = 0.78	Intersection LOS	B

INITIAL QUEUE DELAY WORKSHEET

General Information

Project Description *JUAIF*

Input Parameters

Period (i) *pm peak*

Duration, T *0.25 h*

Cycle Length, C *120.0 s*

	EB			WB			NB			SB		
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Initial Queue, Q_b (veh)				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Green Ratio, g/C				*0.10*		*0.10*		*0.67*	*0.67*	*0.81*	*0.81*	
v/c Ratio, X (X = v/c)				*0.53*		*0.50*		*0.95*	*0.01*	*0.03*	*0.81*	
Adjusted Lane Group Capacity, c (veh/h)				*348*		*160*		*2430*	*1085*	*222*	*2928*	
Duration of Unmet Demand in T (h)				*0.00*		*0.00*		*0.00*	*0.00*	*0.00*	*0.00*	
Case				*I*		*I*		*I*	*I*	*I*	*I*	
Cases I and II (Q_b = 0)												
Initial Queue Delay, d_3 = 0, and Uniform Delay, $d_{1,}$ is as shown on Capacity and LOS Worksheet												
Case III (Q_b > 0) (X <= 1.0) (t < T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												
Case IV (Q_b > 0) (X <= 1.0) (t = T)												
Delay Parameter, u												
Initial Queue Delay, d_3 (s)												
Uniform Delay												
Case V (Q_b > 0) (X > 1.0) (t = T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *JUAIF*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*		*LT*	*R*	*L*	*T*	
Initial Queue/Lane				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group				*183*		*80*		*2311*	*8*	*7*	*2381*	
Satflow/Lane				*1805*		*1615*		*1900*	*1615*	*274*	*1900*	
Capacity/Lane Group				*348*		*160*		*2430*	*1085*	*222*	*2928*	
Flow Ratio				*0.1*		*0.0*		*0.6*	*0.0*	*0.0*	0.7	
v/c Ratio				*0.53*		*0.50*		*0.95*	*0.01*	*0.03*	*0.81*	
I Factor				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Arrival Type				*3*		*3*		*3*	*3*	*3*	*3*	
Platoon Ratio				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
Q_1				*3.0*		*2.5*		*36.7*	*0.1*	*0.0*	*23.3*	
k_B				*0.3*		*0.3*		*0.9*	*0.9*	*0.1*	*0.3*	
Q_2				*0.3*		*0.3*		*8.7*	*0.0*	*0.0*	*1.4*	
Q Average				*3.3*		*2.8*		*45.4*	*0.1*	*0.0*	*24.7*	

Percentile Back of Queue (95th percentile)

$f_{B\%}$				*2.0*		*2.0*		*1.5*	*2.1*	*2.1*	*1.7*	
Back of Queue				*6.6*		*5.6*		*70.3*	*0.2*	*0.1*	*40.7*	

Queue Storage Ratio

Queue Spacing				*25.0*		*25.0*		*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage				*0*		*0*		*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/2007*	Jurisdiction	*VDOT*
Time Period	*am peak*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*		*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*35*		*15*		*902*	*436*	*235*	*2715*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*8*	*0*	*0*	*40*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*				*3.2*		*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *5.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *11.5*	G = *56.5*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *90.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*39*		*8*		*1002*	*440*	*261*	*3017*	
Lane Group Capacity, c				*195*		*90*		*2271*	*1014*	*525*	*2975*	
v/c Ratio, X				*0.20*		*0.09*		*0.44*	*0.43*	*0.50*	*1.01*	
Total Green Ratio, g/C				*0.06*		*0.06*		*0.63*	*0.63*	*0.82*	*0.82*	
Uniform Delay, d_1				*40.6*		*40.3*		*8.6*	*8.6*	*3.7*	*8.0*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.11*		*0.11*		*0.11*	*0.11*	*0.11*	*0.50*	
Incremental Delay, d_2				*0.5*		*0.4*		*0.1*	*0.3*	*0.7*	*20.1*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*41.1*		*40.8*		*8.8*	*8.9*	*4.4*	*28.1*	
Lane Group LOS				*D*		*D*		*A*	*A*	*A*	*C*	

Approach Delay		41.0	8.8	26.2
Approach LOS		D	A	C
Intersection Delay	21.1	X_c = 0.96	Intersection LOS	C

INITIAL QUEUE DELAY WORKSHEET

General Information

Project Description *JUAIF*

Input Parameters

Period (i) *am peak*

Duration, T *0.25 h*

Cycle Length, C *90.0 s*

	EB			WB			NB			SB		
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Initial Queue, Q_b (veh)				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Green Ratio, g/C				*0.06*		*0.06*		*0.63*	*0.63*	*0.82*	*0.82*	
v/c Ratio, X (X = v/c)				*0.20*		*0.09*		*0.44*	*0.43*	*0.50*	*1.01*	
Adjusted Lane Group Capacity, c (veh/h)				*195*		*90*		*2271*	*1014*	*525*	*2975*	
Duration of Unmet Demand in T (h)				*0.00*		*0.00*		*0.00*	*0.00*	*0.00*	*0.00*	
Case				*I*		*I*		*I*	*I*	*I*	*II*	
Cases I and II (Q_b = 0)												
Initial Queue Delay, d_3 = 0, and Uniform Delay, d_1, is as shown on Capacity and LOS Worksheet												
Case III (Q_b > 0) (X <= 1.0) (t < T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												
Case IV (Q_b > 0) (X <= 1.0) (t = T)												
Delay Parameter, u												
Initial Queue Delay, d_3 (s)												
Uniform Delay												
Case V (Q_b > 0) (X > 1.0) (t = T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *JUAIF*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Initial Queue/Lane				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group				*39*		*8*		*1002*	*440*	*261*	*3017*	
Satflow/Lane				*1805*		*1615*		*1900*	*1615*	*639*	*1900*	
Capacity/Lane Group				*195*		*90*		*2271*	*1014*	*525*	*2975*	
Flow Ratio				*0.0*		*0.0*		*0.3*	*0.3*	*0.4*	0.8	
v/c Ratio				*0.20*		*0.09*		*0.44*	*0.43*	*0.50*	*1.01*	
I Factor				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Arrival Type				*3*		*3*		*3*	*3*	*3*	*3*	
Platoon Ratio				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
Q_1				*0.5*		*0.2*		*6.8*	*5.6*	*1.2*	*39.6*	
k_B				*0.2*		*0.2*		*0.8*	*0.7*	*0.5*	*0.9*	
Q_2				*0.0*		*0.0*		*0.6*	*0.5*	*0.5*	*14.8*	
Q Average				*0.5*		*0.2*		*7.4*	*6.2*	*1.7*	*54.4*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$				*2.1*		*2.1*		*1.9*	*1.9*	*2.0*	*1.5*	
Back of Queue				*1.1*		*0.4*		*14.0*	*11.9*	*3.5*	*83.2*	
Queue Storage Ratio												
Queue Spacing				*25.0*		*25.0*		*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage				*0*		*0*		*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/07*	Jurisdiction	*VDOT*
Time Period	*pm peak normal day*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*		*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*519*		*223*		*2645*	*29*	*15*	*1506*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*25*	*0*	*0*	*5*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*			*3.2*			*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *24.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *4.2*	G = *74.8*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *120.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*577*		*220*		*2939*	*27*	*17*	*1673*	
Lane Group Capacity, c				*701*		*447*		*2255*	*1007*	*126*	*2563*	
v/c Ratio, X				*0.82*		*0.49*		*1.30*	*0.03*	*0.13*	*0.65*	
Total Green Ratio, g/C				*0.20*		*0.28*		*0.62*	*0.62*	*0.71*	*0.71*	
Uniform Delay, d_1				*46.0*		*36.3*		*22.6*	*8.7*	*30.0*	*9.5*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.36*		*0.11*		*0.50*	*0.11*	*0.11*	*0.23*	
Incremental Delay, d_2				*7.9*		*0.9*		*139.8*	*0.0*	*0.2*	*0.2*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*53.8*		*37.2*		*162.4*	*8.7*	*30.1*	*9.7*	
Lane Group LOS				*D*		*D*		*F*	*A*	*C*	*A*	

Approach Delay		49.2	161.0	9.9
Approach LOS		D	F	A
Intersection Delay	97.9	X_c = 1.15	Intersection LOS	F

INITIAL QUEUE DELAY WORKSHEET

General Information

Project Description *JUAIF*

Input Parameters

Period (i) *pm peak normal day*

Duration, T *0.25 h*

Cycle Length, C *120.0 s*

	EB			WB			NB		SB		
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Initial Queue, Q_b (veh)				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Green Ratio, g/C				*0.20*		*0.28*		*0.62*	*0.62*	*0.71*	*0.71*	
v/c Ratio, X (X = v/c)				*0.82*		*0.49*		*1.30*	*0.03*	*0.13*	*0.65*	
Adjusted Lane Group Capacity, c (veh/h)				*701*		*447*		*2255*	*1007*	*126*	*2563*	
Duration of Unmet Demand in T (h)				*0.00*		*0.00*		*0.00*	*0.00*	*0.00*	*0.00*	
Case				*I*		*I*		*II*	*I*	*I*	*I*	
Cases I and II (Q_b = 0)												
Initial Queue Delay, d_3 = 0, and Uniform Delay, d_1, is as shown on Capacity and LOS Worksheet												
Case III (Q_b > 0) (X <= 1.0) (t < T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												
Case IV (Q_b > 0) (X <= 1.0) (t = T)												
Delay Parameter, u												
Initial Queue Delay, d_3 (s)												
Uniform Delay												
Case V (Q_b > 0) (X > 1.0) (t = T)												
Initial Queue Delay, d_3 (s)												
Uniform Delay, d_1 (s)												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *JUAIF*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Initial Queue/Lane				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group				*577*		*220*		*2939*	*27*	*17*	*1673*	
Satflow/Lane				*1805*		*1615*		*1900*	*1615*	*179*	*1900*	
Capacity/Lane Group				*701*		*447*		*2255*	*1007*	*126*	*2563*	
Flow Ratio				*0.2*		*0.1*		*0.8*	*0.0*	*0.1*	0.5	
v/c Ratio				*0.82*		*0.49*		*1.30*	*0.03*	*0.13*	*0.65*	
I Factor				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Arrival Type				*3*		*3*		*3*	*3*	*3*	*3*	
Platoon Ratio				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor				*1.00*		*1.00*		*1.00*	*1.00*	*1.00*	*1.00*	
Q_1				*9.5*		*6.1*		*51.4*	*0.3*	*0.2*	*15.9*	
k_B				*0.4*		*0.5*		*0.9*	*0.8*	*0.1*	*0.3*	
Q_2				*1.7*		*0.5*		*48.5*	*0.0*	*0.0*	*0.6*	
Q Average				*11.2*		*6.6*		*99.9*	*0.4*	*0.2*	*16.4*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$				*1.8*		*1.9*		*1.5*	*2.1*	*2.1*	*1.7*	
Back of Queue				*20.4*		*12.7*		*150*	*0.8*	*0.4*	*28.6*	
Queue Storage Ratio												
Queue Spacing				*25.0*		*25.0*		*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage				*0*		*0*		*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/07*	Jurisdiction	*VDOT*
Time Period	*pm peak normal day-optimized*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*		*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*519*		*223*		*2645*	*29*	*15*	*1506*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*25*	*0*	*0*	*5*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*				*3.2*		*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *18.8*	G = *0.0*	G = *0.0*	G = *0.0*	G = *4.0*	G = *100.2*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *140.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*577*		*220*		*2939*	*27*	*17*	*1673*	
Lane Group Capacity, c				*471*		*321*		*2589*	*1156*	*107*	*2848*	
v/c Ratio, X				*1.23*		*0.69*		*1.14*	*0.02*	*0.16*	*0.59*	
Total Green Ratio, g/C				*0.13*		*0.20*		*0.72*	*0.72*	*0.79*	*0.79*	
Uniform Delay, d_1				*60.6*		*52.0*		*19.9*	*5.8*	*40.8*	*5.9*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.50*		*0.25*		*0.50*	*0.11*	*0.11*	*0.18*	
Incremental Delay, d_2				*119.0*		*6.0*		*66.2*	*0.0*	*0.2*	*0.1*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*179.6*		*58.0*		*86.1*	*5.8*	*41.1*	*6.0*	

Lane Group LOS				F		E		F	A	D	A	
Approach Delay				146.0			85.4			6.4		
Approach LOS				F			F			A		
Intersection Delay	69.7			X_C = 1.12			Intersection LOS			E		

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/2007*	Jurisdiction	*VDOT*
Time Period	*am peak event day*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*		*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*35*		*15*		*902*	*501*	*270*	*2715*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*8*	*0*	*0*	*40*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*				*3.2*		*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *5.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *11.5*	G = *56.5*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *90.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*39*		*8*		*1002*	*512*	*300*	*3017*	
Lane Group Capacity, c				*195*		*90*		*2271*	*1014*	*525*	*2975*	
v/c Ratio, X				*0.20*		*0.09*		*0.44*	*0.50*	*0.57*	*1.01*	
Total Green Ratio, g/C				*0.06*		*0.06*		*0.63*	*0.63*	*0.82*	*0.82*	
Uniform Delay, d_1				*40.6*		*40.3*		*8.6*	*9.1*	*4.1*	*8.0*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.11*		*0.11*		*0.11*	*0.11*	*0.17*	*0.50*	
Incremental Delay, d_2				*0.5*		*0.4*		*0.1*	*0.4*	*1.5*	*20.1*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*41.1*		*40.8*		*8.8*	*9.5*	*5.6*	*28.1*	
Lane Group LOS				*D*		*D*		*A*	*A*	*A*	*C*	

Approach Delay		*41.0*	*9.0*	*26.1*
Approach LOS		*D*	*A*	*C*
Intersection Delay	*20.9*	X_c = *0.96*	Intersection LOS	*C*

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/07*	Jurisdiction	*VDOT*
Time Period	*pm peak event day*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*2*		*1*		*2*	*1*	*1*	*2*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*584*		*258*		*2645*	*29*	*15*	*1506*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*25*	*0*	*0*	*5*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*			*3.2*			*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *24.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *4.2*	G = *74.8*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *120.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*649*		*259*		*2939*	*27*	*17*	*1673*	
Lane Group Capacity, c				*701*		*447*		*2255*	*1007*	*126*	*2563*	
v/c Ratio, X				*0.93*		*0.58*		*1.30*	*0.03*	*0.13*	*0.65*	
Total Green Ratio, g/C				*0.20*		*0.28*		*0.62*	*0.62*	*0.71*	*0.71*	
Uniform Delay, d_1				*47.1*		*37.4*		*22.6*	*8.7*	*30.0*	*9.5*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.44*		*0.17*		*0.50*	*0.11*	*0.11*	*0.23*	
Incremental Delay, d_2				*18.3*		*1.9*		*139.8*	*0.0*	*0.2*	*0.2*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*65.4*		*39.3*		*162.4*	*8.7*	*30.1*	*9.7*	
Lane Group LOS				*E*		*D*		*F*	*A*	*C*	*A*	

Approach Delay		58.0	161.0	9.9
Approach LOS		E	F	A
Intersection Delay	98.3	X_c = 1.17	Intersection LOS	F

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/2007*	Jurisdiction	*VDOT*
Time Period	*am peak with Rt 29 Improvement*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*3*		*1*		*3*	*1*	*1*	*3*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*35*		*15*		*902*	*436*	*235*	*2715*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*8*	*0*	*0*	*50*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*				*3.2*		*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *5.0*	G = *0.0*	G = *0.0*	G = *0.0*	G = *4.0*	G = *74.0*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *100.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*39*		*8*		*1002*	*429*	*261*	*3017*	
Lane Group Capacity, c				*246*		*81*		*3830*	*1195*	*453*	*4348*	
v/c Ratio, X				*0.16*		*0.10*		*0.26*	*0.36*	*0.58*	*0.69*	
Total Green Ratio, g/C				*0.05*		*0.05*		*0.74*	*0.74*	*0.84*	*0.84*	
Uniform Delay, d_1				*45.5*		*45.3*		*4.2*	*4.6*	*1.9*	*3.1*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.11*		*0.11*		*0.11*	*0.11*	*0.17*	*0.26*	
Incremental Delay, d_2				*0.3*		*0.5*		*0.0*	*0.2*	*1.8*	*0.5*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*45.8*		*45.9*		*4.2*	*4.8*	*3.8*	*3.6*	
Lane Group LOS				*D*		*D*		*A*	*A*	*A*	*A*	

Approach Delay		45.8	4.4	3.6
Approach LOS		D	A	A
Intersection Delay	4.2	X_C = 0.66	Intersection LOS	A

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	*dsl*	Intersection	
Agency or Co.	*LandMark Design Group*	Area Type	*All other areas*
Date Performed	*6/06/07*	Jurisdiction	*VDOT*
Time Period	*pm peak normal day-optimized*	Analysis Year	*2015*
		Project ID	*JUAIF*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1				*3*		*1*		*3*	*1*	*1*	*3*	
Lane Group				*L*		*R*		*T*	*R*	*L*	*T*	
Volume, V (vph)				*519*		*223*		*2645*	*29*	*15*	*1506*	
% Heavy Vehicles, %HV				*0*		*0*		*0*	*0*	*0*	*0*	
Peak-Hour Factor, PHF				*0.90*		*0.90*		*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed (P) or Actuated (A)				*A*		*A*		*A*	*A*	*A*	*A*	
Start-up Lost Time, l_1				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green, e				*2.0*		*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type, AT				*3*		*3*		*3*	*3*	*3*	*3*	
Unit Extension, UE				*3.0*		*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	
Filtering/Metering, I				*1.000*		*1.000*		*1.000*	*1.000*	*0.314*	*0.314*	
Initial Unmet Demand, Q_b				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Ped / Bike / RTOR Volumes				*0*	*0*	*25*	*0*	*0*	*5*	*0*	*0*	
Lane Width				*12.0*		*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	
Parking / Grade / Parking				*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking Maneuvers, N_m												
Buses Stopping, N_B				*0*		*0*		*0*	*0*	*0*	*0*	
Min. Time for Pedestrians, G_p				*3.2*			*3.2*			*3.2*		

Phasing	WB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *13.8*	G = *0.0*	G = *0.0*	G = *0.0*	G = *4.0*	G = *65.2*	G = *0.0*	G = *0.0*
	Y = *5*	Y = *0*	Y = *0*	Y = *0*	Y = *6*	Y = *6*	Y = *0*	Y = *0*
Duration of Analysis, T = *0.25*						Cycle Length, C = *100.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v				*577*		*220*		*2939*	*27*	*17*	*1673*	
Lane Group Capacity, c				*679*		*368*		*3375*	*1053*	*148*	*3892*	
v/c Ratio, X				*0.85*		*0.60*		*0.87*	*0.03*	*0.11*	*0.43*	
Total Green Ratio, g/C				*0.14*		*0.23*		*0.65*	*0.65*	*0.75*	*0.75*	
Uniform Delay, d_1				*42.1*		*34.5*		*14.0*	*6.2*	*17.3*	*4.5*	
Progression Factor, PF				*1.000*		*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	
Delay Calibration, k				*0.38*		*0.19*		*0.40*	*0.11*	*0.11*	*0.11*	
Incremental Delay, d_2				*10.0*		*2.7*		*2.7*	*0.0*	*0.1*	*0.0*	
Initial Queue Delay, d_3				*0.0*		*0.0*		*0.0*	*0.0*	*0.0*	*0.0*	
Control Delay				*52.1*		*37.2*		*16.8*	*6.2*	*17.4*	*4.6*	
Lane Group LOS				*D*		*D*		*B*	*A*	*B*	*A*	

Approach Delay		48.0	16.7	4.7
Approach LOS		D	B	A
Intersection Delay	17.5	X_c = 0.80	Intersection LOS	B

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Appendix E

CATEGORICAL EXCLUSION, NATIONAL GROUND INTELLIGENCE CENTER, ALBEMARLE COUNTY OFFICE BUILDING

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CATEX CHECKLIST

Action Name: Department of Army National Ground Intelligence Center, Albemarle County Office Building
Action Location: Boulders Road, Charlottesville, Virginia
Action Description: Lease Construction
Category: (b) Acquisition of space by Federal construction or lease construction, or expansion or improvement of an existing facility expansion

Part A: All checklist CATEX Actions

	YES	NO	Need Data
A. Is the action likely to be inconsistent with any applicable Federal, State, Indian tribal, or local laws regulation, or standard designed to protect any aspect of the environment?		X	
B. Is the action likely to have results that are inconsistent with locally desired social, economic, or other environmental conditions?		X	
C. Is the action likely to result in the use, storage, release and/or disposal of toxic, hazardous, or radioactive materials or in the exposure of people to such materials?		X	
D. Is the action likely to adversely affect a significant aspect of the natural environment?		X	
E. Is the action likely to adversely affect a significant aspect of the socio-cultural environment?	X		
F. Is this action likely to generate controversy on environmental grounds?		X	
G. Is there a high level of uncertainty about your action's environmental effects?		X	
H. Is the action likely to do something especially risky to the human environment?		X	
I. Is the action part of an ongoing pattern of actions (whether under the control of GSA or others) that are cumulatively likely to have adverse effects on human environment?		X	
J. Is the action likely to set a precedent for, or represent a decision in principle about, future GSA actions that could have significant effects on the human environment?		X	
K. Is the action likely to have some other adverse effect on public health and safety or any other environmental media or resources that are not specifically identified above?		X	

CONCLUSIONS:

The action is a CATEX but requires further review under one or more other environmental authorities (list).

- Proposed site has the potential for archaeology and additional studies and further Section 106, under the National Historic Preservation Act is required.

Helen L. Foster 7/19/07
Program Staff Date

Katrina M. Scaggato 7/17/07
REQA Representative Date

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CATEX Checklist for the Department of Army National Ground Intelligence Center Albemarle County Office Building

United Land Corp Site located off Boulders Road in Charlottesville, Virginia

Lease Acquisition/New Construction Category

Submitted to:
General Services Administration
Region 3

May 2006

Environmental CATEX Checklist

Action Name: Department of Army National Ground Intelligence Center
Albemarle County Office Building
Action Location: Boulders Road, Charlottesville, Virginia
Action Description: Lease Acquisition/New Construction
Category:

Part A: All CATEX Actions Checklist

	YES	NO	Need Data
A. Is the action likely to be inconsistent with any applicable Federal, State, Indian tribal, or local law, regulation, or standard designed to protect any aspect of the environment?		X	
B. Is the action likely to have results that are inconsistent with locally desired social, economic, or other environmental conditions?		X	
C. Is the action likely to result in the use, storage, release and/or disposal of toxic, hazardous, or radioactive materials, or in the exposure of people to such materials?		X	
D. Is the action likely to adversely affect a significant aspect of the natural environment?			X
E. Is the action likely to adversely affect a significant aspect of the sociocultural environment?	X		
F. Is the action likely to generate controversy on environmental grounds?		X	
G. Is there a high level of uncertainty about the action's environmental effects?		X	
H. Is the action likely to do something especially risky to the human environment?		X	
I. Is the action part of an ongoing pattern of actions (whether under the control of GSA or others) that are cumulatively likely to have adverse effects on the human environment?		X	
J. Is the action likely to set a precedent for, or represent a decision in principle about, future GSA actions that could have significant effects on the human environment?		X	
K. Is the action likely to have some other adverse effect on public health and safety or on any other environmental media or resources that are not specifically identified above?"		X	

CONCLUSIONS:

1. The action is a CATEX and requires no further environmental review.
2. The action is a CATEX but requires further review under one or more other environmental authorities (list).
3. The action requires an EA.
4. The action requires an EIS.

_____ _____

Program Staff Date REQA Representative Date

DEPARTMENT OF ARMY NATIONAL GROUND INTELLIGENCE CENTER

ENVIRONMENTAL CATEX CHECKLIST

BOULDERS ROAD, CHARLOTTESVILLE, VIRGINIA

Portions of two parcels (X and Y) on tax maps 33-1D and 33-1F, respectively are being offered to General Services Administration (GSA) for the proposed lease/construction of a new Department of Army National Ground Intelligence Center (NGIC) Office Building. The proposed site is currently owned by a joint venture between Next Generation, LLC and United Land Corp. The NGIC offices are currently located at 2055 Boulders Road in Albemarle County, Virginia. The new office building will provide 35,000 usable square feet and 150 surface parking spaces on a site of approximately 13 acres.

Lease/construction projects qualify for a categorical exclusion (CATEX) that requires the preparation of a checklist to ensure that no extraordinary circumstances exist that would require a higher level of environmental analysis and documentation. The CATEX checklist, found in the PBS NEPA Desk Guide (October 1999), requests that answers be presented in a "Yes/No" format to determine whether the proposed action qualifies for a CATEX or whether the preparation of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) is warranted. To support the findings of the environmental checklist, a description of the environmental conditions present on and surrounding the project site are provided. In addition, the PBS NEPA Desk Guide, Chapter 5, Section 5.9.2.1 through Section 5.9.2.11 provides a list of questions that should be addressed to help GSA determine and support the yes or no answers in the checklist. These questions and answers are also provided to further support the findings in the Checklist.

Description of Project Site

The proposed lease/construction project site is located in Albemarle County, Virginia (approximately 9 miles north of the City of Charlottesville, Virginia). It is bounded by undeveloped land on each side with the current NGIC office building located on an adjacent parcel approximately 5,000 feet southwest. At present, the property (identified as the United Land Corp Site) is undeveloped and according to the current land owner, the property has always been undeveloped. Mr. Wendal Wood has owned the parcels being offered, along with approximately 1,000 acres in the vicinity for 15-25 years (Personal communication, Wendal Wood, May 16, 2007). The proposed site consists mostly of grassland with a few trees throughout. Surrounding uses include the existing NGIC office building in the immediate vicinity. Within a 2-mile radius of the United Land Corp site, commercial, university, and residential uses were identified.

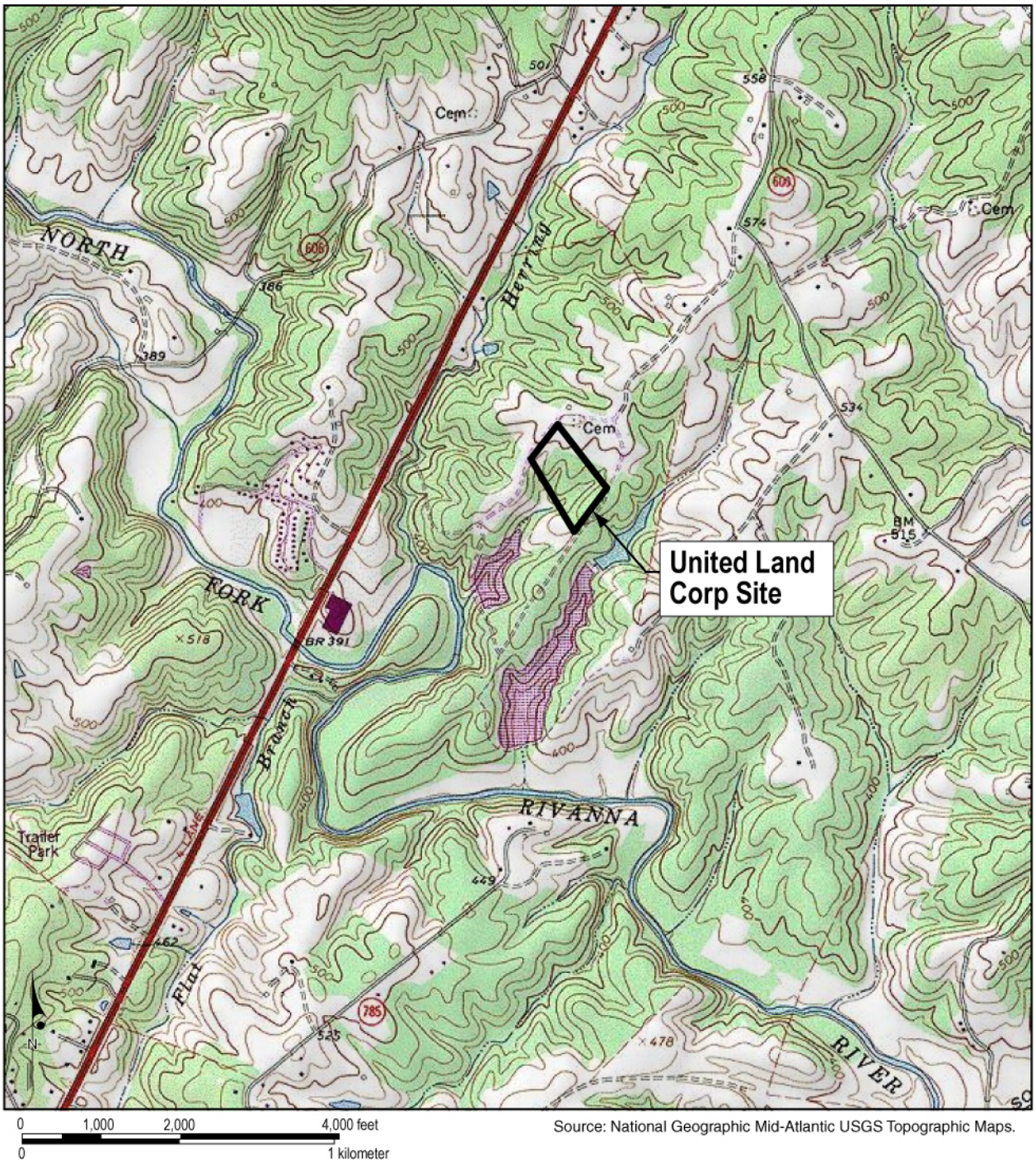

Figure 1: Project Location Map

Figure 2: Aerial Photograph of Site

Checklist Question A:

Is the action likely to be inconsistent with any applicable Federal, State, Indian tribal, or local law regulation, or standard designed to protect any aspect of the environment?

Is the action likely to have effects that would be inconsistent with such authorities as:

…U.S. Environmental Protection Agency's (EPA) solid waste management guidelines:

No. EPA's Office of Solid Waste regulates all waste under the Resource Conservation and Recovery Act (RCRA). RCRA's goals include regulation of waste disposal; energy and natural resource conservation through recycling and recovery; reduction or elimination of waste; and cleanup of waste that may have spilled, leaked or been disposed of improperly. The proposed action involves the lease/construction of an office building for the NGIC. It can be assumed that all waste generated by NGIC would be properly categorized and managed in accordance with state regulations.

…Occupational Safety and Health Administration (OSHA) noise standards:

No. This is an office facility and would not produce above-normal levels of noise. Noise generated from construction would be negligible and short-term.

…A State Implementation Plan (SIP) under the Clean Air Act:

No. While the proposed project would include the extension of Boulders Road, major changes in transportation volumes or installation of any equipment that would produce substantial air emissions would not occur. The action would be consistent with Virginia's SIP. It can be assumed that the facility would operate in compliance with the Clean Air Act (CAA).

…Executive Order 11988 (Floodplain protection):

No. According to the U.S. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 51003C0145D, no portion of the project site is located within or adjacent to either the 100-year or 500-year floodplain. The site is located in Zone X, an area of moderate or minimal hazard from the principal source of flood in the area. Route 29 and Boulders Road, which provide access to the site, are also out of the 100- and 500-year floodplain.