RAMEY KEMP & ASSOCIATES, INC. 5808 Faringdon Place, Suite 100 Raleigh, NC 27609

Phone - 919-872-5115 Fax - 919-878-5416 www.rameykemp.com

September 9, 2008

Joseph Mosnier, Ph.D. 585 Gilmore Road Chapel Hill, NC 27516-4909

P: 919-942-2754 F: 419-574-6006

E: mosnier@email.unc.edu

Subject:

Traffic Assessment – Mann's Chapel Church Property

Chatham County, North Carolina

Dear Mr. Mosnier:

This letter summarizes the findings of a Traffic Assessment (TA) prepared by Ramey Kemp & Associates, Inc. (RKA) for the proposed Mann's Chapel Church Property located on the south side of Lamont Norwood Road at the intersection with Poythress Road in Chatham County. The purpose of this study is to determine impacts to the surrounding transportation system created by traffic generated by the development.

Based on the preliminary plan, the development will include renovation of a church building to provide an Events and Gathering Center. The redeveloped site will provide a maximum seasonal seating capacity of 120 seats for a cafe.

Access to the property is presently provided via three driveways on Lamont Norwood Road/Poythress Road. The new site plan proposes to reduce the existing access and provide one full access along the western property boundary and one entrance only driveway along the eastern property boundary. Meetings have occurred with the North Carolina Department of Transportation (NCDOT) regarding the type and location of the proposed access. Refer to Appendix A for the site plan.

The study area for this project includes the intersection of Lamont Norwood Road and Poythress Road as well as the proposed site driveway intersections. Intersections were analyzed under existing (2008) conditions and combined (2009) conditions with the proposed site in place.

Existing Traffic Volumes and Data Collection

Turning movement counts were conducted at the intersection of Lamont Norwood Road and Poythress Road during the AM peak period (7:00 to 9:00) and PM peak period (5:00 to 7:00) on August 7, 2008. Refer to Appendix A for an illustration of the Existing AM peak hour traffic and Existing PM peak hour traffic volumes. Refer to Appendix B for copies of the raw traffic data.

Background (2009) Traffic Volumes

Background (2009) traffic volumes without the site were determined by projecting existing (2008) traffic volumes to the year 2009 using a compounded annual growth rate of 5.0%.

Trip Generation and Distribution

The proposed site will be used as a gathering center and will also provide food service for a cafe. To provide a conservative (high) estimate of the potential trips to be generated by the development, a sit-down restaurant use is assumed for the site. Trips generated by the proposed site were estimated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 7th Edition. Refer to Table 1 for a detailed breakdown of the entering and exiting site traffic.

Table 1
Site Trip Generation

FTE Land Use	Size	Average Daily Traffic (vpd)	AM Peak I (Yp Entering	The state of the s	PM Peak (vp Entering	A Hour h) Exiting
Sit-Down Restaurant (932)	120 seats	580	29	28	29	22

It is estimated that the site will generate approximately 580 total site trips (290 entering and 290 exiting) during an average 24-hour weekday period. Of this total, approximately 29 entering and 28 exiting trips will occur during the weekday AM peak hour, while approximately 29 entering and 22 exiting trips will occur during the weekday PM peak hour.

Site trip distribution percentages were determined based on existing traffic patterns and engineering judgment. Trips generated by the development were distributed based on the trip distribution percentages. Site trips were distributed to the study area as follows:

- 10% to/from the west on Lamont Norwood Road
- 20% to/from the north on Poythress Road
- 70% to/from the east on Poythress Road

Combined (2009) Traffic Volumes

Combined (2009) traffic volumes were determined by adding the new site trips to the background traffic volumes. Refer to Appendix A for illustration of the Combined (2009) AM peak hour traffic and Combined (2009) PM peak hour traffic volumes.



Estimated Average Daily Traffic (ADT) volumes on study roadways in 2009 with site trips are given below. These ADT volumes were estimated based on the combined (2009) PM peak hour traffic volumes being 10% of the ADT.

• Poythress Road southeast of the site driveway: 2,100 vehicles per day

Poythress Road north of site: 1,200 vehicles per day
 Lamont Norwood Road west of site: 1,000 vehicles per day

Capacity Analysis

Study intersections were analyzed using the methodology outlined in the 2000 Highway Capacity Manual (HCM) published by the Transportation Research Board. Capacity and level of service (LOS) are the design criteria for this traffic study. A computer software package, Synchro (version 7), was used to complete the analyses for all of the study area intersections.

Existing AM and PM peak hour traffic volumes at the study intersections were analyzed to determine the current levels of service. Combined AM and PM peak hour traffic volumes were analyzed to determine the expected levels of service once the development is in place. The detailed capacity analysis reports can be found in Appendix C.

Under Existing (2008) conditions, analysis indicates all intersections and movements operate at LOS A in the AM peak hour and PM peak hour. Delays and queues are minimal at the study intersection.

Under Combined (2009) conditions with new site trips, analysis indicates all intersections and movements will continue to operate at LOS A in the AM peak hour and PM peak hour. The addition of site trips does not have an impact on the delays and queues at the study intersection. The site driveways are expected to operate at LOS A during the AM and PM peak hours without improvements.

In addition, all study area roadways are expected to operate well-below capacity in the future based on the estimated ADT volumes on each roadway. These roadways would be expected to carry approximately 8,000 – 10,000 vehicles per day before nearing capacity.

Conclusions and Recommendations

The purpose of this study was to determine impacts to the surrounding transportation system created by the new trips generated by the Mann's Chapel Church Property. This study considers a conservative (high) estimate for site trip generation. Study intersections were analyzed under existing (2008) and combined (2009) conditions with site trips.

Based on the analysis results, all intersections and turning movements are expected to operate at LOS A during the AM and PM peak hours under combined (2009) conditions with site trips. In addition, all study roadways are expected to operate well-below capacity in the future with site trips.

No improvements are recommended to be provided at study intersections. Site trips generated by the site are expected to relatively small and would not have a significant impact on the surrounding transportation system.



If you should have any questions, please feel free to contact me at (919) 872-5115.

Sincerely,

Ramey Kemp & Associates, Inc.

Rynal Stephenson, P.E.

Transportation Manager

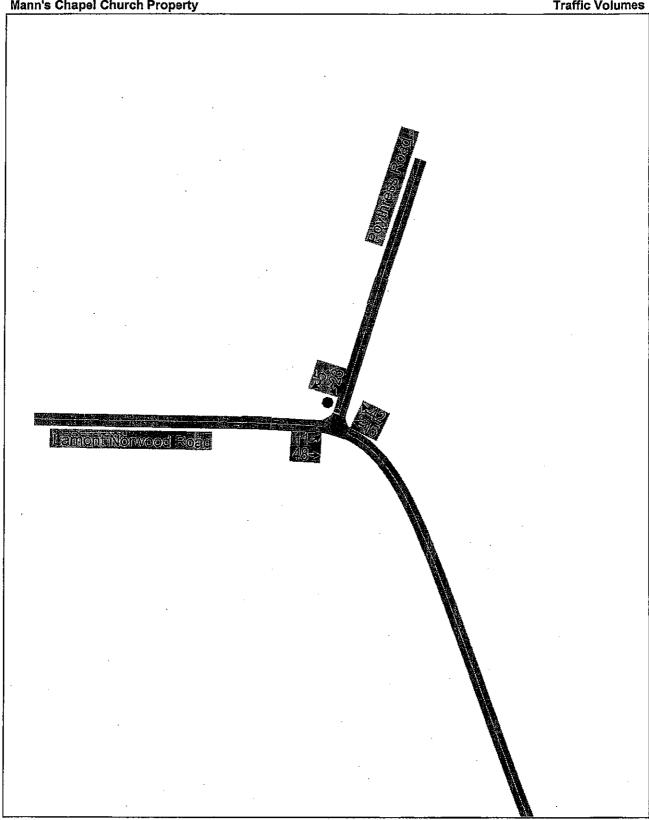
Attachments

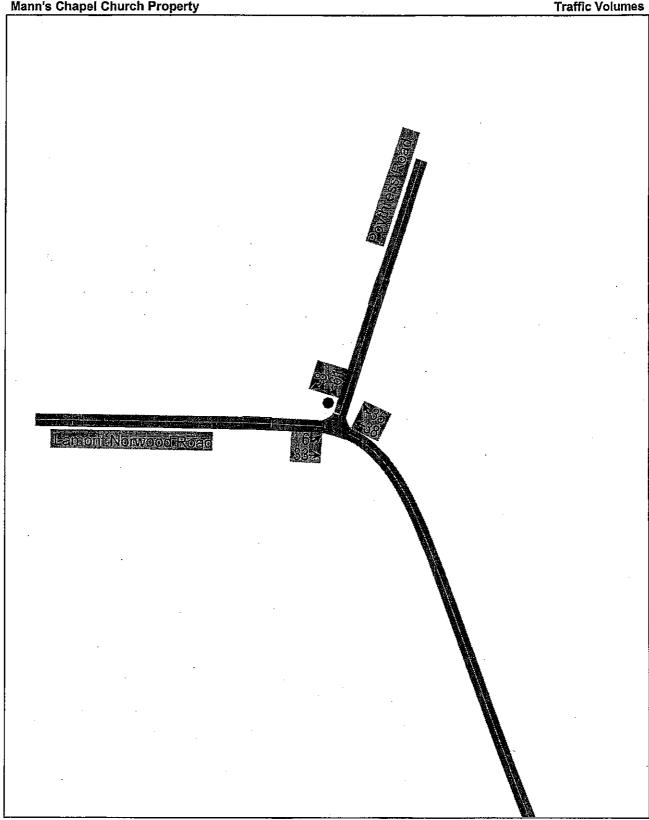
cc: Nicolas P. Robinson, Bradshaw & Robinson, LLP

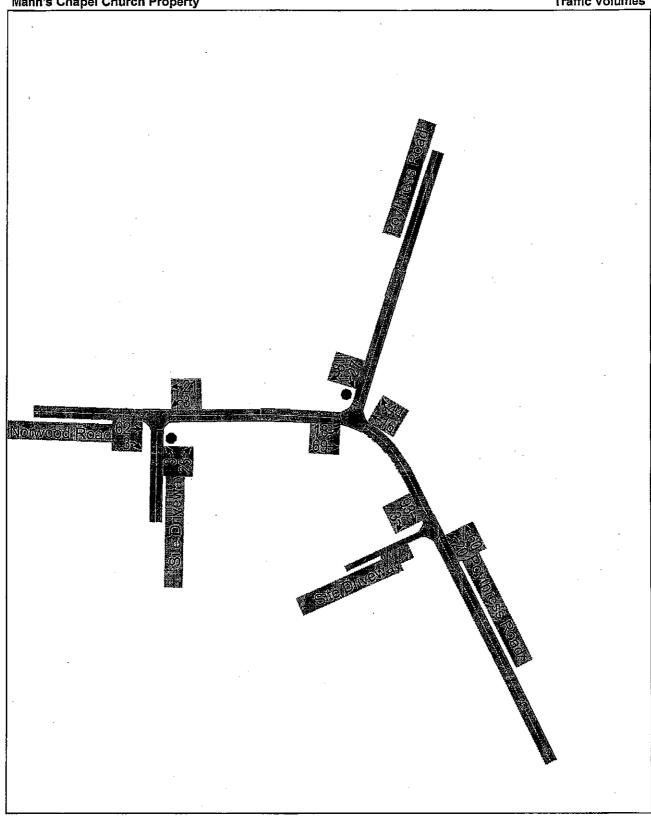
TECHNICAL APPENDIX

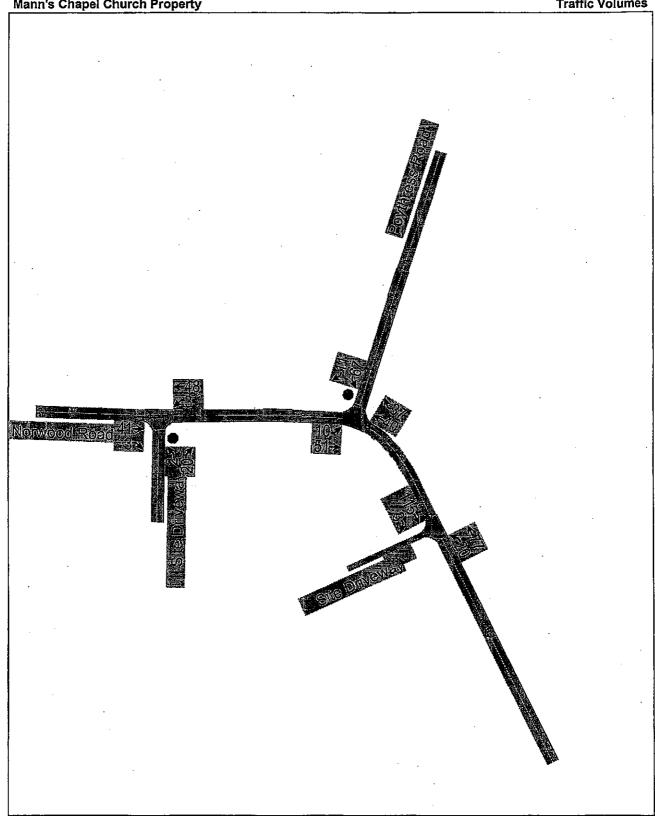
APPENDIX A

FIGURES









APPENDIX B

TRAFFIC COUNT DATA

Ramey Kemp and Associates, Inc. 5808 Faringdon Place, Suite 100 Raleigh, NC 27609 Ph. (919) 872-5115

File Name: Lamant@Poythress Site Code: 08072008

Start Date : 08/07/2008

Page No : 1

rks Left 0 0 0 0 0 0 0 0 0 0 0 0 0	Thru 1 3 2 6	wood Ro ound Right 8 10 12 11	Trks	Left 0 0	Northi Thru	Right 0	Trks	Left 1	oythres Eastb Thru	s Road ound Right	Trks	Exclu. Total	Inclu. Total	Int. Total
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0 0	6			^	•	0	0	2	14	0	1	1	38	39
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	12	41	1	0	Ö	. 0	0	11	45	0	1	2	141	143
0 (0	4	9	0	0	0	0	0	1	9	0	0	0	27	27
1 0	4		0	0	0	0	0	2		0	0	1		34
0 0	· 3	11	0	0	0	. 0	0	3	_	0	1	1		35
1 0	4	. 9	0	0	0	0	0	2		0	0	1		30
2 0	15	37	0	0	0	0	0	8	27	0	1	3	123	126
1 0	10	9	0	0	0	0	0	2	11	0	0	1	55	56
0 0	10		- 0	0	Đ		0		7	0	0	0	47	47
0 0	7	6	0	0	0		0			0	0	0		33
0 0	11	8		0			0			0	0	0		46
1 0	38	35	0	0	0	0	0	- 6	33	0	0	1	181	182
0 0	14	12	0	0	0	0	0	3	11	0	0 [0	50	50
0 0	14	11	0	0	0		0	2		0	0	0		50
0 0	9	6	0	0	0	-	0	1		0	- 1	0		34
0 0				0			0		•	0		0		41
0 0	49	41	0	0	0	0	0	6	37	0	0	0	175	175
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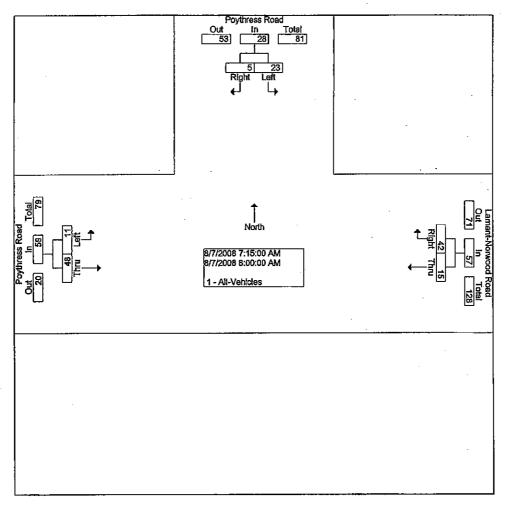
Ramey Kemp and Associates, Inc. 5808 Faringdon Place, Suite 100 Raleigh, NC 27609 Ph. (919) 872-5115

File Name: Lamant@Poythress Site Code: 08072008

Start Date : 08/07/2008

Page No : 2

	1		ss Road		Lar		rwood Ro Ibound	ad		North	nbound				ss Road bound		
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07	7:00 AM to	11:45 Al	M - Peak	of 1					•								
Intersection	07:15 AM												1				
Volume	23	0	5	28	0	15	42	57	0	0	0	0	11	48	0	59	144
Percent	82.1	0.0	17.9		0.0	26.3	73.7		0.0	0.0	0.0		18.6	81.4	0.0		
07:45 Volume	6	0	3	9	0	6	11	17	0	0	0	0	6.	12	0	18	44
Peak Factor]								0.818
	07:15 AM				07:45 AM	ſ			6:45:00 AN	A.	•		07:45 AM				}
Volume	9	0	0	9	0	6	11	17	1 0	0	0	0	6	12	0	18	
Peak Factor				0.778				0.838	1				1			0.819	



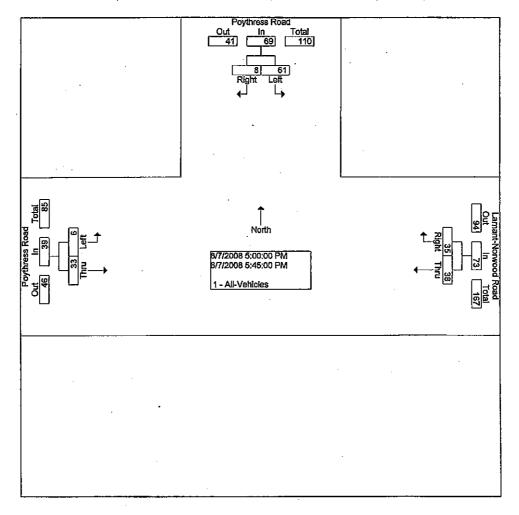
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File Name: Lamant@Poythress Site Code: 08072008

Start Date : 08/07/2008

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			ss Road	I	La		rwood Re	oad		Norti	nbound				ess Road bound	-	
Start Time	. Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	int. Total
Peak Hour From 12	2:00 PM to	06;45 P	M - Peak	1 of 1													
Intersection	05:00 PM							1					1				
Volume	61	0	8	69	0	38	35	73	0	0	0	0	6	33	0	39	181
Percent	88.4	0.0	11.6		0.0	52.1	47.9		0.0	0.0	0.0		15.4	84.6	0.0		
05:00 Valume	21	0	2	. 23	0	10	9	19	0	0	0	0	. 2	11	0	13	55
Peak Factor																	0.823
High int.	05:00 PM	i			05:15 Pλ	4		l.					05:00 PN	A			
Volume	21	0	2	23	0	10	12	22	0	0	0	0	2	11	0	13	
Peak Factor				0.750				0.830								0.750	



APPENDIX C

CAPACITY ANALYSIS CALCULATIONS

HCM Unsignalized Intersection Capacity Analysis 1: Lamont Norwood Road & Poythress Road

	۶	→	←	4	-	4		
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations Volume (veh/h)	11	€ 1 48	15 .15	42	'\' 23	5		-
Sign Control		Free	Free		Stop	•		
Grade		0%	0%		0%			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly flow rate (vph) Pedestrians	12	53	· 17	47	26	6		
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage							•	
Right turn flare (veh)		None	Mana					
Median type Median storage veh)		MODE	None					
Upstream signal (ft)							•	
pX, platoon unblocked								
vC, conflicting volume	63				118	40		
vC1, stage 1 conf vol vC2, stage 2 conf vol								
vCu, unblocked vol	63				118	40		
tC, single (s)	4.1				6.4	6.2		
tC, 2 stage (s)	2.2	-						
tF (s) p0 queue free %	2.2 99				3.5 97	3.3 99	-	
cM capacity (veh/h)	1539				871	1031		•
Direction, Lane #	EB 1	WB 1	SB 1				•	
Volume Total	66	63	31					
Volume Left	12	0	26				_	
Volume Right	0	47	6					
cSH · Volume to Capacity	1539 0.01	1700 0.04	896 0.03					
Queue Length 95th (ft)	1	0.04	3					
Control Delay (s)	1.4	0.0	9.2					
Lane LOS	Α		Α					
Approach Delay (s)	1.4	0.0	9.2					
Approach LOS			Α					
Intersection Summary			0.4					
Average Delay Intersection Capacity Utiliz	ation		2.4 19.8%	10	ill avel r	of Service		
Analysis Period (min)	anoli	•	19.0%	10)O FEAGI (DI OGIAICA		
analysis i stress (mini)								

HCM Unsignalized Intersection Capacity Analysis 1: Lamont Norwood Road & Poythress Road

	•		←	*	-	4	
Movement Lane Configurations	EBL	EBT €Î	WBT ₽	WBR	SBL	SBR	
Volume (veh/h) Sign Control	6	33 Free	38 Free	35	61 Stop	8	
Grade	0.00	0%	0%	0.00	0%	0.00	
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage	0.90 7	0.90 37	0.90 42	0.90 39	0.90 68	0.90 ·9	
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked		None	None				
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	81				112	62	
vCu, unblocked vol	81				112	62	
tC, single (s) tC, 2 stage (s)	.4.1				6.4	6.2	
tF (s)	2.2				3.5	3.3	
p0 queue free % cM capacity (veh/h)	100 1516				92 881	99 1003	
Direction, Lane # Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	EB 1 43 7 0 1516 0.00 0 1.2 A 1.2	WB 1 81 0 39 1700 0.05 0 0.0	SB 1 77 68 9 894 0.09 7 9.4 A 9.4				
Intersection Summary	•						
Average Delay Intersection Capacity Utiliza Analysis Perlod (min)	ation .		3.8 17.4% 15	IC	U Level o	of Service	

	٠	-	←	A.	\	4
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्ब	4		Υ	
Volume (veh/h)	18	_ 69	_ 16	44	27	8
Sign Control		Free 0%	Free 0%		Stop	
Grade Peak Hour Factor	0.90	0.90	0.90	0.90	0% 0.90	0.90
Hourly flow rate (vph)	20	77	18	49	30	9.90
Pedestrians	20	11	10	43	30	J
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked vC, conflicting volume	67				159	42
vC1, stage 1 conf vol	07				100	42
vC2, stage 2 conf vol						•
vCu, unblocked vol	67				159	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96 821	9 9 1028
cM capacity (veh/h)	1535				021	1020
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	97	67	39			
Volume Left Volume Right	20 0	0 49	30 9			
cSH	1535	1700	861			
Volume to Capacity	0.01	0.04	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	1.6	0.0	9.4			
Lane LOS	Α		Α			
Approach Delay (s)	1.6	0.0	9.4			
Approach LOS			· A			
Intersection Summary	,					
Average Delay			2.6			
Intersection Capacity Utiliz	zation		21.3%	10	CU Level o	of Service
Analysis Period (min)			15			

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Movement Lane Configurations	EBT }	EBR	WBL	WBT वी	NBL	NBR	
Volume (veh/h) Sign Control	62 Free	3	3	21 Free	3 Stop	25	
Grade Peak Hour Factor	0% 0.90	0.90	0.90	0% 0.90	0% 0.90	0.90	
Hourly flow rate (vph)	69	3	3	23	. 3	28	
Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage							
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked	None			None	•		
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol			72		101	71	
vCu, unblocked vol			72		101	71	
tC, single (s) tC, 2 stage (s)			. 4.1		6.4	6.2	
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	97	
cM capacity (veh/h)			1528		896	992	
Direction, Lane # Volume Total	EB 1 72	WB 1 27	NB 1 31				
Volume Left	0	3	3				
Volume Right	3	0	28 ^		•		
cSH	1700	1528	981				
Volume to Capacity Queue Length 95th (ft)	0.04 0	0.00	0.03 2	•			
Control Delay (s)	0.0	0.9	8.8				
Lane LOS	0.0	A	A				
Approach Delay (s)	0.0	0.9	8.8				
Approach LOS			Α				
Intersection Summary							
Average Delay			2.3				
Intersection Capacity Utiliza	ation		13.6%	łC	U Level o	f Service	
Analysis Period (min)			15				

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Movement Lane Configurations	EBL	EBR	NBL	NBT €Î	SBT 1 ∍	SBR		
Volume (veh/h) Sign Control	0 Stop	0	20	60 Free	93 Free	3		
Grade Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s)	0% 0.90 0	0.90 0	0.90 22	0% 0.90 67	0% 0.90 103	0.90 3		
Percent Blockage Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked				None	None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	216	105	107					
vCu, unblocked vol tC, single (s) tC, 2 stage (s)	216 6.4	105 6.2	107 4.1		·			
tF (s) p0 queue free % cM capacity (veh/h)	3.5 100 761	3.3 100 949	2.2 99 1484					
Direction, Lane # Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	NB 1 89 22 0 1484 0.01 1 2.0 A 2.0	SB 1 107 0 3 1700 0.06 0 0.0						-
Intersection Summary Average Delay Intersection Capacity Utiliz Analysis Period (min)	ation		0.9 14.3% 15	IC	CU Level o	of Service	A	

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Movement Lane Configurations	EBL	EBT बी	WBT	WBR	SBL	SBR
Volume (veh/h) Sign Control	10	51 Free	40 Free	37	67 Stop	11
Grade Peak Hour Factor	0.90	0% 0.90	0% 0.90	0.90	0% 0.90	0.90
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	11	57	44	41	74	12
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked		None	None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	86				144	65
vCu, unblocked vol tC, single (s)	86 4.1				144 6.4	65 6.2
tC, 2 stage (s)						
tF (s) p0 queue free %	2.2 99				3.5 91	3.3 99
cM capacity (veh/h)	1511				842	999
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total Volume Left	68 11	86 0	87 74			
Volume Right	0	41	12			
cSH	1511	1700	861			
Volume to Capacity	0.01	0.05	0.10			
Queue Length 95th (ft)	1	0	8			
Control Delay (s)	1.3	0.0	9.6			
Lane LOS	A		Α			
Approach Delay (s) Approach LOS	1.3	0.0	9.6 A			
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Util	ization		21.0%	, IC	U Level o	f Service
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 6: Lamont Norwood Road & Site Driveway 1

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Movement Lane Configurations	EBT 1 >	EBR	WBL	WBT बी	NBL	NBR			
Volume (veh/h) Sign Control Grade	41 Free 0%	3	3	48 Free 0%	2 Stop 0%	20			
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage	0.90 46	0.90 3	0.90	0.90 53	0.90	0.90 22			
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft)	None			None					
pX, platoon unblocked vC, conflicting volume vC1, stage 1 conf vol			49		107	47			
vC2, stage 2 conf vol vCu, unblocked vol tC, single (s) tC, 2 stage (s)			49 4.1		107 6.4	47 6.2			
tF (s) p0 queue free % cM capacity (veh/h)		,	2.2 100 1558		3.5 100 888	3.3 98 1022		•	
Direction, Lane # Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	EB 1 49 0 3 1700 0.03 0 0.0	WB 1 57 3 0 1558 0.00 0 0.4 A 0.4	NB 1 24 2 22 1008 0.02 2 8.7 A 8.7				·		
Intersection Summary Average Delay Intersection Capacity Util Analysis Period (min)	ization		1.8 15.0% 15	IC	CU Level (of Service			Α

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Movement Lane Configurations	EBL	EBR	NBL	NBT ∉i	SBT	SBR	-	
Volume (veh/h) Sign Control	0 Stop	0	20	77 Free	115 Free	3	,	
Grade	0%	0.00	0.00	0%	0%	0.00		
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	0.90 0	0.90 0	0.90 22	0.90 86	0.90 128	0.90 3		
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked				None	None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	259	129	131					
vCu, unblocked vol tC, single (s) tC, 2 stage (s)	259 6.4	129 6.2	131 4.1					
tF (s)	3.5	3.3	2.2					
p0 queue free % cM capacity (veh/h)	100 718	100 920	98 1454					
Direction, Lane # Volume Total Volume Left Volume Right	NB 1 108 22 0	SB 1 131 0 3						
cSH	1454	1700						
Volume to Capacity Queue Length 95th (ft)	0.02 1	0.08 0						
Control Delay (s)	1.6	0.0						
Lane LOS Approach Delay (s) Approach LOS	A 1.6	0.0						
Intersection Summary								
Average Delay Intersection Capacity Utilization Analysis Period (min)	1		0.7 15.2% 15	l	CU Level o	of Service		Α