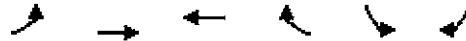


Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2018 Existing AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↰	↰	↰
Traffic Volume (vph)	9	597	1305	14	18	49
Future Volume (vph)	9	597	1305	14	18	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	663	1450	16	20	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	663	1450	16	20	54
Sign Control		Free	Free		Stop	

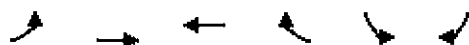
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.7%
Analysis Period (min) 15
ICU Level of Service D

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2018 Existing AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱	↰	↱
Traffic Volume (veh/h)	9	597	1305	14	18	49
Future Volume (Veh/h)	9	597	1305	14	18	49
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)	10	663	1450	16	20	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.34				0.34	0.34
vC, conflicting volume	1466				2133	1450
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1401				3345	1354
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				0	14
cM capacity (veh/h)	167				3	63

Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	10	663	1450	16	74
Volume Left	10	0	0	0	20
Volume Right	0	0	0	16	54
cSH	167	1700	1700	1700	10
Volume to Capacity	0.06	0.39	0.85	0.01	7.68
Queue Length 95th (ft)	5	0	0	0	Err
Control Delay (s)	27.9	0.0	0.0	0.0	Err
Lane LOS	D				F
Approach Delay (s)	0.4		0.0		Err
Approach LOS					F

Intersection Summary					
Average Delay		334.5			
Intersection Capacity Utilization		78.7%	ICU Level of Service	D	
Analysis Period (min)		15			

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2018 Existing AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	520	91	49	905	4	393	2	73	18	6	21
Future Volume (vph)	4	520	91	49	905	4	393	2	73	18	6	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.999			0.854			0.938	
Flt Protected	0.950			0.950			0.950				0.980	
Satd. Flow (prot)	1778	1831	0	1770	1861	0	1787	1607	0	0	1695	0
Flt Permitted	0.060			0.067			0.400				0.833	
Satd. Flow (perm)	112	1831	0	125	1861	0	753	1607	0	0	1441	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6					81				23	
Link Speed (mph)		45			45		45				25	
Link Distance (ft)		585			557		625				740	
Travel Time (s)		8.9			8.4		9.5				20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	578	101	54	1006	4	437	2	81	20	7	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	679	0	54	1010	0	437	83	0	0	50	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		3				4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	61.0	48.0		13.0	61.0		60.0	60.0		24.0	24.0	
Total Split (%)	42.1%	33.1%		9.0%	42.1%		41.4%	41.4%		16.6%	16.6%	
Maximum Green (s)	54.8	41.8		7.4	54.8		54.3	54.3		17.9	17.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	68.2	57.4		68.2	68.2		55.0	55.0			9.4	
Actuated g/C Ratio	0.47	0.40		0.47	0.47		0.38	0.38			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2018 Existing AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	0.93		0.36	1.15		1.53	0.13			0.43	
Control Delay	28.8	63.4		29.4	118.2		289.7	6.5			50.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	28.8	63.4		29.4	118.2		289.7	6.5			50.9	
LOS	C	E		C	F		F	A			D	
Approach Delay		63.2			113.7			244.5			50.9	
Approach LOS		E			F			F			D	
Queue Length 50th (ft)	2	631		28	~1140		~576	1			25	
Queue Length 95th (ft)	11	#989		58	#1456		#792	37			69	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	52	728		155	875		285	659			208	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.08	0.93		0.35	1.15		1.53	0.13			0.24	

Intersection Summary

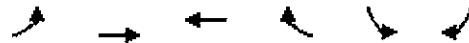
Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.53
 Intersection Signal Delay: 126.8
 Intersection Capacity Utilization 84.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
 Ø6 (R)			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2018 Existing PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (vph)	25	1117	736	27	34	20
Future Volume (vph)	25	1117	736	27	34	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	1241	818	30	38	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	1241	818	30	38	22
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.8%

ICU Level of Service C

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2018 Existing PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↑	↰	↑
Traffic Volume (veh/h)	25	1117	736	27	34	20
Future Volume (Veh/h)	25	1117	736	27	34	20
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)	28	1241	818	30	38	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.71				0.71	0.71
vC, conflicting volume	848				2115	818
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				2364	541
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	94
cM capacity (veh/h)	705				26	385

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	28	1241	818	30	60
Volume Left	28	0	0	0	38
Volume Right	0	0	0	30	22
cSH	705	1700	1700	1700	41
Volume to Capacity	0.04	0.73	0.48	0.02	1.46
Queue Length 95th (ft)	3	0	0	0	152
Control Delay (s)	10.3	0.0	0.0	0.0	457.9
Lane LOS	B				F
Approach Delay (s)	0.2		0.0		457.9
Approach LOS					F

Intersection Summary					
Average Delay		12.8			
Intersection Capacity Utilization		68.8%	ICU Level of Service		C
Analysis Period (min)		15			

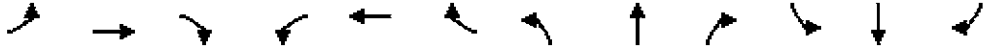
Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2018 Existing PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	919	221	40	544	7	207	16	93	14	4	12
Future Volume (vph)	11	919	221	40	544	7	207	16	93	14	4	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.998			0.872			0.947	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1778	1818	0	1770	1859	0	1787	1641	0	0	1704	0
Flt Permitted	0.337			0.046			0.485				0.785	
Satd. Flow (perm)	631	1818	0	86	1859	0	912	1641	0	0	1371	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			1			103			13	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	1021	246	44	604	8	230	18	103	16	4	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1267	0	44	612	0	230	121	0	0	33	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	89.0	76.0		13.0	89.0		33.0	33.0		23.0	23.0	
Total Split (%)	61.4%	52.4%		9.0%	61.4%		22.8%	22.8%		15.9%	15.9%	
Maximum Green (s)	82.8	69.8		7.4	82.8		27.3	27.3		16.9	16.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	95.7	85.6		95.7	95.7		28.0	28.0			8.9	
Actuated g/C Ratio	0.66	0.59		0.66	0.66		0.19	0.19			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

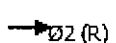
The Courtyards on Lawyers
2018 Existing PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	1.18		0.30	0.50		1.31	0.30				0.34
Control Delay	10.2	118.2		15.2	15.0		217.6	14.4				54.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Total Delay	10.2	118.2		15.2	15.0		217.6	14.4				54.4
LOS	B	F		B	B		F	B				D
Approach Delay		117.2			15.0			147.6				54.4
Approach LOS		F			B			F				D
Queue Length 50th (ft)	4	~1480		14	286		~278	14				18
Queue Length 95th (ft)	13	#1792		32	406		#452	71				55
Internal Link Dist (ft)		505			477			545				660
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	416	1077		149	1227		176	399				181
Starvation Cap Reductn	0	0		0	0		0	0				0
Spillback Cap Reductn	0	0		0	0		0	0				0
Storage Cap Reductn	0	0		0	0		0	0				0
Reduced v/c Ratio	0.03	1.18		0.30	0.50		1.31	0.30				0.18

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.31
 Intersection Signal Delay: 92.0
 Intersection Capacity Utilization 88.3%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

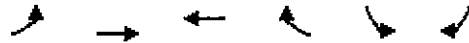
 Ø1	 Ø2 (R)	 Ø3	 Ø4
 Ø5 (R)			

2022 Background Conditions



Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (vph)	10	646	1413	15	19	53
Future Volume (vph)	10	646	1413	15	19	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	718	1570	17	21	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	718	1570	17	21	59
Sign Control		Free	Free		Stop	

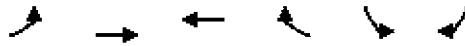
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 84.4%
Analysis Period (min) 15
ICU Level of Service E

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	←	↑
Traffic Volume (veh/h)	10	646	1413	15	19	53
Future Volume (Veh/h)	10	646	1413	15	19	53
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)	11	718	1570	17	21	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.32				0.32	0.32
vC, conflicting volume	1587				2310	1570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1771				4025	1718
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				0	0
cM capacity (veh/h)	113				1	36

Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	11	718	1570	17	80
Volume Left	11	0	0	0	21
Volume Right	0	0	0	17	59
cSH	113	1700	1700	1700	3
Volume to Capacity	0.10	0.42	0.92	0.01	24.69
Queue Length 95th (ft)	8	0	0	0	Err
Control Delay (s)	40.4	0.0	0.0	0.0	Err
Lane LOS	E				F
Approach Delay (s)	0.6		0.0		Err
Approach LOS					F

Intersection Summary					
Average Delay		334.0			
Intersection Capacity Utilization		84.4%	ICU Level of Service	E	
Analysis Period (min)		15			

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	563	99	53	980	4	425	2	79	19	6	23
Future Volume (vph)	4	563	99	53	980	4	425	2	79	19	6	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.999			0.853			0.935	
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1778	1831	0	1770	1861	0	1787	1605	0	0	1691	0
Flt Permitted	0.060			0.068			0.389				0.833	
Satd. Flow (perm)	112	1831	0	127	1861	0	732	1605	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						88			26	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	626	110	59	1089	4	472	2	88	21	7	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	736	0	59	1093	0	472	90	0	0	54	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	61.0	48.0		13.0	61.0		60.0	60.0		24.0	24.0	
Total Split (%)	42.1%	33.1%		9.0%	42.1%		41.4%	41.4%		16.6%	16.6%	
Maximum Green (s)	54.8	41.8		7.4	54.8		54.3	54.3		17.9	17.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	68.0	57.1		68.0	68.0		55.0	55.0			9.6	
Actuated g/C Ratio	0.47	0.39		0.47	0.47		0.38	0.38			0.07	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	1.02		0.38	1.25		1.70	0.14			0.45	
Control Delay	29.0	81.0		30.2	157.0		361.8	6.3			50.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	29.0	81.0		30.2	157.0		361.8	6.3			50.0	
LOS	C	F		C	F		F	A			D	
Approach Delay		80.7			150.5			304.9			50.0	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	2	~770		31	~1304		~653	1			26	
Queue Length 95th (ft)	12	#1112		63	#1626		#874	38			71	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	52	724		157	873		277	663			210	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.08	1.02		0.38	1.25		1.70	0.14			0.26	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.70
 Intersection Signal Delay: 162.4
 Intersection Capacity Utilization 90.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service E

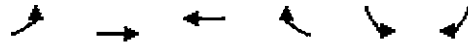
~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

Ø1	Ø2 (R)	Ø3	Ø4
18.5	48.5	50.5	24.5
Ø6 (R)			
61.5			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱	↰	↱
Traffic Volume (vph)	27	1209	797	29	37	22
Future Volume (vph)	27	1209	797	29	37	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	1343	886	32	41	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	1343	886	32	41	24
Sign Control		Free	Free		Stop	

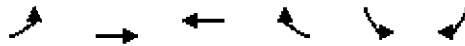
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.6%
Analysis Period (min) 15
ICU Level of Service D

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	←	↑
Traffic Volume (veh/h)	27	1209	797	29	37	22
Future Volume (Veh/h)	27	1209	797	29	37	22
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)	30	1343	886	32	41	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.67				0.67	0.67
vC, conflicting volume	918				2289	886
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	636				2671	589
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				0	93
cM capacity (veh/h)	638				16	343

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	30	1343	886	32	65
Volume Left	30	0	0	0	41
Volume Right	0	0	0	32	24
cSH	638	1700	1700	1700	25
Volume to Capacity	0.05	0.79	0.52	0.02	2.65
Queue Length 95th (ft)	4	0	0	0	202
Control Delay (s)	10.9	0.0	0.0	0.0	1080.4
Lane LOS	B				F
Approach Delay (s)	0.2		0.0		1080.4
Approach LOS					F

Intersection Summary					
Average Delay		29.9			
Intersection Capacity Utilization		73.6%	ICU Level of Service	D	
Analysis Period (min)		15			

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	995	239	43	589	8	224	17	101	15	4	13
Future Volume (vph)	12	995	239	43	589	8	224	17	101	15	4	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.998			0.872			0.946	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1778	1818	0	1770	1859	0	1787	1641	0	0	1703	0
Flt Permitted	0.306			0.046			0.486				0.780	
Satd. Flow (perm)	573	1818	0	86	1859	0	914	1641	0	0	1361	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			1			112			14	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1106	266	48	654	9	249	19	112	17	4	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1372	0	48	663	0	249	131	0	0	35	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	89.0	76.0		13.0	89.0		33.0	33.0		23.0	23.0	
Total Split (%)	61.4%	52.4%		9.0%	61.4%		22.8%	22.8%		15.9%	15.9%	
Maximum Green (s)	82.8	69.8		7.4	82.8		27.3	27.3		16.9	16.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	95.6	85.4		95.6	95.6		28.0	28.0			9.0	
Actuated g/C Ratio	0.66	0.59		0.66	0.66		0.19	0.19			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	1.28		0.33	0.54		1.41	0.32			0.36	
Control Delay	10.3	159.5		17.3	15.9		258.2	14.2			54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	10.3	159.5		17.3	15.9		258.2	14.2			54.3	
LOS	B	F		B	B		F	B			D	
Approach Delay		158.1			16.0			174.1			54.3	
Approach LOS		F			B			F			D	
Queue Length 50th (ft)	4	~1688		15	322		~315	15			19	
Queue Length 95th (ft)	14	#2007		39	460		#493	75			57	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	377	1075		149	1225		176	407			181	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.03	1.28		0.32	0.54		1.41	0.32			0.19	

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.41

Intersection Signal Delay: 118.8

Intersection LOS: F

Intersection Capacity Utilization 94.3%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

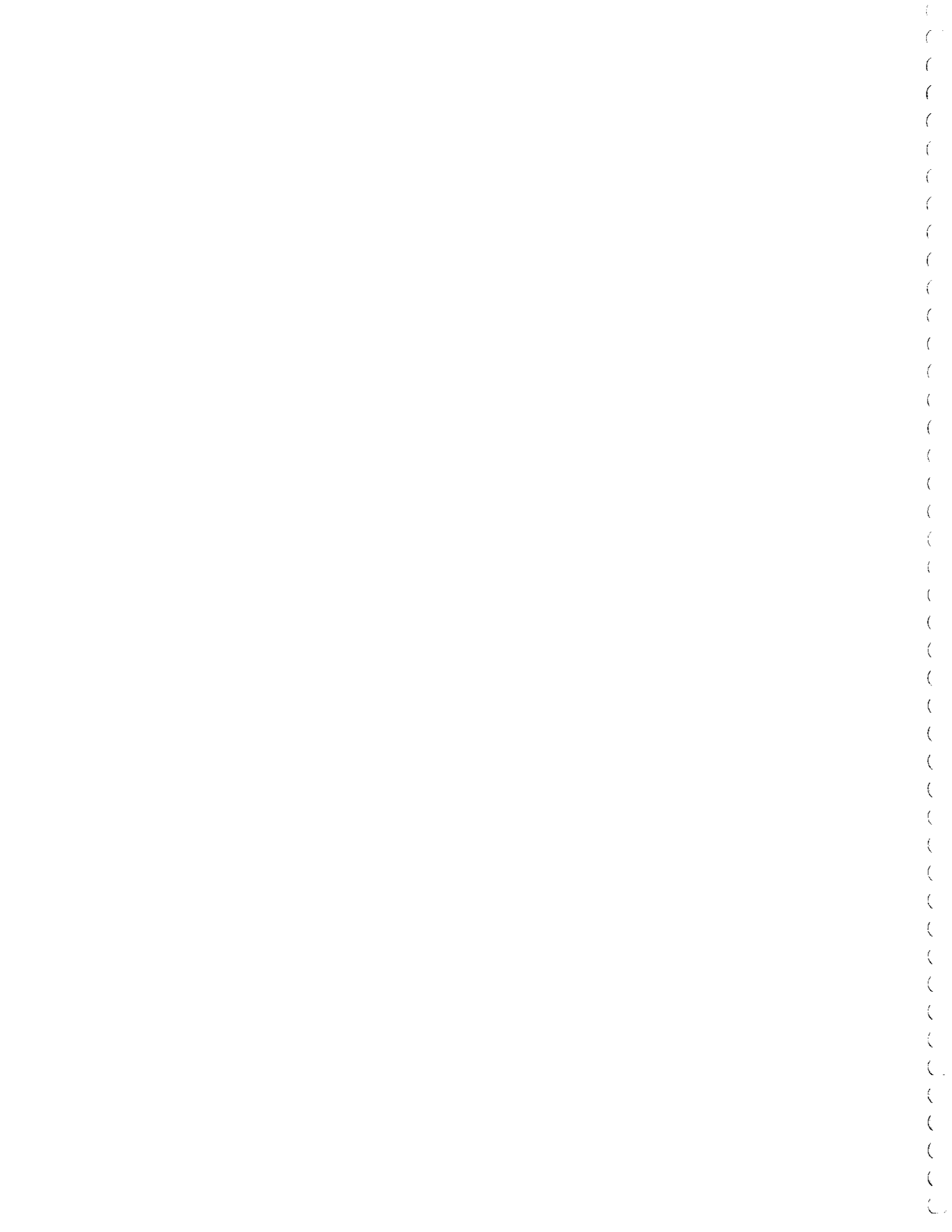
Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

Ø1	Ø2 (R)	Ø3	Ø4
16%	76%	33%	25%
Ø6 (R)			
89%			

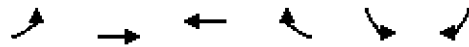
2022 Background Conditions

Improved



Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑
Traffic Volume (vph)	10	646	1413	15	19	53
Future Volume (vph)	10	646	1413	15	19	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	0			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected		0.999			0.950	
Satd. Flow (prot)	0	3536	3532	0	1770	1583
Flt Permitted		0.999			0.950	
Satd. Flow (perm)	0	3536	3532	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	718	1570	17	21	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	729	1587	0	21	59
Sign Control		Yield	Yield		Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Traffic Volume (veh/h)	10	646	1413	15	19	53
Future Volume (veh/h)	10	646	1413	15	19	53
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	718	1570	17	21	59
Approach Volume (veh/h)		729	1587		80	
Crossing Volume (veh/h)		21	11		1570#	
High Capacity (veh/h)		1362	1373		387	
High v/c (veh/h)		0.54	1.16		0.21	
Low Capacity (veh/h)		1141	1151		285	
Low v/c (veh/h)		0.64	1.38		0.28	
Intersection Summary						
Maximum v/c High			1.16			
Maximum v/c Low			1.38			
Intersection Capacity Utilization			49.5%	ICU Level of Service		A
# Crossing flow exceeds 1200, method is not applicable						

Lanes, Volumes, Timings

The Courtyards on Lawyers

4: Stevens Mill Road & Lawyers Rd

2022 Background IMP AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	563	99	53	980	4	425	2	79	19	6	23
Future Volume (vph)	4	563	99	53	980	4	425	2	79	19	6	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		650	400		0	0		0
Storage Lanes	1		1	1		1	2		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999			0.853			0.935	
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1778	1872	1591	1770	3536	0	3467	1605	0	0	1691	0
Flt Permitted	0.130			0.076			0.389				0.833	
Satd. Flow (perm)	243	1872	1591	142	3536	0	1420	1605	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116					88			26	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	626	110	59	1089	4	472	2	88	21	7	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	626	110	59	1093	0	472	90	0	0	54	0
Turn Type	D.Pm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6		2	6			3			4		
Detector Phase	6	2	2	1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5	22.5	12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	44.0	31.0	31.0	13.0	44.0		68.0	68.0		23.0	23.0	
Total Split (%)	32.6%	23.0%	23.0%	9.6%	32.6%		50.4%	50.4%		17.0%	17.0%	
Maximum Green (s)	37.8	24.8	24.8	7.4	37.8		62.3	62.3		16.9	16.9	
Yellow Time (s)	4.6	4.6	4.6	3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6	1.6	2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0	6.0	2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0	15.0	0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0	45.0	0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	61.4	50.3	50.3	61.4	61.4		51.8	51.8			9.4	
Actuated g/C Ratio	0.45	0.37	0.37	0.45	0.45		0.38	0.38			0.07	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.04	0.90	0.17	0.35	0.68		0.87	0.13			0.44	
Control Delay	30.0	59.2	7.0	32.1	34.6		54.5	4.8			46.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	30.0	59.2	7.0	32.1	34.6		54.5	4.8			46.2	
LOS	C	E	A	C	C		D	A			D	
Approach Delay		51.3			34.4			46.5			46.2	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	2	540	0	30	404		192	1			24	
Queue Length 95th (ft)	12	#1017	46	70	#627		239	32			67	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			400					
Base Capacity (vph)	110	697	665	170	1608		662	795			214	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.04	0.90	0.17	0.35	0.68		0.71	0.11			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 42.4

Intersection LOS: D

Intersection Capacity Utilization 68.5%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

↙ Ø1	→ Ø2 (R)	↑ Ø3	↓ Ø4
13s	51s	68s	23s
← Ø6 (R)			
24s			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

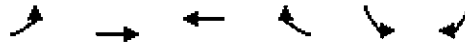
The Courtyards on Lawyers
2022 Background IMP AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	646	1413	15	19	53
Future Volume (vph)	10	646	1413	15	19	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3532	0	1770	1583
Flt Permitted	0.144				0.950	
Satd. Flow (perm)	268	1863	3532	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			59
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	718	1570	17	21	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	718	1587	0	21	59
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	7.0
Minimum Split (s)	19.0	19.0	19.0		14.0	14.0
Total Split (s)	115.0	115.0	115.0		20.0	20.0
Total Split (%)	85.2%	85.2%	85.2%		14.8%	14.8%
Maximum Green (s)	108.0	108.0	108.0		13.0	13.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Min	C-Min	C-Min		None	None
Act Effct Green (s)	119.0	119.0	119.0		9.8	9.8
Actuated g/C Ratio	0.88	0.88	0.88		0.07	0.07
v/c Ratio	0.05	0.44	0.51		0.16	0.35
Control Delay	2.1	3.1	1.5		61.3	19.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	2.1	3.1	1.5		61.3	19.8
LOS	A	A	A		E	B
Approach Delay		3.0	1.5		30.7	
Approach LOS		A	A		C	

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	1	105	45		18	0
Queue Length 95th (ft)	4	174	38		45	45
Internal Link Dist (ft)		1067	366		1152	
Turn Bay Length (ft)	300					100
Base Capacity (vph)	236	1642	3114		196	228
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.05	0.44	0.51		0.11	0.26

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 3.0
Intersection Capacity Utilization 53.7%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service A

Splits and Phases: 1: Lawyers Rd & Allen Black Rd

→ Ø2 (R)	Ø4
← Ø6 (R)	

LANE SUMMARY

 Site: 101 [Lawyers/Allen Black AM - Background]

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	Demand Flows			Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Cap. veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
East: Lawyers Road													
Lane 1 ^d	1570	2.0	1379	1.139	100	86.9	LOS F	473.9	12036.0	Full	1600	0.0	100.0
Lane 2	17	2.0	1310	0.013	100	2.8	LOS A	0.0	1.2	Short	100	0.0	NA
Approach	1587	2.0		1.139		86.0	LOS F	473.9	12036.0				
North: Allen Black Road													
Lane 1	21	2.0	385	0.055	100	10.1	LOS B	0.2	4.5	Full	1600	0.0	0.0
Lane 2 ^d	59	2.0	385	0.153	100	11.7	LOS B	0.5	12.8	Short	100	0.0	NA
Approach	80	2.0		0.153		11.3	LOS B	0.5	12.8				
West: Lawyers Road													
Lane 1	11	2.0	1365	0.008	100	2.7	LOS A	0.0	0.8	Short	300	0.0	NA
Lane 2 ^d	718	2.0	1365	0.526	100	8.2	LOS A	4.0	101.8	Full	1600	0.0	0.0
Approach	729	2.0		0.526		8.1	LOS A	4.0	101.8				
Intersection	2396	2.0		1.139		59.8	LOS F	473.9	12036.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Tuesday, October 16, 2018 5:07:29 PM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

LANE SUMMARY

 **Site: 101 [Lawyers/Allen Black AM - IMP - Background]**

New Site

Site Category: (None)

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Lawyers Road													
Lane 1	773	2.0	1310	0.590	100	9.6	LOS A	5.0	127.2	Full	1600	0.0	0.0
Lane 2 ^d	814	2.0	1379	0.590	100	9.2	LOS A	4.9	123.8	Full	1600	0.0	0.0
Approach	1587	2.0		0.590		9.4	LOS A	5.0	127.2				
North: Allen Black Road													
Lane 1	21	2.0	303	0.070	100	13.1	LOS B	0.2	5.4	Full	1600	0.0	0.0
Lane 2 ^d	59	2.0	357	0.165	100	12.9	LOS B	0.5	13.2	Short	100	0.0	NA
Approach	80	2.0		0.165		13.0	LOS B	0.5	13.2				
West: Lawyers Road													
Lane 1	364	2.0	1365	0.267	100	4.9	LOS A	1.4	34.4	Short	300	0.0	NA
Lane 2 ^d	364	2.0	1365	0.267	100	4.9	LOS A	1.4	34.4	Full	1600	0.0	0.0
Approach	729	2.0		0.267		4.9	LOS A	1.4	34.4				
Intersection	2396	2.0		0.590		8.2	LOS A	5.0	127.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

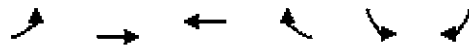
SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Wednesday, October 17, 2018 10:08:28 AM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔↔		↔	↔
Traffic Volume (vph)	27	1209	797	29	37	22
Future Volume (vph)	27	1209	797	29	37	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	0			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.995			0.850
Flt Protected		0.999			0.950	
Satd. Flow (prot)	0	3536	3522	0	1770	1583
Flt Permitted		0.999			0.950	
Satd. Flow (perm)	0	3536	3522	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	1343	886	32	41	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1373	918	0	41	24
Sign Control		Yield	Yield		Yield	

Intersection Summary

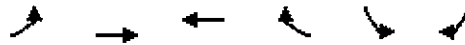
Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 62.7%
Analysis Period (min) 15
ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers

2022 Background IMP PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Traffic Volume (veh/h)	27	1209	797	29	37	22
Future Volume (veh/h)	27	1209	797	29	37	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	30	1343	886	32	41	24
Approach Volume (veh/h)		1373	918		65	
Crossing Volume (veh/h)		41	30		886	
High Capacity (veh/h)		1341	1353		683	
High v/c (veh/h)		1.02	0.68		0.10	
Low Capacity (veh/h)		1122	1132		535	
Low v/c (veh/h)		1.22	0.81		0.12	
Intersection Summary						
Maximum v/c High			1.02			
Maximum v/c Low			1.22			
Intersection Capacity Utilization			62.7%	ICU Level of Service		B

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	995	239	43	589	8	224	17	101	15	4	13
Future Volume (vph)	12	995	239	43	589	8	224	17	101	15	4	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		650	400		0	0		0
Storage Lanes	1		1	1		1	2		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998			0.872			0.946	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1778	1872	1591	1770	3532	0	3467	1641	0	0	1703	0
Flt Permitted	0.372			0.045			0.486				0.780	
Satd. Flow (perm)	696	1872	1591	84	3532	0	1774	1641	0	0	1361	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		1			112			14	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1106	266	48	654	9	249	19	112	17	4	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1106	266	48	663	0	249	131	0	0	35	0
Turn Type	D.Pm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6		2	6			3			4		
Detector Phase	6	2	2	1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5	22.5	12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	69.0	56.0	56.0	13.0	69.0		53.0	53.0		23.0	23.0	
Total Split (%)	47.6%	38.6%	38.6%	9.0%	47.6%		36.6%	36.6%		15.9%	15.9%	
Maximum Green (s)	62.8	49.8	49.8	7.4	62.8		47.3	47.3		16.9	16.9	
Yellow Time (s)	4.6	4.6	4.6	3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6	1.6	2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0	6.0	2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0	15.0	0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0	45.0	0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	97.7	87.4	87.4	97.7	97.7		25.9	25.9			9.0	
Actuated g/C Ratio	0.67	0.60	0.60	0.67	0.67		0.18	0.18			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP PM

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.98	0.27	0.33	0.28		0.79	0.34			0.36	
Control Delay	11.4	52.8	10.8	18.3	11.2		73.9	13.7			54.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	11.4	52.8	10.8	18.3	11.2		73.9	13.7			54.3	
LOS	B	D	B	B	B		E	B			D	
Approach Delay		44.3			11.7			53.1			54.3	
Approach LOS		D			B			D			D	
Queue Length 50th (ft)	4	~1112	68	15	127		117	15			19	
Queue Length 95th (ft)	16	#1537	149	44	203		157	70			57	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			400					
Base Capacity (vph)	468	1128	1002	150	2379		587	618			181	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.03	0.98	0.27	0.32	0.28		0.42	0.21			0.19	

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 36.6

Intersection LOS: D

Intersection Capacity Utilization 72.6%

ICU Level of Service C

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

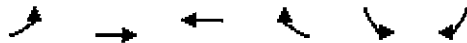
Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

↖ Ø1	→ Ø2 (R)	↑ Ø3	↓ Ø4
18.3%	56.5%	56.5%	23.5%
← Ø6 (R)			
69.5%			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

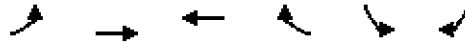
The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	27	1209	797	29	37	22
Future Volume (vph)	27	1209	797	29	37	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3522	0	1770	1583
Flt Permitted	0.307				0.950	
Satd. Flow (perm)	572	1863	3522	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13			24
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	1343	886	32	41	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	1343	918	0	41	24
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	7.0
Minimum Split (s)	19.0	19.0	19.0		14.0	14.0
Total Split (s)	131.0	131.0	131.0		14.0	14.0
Total Split (%)	90.3%	90.3%	90.3%		9.7%	9.7%
Maximum Green (s)	124.0	124.0	124.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Min	C-Min	C-Min		None	None
Act Effct Green (s)	129.4	129.4	129.4		9.4	9.4
Actuated g/C Ratio	0.89	0.89	0.89		0.06	0.06
v/c Ratio	0.06	0.81	0.29		0.36	0.19
Control Delay	1.6	9.2	1.1		74.2	25.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	1.6	9.2	1.1		74.2	25.9
LOS	A	A	A		E	C
Approach Delay		9.0	1.1		56.4	
Approach LOS		A	A		E	

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	3	493	42		37	0
Queue Length 95th (ft)	7	649	30		80	31
Internal Link Dist (ft)		1067	366		1152	
Turn Bay Length (ft)	300					100
Base Capacity (vph)	512	1667	3154		114	125
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.06	0.81	0.29		0.36	0.19

Intersection Summary:

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 145
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 7.3
Intersection Capacity Utilization 77.8%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service D

Splits and Phases: 1: Lawyers Rd & Allen Black Rd

→ Ø2 (R)	Ø4
← Ø6 (R)	

LANE SUMMARY

 **Site: 101 [Lawyers/Allen Black PM - Background]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
East: Lawyers Road													
Lane 1 ^d	886	2.0	1356	0.653	100	10.8	LOS B	6.1	155.1	Full	1600	0.0	0.0
Lane 2	32	2.0	1287	0.025	100	3.0	LOS A	0.1	2.4	Short	100	0.0	NA
Approach	918	2.0		0.653		10.5	LOS B	6.1	155.1				
North: Allen Black Road													
Lane 1 ^d	41	2.0	612	0.067	100	6.6	LOS A	0.2	6.0	Full	1600	0.0	0.0
Lane 2	24	2.0	612	0.040	100	6.3	LOS A	0.1	3.5	Short	100	0.0	NA
Approach	66	2.0		0.067		6.5	LOS A	0.2	6.0				
West: Lawyers Road													
Lane 1	30	2.0	1340	0.022	100	2.9	LOS A	0.1	2.2	Short	300	0.0	NA
Lane 2 ^d	1343	2.0	1340	1.002	100	43.1	LOS F	156.0	3963.4	Full	1600	0.0	49.6
Approach	1373	2.0		1.002		42.2	LOS E	156.0	3963.4				
Intersection	2357	2.0		1.002		28.8	LOS D	156.0	3963.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Tuesday, October 16, 2018 5:08:39 PM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

LANE SUMMARY

 **Site: 101 [Lawyers/Allen Black PM - IMP - Background]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
East: Lawyers Road													
Lane 1	447	2.0	1287	0.347	100	6.0	LOS A	1.9	47.7	Full	1600	0.0	0.0
Lane 2 ^d	471	2.0	1356	0.347	100	5.8	LOS A	1.8	46.5	Full	1600	0.0	0.0
Approach	918	2.0		0.347		5.9	LOS A	1.9	47.7				
North: Allen Black Road													
Lane 1 ^d	41	2.0	646	0.064	100	6.3	LOS A	0.2	5.4	Full	1600	0.0	0.0
Lane 2	24	2.0	577	0.042	100	6.7	LOS A	0.1	3.6	Short	100	0.0	NA
Approach	66	2.0		0.064		6.4	LOS A	0.2	5.4				
West: Lawyers Road													
Lane 1	687	2.0	1340	0.512	100	8.0	LOS A	3.7	94.8	Short	300	0.0	NA
Lane 2 ^d	687	2.0	1340	0.512	100	8.0	LOS A	3.7	94.8	Full	1600	0.0	0.0
Approach	1373	2.0		0.512		8.0	LOS A	3.7	94.8				
Intersection	2357	2.0		0.512		7.2	LOS A	3.7	94.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

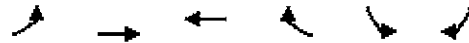
Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Wednesday, October 17, 2018 10:08:45 AM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

2022 Build-out Conditions

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	646	1424	15	30	63
Future Volume (vph)	21	646	1424	15	30	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	718	1582	17	33	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	718	1582	17	33	70
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 85.5%

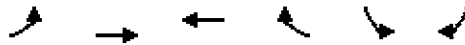
ICU Level of Service E

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	←	↑
Traffic Volume (veh/h)	21	646	1424	15	30	63
Future Volume (Veh/h)	21	646	1424	15	30	63
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)	23	718	1582	17	33	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.32				0.32	0.32
vC, conflicting volume	1599				2346	1582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1810				4148	1757
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				0	0
cM capacity (veh/h)	108				1	34

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	23	718	1582	17	103
Volume Left	23	0	0	0	33
Volume Right	0	0	0	17	70
cSH	108	1700	1700	1700	2
Volume to Capacity	0.21	0.42	0.93	0.01	52.69
Queue Length 95th (ft)	19	0	0	0	Err
Control Delay (s)	46.9	0.0	0.0	0.0	Err
Lane LOS	E				F
Approach Delay (s)	1.5		0.0		Err
Approach LOS					F

Intersection Summary					
Average Delay		422.0			
Intersection Capacity Utilization		85.5%	ICU Level of Service	E	
Analysis Period (min)		15			

Lanes, Volumes, Timings
2: Lawyers Rd & Site Access

The Courtyards on Lawyers
2022 Build AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	677	1428	5	0	11
Future Volume (vph)	0	677	1428	5	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1861	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1861	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		446	585		793	
Travel Time (s)		6.8	8.9		21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	752	1587	6	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	752	1593	0	0	12
Sign Control		Free	Free		Stop	

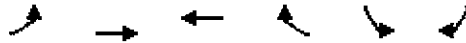
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 85.5%
Analysis Period (min) 15
ICU Level of Service E

HCM Unsignalized Intersection Capacity Analysis

2: Lawyers Rd & Site Access

The Courtyards on Lawyers
2022 Build AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (veh/h)	0	677	1428	5	0	11
Future Volume (Veh/h)	0	677	1428	5	0	11
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)	0	752	1587	6	0	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)			585			
pX, platoon unblocked	0.32				0.32	0.32
vC, conflicting volume	1593				2342	1590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1793				4156	1784
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	63
cM capacity (veh/h)	109				1	32

Direction Lane #	EB 1	WB 1	SB 1
Volume Total	752	1593	12
Volume Left	0	0	0
Volume Right	0	6	12
cSH	1700	1700	32
Volume to Capacity	0.44	0.94	0.37
Queue Length 95th (ft)	0	0	30
Control Delay (s)	0.0	0.0	172.7
Lane LOS			F
Approach Delay (s)	0.0	0.0	172.7
Approach LOS			F

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		85.5%	ICU Level of Service E
Analysis Period (min)		15	

Lanes, Volumes, Timings
3: Allen Black Rd & Site Access

The Courtyards on Lawyers
2022 Build AM

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	4	25	11	2	73
Future Volume (vph)	21	4	25	11	2	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.980		0.959			
Flt Protected	0.959					0.999
Satd. Flow (prot)	1751	0	1786	0	0	1861
Flt Permitted	0.959					0.999
Satd. Flow (perm)	1751	0	1786	0	0	1861
Link Speed (mph)	25		55			55
Link Distance (ft)	1054		1232			1027
Travel Time (s)	28.7		15.3			12.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	4	28	12	2	81
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	40	0	0	83
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 15.5%
Analysis Period (min) 15

ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

3: Allen Black Rd & Site Access

The Courtyards on Lawyers
2022 Build AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	4	25	11	2	73
Future Volume (Veh/h)	21	4	25	11	2	73
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	4	28	12	2	81
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	119	34			40	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	34			40	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	876	1039			1570	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	27	40	83			
Volume Left	23	0	2			
Volume Right	4	12	0			
cSH	896	1700	1570			
Volume to Capacity	0.03	0.02	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	9.1	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		15.5%		ICU Level of Service		A
Analysis Period (min)		15				

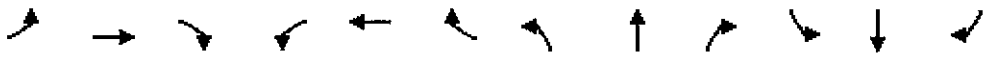
Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Build AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	570	103	53	984	4	426	2	79	19	6	23
Future Volume (vph)	4	570	103	53	984	4	426	2	79	19	6	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977			0.999			0.853			0.935	
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1778	1829	0	1770	1861	0	1787	1605	0	0	1691	0
Flt Permitted	0.060			0.068			0.389				0.833	
Satd. Flow (perm)	112	1829	0	127	1861	0	732	1605	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6					88				26	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	633	114	59	1093	4	473	2	88	21	7	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	747	0	59	1097	0	473	90	0	0	54	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	61.0	48.0		13.0	61.0		60.0	60.0		24.0	24.0	
Total Split (%)	42.1%	33.1%		9.0%	42.1%		41.4%	41.4%		16.6%	16.6%	
Maximum Green (s)	54.8	41.8		7.4	54.8		54.3	54.3		17.9	17.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	68.0	57.1		68.0	68.0		55.0	55.0			9.6	
Actuated g/C Ratio	0.47	0.39		0.47	0.47		0.38	0.38			0.07	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Build AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	1.03		0.38	1.26		1.71	0.14			0.45	
Control Delay	29.0	85.1		30.2	158.9		363.3	6.3			50.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	29.0	85.1		30.2	158.9		363.3	6.3			50.0	
LOS	C	F		C	F		F	A			D	
Approach Delay		84.8			152.3			306.3			50.0	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	2	~793		31	~1312		~655	1			26	
Queue Length 95th (ft)	12	#1136		63	#1632		#876	38			71	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	52	723		157	873		277	663			210	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.08	1.03		0.38	1.26		1.71	0.14			0.26	

Intersection Summary

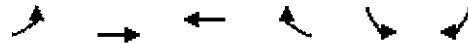
Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.71
 Intersection Signal Delay: 164.4
 Intersection Capacity Utilization 90.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
 Ø6 (R)			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (vph)	51	1209	805	29	44	29
Future Volume (vph)	51	1209	805	29	44	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	1343	894	32	49	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	1343	894	32	49	32
Sign Control		Free	Free		Stop	

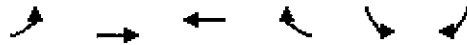
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.6%
Analysis Period (min) 15
ICU Level of Service D

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build PM



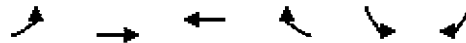
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	←	↑
Traffic Volume (veh/h)	51	1209	805	29	44	29
Future Volume (Veh/h)	51	1209	805	29	44	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	57	1343	894	32	49	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked	0.67				0.67	0.67
vC, conflicting volume	926				2351	894
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643				2771	595
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				0	91
cM capacity (veh/h)	631				13	338

Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	57	1343	894	32	81
Volume Left	57	0	0	0	49
Volume Right	0	0	0	32	32
cSH	631	1700	1700	1700	21
Volume to Capacity	0.09	0.79	0.53	0.02	3.87
Queue Length 95th (ft)	7	0	0	0	Err
Control Delay (s)	11.3	0.0	0.0	0.0	Err
Lane LOS	B				F
Approach Delay (s)	0.5		0.0		Err
Approach LOS					F

Intersection Summary					
Average Delay		336.8			
Intersection Capacity Utilization		73.6%	ICU Level of Service		D
Analysis Period (min)		15			

Lanes, Volumes, Timings
2: Lawyers Rd & Site Access

The Courtyards on Lawyers
2022 Build PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	1253	826	12	0	8
Future Volume (vph)	0	1253	826	12	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1859	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1859	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		446	585		793	
Travel Time (s)		6.8	8.9		21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1392	918	13	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1392	931	0	0	9
Sign Control		Free	Free		Stop	

Intersection Summary

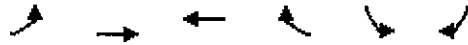
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 69.3%
Analysis Period (min) 15

ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis

2: Lawyers Rd & Site Access

The Courtyards on Lawyers
2022 Build PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (veh/h)	0	1253	826	12	0	8
Future Volume (Veh/h)	0	1253	826	12	0	8
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)	0	1392	918	13	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			585			
pX, platoon unblocked	0.66				0.66	0.66
vC, conflicting volume	931				2316	924
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640				2733	631
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	625				15	319

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1392	931	9
Volume Left	0	0	0
Volume Right	0	13	9
cSH	1700	1700	319
Volume to Capacity	0.82	0.55	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	16.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.6
Approach LOS			C

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		69.3%	ICU Level of Service C
Analysis Period (min)		15	

Lanes, Volumes, Timings
3: Allen Black Rd & Site Access

The Courtyards on Lawyers
2022 Build PM

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	3	56	24	4	58
Future Volume (vph)	14	3	56	24	4	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979		0.959			
Flt Protected	0.960					0.997
Satd. Flow (prot)	1751	0	1786	0	0	1857
Flt Permitted	0.960					0.997
Satd. Flow (perm)	1751	0	1786	0	0	1857
Link Speed (mph)	25		55			55
Link Distance (ft)	1054		1232			1027
Travel Time (s)	28.7		15.3			12.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	3	62	27	4	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	89	0	0	68
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 16.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

3: Allen Black Rd & Site Access

The Courtyards on Lawyers
2022 Build PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	3	56	24	4	58
Future Volume (Veh/h)	14	3	56	24	4	58
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	3	62	27	4	64
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	148	76			89	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	76			89	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	842	986			1506	
Direction/Lane #	WB:1	NB:1	SB:1			
Volume Total	19	89	68			
Volume Left	16	0	4			
Volume Right	3	27	0			
cSH	862	1700	1506			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	9.3	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			16.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Build PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	999	242	43	597	8	228	17	101	15	4	13
Future Volume (vph)	12	999	242	43	597	8	228	17	101	15	4	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		0	225		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.998			0.872			0.946	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1778	1818	0	1770	1859	0	1787	1641	0	0	1703	0
Flt Permitted	0.300			0.046			0.486				0.780	
Satd. Flow (perm)	562	1818	0	86	1859	0	914	1641	0	0	1361	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			1			112			14	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1110	269	48	663	9	253	19	112	17	4	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1379	0	48	672	0	253	131	0	0	35	0
Turn Type	D.Pm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6			6			3			4		
Detector Phase	6	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	89.0	76.0		13.0	89.0		33.0	33.0		23.0	23.0	
Total Split (%)	61.4%	52.4%		9.0%	61.4%		22.8%	22.8%		15.9%	15.9%	
Maximum Green (s)	82.8	69.8		7.4	82.8		27.3	27.3		16.9	16.9	
Yellow Time (s)	4.6	4.6		3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6		2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0		0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	95.6	85.4		95.6	95.6		28.0	28.0			9.0	
Actuated g/C Ratio	0.66	0.59		0.66	0.66		0.19	0.19			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Build PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.04	1.28		0.33	0.55		1.44	0.32			0.36	
Control Delay	10.4	162.2		17.3	16.1		267.0	14.2			54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	10.4	162.2		17.3	16.1		267.0	14.2			54.3	
LOS	B	F		B	B		F	B			D	
Approach Delay		160.8			16.2			180.7			54.3	
Approach LOS		F			B			F			D	
Queue Length 50th (ft)	4	~1702		15	329		~323	15			19	
Queue Length 95th (ft)	14	#2021		39	470		#503	75			57	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			225					
Base Capacity (vph)	370	1075		149	1225		176	407			181	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.04	1.28		0.32	0.55		1.44	0.32			0.19	

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.44

Intersection Signal Delay: 121.2

Intersection LOS: F

Intersection Capacity Utilization 94.9%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

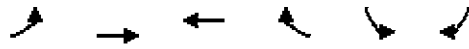
Ø1	Ø2 (R)	Ø3	Ø4
89 S	76 S	88 S	25 S
Ø6 (R)			
89 S			

2022 Build-out Conditions

Improved

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build IMP AM - unsignalized



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑↑		←	↑
Traffic Volume (vph)	21	646	1424	15	30	63
Future Volume (vph)	21	646	1424	15	30	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			0	1	0
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3532	0	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	3532	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	718	1582	17	33	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	718	1599	0	33	70
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 50.4%

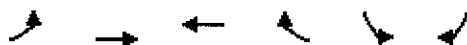
ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build IMP AM - unsignalized



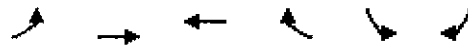
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑↑		←	↑
Traffic Volume (veh/h)	21	646	1424	15	30	63
Future Volume (Veh/h)	21	646	1424	15	30	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	718	1582	17	33	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked						
vC, conflicting volume	1599				2354	800
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1599				2354	800
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				0	79
cM capacity (veh/h)	406				28	328

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	23	718	1055	544	33	70
Volume Left	23	0	0	0	33	0
Volume Right	0	0	0	17	0	70
cSH	406	1700	1700	1700	28	328
Volume to Capacity	0.06	0.42	0.62	0.32	1.17	0.21
Queue Length 95th (ft)	4	0	0	0	96	20
Control Delay (s)	14.4	0.0	0.0	0.0	434.3	18.9
Lane LOS	B				F	C
Approach Delay (s)	0.4		0.0		152.0	
Approach LOS					F	

Intersection Summary						
Average Delay		6.5				
Intersection Capacity Utilization		50.4%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



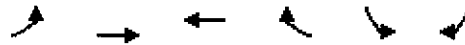
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔↔		↔	↔
Traffic Volume (vph)	21	646	1424	15	30	63
Future Volume (vph)	21	646	1424	15	30	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	0			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected		0.998			0.950	
Satd. Flow (prot)	0	3532	3532	0	1770	1583
Flt Permitted		0.998			0.950	
Satd. Flow (perm)	0	3532	3532	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	718	1582	17	33	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	741	1599	0	33	70
Sign Control		Yield	Yield		Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 50.4%
Analysis Period (min) 15
ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis 1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Traffic Volume (veh/h)	21	646	1424	15	30	63
Future Volume (veh/h)	21	646	1424	15	30	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	718	1582	17	33	70
Approach Volume (veh/h)		741	1599		103	
Crossing Volume (veh/h)		33	23		1582#	
High Capacity (veh/h)		1349	1360		383	
High v/c (veh/h)		0.55	1.18		0.27	
Low Capacity (veh/h)		1129	1139		282	
Low v/c (veh/h)		0.66	1.40		0.37	

Intersection Summary						
Maximum v/c High			1.18			
Maximum v/c Low			1.40			
Intersection Capacity Utilization			50.4%	ICU Level of Service		A
# Crossing flow exceeds 1200, method is not applicable						

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	570	103	53	984	4	426	2	79	19	6	23
Future Volume (vph)	4	570	103	53	984	4	426	2	79	19	6	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		650	400		0	0		0
Storage Lanes	1		1	1		1	2		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999			0.853			0.935	
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1778	1872	1591	1770	3536	0	3467	1605	0	0	1691	0
Flt Permitted	0.129			0.076			0.389				0.833	
Satd. Flow (perm)	241	1872	1591	142	3536	0	1420	1605	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116					88			26	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	633	114	59	1093	4	473	2	88	21	7	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	633	114	59	1097	0	473	90	0	0	54	0
Turn Type	D.Pm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6		2	6			3			4		
Detector Phase	6	2	2	1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5	22.5	12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	44.0	31.0	31.0	13.0	44.0		68.0	68.0		23.0	23.0	
Total Split (%)	32.6%	23.0%	23.0%	9.6%	32.6%		50.4%	50.4%		17.0%	17.0%	
Maximum Green (s)	37.8	24.8	24.8	7.4	37.8		62.3	62.3		16.9	16.9	
Yellow Time (s)	4.6	4.6	4.6	3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6	1.6	2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0	6.0	2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0	15.0	0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0	45.0	0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	61.3	50.2	50.2	61.3	61.3		51.9	51.9			9.4	
Actuated g/C Ratio	0.45	0.37	0.37	0.45	0.45		0.38	0.38			0.07	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP AM

												
Lane/Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.04	0.91	0.17	0.35	0.68		0.87	0.13			0.44	
Control Delay	30.0	60.8	7.6	32.2	34.7		54.4	4.8			46.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	30.0	60.8	7.6	32.2	34.7		54.4	4.8			46.2	
LOS	C	E	A	C	C		D	A			D	
Approach Delay		52.5			34.6			46.5			46.2	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	2	550	0	30	407		193	1			24	
Queue Length 95th (ft)	12	#1031	50	70	#632		239	32			67	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			400					
Base Capacity (vph)	109	696	664	170	1605		662	795			214	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.04	0.91	0.17	0.35	0.68		0.71	0.11			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 42.8

Intersection LOS: D

Intersection Capacity Utilization 68.6%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

↙ Ø1	→ Ø2 (R)	↑ Ø3	↓ Ø4
12.5%	81.3%	60.5%	23.3%
↙ Ø6 (R)			
24.3%			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑↑		←	↑
Traffic Volume (vph)	21	646	1424	15	30	63
Future Volume (vph)	21	646	1424	15	30	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3532	0	1770	1583
Flt Permitted	0.141				0.950	
Satd. Flow (perm)	263	1863	3532	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			70
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	718	1582	17	33	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	718	1599	0	33	70
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	7.0
Minimum Split (s)	19.0	19.0	19.0		14.0	14.0
Total Split (s)	115.0	115.0	115.0		20.0	20.0
Total Split (%)	85.2%	85.2%	85.2%		14.8%	14.8%
Maximum Green (s)	108.0	108.0	108.0		13.0	13.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Min	C-Min	C-Min		None	None
Act Effct Green (s)	118.5	118.5	118.5		10.3	10.3
Actuated g/C Ratio	0.88	0.88	0.88		0.08	0.08
v/c Ratio	0.10	0.44	0.52		0.24	0.38
Control Delay	2.9	3.2	1.5		62.6	18.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	2.9	3.2	1.5		62.6	18.6
LOS	A	A	A		E	B
Approach Delay		3.2	1.5		32.7	
Approach LOS		A	A		C	

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP AM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	2	113	41		28	0
Queue Length 95th (ft)	9	182	36		62	48
Internal Link Dist (ft)		1067	366		1152	
Turn Bay Length (ft)	300					100
Base Capacity (vph)	230	1634	3099		196	238
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.10	0.44	0.52		0.17	0.29

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 3.4
Intersection Capacity Utilization 54.0%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 1: Lawyers Rd & Allen Black Rd

→ Ø2 (R)	Ø4
← Ø6 (R)	

LANE SUMMARY

 Site: 101 [Lawyers/Allen Black AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Lawyers Road													
Lane 1 ^d	1582	2.0	1364	1.160	100	95.2	LOS F	378.9	9624.6	Full	1600	0.0	100.0
Lane 2	17	2.0	1295	0.013	100	2.9	LOS A	0.0	1.2	Short	100	0.0	NA
Approach	1599	2.0		1.160		94.3	LOS F	378.9	9624.6				
North: Allen Black Road													
Lane 1	33	2.0	390	0.085	100	10.5	LOS B	0.3	7.1	Full	1600	0.0	0.0
Lane 2 ^d	70	2.0	390	0.179	100	12.1	LOS B	0.6	15.2	Short	100	0.0	NA
Approach	103	2.0		0.179		11.6	LOS B	0.6	15.2				
West: Lawyers Road													
Lane 1	23	2.0	1350	0.017	100	2.8	LOS A	0.1	1.7	Short	300	0.0	NA
Lane 2 ^d	718	2.0	1350	0.532	100	8.3	LOS A	4.0	102.8	Full	1600	0.0	0.0
Approach	741	2.0		0.532		8.1	LOS A	4.0	102.8				
Intersection	2443	2.0		1.160		64.7	LOS F	378.9	9624.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Wednesday, October 3, 2018 9:31:16 AM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

LANE SUMMARY

 Site: 101 [Lawyers/Allen Black AM - IMP]

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
East: Lawyers Road													
Lane 1	779	2.0	1295	0.601	100	9.9	LOS A	5.1	130.7	Full	1600	0.0	0.0
Lane 2 ^d	820	2.0	1364	0.601	100	9.5	LOS A	5.0	127.4	Full	1600	0.0	0.0
Approach	1599	2.0		0.601		9.7	LOS A	5.1	130.7				
North: Allen Black Road													
Lane 1	33	2.0	300	0.111	100	14.1	LOS B	0.3	8.8	Full	1600	0.0	0.0
Lane 2 ^d	70	2.0	353	0.198	100	13.7	LOS B	0.6	15.9	Short	100	0.0	NA
Approach	103	2.0		0.198		13.8	LOS B	0.6	15.9				
West: Lawyers Road													
Lane 1	371	2.0	1350	0.275	100	5.0	LOS A	1.4	35.5	Short	300	0.0	NA
Lane 2 ^d	371	2.0	1350	0.275	100	5.0	LOS A	1.4	35.5	Full	1600	0.0	0.0
Approach	741	2.0		0.275		5.0	LOS A	1.4	35.5				
Intersection	2443	2.0		0.601		8.5	LOS A	5.1	130.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

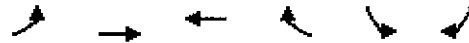
SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Wednesday, October 17, 2018 10:08:07 AM

Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build IMP PM - unsignalized



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	51	1209	805	29	44	29
Future Volume (vph)	51	1209	805	29	44	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			100	0	100
Storage Lanes	1			0	1	0
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3522	0	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	3522	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	1343	894	32	49	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	1343	926	0	49	32
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 73.6%

ICU Level of Service D

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Build IMP PM - unsignalized



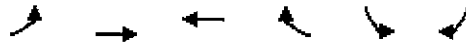
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑↑		←	↑
Traffic Volume (veh/h)	51	1209	805	29	44	29
Future Volume (Veh/h)	51	1209	805	29	44	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	57	1343	894	32	49	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1031			
pX, platoon unblocked						
vC, conflicting volume	926				2367	463
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	926				2367	463
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				0	94
cM capacity (veh/h)	734				27	546

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	57	1343	596	330	49	32
Volume Left	57	0	0	0	49	0
Volume Right	0	0	0	32	0	32
cSH	734	1700	1700	1700	27	546
Volume to Capacity	0.08	0.79	0.35	0.19	1.82	0.06
Queue Length 95th (ft)	6	0	0	0	147	5
Control Delay (s)	10.3	0.0	0.0	0.0	699.7	12.0
Lane LOS	B				F	B
Approach Delay (s)	0.4		0.0		428.0	
Approach LOS					F	

Intersection Summary						
Average Delay		14.6				
Intersection Capacity Utilization		73.6%		ICU Level of Service		D
Analysis Period (min)		15				

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔↔		↔	↔
Traffic Volume (vph)	51	1209	805	29	44	29
Future Volume (vph)	51	1209	805	29	44	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	0			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.995			0.850
Flt Protected		0.998			0.950	
Satd. Flow (prot)	0	3532	3522	0	1770	1583
Flt Permitted		0.998			0.950	
Satd. Flow (perm)	0	3532	3522	0	1770	1583
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	1343	894	32	49	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1400	926	0	49	32
Sign Control		Yield	Yield		Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

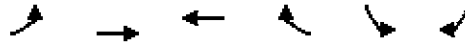
Intersection Capacity Utilization 71.4%

ICU Level of Service C

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Traffic Volume (veh/h)	51	1209	805	29	44	29
Future Volume (veh/h)	51	1209	805	29	44	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	57	1343	894	32	49	32
Approach Volume (veh/h)		1400	926		81	
Crossing Volume (veh/h)		49	57		894	
High Capacity (veh/h)		1333	1324		679	
High v/c (veh/h)		1.05	0.70		0.12	
Low Capacity (veh/h)		1114	1106		531	
Low v/c (veh/h)		1.26	0.84		0.15	

Intersection Summary						
Maximum v/c High			1.05			
Maximum v/c Low			1.26			
Intersection Capacity Utilization			71.4%	ICU Level of Service		C

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	999	242	43	597	8	228	17	101	15	4	13
Future Volume (vph)	12	999	242	43	597	8	228	17	101	15	4	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			-2%			2%	
Storage Length (ft)	125		0	125		650	400		0	0		0
Storage Lanes	1		1	1		1	2		0	0		0
Taper Length (ft)	100			75			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998			0.872			0.946	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1778	1872	1591	1770	3532	0	3467	1641	0	0	1703	0
Flt Permitted	0.368			0.045			0.486				0.780	
Satd. Flow (perm)	689	1872	1591	84	3532	0	1774	1641	0	0	1361	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		1			112			14	
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		585			557			625			740	
Travel Time (s)		8.9			8.4			9.5			20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1110	269	48	663	9	253	19	112	17	4	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1110	269	48	672	0	253	131	0	0	35	0
Turn Type	D.Pm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			3			4	
Permitted Phases	6		2	6			3			4		
Detector Phase	6	2	2	1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5	22.5	12.6	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	69.0	56.0	56.0	13.0	69.0		53.0	53.0		23.0	23.0	
Total Split (%)	47.6%	38.6%	38.6%	9.0%	47.6%		36.6%	36.6%		15.9%	15.9%	
Maximum Green (s)	62.8	49.8	49.8	7.4	62.8		47.3	47.3		16.9	16.9	
Yellow Time (s)	4.6	4.6	4.6	3.0	4.6		4.7	4.7		4.3	4.3	
All-Red Time (s)	1.6	1.6	1.6	2.6	1.6		1.0	1.0		1.8	1.8	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	-0.6	-1.2		-0.7	-0.7			-1.1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag		Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	6.0	6.0	6.0	2.0	6.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	15.0	15.0	15.0	0.0	15.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	45.0	45.0	45.0	0.0	45.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							7.0	7.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)	97.3	87.1	87.1	97.3	97.3		26.2	26.2			9.0	
Actuated g/C Ratio	0.67	0.60	0.60	0.67	0.67		0.18	0.18			0.06	

Lanes, Volumes, Timings
4: Stevens Mill Road & Lawyers Rd

The Courtyards on Lawyers
2022 Background IMP PM

	↖	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.99	0.27	0.33	0.28		0.79	0.34			0.36	
Control Delay	11.6	54.7	11.0	18.5	11.4		73.6	13.6			54.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	11.6	54.7	11.0	18.5	11.4		73.6	13.6			54.3	
LOS	B	D	B	B	B		E	B			D	
Approach Delay		45.8			11.9			53.1			54.3	
Approach LOS		D			B			D			D	
Queue Length 50th (ft)	4	~1125	70	15	131		119	15			19	
Queue Length 95th (ft)	16	#1550	152	45	207		159	70			57	
Internal Link Dist (ft)		505			477			545			660	
Turn Bay Length (ft)	125			125			400					
Base Capacity (vph)	462	1124	998	150	2371		587	618			181	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.03	0.99	0.27	0.32	0.28		0.43	0.21			0.19	

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:EBWB, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 37.4

Intersection LOS: D

Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

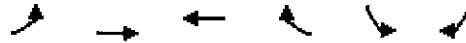
Queue shown is maximum after two cycles.

Splits and Phases: 4: Stevens Mill Road & Lawyers Rd

↖ Ø1	→ Ø2 (R)	↑ Ø3	↓ Ø4
16.5%	56.3%	53.3%	25.3%
← Ø6 (R)			
69.3%			

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑↑		←	↑
Traffic Volume (vph)	51	1209	805	29	44	29
Future Volume (vph)	51	1209	805	29	44	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	175				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	3522	0	1770	1583
Flt Permitted	0.304				0.950	
Satd. Flow (perm)	566	1863	3522	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13			32
Link Speed (mph)		45	45		55	
Link Distance (ft)		1147	446		1232	
Travel Time (s)		17.4	6.8		15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	1343	894	32	49	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	1343	926	0	49	32
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	7.0
Minimum Split (s)	19.0	19.0	19.0		14.0	14.0
Total Split (s)	131.0	131.0	131.0		14.0	14.0
Total Split (%)	90.3%	90.3%	90.3%		9.7%	9.7%
Maximum Green (s)	124.0	124.0	124.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Min	C-Min	C-Min		None	None
Act Effct Green (s)	129.1	129.1	129.1		9.7	9.7
Actuated g/C Ratio	0.89	0.89	0.89		0.07	0.07
v/c Ratio	0.11	0.81	0.30		0.42	0.24
Control Delay	1.9	9.4	1.2		76.4	24.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	1.9	9.4	1.2		76.4	24.3
LOS	A	A	A		E	C
Approach Delay		9.1	1.2		55.8	
Approach LOS		A	A		E	

Lanes, Volumes, Timings
1: Lawyers Rd & Allen Black Rd

The Courtyards on Lawyers
2022 Background IMP PM



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	7	516	45		45	0
Queue Length 95th (ft)	12	649	30		91	35
Internal Link Dist (ft)		1067	366		1152	
Turn Bay Length (ft)	300					100
Base Capacity (vph)	506	1667	3154		117	135
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.11	0.81	0.29		0.42	0.24

Intersection Summary

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 145
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 7.6
Intersection Capacity Utilization 77.8%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service D

Splits and Phases: 1: Lawyers Rd & Allen Black Rd

→ Ø2 (R)		Ø4
← Ø6 (R)		

LANE SUMMARY

 **Site: 101 [Lawyers/Allen Black PM]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
East: Lawyers Road													
Lane 1 ^d	894	2.0	1325	0.675	100	11.5	LOS B	6.4	162.7	Full	1600	0.0	0.0
Lane 2	32	2.0	1255	0.026	100	3.1	LOS A	0.1	2.4	Short	100	0.0	NA
Approach	927	2.0		0.675		11.2	LOS B	6.4	162.7				
North: Allen Black Road													
Lane 1 ^d	49	2.0	607	0.081	100	6.9	LOS A	0.3	7.2	Full	1600	0.0	0.0
Lane 2	32	2.0	607	0.053	100	6.5	LOS A	0.2	4.7	Short	100	0.0	NA
Approach	81	2.0		0.081		6.7	LOS A	0.3	7.2				
West: Lawyers Road													
Lane 1	57	2.0	1330	0.043	100	3.0	LOS A	0.2	4.2	Short	300	0.0	NA
Lane 2 ^d	1343	2.0	1329 ¹	1.011	100	45.3	LOS F	139.9	3552.8	Full	1600	0.0	39.4
Approach	1400	2.0		1.011		43.6	LOS E	139.9	3552.8				
Intersection	2408	2.0		1.011		29.9	LOS D	139.9	3552.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

d Dominant lane on roundabout approach

LANE SUMMARY

 Site: 101 [Lawyers/Allen Black PM - IMP]

New Site

Site Category: (None)

Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	veh/h	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%		v/c	%	sec			ft		ft	%	%
East: Lawyers Road													
Lane 1	451	2.0	1255	0.359	100	6.3	LOS A	1.9	49.5	Full	1600	0.0	0.0
Lane 2 ^d	476	2.0	1325	0.359	100	6.0	LOS A	1.9	48.2	Full	1600	0.0	0.0
Approach	927	2.0		0.359		6.1	LOS A	1.9	49.5				
North: Allen Black Road													
Lane 1 ^d	49	2.0	641	0.076	100	6.5	LOS A	0.3	6.5	Full	1600	0.0	0.0
Lane 2	32	2.0	572	0.056	100	7.0	LOS A	0.2	4.8	Short	100	0.0	NA
Approach	81	2.0		0.076		6.7	LOS A	0.3	6.5				
West: Lawyers Road													
Lane 1	700	2.0	1330	0.526	100	8.3	LOS A	3.9	99.1	Short	300	0.0	NA
Lane 2 ^d	700	2.0	1330	0.526	100	8.3	LOS A	3.9	99.1	Full	1600	0.0	0.0
Approach	1400	2.0		0.526		8.3	LOS A	3.9	99.1				
Intersection	2408	2.0		0.526		7.4	LOS A	3.9	99.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KIMLEY-HORN & ASSOCIATES INC | Processed: Wednesday, October 17, 2018 10:09:26 AM

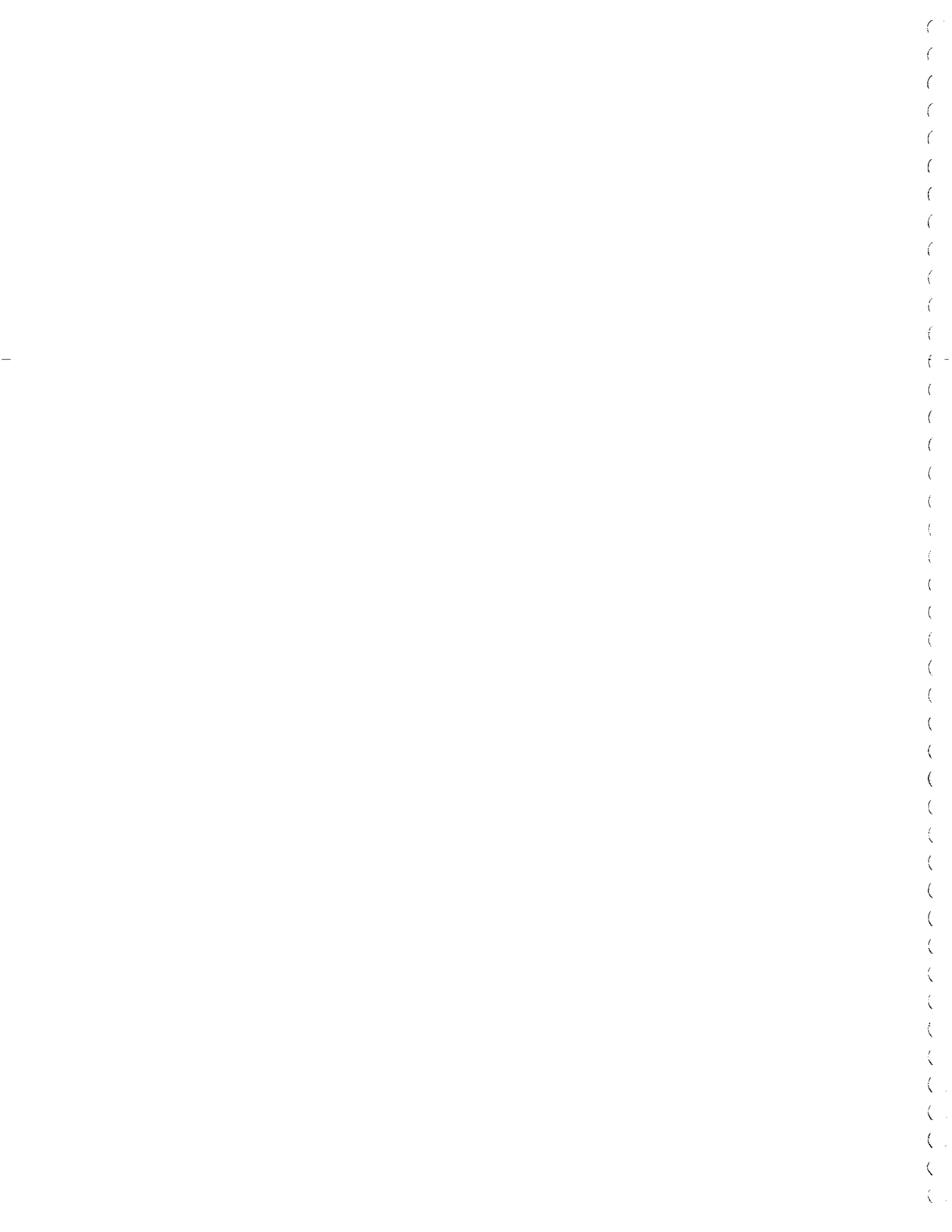
Project: K:\CHL_PRJ\011523 Epcon Communities\001 Courtyards on Lawyers Rd\08B_SIDRA\Courtyards on Lawyers RAB.sip8

Queuing and Blocking Reports



2022 Build-out Conditions

Improved



Intersection: 1: Lawyers Rd & Allen Black Rd

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	62	11	162	81
Average Queue (ft)	15	0	66	28
95th Queue (ft)	42	5	167	59
Link Distance (ft)		378	1151	1151
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: Lawyers Rd & Allen Black Rd

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	475	1156	4	765	52
Average Queue (ft)	90	734	0	350	16
95th Queue (ft)	365	1555	3	748	41
Link Distance (ft)		1113	378	1151	1151
Upstream Blk Time (%)		29			
Queuing Penalty (veh)		0			
Storage Bay Dist (ft)	300				
Storage Blk Time (%)		29			
Queuing Penalty (veh)		15			

Turn Lane Warrants



Lawyers Rd & Sts Access

AM

V_R = 5

→ S = 0

PM

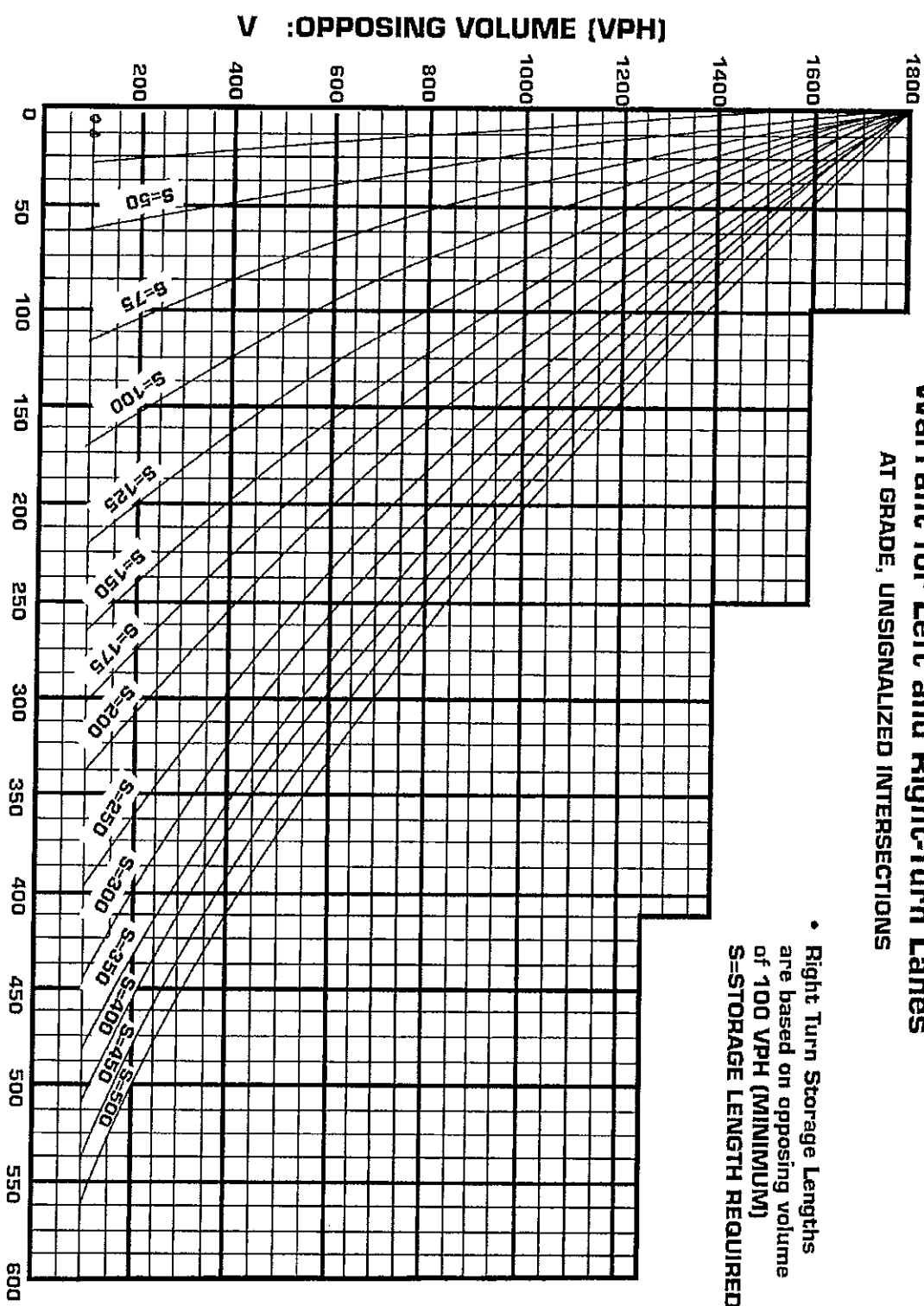
V_R = 12

→ S = 0

July 2003

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS

• Right Turn Storage Lengths
are based on opposing volume
of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED



V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Alpen Black Rd & Site Access

AM

$V_R = 11$

$\hookrightarrow S = 0$

$V_L = 2$

$V_S = 30$

$\hookrightarrow S = 0$

PM

Page 80

$V_R = 24$

$\hookrightarrow S = 0$

$V_L = 4$

$V_S = 80$

$\hookrightarrow S = 0$

July 2003

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS

- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

