

Appendix B

Level of Service (CLV & Synchro) Worksheets

Critical Lane Volume (CLV) Methodology for Prince Georges County

Main Line: Van Dusen Road
Minor Street: Laurel Park Drive
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

VAN DUSEN ROAD

--- TL

	AM	PM
T	431	467
L	86	58
adjusted lefts	172	232

PM	AM	
585	386	T
237	161	R

T ---
R ---

VAN DUSEN ROAD

| |
L R

Laurel Park Drive

	L	R
AM	158	48
PM	175	112

Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	158	1.00	158			
EB	386	1.00	386	86	1.00	86
WB	603	1.00	603			
CLV TOTAL=						761
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	175	1.00	175			
EB	585	1.00	585	58	1.00	58
WB	699	1.00	699			
CLV TOTAL=						874
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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**Van Dusen Road &
 Laurel Park Drive**
 (Total Traffic)

**Intersection
 2**

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Prince Georges County

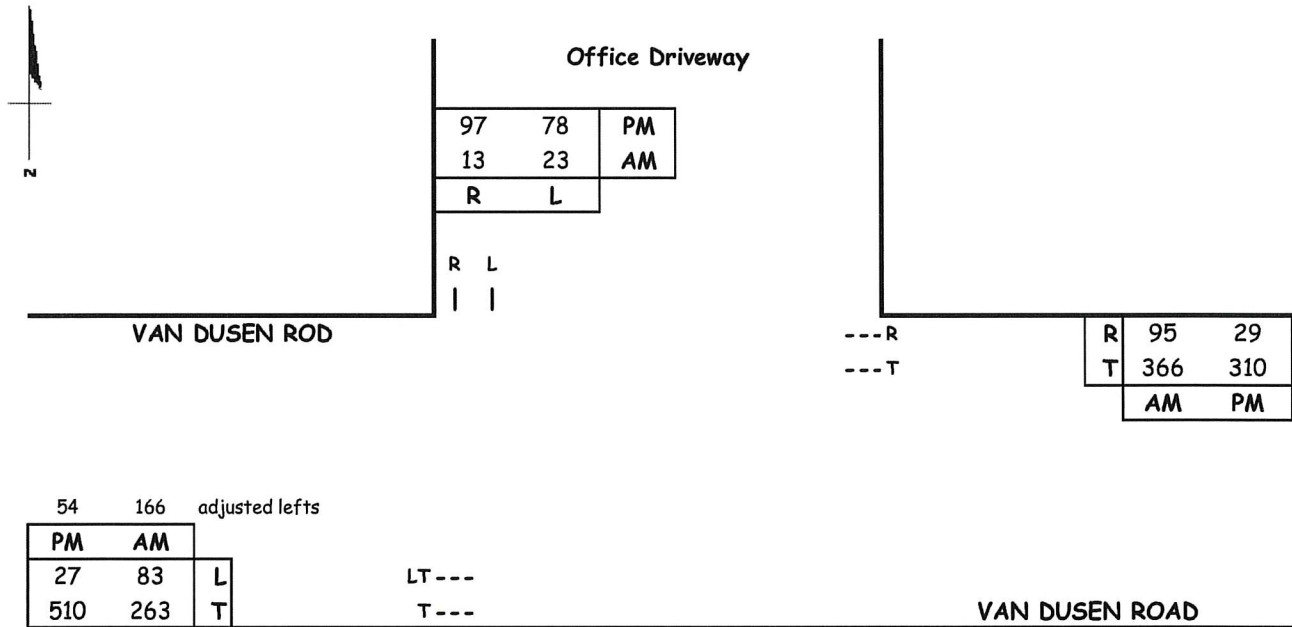
Intersection of: Office Driveway

Analyst: Lenhart Traffic

and: Van Dusen Rod

Conditions: Existing Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	23	1.00	23			
EB	429	0.55	236			
WB	366	1.00	366	83	1.00	83
CLV TOTAL=						472
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	78	1.00	78			
EB	564	0.55	310			
WB	310	1.00	310	27	1.00	27
CLV TOTAL=						415
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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Office Driveway &
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(Existing Traffic)

**Intersection
3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Prince Georges County

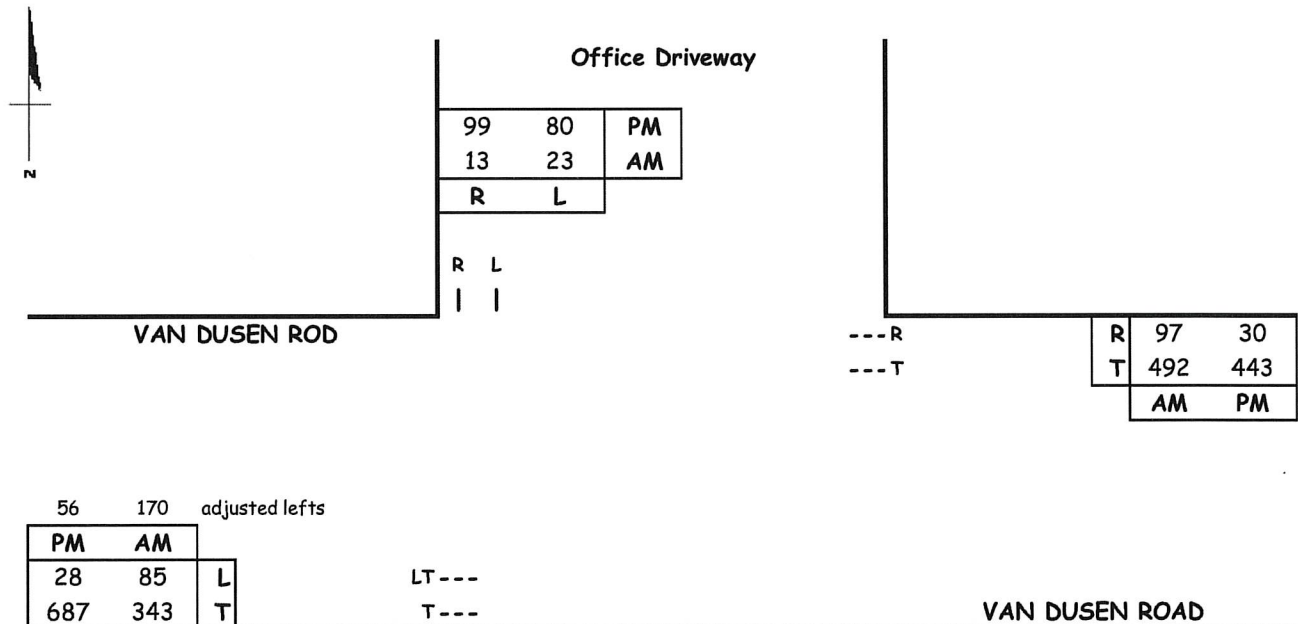
Intersection of: Office Driveway

Analyst: Lenhart Traffic

and: Van Dusen Rod

Conditions: Background Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	23	1.00	23			
EB	513	0.55	282			
WB	492	1.00	492	85	1.00	85
CLV TOTAL=						600
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	80	1.00	80			
EB	743	0.55	409			
WB	443	1.00	443	28	1.00	28
CLV TOTAL=						551
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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Office Driveway &
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(Background Traffic)

Intersection
3

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Prince Georges County

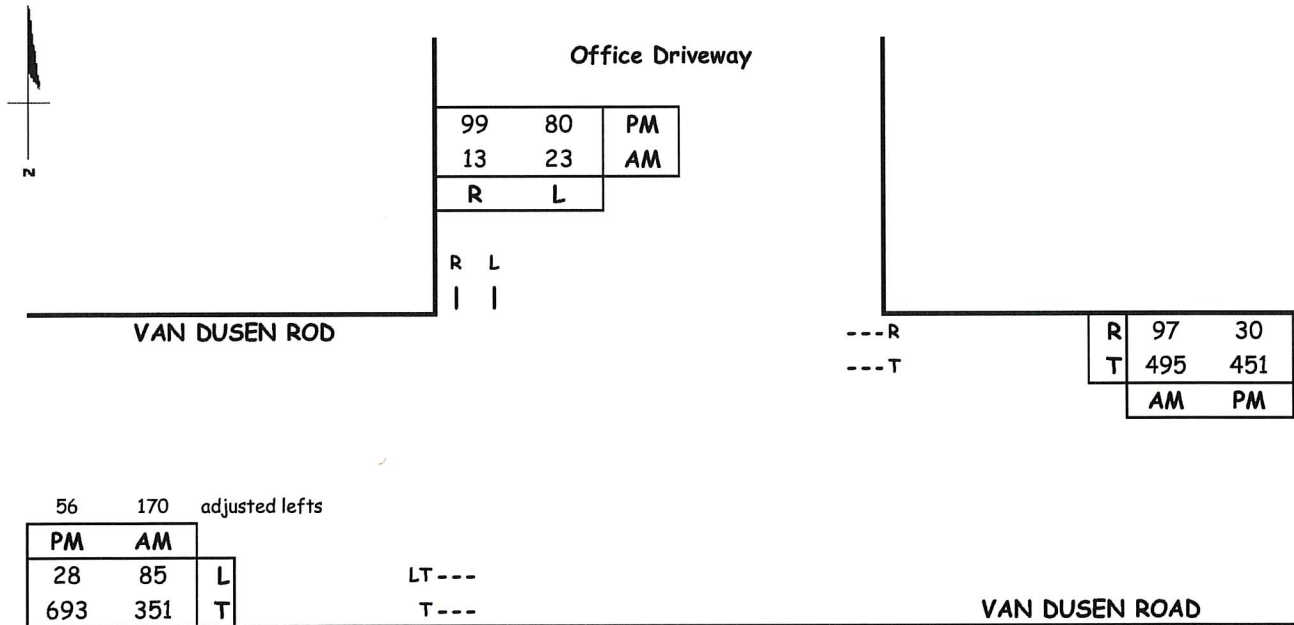
Intersection of: Office Driveway

Analyst: Lenhart Traffic

and: Van Dusen Rod

Conditions: Total Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	23	1.00	23			
EB	521	0.55	287			
WB	495	1.00	495	85	1.00	85
CLV TOTAL=						603
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	80	1.00	80			
EB	749	0.55	412			
WB	451	1.00	451	28	1.00	28
CLV TOTAL=						559
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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Office Driveway &
Van Dusen Rod
(Total Traffic)

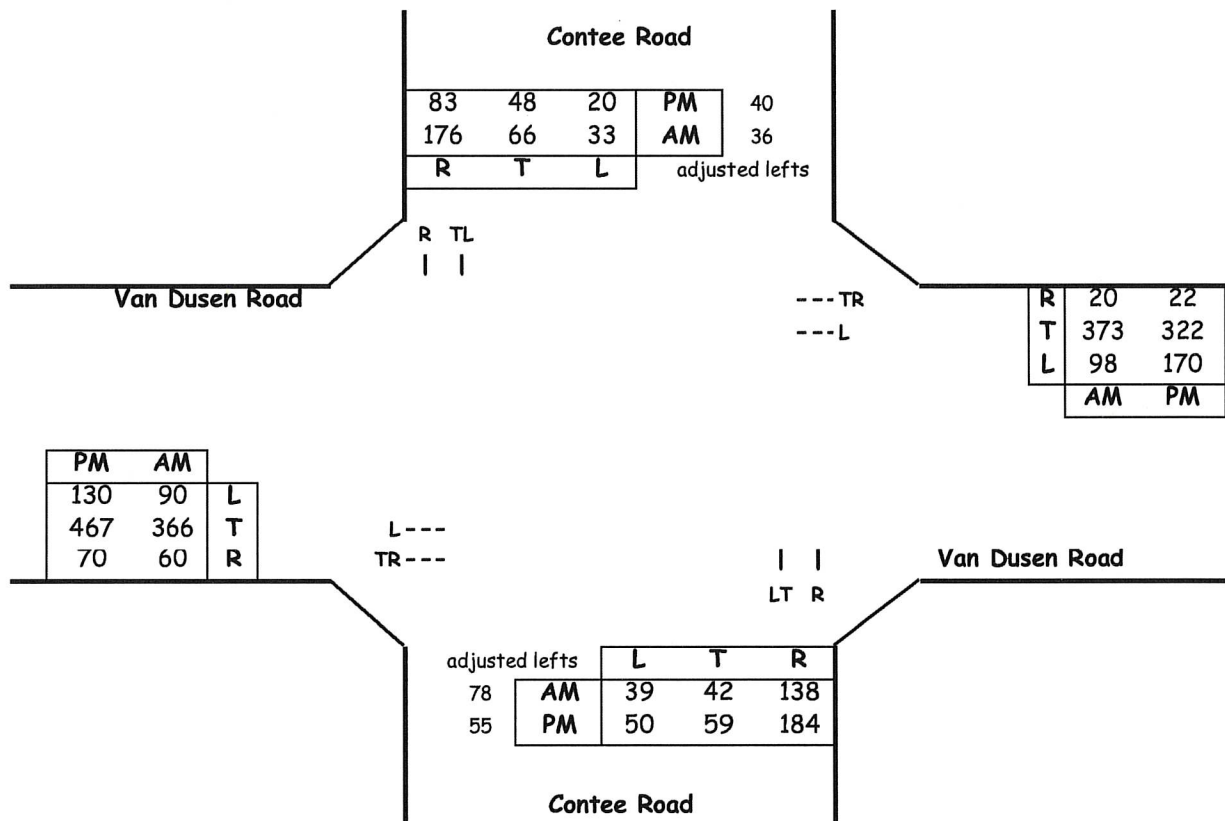
Intersection
3

CRITICAL LANE VOLUME (CLV) METHODOLOGY for Prince Georges County

Main Line: Contee Road
Minor Street: Van Dusen Road
Study Period: Existing Traffic

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	120	1.00	120	33	1	33
SB	102	1.00	102	39	1	39
EB	426	1	426	98	1	98
WB	393	1	393	90	1	90
CLV TOTAL=						677
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	114	1.00	114	20	1	20
SB	88	1.00	88	50	1	50
EB	537	1	537	170	1	170
WB	344	1	344	130	1	130
CLV TOTAL=						845
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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**Contee Road &
 Van Dusen Road**
 (Existing Traffic)

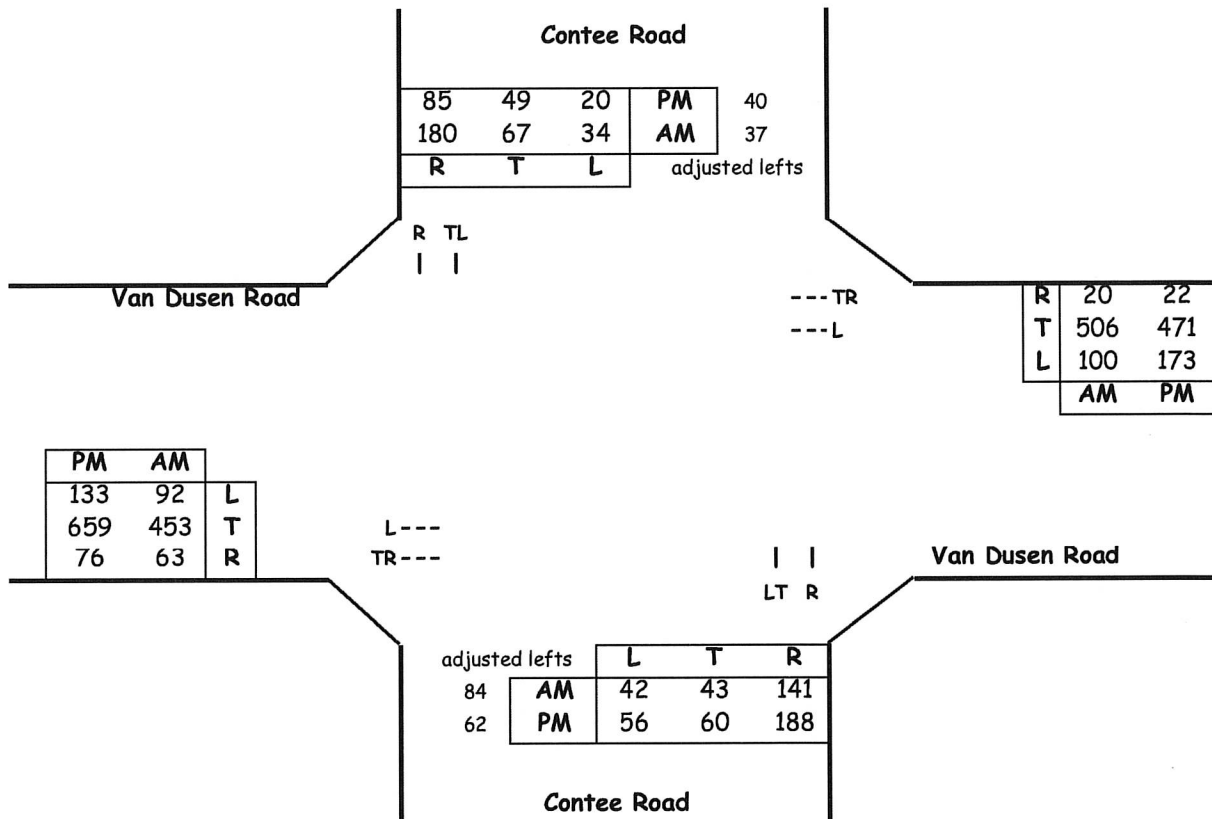
**Intersection
 5**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for Prince Georges County

Main Line: Contee Road
Minor Street: Van Dusen Road
Study Period: Background Traffic

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	127	1.00	127	34	1	34
SB	104	1.00	104	42	1	42
EB	516	1	516	100	1	100
WB	526	1	526	92	1	92
CLV TOTAL=						779
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	122	1.00	122	20	1	20
SB	89	1.00	89	56	1	56
EB	735	1	735	173	1	173
WB	493	1	493	133	1	133
CLV TOTAL=						1053
Level of Service (LOS) =						B

Critical Lane Volume Analysis



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Contee Road &
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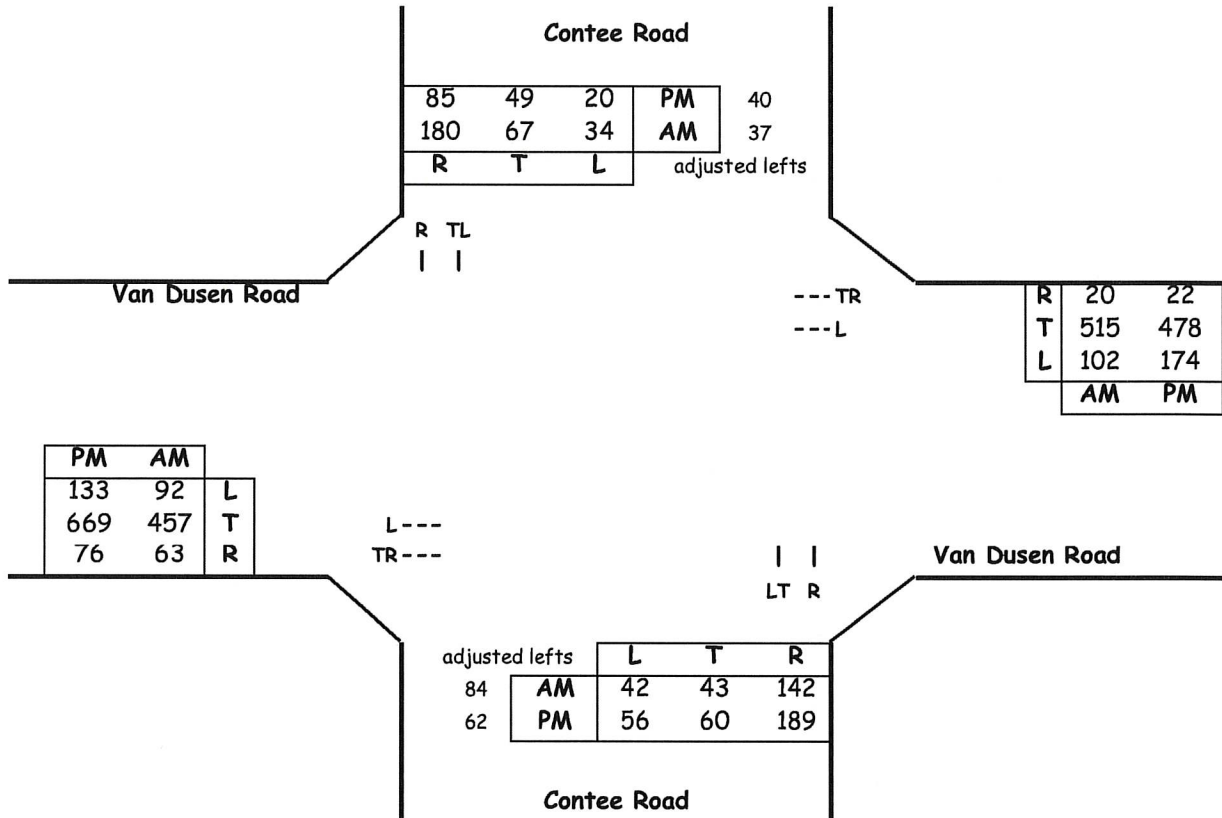
Intersection
5

CRITICAL LANE VOLUME (CLV) METHODOLOGY for Prince Georges County

Main Line: Contee Road
Minor Street: Van Dusen Road
Study Period: Total Traffic

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	127	1.00	127	34	1	34
SB	104	1.00	104	42	1	42
EB	520	1	520	102	1	102
WB	535	1	535	92	1	92
CLV TOTAL=						788
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	122	1.00	122	20	1	20
SB	89	1.00	89	56	1	56
EB	745	1	745	174	1	174
WB	500	1	500	133	1	133
CLV TOTAL=						1064
Level of Service (LOS) =						B

Critical Lane Volume Analysis



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**Contee Road &
 Van Dusen Road**
 (Total Traffic)

**Intersection
 5**

HCM Unsignalized Intersection Capacity Analysis 1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
AM Existing

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	1	10	0	34	0	132	12	116	85	11
Future Volume (Veh/h)	10	0	1	10	0	34	0	132	12	116	85	11
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
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)	11	0	1	11	0	37	0	143	13	126	92	12
Pedestrians												
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	536	506	98	500	506	150	104			156		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	506	98	500	506	150	104			156		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	98	100	96	100			91		
cM capacity (veh/h)	407	428	958	448	428	897	1488			1424		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	48	156	230								
Volume Left	11	11	0	126								
Volume Right	1	37	13	12								
cSH	427	729	1488	1424								
Volume to Capacity	0.03	0.07	0.00	0.09								
Queue Length 95th (ft)	2	5	0	7								
Control Delay (s)	13.7	10.3	0.0	4.6								
Lane LOS	B	B		A								
Approach Delay (s)	13.7	10.3	0.0	4.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay				3.8								
Intersection Capacity Utilization				32.6%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
AM Existing

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗		↖	↗	↗
Traffic Volume (veh/h)	305	153	81	306	144	39
Future Volume (Veh/h)	305	153	81	306	144	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	332	166	88	333	157	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			498		841	332
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			498		841	332
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		49	94
cM capacity (veh/h)			1066		307	710
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	332	166	421	199		
Volume Left	0	0	88	157		
Volume Right	0	166	0	42		
cSH	1700	1700	1066	389		
Volume to Capacity	0.20	0.10	0.08	0.51		
Queue Length 95th (ft)	0	0	7	70		
Control Delay (s)	0.0	0.0	2.5	24.6		
Lane LOS			A	C		
Approach Delay (s)	0.0	2.5		24.6		
Approach LOS			C			
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			54.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Cypress Street & Westmeath Drive

Oaks at Laurel
AM Existing

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	35	75	12	67	40
Future Volume (vph)	7	35	75	12	67	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	38	82	13	73	43
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	46	95	116			
Volume Left (vph)	0	82	73			
Volume Right (vph)	38	0	43			
Hadj (s)	-0.46	0.21	-0.06			
Departure Headway (s)	3.8	4.4	4.1			
Degree Utilization, x	0.05	0.12	0.13			
Capacity (veh/h)	911	792	834			
Control Delay (s)	7.0	8.0	7.8			
Approach Delay (s)	7.0	8.0	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	1	10	0	35	0	135	12	118	87	11
Future Volume (Veh/h)	10	0	1	10	0	35	0	135	12	118	87	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	11	0	1	11	0	38	0	147	13	128	95	12
Pedestrians												
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	548	517	101	512	516	154	107	160				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	548	517	101	512	516	154	107	160				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	97	100	100	97	100	96	100	91				
cM capacity (veh/h)	398	421	954	440	421	892	1484	1419				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	49	160	235								
Volume Left	11	11	0	128								
Volume Right	1	38	13	12								
cSH	419	725	1484	1419								
Volume to Capacity	0.03	0.07	0.00	0.09								
Queue Length 95th (ft)	2	5	0	7								
Control Delay (s)	13.9	10.3	0.0	4.6								
Lane LOS	B	B		A								
Approach Delay (s)	13.9	10.3	0.0	4.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			32.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
AM Background

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	386	156	83	431	147	40
Future Volume (Veh/h)	386	156	83	431	147	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	420	170	90	468	160	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			590		1068	420
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			590		1068	420
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		28	93
cM capacity (veh/h)			985		223	633
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	420	170	558	203		
Volume Left	0	0	90	160		
Volume Right	0	170	0	43		
cSH	1700	1700	985	283		
Volume to Capacity	0.25	0.10	0.09	0.72		
Queue Length 95th (ft)	0	0	8	126		
Control Delay (s)	0.0	0.0	2.4	44.7		
Lane LOS			A	E		
Approach Delay (s)	0.0		2.4	44.7		
Approach LOS				E		
Intersection Summary						
Average Delay			7.7			
Intersection Capacity Utilization			65.7%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Cypress Street & Westmeath Drive

Oaks at Laurel
AM Background

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	36	77	12	68	41
Future Volume (vph)	7	36	77	12	68	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	39	84	13	74	45
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	47	97	119			
Volume Left (vph)	0	84	74			
Volume Right (vph)	39	0	45			
Hadj (s)	-0.46	0.21	-0.07			
Departure Headway (s)	3.8	4.4	4.1			
Degree Utilization, x	0.05	0.12	0.14			
Capacity (veh/h)	908	790	834			
Control Delay (s)	7.0	8.0	7.8			
Approach Delay (s)	7.0	8.0	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
AM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	1	18	0	54	0	135	16	126	87	11
Future Volume (Veh/h)	10	0	1	18	0	54	0	135	16	126	87	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	11	0	1	20	0	59	0	147	17	137	95	12
Pedestrians												
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	590	539	101	532	536	156	107			164		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	539	101	532	536	156	107			164		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	95	100	93	100			90		
cM capacity (veh/h)	363	406	954	424	407	890	1484			1414		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	79	164	244								
Volume Left	11	20	0	137								
Volume Right	1	59	17	12								
cSH	382	696	1484	1414								
Volume to Capacity	0.03	0.11	0.00	0.10								
Queue Length 95th (ft)	2	10	0	8								
Control Delay (s)	14.7	10.8	0.0	4.7								
Lane LOS	B	B		A								
Approach Delay (s)	14.7	10.8	0.0	4.7								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			34.3%								A	
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
AM Total

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	386	161	86	431	158	48
Future Volume (Veh/h)	386	161	86	431	158	48
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	420	175	93	468	172	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			595		1074	420
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			595		1074	420
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		22	92
cM capacity (veh/h)			981		220	633
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	420	175	561	224		
Volume Left	0	0	93	172		
Volume Right	0	175	0	52		
cSH	1700	1700	981	280		
Volume to Capacity	0.25	0.10	0.09	0.80		
Queue Length 95th (ft)	0	0	8	158		
Control Delay (s)	0.0	0.0	2.5	54.4		
Lane LOS			A	F		
Approach Delay (s)	0.0		2.5	54.4		
Approach LOS				F		
Intersection Summary						
Average Delay			9.8			
Intersection Capacity Utilization			66.5%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Cypress Street & Westmeath Drive

Oaks at Laurel
AM Total

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	44	77	12	72	41
Future Volume (vph)	7	44	77	12	72	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	48	84	13	78	45
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	56	97	123			
Volume Left (vph)	0	84	78			
Volume Right (vph)	48	0	45			
Hadj (s)	-0.48	0.21	-0.06			
Departure Headway (s)	3.8	4.4	4.2			
Degree Utilization, x	0.06	0.12	0.14			
Capacity (veh/h)	908	786	827			
Control Delay (s)	7.0	8.0	7.9			
Approach Delay (s)	7.0	8.0	7.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			24.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
PM Existing

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	0	18	0	138	0	83	6	85	174	1
Future Volume (Veh/h)	14	0	0	18	0	138	0	83	6	85	174	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
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)	15	0	0	20	0	150	0	90	7	92	189	1
Pedestrians												
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	617	470	190	467	468	94	190	97				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	617	470	190	467	468	94	190	97				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	95	100	100	96	100	84	100	94				
cM capacity (veh/h)	324	461	852	482	463	963	1384	1496				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	15	170	97	282								
Volume Left	15	20	0	92								
Volume Right	0	150	7	1								
cSH	324	862	1384	1496								
Volume to Capacity	0.05	0.20	0.00	0.06								
Queue Length 95th (ft)	4	18	0	5								
Control Delay (s)	16.7	10.2	0.0	2.8								
Lane LOS	C	B		A								
Approach Delay (s)	16.7	10.2	0.0	2.8								
Approach LOS	C	B										
Intersection Summary												
Average Delay	4.9											
Intersection Capacity Utilization	36.3%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
PM Existing

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗		↖	↗	↖
Traffic Volume (veh/h)	410	222	49	333	164	104
Future Volume (Veh/h)	410	222	49	333	164	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	446	241	53	362	178	113
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			687		914	446
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			687		914	446
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		38	82
cM capacity (veh/h)			907		285	612
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	446	241	415	291		
Volume Left	0	0	53	178		
Volume Right	0	241	0	113		
cSH	1700	1700	907	467		
Volume to Capacity	0.26	0.14	0.06	0.62		
Queue Length 95th (ft)	0	0	5	104		
Control Delay (s)	0.0	0.0	1.8	27.0		
Lane LOS			A	D		
Approach Delay (s)	0.0		1.8	27.0		
Approach LOS				D		
Intersection Summary						
Average Delay			6.2			
Intersection Capacity Utilization			60.9%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Cypress Street & Westmeath Drive

Oaks at Laurel
PM Existing

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	11	100	76	6	51	62
Future Volume (vph)	11	100	76	6	51	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	109	83	7	55	67
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	121	90	122			
Volume Left (vph)	0	83	55			
Volume Right (vph)	109	0	67			
Hadj (s)	-0.51	0.22	-0.21			
Departure Headway (s)	3.8	4.5	4.1			
Degree Utilization, x	0.13	0.11	0.14			
Capacity (veh/h)	921	763	824			
Control Delay (s)	7.3	8.1	7.8			
Approach Delay (s)	7.3	8.1	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
PM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	0	18	0	141	0	85	6	87	177	1
Future Volume (Veh/h)	14	0	0	18	0	141	0	85	6	87	177	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
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)	15	0	0	20	0	153	0	92	7	95	192	1
Pedestrians												
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	631	482	192	478	478	96	193	99				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	631	482	192	478	478	96	193	99				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	95	100	100	96	100	84	100	94				
cM capacity (veh/h)	315	453	849	473	455	961	1380	1494				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	15	173	99	288								
Volume Left	15	20	0	95								
Volume Right	0	153	7	1								
cSH	315	859	1380	1494								
Volume to Capacity	0.05	0.20	0.00	0.06								
Queue Length 95th (ft)	4	19	0	5								
Control Delay (s)	17.0	10.2	0.0	2.9								
Lane LOS	C	B		A								
Approach Delay (s)	17.0	10.2	0.0	2.9								
Approach LOS	C	B										
Intersection Summary												
Average Delay	5.0											
Intersection Capacity Utilization	36.8%			ICU Level of Service				A				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
PM Background

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	585	226	50	467	167	106
Future Volume (Veh/h)	585	226	50	467	167	106
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	636	246	54	508	182	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			882		1252	636
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			882		1252	636
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	76
cM capacity (veh/h)			767		177	478
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	636	246	562	297		
Volume Left	0	0	54	182		
Volume Right	0	246	0	115		
cSH	1700	1700	767	254		
Volume to Capacity	0.37	0.14	0.07	1.17		
Queue Length 95th (ft)	0	0	6	339		
Control Delay (s)	0.0	0.0	1.9	151.0		
Lane LOS			A	F		
Approach Delay (s)	0.0		1.9	151.0		
Approach LOS				F		
Intersection Summary						
Average Delay			26.4			
Intersection Capacity Utilization			77.4%	ICU Level of Service		D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Cypress Street & Westmeath Drive

Oaks at Laurel
PM Background

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	11	102	78	6	52	63
Future Volume (vph)	11	102	78	6	52	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	111	85	7	57	68
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	123	92	125			
Volume Left (vph)	0	85	57			
Volume Right (vph)	111	0	68			
Hadj (s)	-0.51	0.22	-0.20			
Departure Headway (s)	3.8	4.5	4.1			
Degree Utilization, x	0.13	0.12	0.14			
Capacity (veh/h)	918	761	821			
Control Delay (s)	7.3	8.1	7.8			
Approach Delay (s)	7.3	8.1	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay	7.7					
Level of Service	A					
Intersection Capacity Utilization	24.7%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

1: Laurel Park Drive & Driveway/Park Center Drive

Oaks at Laurel
PM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	0	24	0	155	0	85	14	106	177	1
Future Volume (Veh/h)	14	0	0	24	0	155	0	85	14	106	177	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
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)	15	0	0	26	0	168	0	92	15	115	192	1
Pedestrians												
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	690	530	192	522	522	100	193	107				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	690	530	192	522	522	100	193	107				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	95	100	100	94	100	82	100	92				
cM capacity (veh/h)	279	420	849	438	423	956	1380	1484				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	15	194	107	308								
Volume Left	15	26	0	115								
Volume Right	0	168	15	1								
cSH	279	825	1380	1484								
Volume to Capacity	0.05	0.24	0.00	0.08								
Queue Length 95th (ft)	4	23	0	6								
Control Delay (s)	18.7	10.7	0.0	3.3								
Lane LOS	C	B		A								
Approach Delay (s)	18.7	10.7	0.0	3.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	5.4											
Intersection Capacity Utilization	38.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2: Laurel Park Drive & Van Dusen Road

Oaks at Laurel
PM Total

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	585	237	58	467	175	112
Future Volume (Veh/h)	585	237	58	467	175	112
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	636	258	63	508	190	122
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			894		1270	636
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			894		1270	636
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		0	74
cM capacity (veh/h)			759		170	478
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	636	258	571	312		
Volume Left	0	0	63	190		
Volume Right	0	258	0	122		
cSH	1700	1700	759	245		
Volume to Capacity	0.37	0.15	0.08	1.28		
Queue Length 95th (ft)	0	0	7	395		
Control Delay (s)	0.0	0.0	2.2	192.4		
Lane LOS			A	F		
Approach Delay (s)	0.0		2.2	192.4		
Approach LOS				F		
Intersection Summary						
Average Delay			34.5			
Intersection Capacity Utilization			78.3%	ICU Level of Service		D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Cypress Street & Westmeath Drive

Oaks at Laurel
PM Total

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	11	108	78	6	60	63
Future Volume (vph)	11	108	78	6	60	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	117	85	7	65	68
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	129	92	133			
Volume Left (vph)	0	85	65			
Volume Right (vph)	117	0	68			
Hadj (s)	-0.51	0.22	-0.18			
Departure Headway (s)	3.8	4.5	4.2			
Degree Utilization, x	0.14	0.12	0.15			
Capacity (veh/h)	911	755	814			
Control Delay (s)	7.4	8.1	8.0			
Approach Delay (s)	7.4	8.1	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization		25.2%		ICU Level of Service		A
Analysis Period (min)			15			

Appendix C

Background Developments



Traffic Impact Analysis	Background Development Location Map	Exhibit C-1
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com		

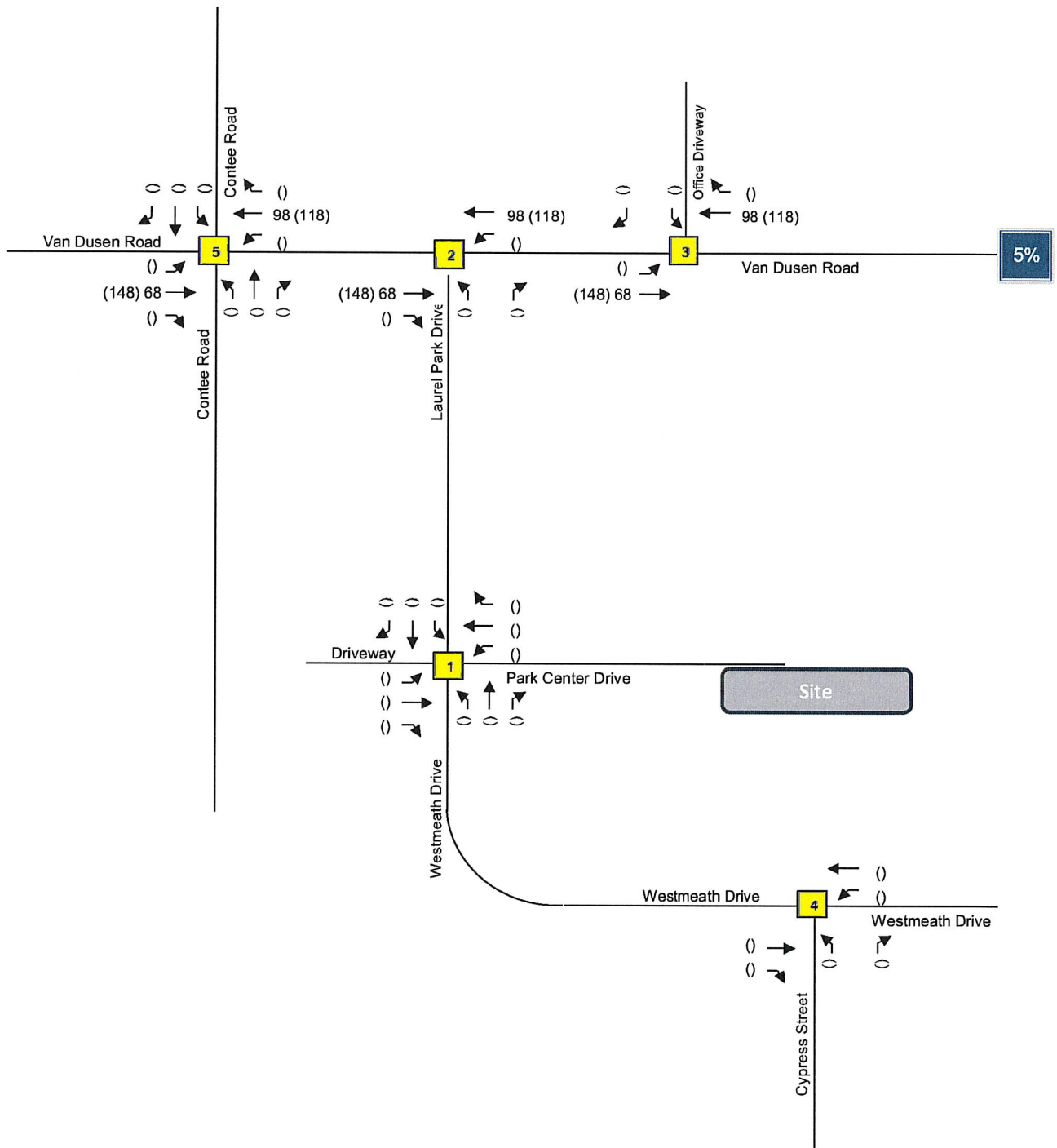
Trip Generation Totals

			AM Peak			PM Peak		
			In	Out	Total	In	Out	Total
1	Konterra Town Center East - Phase I	Primary Residential Trips	357	859	1216	834	497	1331
		Primary Office Trips	669	84	753	68	506	574
		Primary Retail Trips	383	233	616	1256	1300	2556
		External SHA Trips	551	178	729	207	663	870
		Net Trips:	1960	1354	3314	2365	2966	5331
2	Park Place	Net Trips:	107	16	123	23	94	117
3	Konterra Business Campus	Net Trips:	212	108	320	96	170	266
4	12808 Konterra Drive	High-Cube Fulfillment Center Warehouse (ksf, ITE-155)[Sort]						
		269,200 sq. ft.	190	44	234	126	197	323
5	Strip Retail Plaza (<40k) (ksf, ITE-822)	31,110 sq.ft.	37	24	61	87	87	174
		Passby Rates: 40%	-15	-9	-24	-35	-35	-70

Notes:

1. Trip generation details for BDs 1-3 were determined from the Park Place TIA (August 2019). The relevant pages are provided with this report.
2. Trip generation for 12808 Konterra Drive obtained from the subject TIS.

Traffic Impact Analysis	Background Development Trip Generation	Exhibit C-2
 LENHART TRAFFIC CONSULTING, INC. 845 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVENNA PLAZA, INC. 21146 www.lenharttraffic.com		



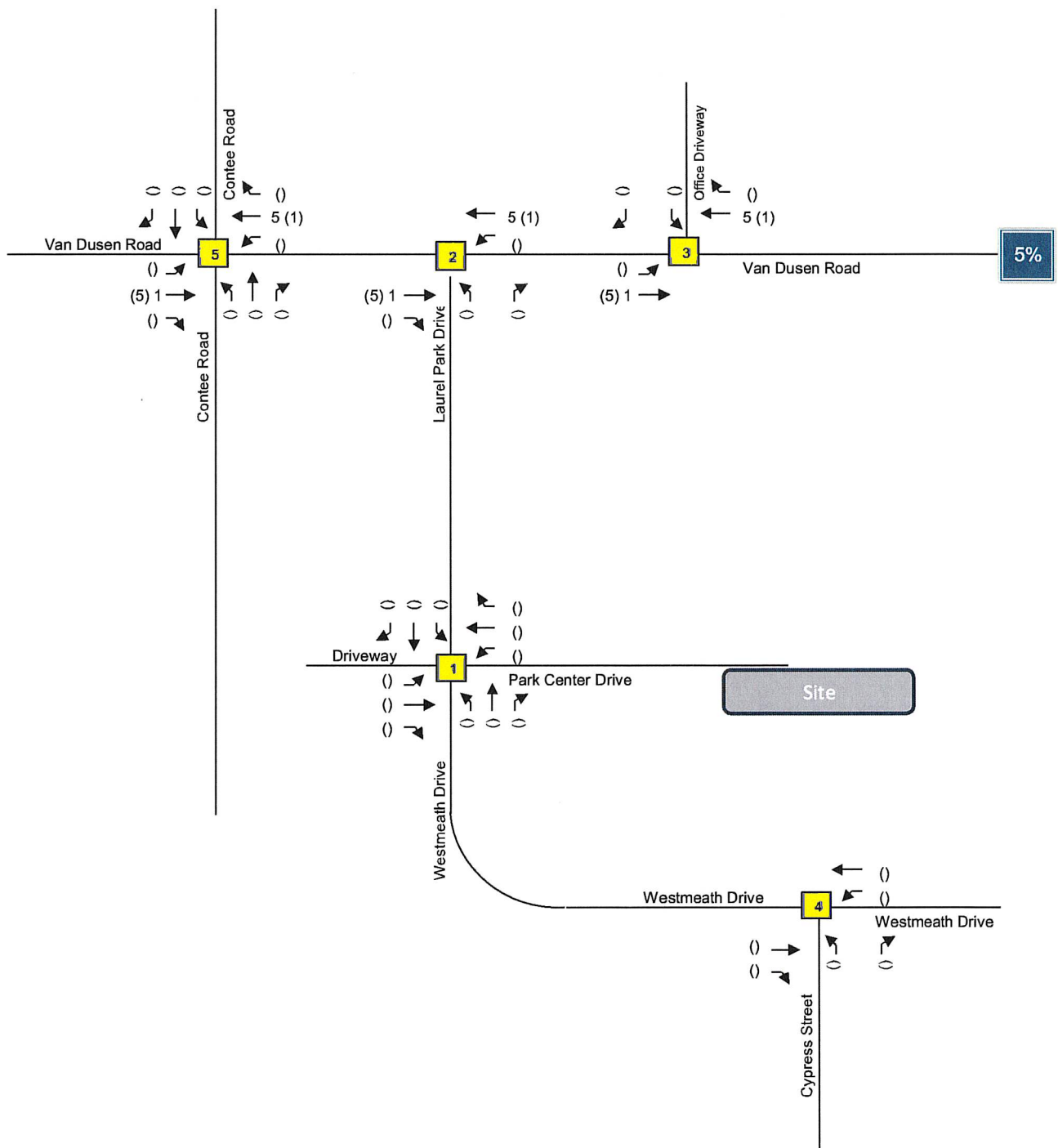
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Back. Dev 1 Trip Assignment

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3**



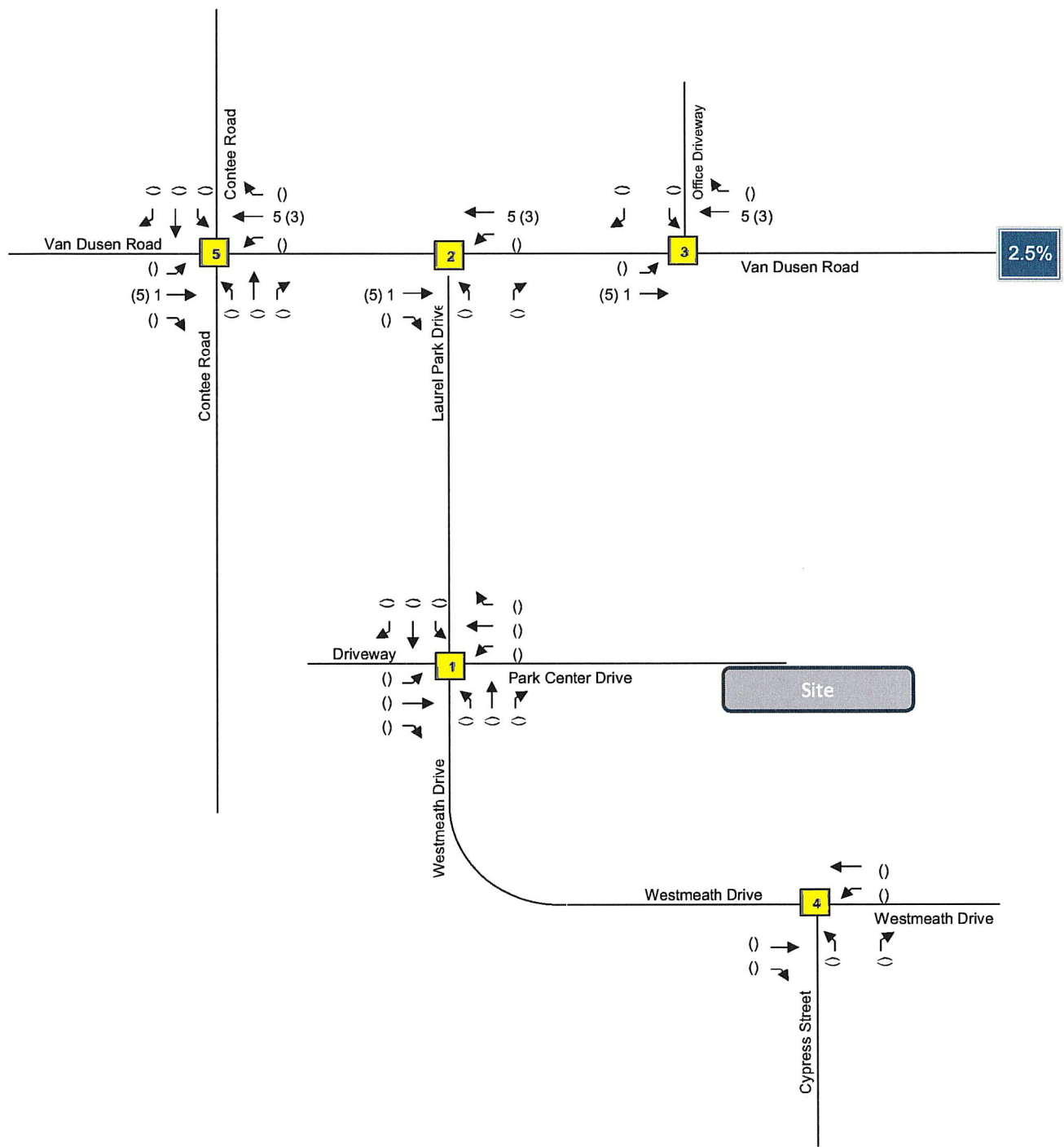
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

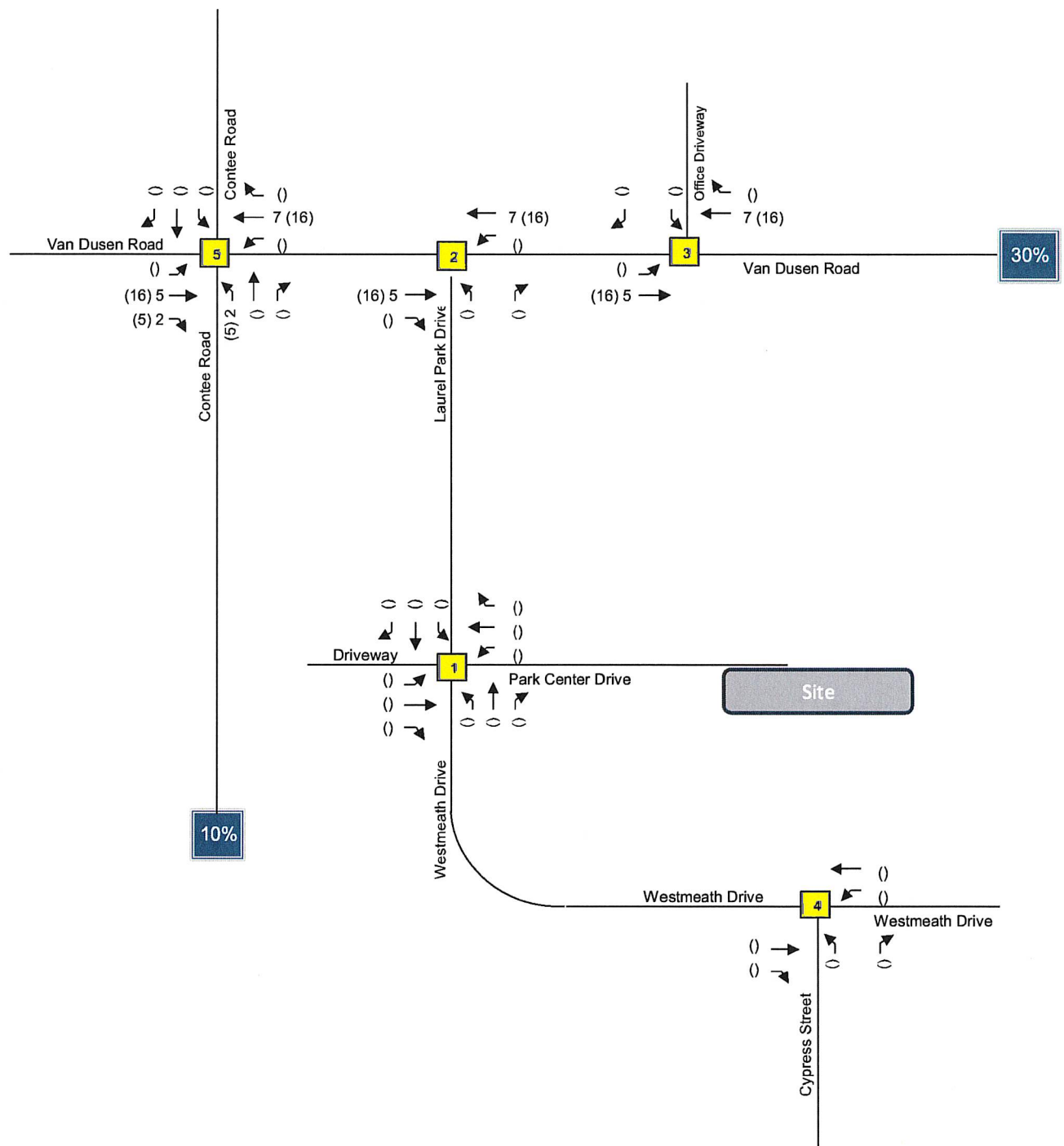
Back. Dev 2 Trip Assignment

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

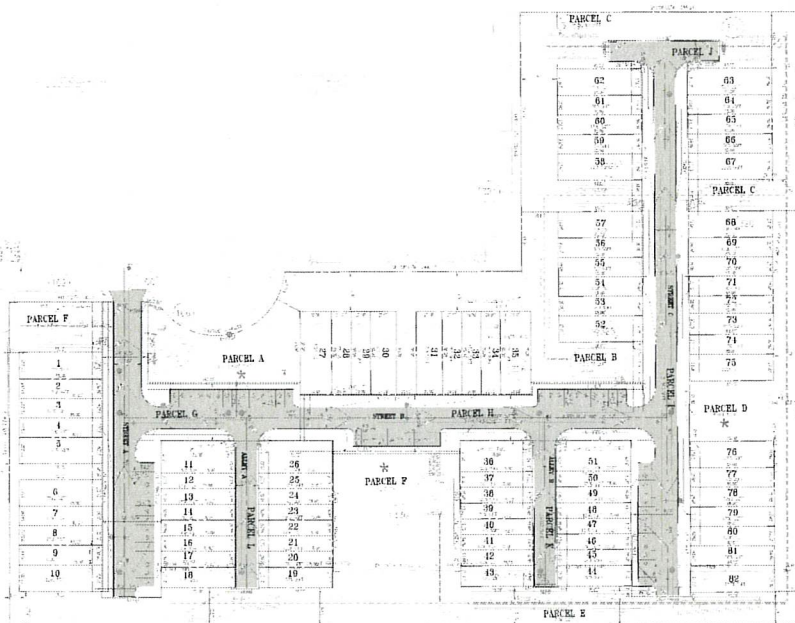
**Exhibit
C-4**



Traffic Impact Analysis	Back. Dev 3 Trip Assignment	Exhibit C-5
Lenhart Traffic Consulting, Inc. Traffic Engineering & Transportation Planning		

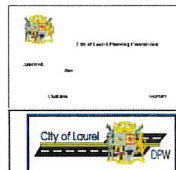


Traffic Impact Analysis	Back. Dev 3 Trip Assignment	Exhibit C-5
Lenhart Traffic Consulting, Inc. Traffic Engineering & Transportation Planning		



CITY HOUSE DEVELOPMENT STANDARDS	
Residential (Single or 2-4 Units)	Greenhouse: 1,200 sq. ft. Deck: 1,000 sq. ft. Attached: 1,000 sq. ft. Detached: 1,000 sq. ft.
City House Development Standards	Greenhouse: 1,200 sq. ft. Deck: 1,000 sq. ft. Attached: 1,000 sq. ft. Detached: 1,000 sq. ft.

PARCEL TABLE		
PARCEL	USE	OWNER
PARCEL A	OPEN SPACE/RECREATION	HCIA
PARCEL B	OPEN SPACE/RECREATION	HCIA
PARCEL C	OPEN SPACE/RECREATION	HCIA
PARCEL D	OPEN SPACE	HCIA
PARCEL E	OPEN SPACE/RECREATION	HCIA
PARCEL F	OPEN SPACE/RECREATION	HCIA
PARCEL G	OPEN SPACE	HCIA
PARCEL H	PRIVATE USE	HCIA
PARCEL I	PRIVATE USE	HCIA
PARCEL J	PRIVATE USE	HCIA
PARCEL K	PRIVATE USE	HCIA

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 PRELIMINARY PLAN OF SUBDIVISION
 OAKS AT LAUREL
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2020年12月15日 星期二
 12月15日 星期二
 12月15日 星期二

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