

Alternative O: Widening Northpark + Northpark Grade Separation  
 1: Trailwood Village Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2	ø3	ø4	ø5	ø7	ø8
Lane Configurations	↑↑		↵	↑↑	↵	↵						
Volume (vph)	448	76	19	1290	140	49						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	0.95						
Frt	0.978				0.995	0.850						
Flt Protected			0.950		0.954							
Satd. Flow (prot)	3461	0	1770	3539	1768	1504						
Flt Permitted			0.950		0.954							
Satd. Flow (perm)	3461	0	1770	3539	1768	1504						
Right Turn on Red		Yes				Yes						
Satd. Flow (RTOR)	25				1	56						
Link Speed (mph)	40			40	30							
Link Distance (ft)	225			355	1092							
Travel Time (s)	3.8			6.1	24.8							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Growth Factor	117%	117%	117%	117%	117%	117%						
Adj. Flow (vph)	570	97	24	1641	178	62						
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	667	0	24	1641	184	56						
Enter Blocked Intersection	No	No	No	No	No	No						
Lane Alignment	Left	Right	Left	Left	Left	Right						
Median Width(ft)	40			40	12							
Link Offset(ft)	0			0	0							
Crosswalk Width(ft)	16			16	16							
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00						
Turning Speed (mph)		9	15		15	9						
Number of Detectors	2		1	2	1	1						
Detector Template	Thru		Left	Thru	Left	Right						
Leading Detector (ft)	100		20	100	20	20						
Trailing Detector (ft)	0		0	0	0	0						
Detector 1 Position(ft)	0		0	0	0	0						
Detector 1 Size(ft)	6		20	6	20	20						
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex						
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0						
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0						
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0						
Detector 2 Position(ft)	94			94								
Detector 2 Size(ft)	6			6								
Detector 2 Type	Cl+Ex			Cl+Ex								
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0								
Turn Type	NA		Prot	NA	NA	Perm						
Protected Phases	2 7		1	6	3 8		2	3	4	5	7	8
Permitted Phases						3 8						
Detector Phase	2 7		1	6	3 8	3 8						
Switch Phase												
Minimum Initial (s)			3.0	2.0			10.0	1.0	5.0	3.0	1.0	5.0

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2	ø3	ø4	ø5	ø7	ø8
Minimum Split (s)			10.0	22.0			29.0	14.5	11.0	9.0	7.0	11.0
Total Split (s)			12.0	84.0			83.0	30.0	19.0	11.0	19.0	30.0
Total Split (%)			8.3%	58.3%			58%	21%	13%	8%	13%	21%
Maximum Green (s)			6.0	78.0			77.0	24.0	13.0	5.0	13.0	24.0
Yellow Time (s)			4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)			2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)			0.0	0.0								
Total Lost Time (s)			6.0	6.0								
Lead/Lag			Lead	Lag			Lag			Lead		
Lead-Lag Optimize?			Yes	Yes			Yes			Yes		
Vehicle Extension (s)			3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode			None	C-Max			C-Max	None	None	None	None	None
Walk Time (s)				5.0			5.0					
Flash Dont Walk (s)				11.0			11.0					
Pedestrian Calls (#/hr)				0			0					
Act Effect Green (s)	97.5		5.9	80.5	23.7	23.7						
Actuated g/C Ratio	0.68		0.04	0.56	0.16	0.16						
v/c Ratio	0.28		0.33	0.83	0.63	0.19						
Control Delay	1.1		79.7	31.5	66.4	13.9						
Queue Delay	0.1		0.0	0.0	0.0	0.0						
Total Delay	1.2		79.7	31.5	66.4	13.9						
LOS	A		E	C	E	B						
Approach Delay	1.2			32.2	54.1							
Approach LOS	A			C	D							

Intersection Summary

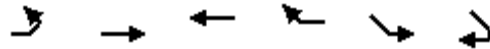
Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	26.2
Intersection LOS:	C
Intersection Capacity Utilization:	62.0%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 1: Trailwood Village Dr. & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
2: Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	0
Link Speed (mph)		40	40		40	
Link Distance (ft)		799	656		804	
Travel Time (s)		13.6	11.2		13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		70	70		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
4: Green Oak Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	445	62	0	0	0	0	104	25	100	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>			0.850						0.850			
Fl <sub>t</sub> Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1583	0	0	0	0	1863	1583	1770	1863	0
Fl <sub>t</sub> Permitted	0.950									0.950		
Satd. Flow (perm)	1770	3539	1583	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			159						159			
Link Speed (mph)		40			40			30				30
Link Distance (ft)		2489			270			515				89
Travel Time (s)		42.4			4.6			11.7				2.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%
Adj. Flow (vph)	51	566	79	0	0	0	0	132	32	127	51	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	566	79	0	0	0	0	132	32	127	51	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	15	2						8		1 4	4	
Permitted Phases			2						8			

Alternative O: Widening Northpark + Northpark Grade Separation  
 4: Green Oak Dr. & Kingwood Dr.

AM Peak Hour

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	1	6
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 4: Green Oak Dr. & Kingwood Dr.

AM Peak Hour

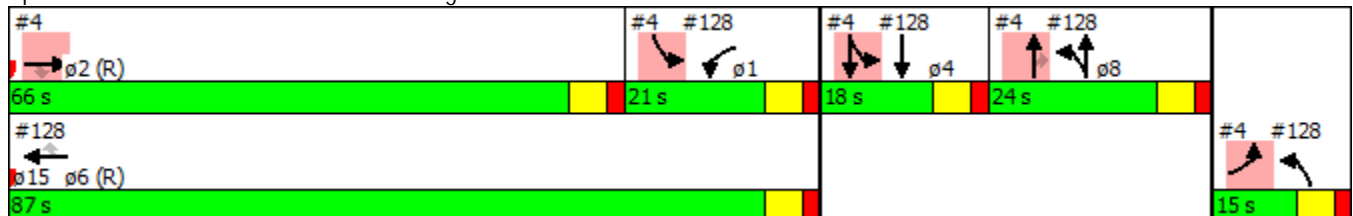


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	2	2					8	8	14	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0	4.0					5.0	5.0		5.0	
Minimum Split (s)	11.0	20.0	20.0					19.0	19.0		11.0	
Total Split (s)	15.0	66.0	66.0					24.0	24.0		18.0	
Total Split (%)	10.4%	45.8%	45.8%					16.7%	16.7%		12.5%	
Maximum Green (s)	9.0	60.0	60.0					18.0	18.0		12.0	
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0					6.0	6.0		6.0	
Lead/Lag		Lead	Lead					Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes					Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max					None	None		None	
Walk Time (s)		4.0	4.0					6.0	6.0			
Flash Dont Walk (s)		10.0	10.0					7.0	7.0			
Pedestrian Calls (#/hr)		0	0					0	0			
Act Effct Green (s)	8.3	64.7	64.7					14.8	14.8	32.1	11.1	
Actuated g/C Ratio	0.06	0.45	0.45					0.10	0.10	0.22	0.08	
v/c Ratio	0.50	0.36	0.10					0.69	0.10	0.32	0.36	
Control Delay	68.3	56.1	17.2					80.5	0.7	7.7	19.7	
Queue Delay	7.1	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	75.5	56.1	17.2					80.5	0.7	7.7	19.7	
LOS	E	E	B					F	A	A	B	
Approach Delay		53.1						64.9			11.2	
Approach LOS		D						E			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 47.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 81.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 4: Green Oak Dr. & Kingwood Dr.



Lane Group	ø1	ø6
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	4.0
Minimum Split (s)	11.0	10.0
Total Split (s)	21.0	87.0
Total Split (%)	15%	60%
Maximum Green (s)	15.0	81.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	C-Max
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
 6: Northpark Dr. & Sorters

AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	93	120	71	0	362	248
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		0.850				
Flt Protected	0.950					0.971
Satd. Flow (prot)	1770	1583	1863	0	0	1809
Flt Permitted	0.950					0.971
Satd. Flow (perm)	1770	1583	1863	0	0	1809
Link Speed (mph)	40		30			30
Link Distance (ft)	1488		70			496
Travel Time (s)	25.4		1.6			11.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	114	147	87	0	445	305
Shared Lane Traffic (%)						
Lane Group Flow (vph)	114	147	87	0	0	750
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.5%
Analysis Period (min)	15
	ICU Level of Service B





Alternative O: Widening Northpark + Northpark Grade Separation  
 8: Lake Houston Parkway & Northpark Dr.

AM Peak Hour

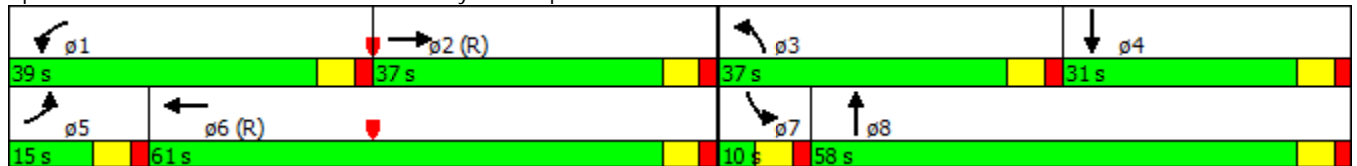


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		10.0	22.0		10.0	22.0		10.0	22.0	
Total Split (s)	15.0	37.0		39.0	61.0		37.0	58.0		10.0	31.0	
Total Split (%)	10.4%	25.7%		27.1%	42.4%		25.7%	40.3%		6.9%	21.5%	
Maximum Green (s)	9.0	31.0		33.0	55.0		31.0	52.0		4.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	8.1	35.4		28.6	58.2		29.0	58.0		4.0	27.0	
Actuated g/C Ratio	0.06	0.25		0.20	0.40		0.20	0.40		0.03	0.19	
v/c Ratio	0.47	0.90dr		0.86	0.51		0.88	0.20		0.13	0.74	
Control Delay	81.3	38.8		66.0	27.5		70.5	13.8		71.3	53.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	81.3	38.8		66.0	27.5		70.5	13.8		71.3	53.4	
LOS	F	D		E	C		E	B		E	D	
Approach Delay		41.0			38.7			52.8			53.8	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 70 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 45.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 89.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Lake Houston Parkway & Northpark Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 11: Woodland Hills & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	537	190	174	1840	79	495	228	140	94	268	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		0	150		0
Storage Lanes	1		0	1		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt		0.961				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4887	0	1770	5085	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.065			0.222			0.950			0.950		
Satd. Flow (perm)	121	4887	0	414	5085	1583	3433	3539	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74				157			172			202
Link Speed (mph)		45			45			35				35
Link Distance (ft)		944			4882			3685				2491
Travel Time (s)		14.3			74.0			71.8				48.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	45	660	233	214	2260	97	608	280	172	115	329	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	893	0	214	2260	97	608	280	172	115	329	178
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			4

Alternative O: Widening Northpark + Northpark Grade Separation  
 11: Woodland Hills & Northpark Dr.

AM Peak Hour

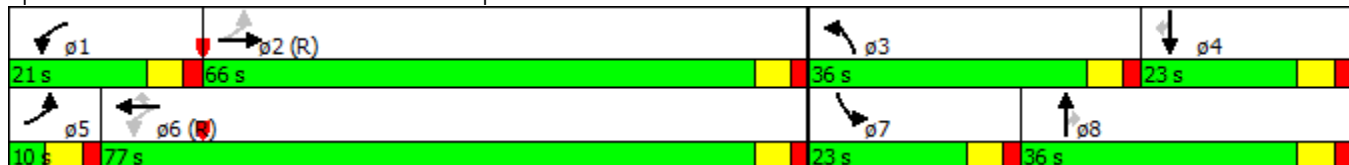


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0		10.0	22.0	22.0	10.0	22.3	22.3	10.0	22.3	22.3
Total Split (s)	10.0	66.0		21.0	77.0	77.0	36.0	36.0	36.0	23.0	23.0	23.0
Total Split (%)	6.8%	45.2%		14.4%	52.7%	52.7%	24.7%	24.7%	24.7%	15.8%	15.8%	15.8%
Maximum Green (s)	4.0	60.0		15.0	71.0	71.0	30.0	30.0	30.0	17.0	17.0	17.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effect Green (s)	65.6	61.6		81.0	73.0	73.0	28.8	32.9	32.9	14.1	18.2	18.2
Actuated g/C Ratio	0.45	0.42		0.55	0.50	0.50	0.20	0.23	0.23	0.10	0.12	0.12
v/c Ratio	0.45	0.42		0.60	0.89	0.11	0.90	0.35	0.35	0.67	0.74	0.48
Control Delay	31.6	28.0		24.1	38.8	0.4	74.3	49.8	8.6	82.5	73.0	9.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	28.0		24.1	38.8	0.4	74.3	49.8	8.6	82.5	73.0	9.1
LOS	C	C		C	D	A	E	D	A	F	E	A
Approach Delay		28.2			36.1			57.2			56.5	
Approach LOS		C			D			E			E	

Intersection Summary

Area Type: Other  
 Cycle Length: 146  
 Actuated Cycle Length: 146  
 Offset: 52 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 41.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 87.8%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 11: Woodland Hills & Northpark Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 13: Kingwood Dr. & Mills Branch

AM Peak Hour



Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	32	0	225	44	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected	0.950			0.960		
Satd. Flow (prot)	3433	0	0	3398	0	0
Flt Permitted	0.950			0.960		
Satd. Flow (perm)	3433	0	0	3398	0	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	199			1077	310	
Travel Time (s)	4.5			18.4	5.3	
Peak Hour Factor	0.57	0.92	0.80	0.79	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	63	0	318	63	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	63	0	0	381	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	40			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.1%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 14: US 59 SBFR & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑		↔↔	↕↕					↔	↑↑↑↑	↔
Volume (vph)	0	228	192	1764	333	0	0	0	0	452	311	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		2	2		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.86	0.81	0.86
Frt		0.931									0.997	0.850
Flt Protected				0.950	0.969					0.950	0.980	
Satd. Flow (prot)	0	5966	0	3044	3105	0	0	0	0	1522	4423	1362
Flt Permitted				0.950	0.659					0.950	0.980	
Satd. Flow (perm)	0	5966	0	3044	2111	0	0	0	0	1522	4423	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26									2	249
Link Speed (mph)		40			30			55			55	
Link Distance (ft)		3907			296			398			255	
Travel Time (s)		66.6			6.7			4.9			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	280	236	2167	409	0	0	0	0	555	382	152
Shared Lane Traffic (%)				33%						50%		10%
Lane Group Flow (vph)	0	516	0	1452	1124	0	0	0	0	277	675	137
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	1
Detector Template		Thru		Left	Thru					Left	Thru	Right
Leading Detector (ft)		100		20	100					20	100	20
Trailing Detector (ft)		0		0	0					0	0	0
Detector 1 Position(ft)		0		0	0					0	0	0
Detector 1 Size(ft)		6		20	6					20	6	20
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		2		1 11 21	1 2 11						3 4	
Permitted Phases										3 4		3 4



Alternative O: Widening Northpark + Northpark Grade Separation  
 14: US 59 SBFR & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2		1 11 21	1 2 11					3 4	3 4	3 4
Switch Phase												
Minimum Initial (s)		7.0										
Minimum Split (s)		14.0										
Total Split (s)		19.9										
Total Split (%)		13.8%										
Maximum Green (s)		13.9										
Yellow Time (s)		4.0										
All-Red Time (s)		2.0										
Lost Time Adjust (s)		0.0										
Total Lost Time (s)		6.0										
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0										
Recall Mode		None										
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		13.9		84.1	98.0					28.7	28.7	28.7
Actuated g/C Ratio		0.10		0.58	0.68					0.20	0.20	0.20
v/c Ratio		1.33dr		0.82	0.61					0.92	0.87dl	0.29
Control Delay		76.6		15.3	5.4					91.6	61.4	1.6
Queue Delay		0.0		1.5	0.8					0.0	0.0	0.0
Total Delay		76.6		16.8	6.2					91.6	61.4	1.6
LOS		E		B	A					F	E	A
Approach Delay		76.6			12.2						61.6	
Approach LOS		E			B						E	

Intersection Summary

Area Type: Other  
 Cycle Length: 144.7  
 Actuated Cycle Length: 144.7  
 Offset: 110 (76%), Referenced to phase 1:WBTL and 6:, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 33.0 Intersection LOS: C  
 Intersection Capacity Utilization 81.1% ICU Level of Service D  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 14: US 59 SBFR & Northpark Dr.

#14 ø11 ø2 19.9 s	#14 ø4 22.7 s	#14 ø3 12 s	#14 ø1 (R) 74.1 s	#14 ø21 7 s	#14 ø21 9 s
#17 ø7 10 s	#17 ø5 9.9 s	#17 ø15 22.7 s	#17 ø6 (R) 66.1 s	#17 ø16 20 s	#17 ø8 16 s



Alternative O: Widening Northpark + Northpark Grade Separation  
 14: US 59 SBFR & Northpark Dr.

AM Peak Hour

Lane Group	ø1	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21
Detector Phase											
Switch Phase											
Minimum Initial (s)	3.0	1.0	5.0	2.7	5.0	1.0	1.0	3.0	3.0	4.0	1.0
Minimum Split (s)	21.3	7.0	22.7	8.7	27.0	7.0	8.0	9.0	9.0	20.0	7.0
Total Split (s)	74.1	12.0	22.7	9.9	66.1	10.0	16.0	9.0	22.7	20.0	7.0
Total Split (%)	51%	8%	16%	7%	46%	7%	11%	6%	16%	14%	5%
Maximum Green (s)	68.1	6.0	16.7	3.9	60.1	4.0	10.0	3.0	16.7	14.0	1.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)											
Total Lost Time (s)											
Lead/Lag	Lag	Lead		Lag	Lead	Lead		Lag		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	None	None	None	None	None	None
Walk Time (s)			5.0		5.0						
Flash Dont Walk (s)			11.0		16.0						
Pedestrian Calls (#/hr)			0		0						
Act Effect Green (s)											
Actuated g/C Ratio											
v/c Ratio											
Control Delay											
Queue Delay											
Total Delay											
LOS											
Approach Delay											
Approach LOS											
Intersection Summary											

Alternative O: Widening Northpark + Northpark Grade Separation  
 17: US 59 NBFR & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑			↑↑↑		↖↖	↑↑	↖↖			
Volume (vph)	71	617	0	0	1823	226	145	126	434	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	2		0	0		1	2		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.86	0.86	0.97	0.95	0.88	1.00	1.00	1.00
Fr <sub>t</sub>					0.983				0.850			
Fl <sub>t</sub> Protected	0.950						0.950					
Satd. Flow (prot)	3433	3539	0	0	6299	0	3433	3539	2787	0	0	0
Fl <sub>t</sub> Permitted	0.950						0.950					
Satd. Flow (perm)	3433	3539	0	0	6299	0	3433	3539	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					34				533			
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			1797			365			309	
Travel Time (s)		6.7			27.2			4.5			3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	87	758	0	0	2239	278	178	155	533	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	758	0	0	2517	0	178	155	533	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5 15	5 6 15			6 16			7 8				
Permitted Phases							7 8		7 8			



Alternative O: Widening Northpark + Northpark Grade Separation  
 17: US 59 NBFR & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5 15	5 6 15			6 16		7 8	7 8	7 8			
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Maximum Green (s)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)												
Recall Mode												
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	26.6	92.7			80.1		20.0	20.0	20.0			
Actuated g/C Ratio	0.18	0.64			0.55		0.14	0.14	0.14			
v/c Ratio	0.14	0.33			0.72		0.38	0.32	0.63			
Control Delay	45.4	1.3			25.1		59.3	58.2	8.0			
Queue Delay	0.0	1.6			0.2		0.0	0.0	0.0			
Total Delay	45.4	2.9			25.2		59.3	58.2	8.0			
LOS	D	A			C		E	E	A			
Approach Delay		7.3			25.2			27.5				
Approach LOS		A			C			C				

Intersection Summary

Area Type:	Other
Cycle Length:	144.7
Actuated Cycle Length:	144.7
Offset:	110 (76%), Referenced to phase 1:WBTL and 6:, Start of Green
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	22.1
Intersection LOS:	C
Intersection Capacity Utilization	81.1%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 17: US 59 NBFR & Northpark Dr.

#14 ø11 ø2 19.9 s	#14 ø4 22.7 s	#14 ø3 12 s	#14 ø1 (R) 74.1 s	#14 ø21 7 s	#14 ø21 9 s
#17 ø7 10 s	#17 ø5 9.9 s	#17 ø15 22.7 s	#17 ø6 (R) 66.1 s	#17 ø16 20 s	#17 ø8 16 s


















Alternative O: Widening Northpark + Northpark Grade Separation  
 17: US 59 NBFR & Northpark Dr.

AM Peak Hour

Lane Group	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21				
Detector Phase																
Switch Phase																
Minimum Initial (s)	3.0	7.0	1.0	5.0	2.7	5.0	1.0	1.0	3.0	3.0	4.0	1.0				
Minimum Split (s)	21.3	14.0	7.0	22.7	8.7	27.0	7.0	8.0	9.0	9.0	20.0	7.0				
Total Split (s)	74.1	19.9	12.0	22.7	9.9	66.1	10.0	16.0	9.0	22.7	20.0	7.0				
Total Split (%)	51%	14%	8%	16%	7%	46%	7%	11%	6%	16%	14%	5%				
Maximum Green (s)	68.1	13.9	6.0	16.7	3.9	60.1	4.0	10.0	3.0	16.7	14.0	1.0				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
Lost Time Adjust (s)																
Total Lost Time (s)																
Lead/Lag	Lag		Lead		Lag		Lead		Lead		Lag		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	C-Max	None	None	None	None	C-Max	None	None	None	None	None	None				
Walk Time (s)					5.0		5.0									
Flash Dont Walk (s)					11.0		16.0									
Pedestrian Calls (#/hr)					0		0									
Act Effect Green (s)																
Actuated g/C Ratio																
v/c Ratio																
Control Delay																
Queue Delay																
Total Delay																
LOS																
Approach Delay																
Approach LOS																
Intersection Summary																

Alternative O: Widening Northpark + Northpark Grade Separation  
 19: US 59 NBFR & Hamblen

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Volume (vph)	3	43	0	0	0	217	0	637	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected		0.997										
Satd. Flow (prot)	0	1857	0	0	0	1611	0	3539	1583	0	0	0
Flt Permitted		0.997										
Satd. Flow (perm)	0	1857	0	0	0	1611	0	3539	1583	0	0	0
Link Speed (mph)		35			35			55				55
Link Distance (ft)		168			123			612				7207
Travel Time (s)		3.3			2.4			7.6				89.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	4	53	0	0	0	267	0	782	154	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	0	267	0	782	154	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.4%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 20: Loop 494 & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	862	108	191	947	72	21	60	146	148	166	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998	0.850		0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4796	1362	1770	5029	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4796	1362	1770	5029	0	1770	1863	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1	205		14				205			159
Link Speed (mph)		45			45			30				30
Link Distance (ft)		1797			1638			3315				2861
Travel Time (s)		27.2			24.8			75.3				65.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	49	1059	133	235	1163	88	26	74	179	182	204	117
Shared Lane Traffic (%)			10%									
Lane Group Flow (vph)	49	1072	120	235	1251	0	26	74	179	182	204	117
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4

Alternative O: Widening Northpark + Northpark Grade Separation  
 20: Loop 494 & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	22.0	10.0	22.0		10.3	22.3	22.3	10.3	22.3	22.3
Total Split (s)	10.0	65.6	65.6	35.0	90.6		12.8	22.4	22.4	21.0	30.6	30.6
Total Split (%)	6.9%	45.6%	45.6%	24.3%	62.9%		8.9%	15.6%	15.6%	14.6%	21.3%	21.3%
Maximum Green (s)	4.0	59.6	59.6	29.0	84.6		6.8	16.4	16.4	15.0	24.6	24.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		5.0	5.0		5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	4.0	64.9	64.9	23.7	84.6		6.5	16.4	16.4	15.0	29.7	29.7
Actuated g/C Ratio	0.03	0.45	0.45	0.16	0.59		0.05	0.11	0.11	0.10	0.21	0.21
v/c Ratio	1.00	0.50	0.17	0.81	0.42		0.33	0.35	0.50	0.99	0.53	0.26
Control Delay	195.8	29.5	0.5	81.7	10.2		77.8	64.0	9.3	126.9	58.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	195.8	29.5	0.5	81.7	10.2		77.8	64.0	9.3	126.9	58.5	3.7
LOS	F	C	A	F	B		E	E	A	F	E	A
Approach Delay		33.3			21.5			30.2			70.5	
Approach LOS		C			C			C			E	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 83 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 33.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 64.9%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 20: Loop 494 & Northpark Dr.





Alternative O: Widening Northpark + Northpark Grade Separation  
 23: Brookdale & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	684	22	7	1255	27	28	16	14	34	42	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.995			0.997			0.964			0.895	
Flt Protected	0.950			0.950				0.977			0.993	
Satd. Flow (prot)	1770	3522	0	1770	3529	0	0	3333	0	0	3145	0
Flt Permitted	0.085			0.300				0.727			0.897	
Satd. Flow (perm)	158	3522	0	559	3529	0	0	2480	0	0	2841	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			3			17			82	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		4882			2785			1365			843	
Travel Time (s)		74.0			42.2			31.0			19.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	68	840	27	9	1541	33	34	20	17	42	52	217
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	867	0	9	1574	0	0	71	0	0	311	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		

Alternative O: Widening Northpark + Northpark Grade Separation  
 23: Brookdale & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		10.0	22.0		10.0	22.0		10.0	22.0	
Total Split (s)	12.0	99.0		10.0	95.0		10.0	29.0		10.0	29.0	
Total Split (%)	8.1%	66.9%		6.8%	64.2%		6.8%	19.6%		6.8%	19.6%	
Maximum Green (s)	6.0	93.0		4.0	89.0		4.0	23.0		4.0	23.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	102.2	101.0		96.6	93.4		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.69	0.68		0.65	0.63		0.22	0.22		0.22	0.22	
v/c Ratio	0.39	0.36		0.02	0.71		0.13	0.13		0.13	0.45	
Control Delay	13.7	10.7		7.2	20.9		35.5	35.5		35.5	38.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.7	10.7		7.2	20.9		35.5	35.5		35.5	38.3	
LOS	B	B		A	C		D	D		D	D	
Approach Delay		10.9			20.8		35.5	35.5			38.3	
Approach LOS		B			C		D	D			D	

Intersection Summary

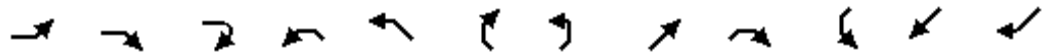
Area Type: Other  
 Cycle Length: 148  
 Actuated Cycle Length: 148  
 Offset: 41 (28%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 19.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 75.8%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 23: Brookdale & Northpark Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 26: Northpark Dr. & Mills Branch

AM Peak Hour



Lane Group	EBL	EBR	EBR2	NWL2	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	149	142	284	150	0	0	0	0	88	138	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0			0	0	0		0	150		0
Storage Lanes	0	1			1	0	0		0	1		0
Taper Length (ft)	25				25		25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.865										0.976
Flt Protected					0.950					0.950		
Satd. Flow (prot)	0	1611	0	0	1770	0	0	0	0	1770	3454	0
Flt Permitted					0.950					0.950		
Satd. Flow (perm)	0	1611	0	0	1770	0	0	0	0	1770	3454	0
Link Speed (mph)	30				30			40			30	
Link Distance (ft)	674				163			1792			311	
Travel Time (s)	15.3				3.7			30.5			7.1	
Peak Hour Factor	0.92	0.92	0.85	0.92	0.94	0.92	0.92	0.92	0.92	0.58	0.82	0.69
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	183	189	349	180	0	0	0	0	171	190	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	372	0	0	529	0	0	0	0	171	226	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				12			12			12	
Link Offset(ft)	0				0			0			0	
Crosswalk Width(ft)	16				16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15	9	9	15	15	9	15		9	15		9
Sign Control	Stop				Free			Stop			Stop	

Intersection Summary

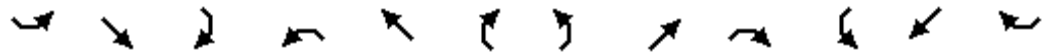
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.3%
ICU Level of Service	A
Analysis Period (min)	15



Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	2	15
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 29: Northpark Dr. & Rock Springs

AM Peak Hour

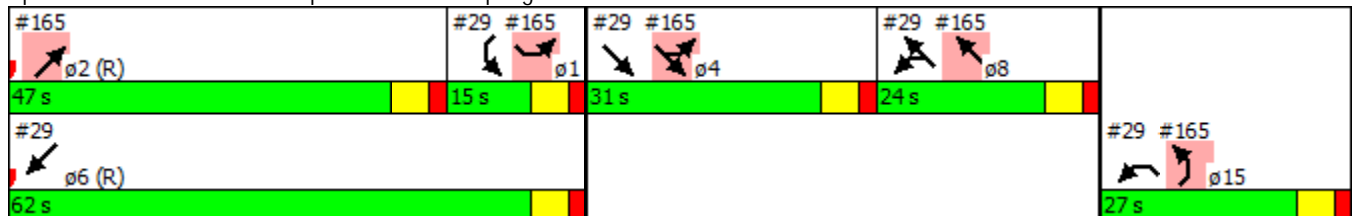


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase		4		15	8					1	6	
Switch Phase												
Minimum Initial (s)		5.0			5.0					5.0	4.0	
Minimum Split (s)		22.0			21.0					11.0	18.0	
Total Split (s)		31.0			24.0					15.0	62.0	
Total Split (%)		21.5%			16.7%					10.4%	43.1%	
Maximum Green (s)		25.0			18.0					9.0	56.0	
Yellow Time (s)		4.0			4.0					4.0	4.0	
All-Red Time (s)		2.0			2.0					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0					0.0	0.0	
Total Lost Time (s)		6.0			6.0					6.0	6.0	
Lead/Lag		Lead			Lag					Lag		
Lead-Lag Optimize?		Yes			Yes					Yes		
Vehicle Extension (s)		3.0			3.0					3.0	3.0	
Recall Mode		None			Max					Max	C-Max	
Walk Time (s)		5.0			5.0						5.0	
Flash Dont Walk (s)		11.0			10.0						7.0	
Pedestrian Calls (#/hr)		0			0						0	
Act Effect Green (s)		9.9		60.1	33.1					9.0	56.0	
Actuated g/C Ratio		0.07		0.42	0.23					0.06	0.39	
v/c Ratio		0.73		0.11	0.16					0.06	0.52	
Control Delay		25.2		2.7	47.9					65.0	34.7	
Queue Delay		0.0		1.1	1.3					0.0	0.0	
Total Delay		25.2		3.8	49.2					65.0	34.7	
LOS		C		A	D					E	C	
Approach Delay		25.2			32.4						35.0	
Approach LOS		C			C						C	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 114 (79%), Referenced to phase 2:NET and 6:, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 31.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 47.3%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 29: Northpark Dr. & Rock Springs



Lane Group	ø2	ø15
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	5.0
Minimum Split (s)	18.0	11.0
Total Split (s)	47.0	27.0
Total Split (%)	33%	19%
Maximum Green (s)	41.0	21.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	Max
Walk Time (s)	5.0	
Flash Dont Walk (s)	7.0	
Pedestrian Calls (#/hr)	0	
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
 32: Kingwood Dr. & Mills Branch

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑						↑↑	
Volume (vph)	0	32	323	5	220	0	0	0	0	0	41	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.869									0.939	
Flt Protected					0.998							
Satd. Flow (prot)	0	3076	0	0	3532	0	0	0	0	0	3323	0
Flt Permitted					0.998							
Satd. Flow (perm)	0	3076	0	0	3532	0	0	0	0	0	3323	0
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		6684			199			1106			329	
Travel Time (s)		151.9			4.5			18.9			5.6	
Peak Hour Factor	0.92	0.57	0.83	0.42	0.80	0.92	0.92	0.92	0.92	0.92	0.64	0.84
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	63	440	13	311	0	0	0	0	0	72	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	503	0	0	324	0	0	0	0	0	122	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			20			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.8%
Analysis Period (min)	15
	ICU Level of Service A



Alternative O: Widening Northpark + Northpark Grade Separation  
 35: Russel Palmer & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑	↗		↖	
Volume (vph)	0	1170	86	0	0	0	0	126	74	11	66	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		150	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990							0.850			
Flt Protected												0.993
Satd. Flow (prot)	0	5034	0	0	0	0	0	1863	1583	0	1850	0
Flt Permitted												0.939
Satd. Flow (perm)	0	5034	0	0	0	0	0	1863	1583	0	1749	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15							91			
Link Speed (mph)		45			45			30				30
Link Distance (ft)		117			2967			1145				106
Travel Time (s)		1.8			45.0			26.0				2.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	1437	106	0	0	0	0	155	91	14	81	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1543	0	0	0	0	0	155	91	0	95	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2						2	1	1	2	
Detector Template		Thru						Thru	Right	Left	Thru	
Leading Detector (ft)		100						100	20	20	100	
Trailing Detector (ft)		0						0	0	0	0	
Detector 1 Position(ft)		0						0	0	0	0	
Detector 1 Size(ft)		6						6	20	20	6	
Detector 1 Type		Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)		0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)		0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type		NA						NA	Perm	Perm	NA	
Protected Phases		2						8			4	
Permitted Phases									8	4		

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	1	6
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 35: Russel Palmer & Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2						8	8	4	4	
Switch Phase												
Minimum Initial (s)		15.0						5.0	5.0	5.0	5.0	
Minimum Split (s)		21.3						11.6	11.6	11.3	11.3	
Total Split (s)		95.0						28.0	28.0	28.0	28.0	
Total Split (%)		66.0%						19.4%	19.4%	19.4%	19.4%	
Maximum Green (s)		89.0						22.0	22.0	22.0	22.0	
Yellow Time (s)		4.0						4.0	4.0	4.0	4.0	
All-Red Time (s)		2.0						2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0						0.0	0.0		0.0	
Total Lost Time (s)		6.0						6.0	6.0		6.0	
Lead/Lag		Lag										
Lead-Lag Optimize?		Yes										
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Recall Mode		C-Max						Max	Max	None	None	
Act Effect Green (s)		91.6						22.0	22.0		22.0	
Actuated g/C Ratio		0.64						0.15	0.15		0.15	
v/c Ratio		0.48						0.55	0.29		0.36	
Control Delay		14.4						64.4	12.4		117.3	
Queue Delay		0.0						0.0	0.0		125.3	
Total Delay		14.4						64.4	12.4		242.6	
LOS		B						E	B		F	
Approach Delay		14.4						45.2			242.6	
Approach LOS		B						D			F	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	0 (0%), Referenced to phase 2:EBT and 6:, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	30.0
Intersection LOS:	C
Intersection Capacity Utilization	52.5%
ICU Level of Service	A
Analysis Period (min)	15

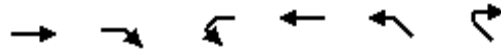
Splits and Phases: 35: Russel Palmer & Northpark Dr.



Lane Group	ø1	ø6
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	15.0
Minimum Split (s)	11.3	21.3
Total Split (s)	21.0	116.0
Total Split (%)	15%	81%
Maximum Green (s)	15.0	110.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	C-Max
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
<b>Intersection Summary</b>		

Alternative O: Widening Northpark + Northpark Grade Separation  
 36: Northpark Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑↑			↑↑↑		
Volume (vph)	1156	0	0	1994	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	5085	0	0	5085	0	0
Flt Permitted						
Satd. Flow (perm)	5085	0	0	5085	0	0
Link Speed (mph)	45			40	45	
Link Distance (ft)	1638			2834	2834	
Travel Time (s)	24.8			48.3	42.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	1420	0	0	2449	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1420	0	0	2449	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 43: Sorters Rd & US 59 SBFR

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↖	↑↑						↙↑	↗
Volume (vph)	0	21	183	221	182	0	0	0	0	77	2	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	200		0	0		0	0		150
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.866										0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	4404	0	1770	3539	0	0	0	0	0	3373	1583
Flt Permitted				0.590							0.953	
Satd. Flow (perm)	0	4404	0	1099	3539	0	0	0	0	0	3373	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		225										74
Link Speed (mph)		35		35				55			55	
Link Distance (ft)		893		863				983			6715	
Travel Time (s)		17.4		16.8				12.2			83.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	26	225	271	224	0	0	0	0	95	2	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	251	0	271	224	0	0	0	0	0	97	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12				0			0	
Link Offset(ft)		0		0				0			0	
Crosswalk Width(ft)		16		16				16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Minimum Split (s)		22.0		22.0	22.0					22.0	22.0	22.0
Total Split (s)		22.0		22.0	22.0					22.0	22.0	22.0
Total Split (%)		50.0%		50.0%	50.0%					50.0%	50.0%	50.0%
Maximum Green (s)		16.0		16.0	16.0					16.0	16.0	16.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0						6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		5.0		5.0	5.0					5.0	5.0	5.0
Flash Dont Walk (s)		11.0		11.0	11.0					11.0	11.0	11.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effect Green (s)		16.0		16.0	16.0						16.0	16.0
Actuated g/C Ratio		0.36		0.36	0.36						0.36	0.36
v/c Ratio		0.14		0.68	0.17						0.08	0.04

Alternative O: Widening Northpark + Northpark Grade Separation  
 43: Sorters Rd & US 59 SBFR

AM Peak Hour

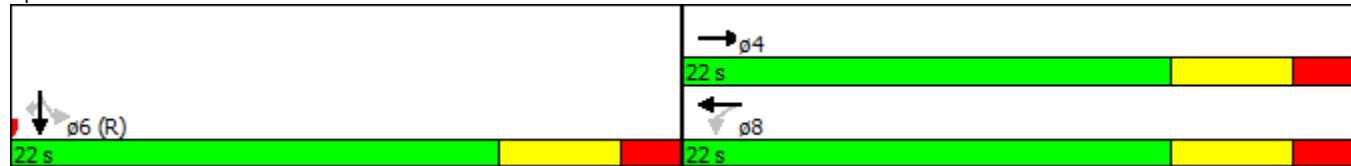


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		2.7		18.7	4.2						3.7	0.3
Queue Delay		0.0		0.0	0.0						0.0	0.0
Total Delay		2.7		18.7	4.2						3.7	0.3
LOS		A		B	A						A	A
Approach Delay		2.7			12.2						3.0	
Approach LOS		A			B						A	

Intersection Summary

Area Type:	Other
Cycle Length:	44
Actuated Cycle Length:	44
Offset:	0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	8.1
Intersection LOS:	A
Intersection Capacity Utilization	38.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 43: Sorters Rd & US 59 SBFR



Alternative O: Widening Northpark + Northpark Grade Separation  
45: Loop 494 & Sorters Rd

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	61	42	317	492	22	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	180			225
Storage Lanes	2	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.88	0.97	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	2787	3433	3539	3539	1583
Flt Permitted	0.950		0.739			
Satd. Flow (perm)	3433	2787	2671	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		52				106
Link Speed (mph)	35			45	45	
Link Distance (ft)	863			804	572	
Travel Time (s)	16.8			12.2	8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	75	52	389	604	27	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	75	52	389	604	27	106
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	16.0	16.0	16.0	16.0	16.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	16.0	16.0	16.0	16.0	16.0	16.0
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36
v/c Ratio	0.06	0.05	0.40	0.47	0.02	0.16



Alternative O: Widening Northpark + Northpark Grade Separation  
 45: Loop 494 & Sorters Rd

AM Peak Hour

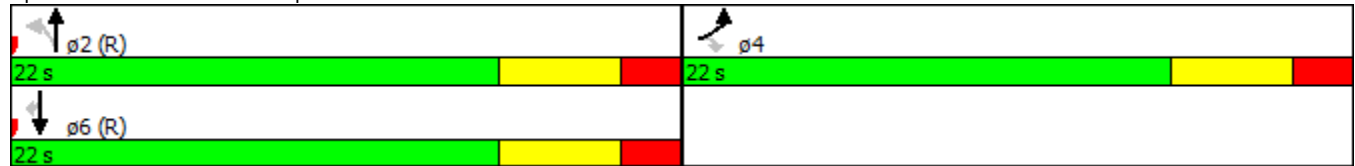


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Control Delay	5.6	2.3	12.0	12.2	9.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	2.3	12.0	12.2	9.1	3.5
LOS	A	A	B	B	A	A
Approach Delay	4.3			12.1	4.6	
Approach LOS	A			B	A	

Intersection Summary

Area Type:	Other
Cycle Length:	44
Actuated Cycle Length:	44
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.47
Intersection Signal Delay:	10.5
Intersection Capacity Utilization	30.2%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	A

Splits and Phases: 45: Loop 494 & Sorters Rd



Alternative O: Widening Northpark + Northpark Grade Separation  
 49: Hamblen & Laurel Springs

AM Peak Hour



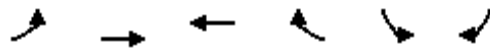
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	36	136	422	18	17	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.881	
Flt Protected		0.990			0.994	
Satd. Flow (prot)	0	1844	1852	0	1631	0
Flt Permitted		0.990			0.994	
Satd. Flow (perm)	0	1844	1852	0	1631	0
Link Speed (mph)		35	35		30	
Link Distance (ft)		1799	1596		734	
Travel Time (s)		35.0	31.1		16.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	44	167	518	22	21	152
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	211	540	0	173	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.4%
Analysis Period (min)	15
	ICU Level of Service B

Alternative O: Widening Northpark + Northpark Grade Separation  
 53: Kingwood Dr. & Woodland Grove Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø1	ø3	ø4	ø6	ø7	ø8
Lane Configurations												
Volume (vph)	33	566	1383	9	20	239						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Lane Util. Factor	1.00	0.95	0.95	0.95	0.97	0.95						
Frt			0.999		0.861							
Flt Protected	0.950				0.996							
Satd. Flow (prot)	1770	3539	3536	0	3099	0						
Flt Permitted	0.950				0.996							
Satd. Flow (perm)	1770	3539	3536	0	3099	0						
Right Turn on Red				Yes		Yes						
Satd. Flow (RTOR)			1		96							
Link Speed (mph)		40	40		30							
Link Distance (ft)		315	225		626							
Travel Time (s)		5.4	3.8		14.2							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Growth Factor	117%	117%	117%	117%	117%	117%						
Adj. Flow (vph)	42	720	1759	11	25	304						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	720	1770	0	329	0						
Enter Blocked Intersection	No	No	No	No	No	No						
Lane Alignment	Left	Left	Left	Right	Left	Right						
Median Width(ft)		40	40		24							
Link Offset(ft)		0	0		0							
Crosswalk Width(ft)		16	16		16							
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00						
Turning Speed (mph)	15			9	15	9						
Number of Detectors	1	2	2		1							
Detector Template	Left	Thru	Thru		Left							
Leading Detector (ft)	20	100	100		20							
Trailing Detector (ft)	0	0	0		0							
Detector 1 Position(ft)	0	0	0		0							
Detector 1 Size(ft)	20	6	6		20							
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0							
Detector 1 Queue (s)	0.0	0.0	0.0		0.0							
Detector 1 Delay (s)	0.0	0.0	0.0		0.0							
Detector 2 Position(ft)		94	94									
Detector 2 Size(ft)		6	6									
Detector 2 Type		Cl+Ex	Cl+Ex									
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0									
Turn Type	Prot	NA	NA		NA							
Protected Phases	5	2	3 6		4 7		1	3	4	6	7	8
Permitted Phases												
Detector Phase	5	2	3 6		4 7							
Switch Phase												
Minimum Initial (s)	3.0	10.0					3.0	1.0	5.0	2.0	1.0	5.0

Alternative O: Widening Northpark + Northpark Grade Separation  
 53: Kingwood Dr. & Woodland Grove Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø1	ø3	ø4	ø6	ø7	ø8
Minimum Split (s)	9.0	29.0					10.0	14.5	11.0	22.0	7.0	11.0
Total Split (s)	11.0	83.0					12.0	30.0	19.0	84.0	19.0	30.0
Total Split (%)	7.6%	57.6%					8%	21%	13%	58%	13%	21%
Maximum Green (s)	5.0	77.0					6.0	24.0	13.0	78.0	13.0	24.0
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0					2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	6.0	6.0										
Lead/Lag	Lead	Lag					Lead			Lag		
Lead-Lag Optimize?	Yes	Yes					Yes			Yes		
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max					None	None	None	C-Max	None	None
Walk Time (s)		5.0								5.0		
Flash Dont Walk (s)		11.0								11.0		
Pedestrian Calls (#/hr)		0								0		
Act Effect Green (s)	5.2	82.1	110.1		13.1							
Actuated g/C Ratio	0.04	0.57	0.76		0.09							
v/c Ratio	0.67	0.36	0.65		1.30dr							
Control Delay	111.4	18.1	0.8		71.9							
Queue Delay	0.0	0.0	0.5		0.0							
Total Delay	111.4	18.1	1.4		71.9							
LOS	F	B	A		E							
Approach Delay		23.2	1.4		71.9							
Approach LOS		C	A		E							

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 15.3      Intersection LOS: B  
 Intersection Capacity Utilization 64.6%      ICU Level of Service C  
 Analysis Period (min) 15  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 53: Kingwood Dr. & Woodland Grove Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 54: Woodland Hills & Hamblen

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	4	0	0	0	6	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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					0.865							
Flt Protected											0.950	
Satd. Flow (prot)	1863	0	0	0	1611	0	0	1863	0	0	1770	0
Flt Permitted											0.950	
Satd. Flow (perm)	1863	0	0	0	1611	0	0	1863	0	0	1770	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		6657			997			912			3265	
Travel Time (s)		129.7			19.4			17.8			63.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	5	0	0	0	7	0	0
Shared Lane Traffic (%)	0%											
Lane Group Flow (vph)	0	0	0	0	5	0	0	0	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
57: Redbud & Hamblen

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	38	5	28	2	6	2	14	77	1	0	89	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.947			0.975			0.999			0.998	
Flt Protected		0.974			0.991			0.993				
Satd. Flow (prot)	0	1718	0	0	1800	0	0	1848	0	0	1859	0
Flt Permitted		0.974			0.991			0.993				
Satd. Flow (perm)	0	1718	0	0	1800	0	0	1848	0	0	1859	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		753			6657			361			271	
Travel Time (s)		14.7			129.7			8.2			6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	47	6	34	2	7	2	17	95	1	0	109	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	87	0	0	11	0	0	113	0	0	111	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.3%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
60: Forest Cove & Hamblen

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	62	62	5	1	96	3	12	7	2	3	19	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.995			0.996			0.990			0.876	
Flt Protected		0.977						0.972			0.999	
Satd. Flow (prot)	0	1811	0	0	1855	0	0	1792	0	0	1630	0
Flt Permitted		0.977						0.972			0.999	
Satd. Flow (perm)	0	1811	0	0	1855	0	0	1792	0	0	1630	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1966			1019			472			603	
Travel Time (s)		38.3			19.9			10.7			13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	76	76	6	1	118	4	15	9	2	4	23	297
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	158	0	0	123	0	0	26	0	0	324	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.4%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
64: Woodland Hills & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	337	36	143	947	68	30	103	112	84	126	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3486	0	1770	3504	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.174			0.477			0.544			0.607		
Satd. Flow (perm)	324	3486	0	889	3504	0	1013	1863	1583	1131	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			12				142			115
Link Speed (mph)		40			40			35				35
Link Distance (ft)		266			1473			2549				2207
Travel Time (s)		4.5			25.1			49.7				43.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%
Adj. Flow (vph)	174	429	46	182	1204	86	38	131	142	107	160	370
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	475	0	182	1290	0	38	131	142	107	160	370
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		70			75			20				30
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8				4
Permitted Phases	2			6			8		8	4		4
Minimum Split (s)	22.0	22.0		22.0	22.0		22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	108.0	108.0		108.0	108.0		36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Maximum Green (s)	102.0	102.0		102.0	102.0		30.0	30.0	30.0	30.0	30.0	30.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effect Green (s)	102.0	102.0		102.0	102.0		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.76	0.19		0.29	0.52		0.18	0.34	0.32	0.46	0.41	0.88



Alternative O: Widening Northpark + Northpark Grade Separation  
 64: Woodland Hills & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	37.8	7.0		9.1	10.5		49.7	51.4	9.0	57.1	53.2	60.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	7.0		9.1	10.5		49.7	51.4	9.0	57.1	53.2	60.4
LOS	D	A		A	B		D	D	A	E	D	E
Approach Delay		15.2			10.3			31.9			58.0	
Approach LOS		B			B			C			E	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	39 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	23.4
Intersection LOS:	C
Intersection Capacity Utilization	73.8%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 64: Woodland Hills & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 69: Kingwood Dr. & High Valley

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR	ø1
Lane Configurations												
Volume (vph)	56	43	0	0	163	68	7	290	43	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.88	1.00	1.00	1.00	
Frt					0.956			0.850				
Flt Protected	0.950	0.993					0.950					
Satd. Flow (prot)	1681	1757	0	0	3383	0	0	2787	0	0	0	
Flt Permitted	0.950	0.993					0.950					
Satd. Flow (perm)	1681	1757	0	0	3383	0	0	2787	0	0	0	
Right Turn on Red			Yes			Yes			Yes		Yes	
Satd. Flow (RTOR)					38			159				
Link Speed (mph)		30			30		40			40		
Link Distance (ft)		93			765		1292			1077		
Travel Time (s)		2.1			17.4		22.0			18.4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	
Adj. Flow (vph)	69	53	0	0	200	84	9	356	53	0	0	
Shared Lane Traffic (%)	13%											
Lane Group Flow (vph)	60	62	0	0	284	0	9	409	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Right	
Median Width(ft)		12			12		0			0		
Link Offset(ft)		0			0		0			0		
Crosswalk Width(ft)		16			16		16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15	9	9	15	9	
Turn Type	Prot	NA			NA		NA	custom				
Protected Phases	1 4	4			8		15	2				1
Permitted Phases												
Minimum Split (s)		11.0			19.0		11.0	20.0				11.0
Total Split (s)		17.0			28.0		16.0	67.0				16.0
Total Split (%)		11.8%			19.4%		11.1%	46.5%				11%
Maximum Green (s)		11.0			22.0		10.0	61.0				10.0
Yellow Time (s)		4.0			4.0		4.0	4.0				4.0
All-Red Time (s)		2.0			2.0		2.0	2.0				2.0
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		6.0			6.0			6.0				
Lead/Lag		Lead			Lag			Lead				Lag
Lead-Lag Optimize?		Yes			Yes			Yes				Yes
Walk Time (s)					6.0			4.0				
Flash Dont Walk (s)					7.0			10.0				
Pedestrian Calls (#/hr)					0			0				
Act Effct Green (s)	27.0	27.0			22.0		0.0	61.0				
Actuated g/C Ratio	0.19	0.19			0.15		0.00	0.42				
v/c Ratio	0.19	0.19			0.52		no cap	0.32				
Control Delay	24.8	24.7			52.1			37.9				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	24.8	24.7			52.1		Error	37.9				

Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Growth Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Minimum Split (s)	10.0
Total Split (s)	83.0
Total Split (%)	58%
Maximum Green (s)	77.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Alternative O: Widening Northpark + Northpark Grade Separation  
 69: Kingwood Dr. & High Valley

AM Peak Hour

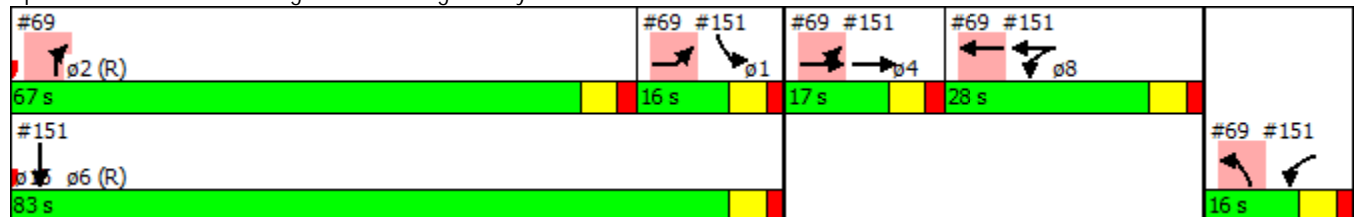


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR	ø1
LOS	C	C			D		F	D				
Approach Delay		24.7			52.1		Err					
Approach LOS		C			D		F					

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	90 (63%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	Err
Intersection Signal Delay:	Err
Intersection LOS:	F
Intersection Capacity Utilization:	Err%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 69: Kingwood Dr. & High Valley

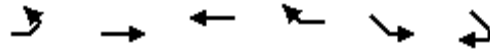


Lane Group	ø6
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

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Alternative O: Widening Northpark + Northpark Grade Separation  
73: Kingwood Dr.

AM Peak Hour




















Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	0
Link Speed (mph)		40	40		40	
Link Distance (ft)		291	315		343	
Travel Time (s)		5.0	5.4		5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		40	40		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 74: Kingwood Dr. & Willow Terrace

AM Peak Hour

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	24	297	185	0	0	0	16	39	0	0	446	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	2		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Fr <sub>t</sub>			0.850									0.989
Fl <sub>t</sub> Protected	0.950							0.986				
Satd. Flow (prot)	1770	3539	1583	0	0	0	0	3490	0	0	3500	0
Fl <sub>t</sub> Permitted	0.950							0.986				
Satd. Flow (perm)	1770	3539	1583	0	0	0	0	3490	0	0	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227									5
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		1403			525			105			533	
Travel Time (s)		23.9			8.9			2.4			12.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	29	365	227	0	0	0	20	48	0	0	548	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	365	227	0	0	0	0	68	0	0	590	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	Perm				Prot	NA			NA	
Protected Phases	15	2					14	4				8
Permitted Phases			2									
Minimum Split (s)	11.0	20.0	20.0					11.0				19.0
Total Split (s)	26.0	42.0	42.0					14.0				46.0
Total Split (%)	18.1%	29.2%	29.2%					9.7%				31.9%
Maximum Green (s)	20.0	36.0	36.0					8.0				40.0
Yellow Time (s)	4.0	4.0	4.0					4.0				4.0
All-Red Time (s)	2.0	2.0	2.0					2.0				2.0
Lost Time Adjust (s)	0.0	0.0	0.0					0.0				0.0
Total Lost Time (s)	6.0	6.0	6.0					6.0				6.0
Lead/Lag		Lead	Lead					Lead				Lag
Lead-Lag Optimize?		Yes	Yes					Yes				Yes
Walk Time (s)		4.0	4.0									6.0
Flash Dont Walk (s)		10.0	10.0									7.0
Pedestrian Calls (#/hr)		0	0									0
Act Effct Green (s)	20.0	36.0	36.0					24.0				40.0
Actuated g/C Ratio	0.14	0.25	0.25					0.17				0.28
v/c Ratio	0.12	0.41	0.40					0.12				0.61

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	1	6
Permitted Phases		
Minimum Split (s)	11.0	10.0
Total Split (s)	16.0	58.0
Total Split (%)	11%	40%
Maximum Green (s)	10.0	52.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		



Alternative O: Widening Northpark + Northpark Grade Separation  
 74: Kingwood Dr. & Willow Terrace

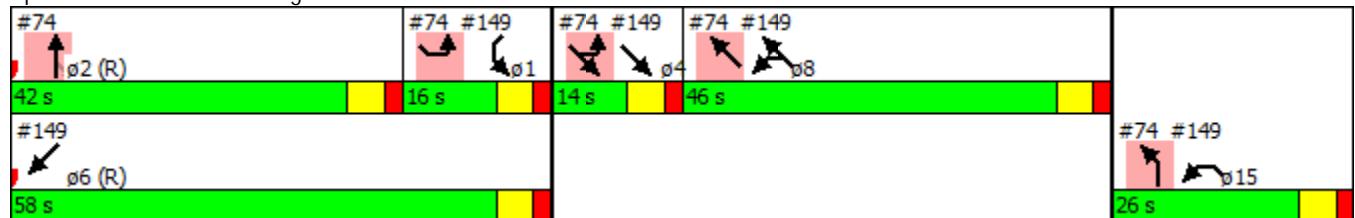
AM Peak Hour

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Control Delay	46.9	76.5	41.8					15.5			47.9	
Queue Delay	0.0	0.0	0.0					2.4			0.0	
Total Delay	46.9	76.5	41.8					17.9			47.9	
LOS	D	E	D					B			D	
Approach Delay		62.4						17.9			47.9	
Approach LOS		E						B			D	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	12 (8%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	53.3
Intersection Capacity Utilization	34.5%
Analysis Period (min)	15
Intersection LOS:	D
ICU Level of Service	A

Splits and Phases: 74: Kingwood Dr. & Willow Terrace



Lane Group	ø1	ø6
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
77: Timber Shade Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	476	23	0	0	0	0	44	3	12	13	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.993						0.990				
Flt Protected	0.950										0.976	
Satd. Flow (prot)	1770	3514	0	0	0	0	0	3504	0	0	3454	0
Flt Permitted	0.950										0.976	
Satd. Flow (perm)	1770	3514	0	0	0	0	0	3504	0	0	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						4				
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		814			1647			741			83	
Travel Time (s)		13.9			28.1			16.8			1.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	38	585	28	0	0	0	0	54	4	15	16	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	613	0	0	0	0	0	58	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA						NA		Prot	NA	
Protected Phases	15	2						8		14	4	
Permitted Phases												
Minimum Split (s)	11.0	20.0						19.0			11.0	
Total Split (s)	17.0	78.0						20.0			16.0	
Total Split (%)	11.8%	54.2%						13.9%			11.1%	
Maximum Green (s)	11.0	72.0						14.0			10.0	
Yellow Time (s)	4.0	4.0						4.0			4.0	
All-Red Time (s)	2.0	2.0						2.0			2.0	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	6.0	6.0						6.0			6.0	
Lead/Lag		Lead						Lag			Lead	
Lead-Lag Optimize?		Yes						Yes			Yes	
Walk Time (s)		4.0						6.0				
Flash Dont Walk (s)		10.0						7.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	11.0	72.0						14.0			23.0	
Actuated g/C Ratio	0.08	0.50						0.10			0.16	
v/c Ratio	0.28	0.35						0.17			0.06	

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphp)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	1	6
Permitted Phases		
Minimum Split (s)	11.0	10.0
Total Split (s)	13.0	91.0
Total Split (%)	9%	63%
Maximum Green (s)	7.0	85.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Alternative O: Widening Northpark + Northpark Grade Separation  
 77: Timber Shade Dr. & Kingwood Dr.

AM Peak Hour

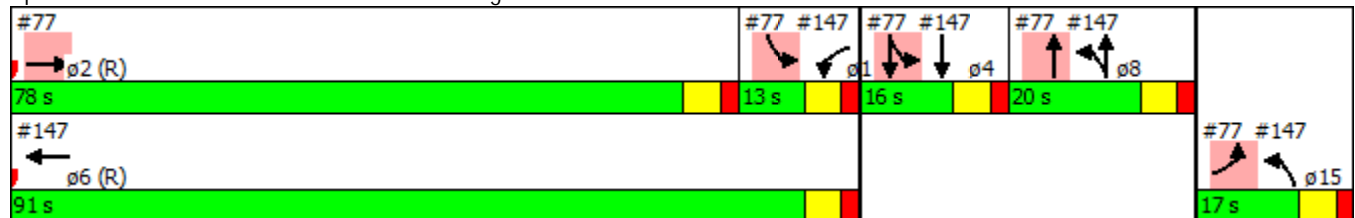


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.6	22.3						56.9			20.7	
Queue Delay	0.0	0.0						0.0			0.0	
Total Delay	68.6	22.3						56.9			20.7	
LOS	E	C						E			C	
Approach Delay		25.0						56.9			20.7	
Approach LOS		C						E			C	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	12 (8%), Referenced to phase 2:EBT and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	27.3
Intersection LOS:	C
Intersection Capacity Utilization	33.1%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 77: Timber Shade Dr. & Kingwood Dr.

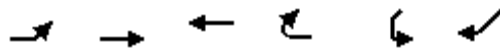


Lane Group	ø1	ø6
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
80: Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88
Frt						
Flt Protected						
Satd. Flow (prot)	3614	0	0	0	0	3278
Flt Permitted						
Satd. Flow (perm)	3614	0	0	0	0	3278
Link Speed (mph)		40	40		40	
Link Distance (ft)		583	814		839	
Travel Time (s)		9.9	13.9		14.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 81: US 59 SBFR

AM Peak Hour



Lane Group	NBT	NBR	SBU	SBL	SBT	NWL	NWR
Lane Configurations			⬇		⬆⬆⬆⬆		
Volume (vph)	0	0	131	0	887	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.81	1.00	1.00
Frt							
Flt Protected			0.950				
Satd. Flow (prot)	0	0	1770	0	7544	0	0
Flt Permitted			0.950				
Satd. Flow (perm)	0	0	1770	0	7544	0	0
Link Speed (mph)	55				55	30	
Link Distance (ft)	255				1812	318	
Travel Time (s)	3.2				22.5	7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	161	0	1089	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	161	0	1089	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Stop				Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.1%
Analysis Period (min)	15
	ICU Level of Service A



Alternative O: Widening Northpark + Northpark Grade Separation  
 83: US 59 NBFR

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	131	0	0	423	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	5085	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	5085	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	318			309	1638	
Travel Time (s)	7.2			3.8	20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	161	0	0	520	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	161	0	0	520	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Yield			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.1%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 84: US 59 SBFR

AM Peak Hour



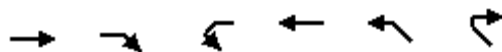
Lane Group	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations							6		7	
Volume (vph)	0	0	0	0	0	0	2267	0	233	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.76	1.00	1.00	1.00
Frt										
Flt Protected									0.950	
Satd. Flow (prot)	0	0	0	0	0	0	8494	0	1770	0
Flt Permitted									0.950	
Satd. Flow (perm)	0	0	0	0	0	0	8494	0	1770	0
Link Speed (mph)	30			55			55		30	
Link Distance (ft)	48			6181			398		362	
Travel Time (s)	1.1			76.6			4.9		8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0	2784	0	286	0
Shared Lane Traffic (%)										
Lane Group Flow (vph)	0	0	0	0	0	0	2784	0	286	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right
Median Width(ft)	0			0			0		12	
Link Offset(ft)	0			0			0		0	
Crosswalk Width(ft)	16			16			16		16	
Two way Left Turn Lane										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	9
Sign Control	Stop			Stop			Free		Yield	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.0%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
87: Kingwood Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations		↑↑		↑↑		
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	3278	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	3278	0	3539	0	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	1473			523	4245	
Travel Time (s)	25.1			8.9	96.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	75			70	70	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 88: Kingwood Dr. & Kingwood High School

AM Peak Hour



Lane Group	SEL	SER	NEL	NET	SWT	SWR	ø6	ø8
Lane Configurations								
Volume (vph)	94	0	72	821	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00		
Frt								
Flt Protected	0.950		0.950					
Satd. Flow (prot)	3433	0	1770	3539	0	0		
Flt Permitted	0.950		0.950					
Satd. Flow (perm)	3433	0	1770	3539	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)								
Link Speed (mph)	30			40	40			
Link Distance (ft)	110			162	902			
Travel Time (s)	2.5			2.8	15.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Growth Factor	113%	113%	113%	113%	113%	113%		
Adj. Flow (vph)	115	0	88	1008	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	115	0	88	1008	0	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	24			12	12			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15			9		
Turn Type	NA		Prot	NA				
Protected Phases	4		15	2			6	8
Permitted Phases								
Minimum Split (s)	11.0		10.0	10.0			10.0	11.0
Total Split (s)	13.0		20.0	101.0			101.0	11.0
Total Split (%)	9.0%		13.8%	69.7%			70%	8%
Maximum Green (s)	7.0		14.0	95.0			95.0	5.0
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0
All-Red Time (s)	2.0		2.0	2.0			2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0				
Total Lost Time (s)	6.0		6.0	6.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?	Yes						Yes	
Act Effct Green (s)	7.0		14.0	95.0				
Actuated g/C Ratio	0.05		0.10	0.66				
v/c Ratio	0.70		0.52	0.43				
Control Delay	44.2		73.8	12.8				
Queue Delay	2.1		0.0	0.0				
Total Delay	46.3		73.8	12.8				
LOS	D		E	B				
Approach Delay	46.3			17.7				
Approach LOS	D			B				

Alternative O: Widening Northpark + Northpark Grade Separation  
 88: Kingwood Dr. & Kingwood High School

AM Peak Hour

Intersection Summary

Area Type:	Other
Cycle Length:	145
Actuated Cycle Length:	145
Offset:	0 (0%), Referenced to phase 2:NET and 6:, Start of Green
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	20.4
Intersection Capacity Utilization	39.8%
Analysis Period (min)	15
Intersection LOS:	C
ICU Level of Service	A

Splits and Phases: 88: Kingwood Dr. & Kingwood High School



Alternative O: Widening Northpark + Northpark Grade Separation  
 90: Kingwood Dr.

AM Peak Hour



Lane Group	EBU	EBL	SBL	SBR	SWR
Lane Configurations	0	893	0	0	0
Volume (vph)	0	893	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Storage Length (ft)		100	0	0	0
Storage Lanes		2	0	0	0
Taper Length (ft)		25	25		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00
Frt					
Flt Protected		0.950			
Satd. Flow (prot)	1863	3433	0	0	0
Flt Permitted		0.950			
Satd. Flow (perm)	1863	3433	0	0	0
Link Speed (mph)		40	30		40
Link Distance (ft)		380	137		162
Travel Time (s)		6.5	3.1		2.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	1097	0	0	0
Shared Lane Traffic (%)					
Lane Group Flow (vph)	0	1097	0	0	0
Enter Blocked Intersection	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Right
Median Width(ft)		36	0		0
Link Offset(ft)		0	0		0
Crosswalk Width(ft)		16	16		16
Two way Left Turn Lane					
Headway Factor	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15	15	9	9
Sign Control		Free	Stop		Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.8%
ICU Level of Service	A
Analysis Period (min)	15



Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	1	6
Permitted Phases		



Alternative O: Widening Northpark + Northpark Grade Separation  
 91: Lake Kingwood Trail & Kingwood Dr.

AM Peak Hour

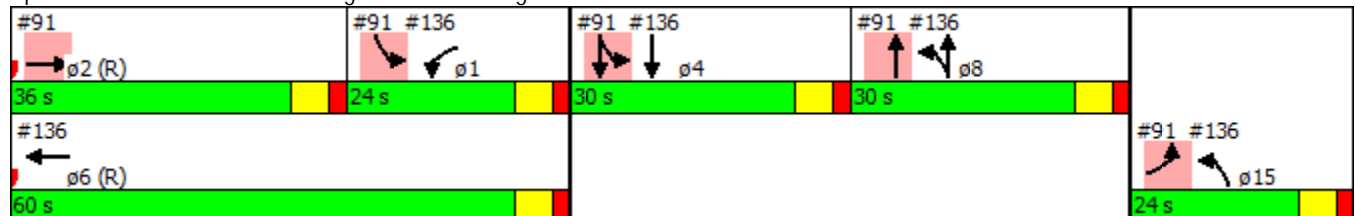


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	2						8		14	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0						5.0			5.0	
Minimum Split (s)	11.0	20.0						19.0			11.0	
Total Split (s)	24.0	36.0						30.0			30.0	
Total Split (%)	16.7%	25.0%						20.8%			20.8%	
Maximum Green (s)	18.0	30.0						24.0			24.0	
Yellow Time (s)	4.0	4.0						4.0			4.0	
All-Red Time (s)	2.0	2.0						2.0			2.0	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	6.0	6.0						6.0			6.0	
Lead/Lag		Lead						Lag			Lead	
Lead-Lag Optimize?		Yes						Yes			Yes	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Recall Mode	None	C-Max						None			None	
Walk Time (s)		4.0						6.0				
Flash Dont Walk (s)		10.0						7.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	6.8	78.5						7.9			34.0	
Actuated g/C Ratio	0.05	0.55						0.05			0.24	
v/c Ratio	0.17	0.54						0.40			0.14	
Control Delay	69.8	24.0						48.8			2.4	
Queue Delay	0.0	0.0						0.0			0.2	
Total Delay	69.8	24.0						48.8			2.6	
LOS	E	C						D			A	
Approach Delay		24.6						48.8			2.6	
Approach LOS		C						D			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 24.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 47.7%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 91: Lake Kingwood Trail & Kingwood Dr.



Lane Group	ø1	ø6
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	4.0
Minimum Split (s)	11.0	10.0
Total Split (s)	24.0	60.0
Total Split (%)	17%	42%
Maximum Green (s)	18.0	54.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	C-Max
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		



Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	1	6
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 96: Chestnut Ridge Dr. & Kingwood Dr.

AM Peak Hour

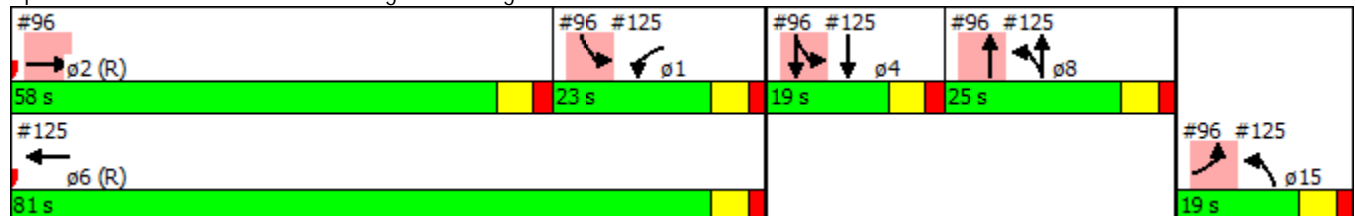


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	2						8		14	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0						5.0			5.0	
Minimum Split (s)	11.0	20.0						19.0			11.0	
Total Split (s)	19.0	58.0						25.0			19.0	
Total Split (%)	13.2%	40.3%						17.4%			13.2%	
Maximum Green (s)	13.0	52.0						19.0			13.0	
Yellow Time (s)	4.0	4.0						4.0			4.0	
All-Red Time (s)	2.0	2.0						2.0			2.0	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	6.0	6.0						6.0			6.0	
Lead/Lag		Lead						Lag			Lead	
Lead-Lag Optimize?		Yes						Yes			Yes	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Recall Mode	None	C-Max						None			None	
Walk Time (s)		4.0						6.0				
Flash Dont Walk (s)		10.0						7.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	12.4	56.8						17.2			33.5	
Actuated g/C Ratio	0.09	0.39						0.12			0.23	
v/c Ratio	0.75	0.57						0.82			0.35	
Control Delay	92.3	36.7						80.9			8.8	
Queue Delay	0.0	0.0						0.0			0.0	
Total Delay	92.3	36.7						80.9			8.8	
LOS	F	D						F			A	
Approach Delay		43.7						80.9			8.8	
Approach LOS		D						F			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 20 (14%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 45.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 52.2%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 96: Chestnut Ridge Dr. & Kingwood Dr.



Lane Group	ø1	ø6
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	4.0
Minimum Split (s)	11.0	10.0
Total Split (s)	23.0	81.0
Total Split (%)	16%	56%
Maximum Green (s)	17.0	75.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	C-Max
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
 102: Kingwood Dr.

AM Peak Hour



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	0	0	3539
Flt Permitted						
Satd. Flow (perm)	1863	0	0	0	0	3539
Link Speed (mph)	30		40			40
Link Distance (ft)	137		129			202
Travel Time (s)	3.1		2.2			3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Yield		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.8%
Analysis Period (min)	15
	ICU Level of Service A





Alternative O: Widening Northpark + Northpark Grade Separation  
 104: US 59 SBFR & Kingwood Dr.

AM Peak Hour

Lane Group	ø1	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21
Lane Configurations											
Volume (vph)											
Ideal Flow (vphpl)											
Lane Util. Factor											
Frt											
Flt Protected											
Satd. Flow (prot)											
Flt Permitted											
Satd. Flow (perm)											
Right Turn on Red											
Satd. Flow (RTOR)											
Link Speed (mph)											
Link Distance (ft)											
Travel Time (s)											
Peak Hour Factor											
Growth Factor											
Adj. Flow (vph)											
Shared Lane Traffic (%)											
Lane Group Flow (vph)											
Enter Blocked Intersection											
Lane Alignment											
Median Width(ft)											
Link Offset(ft)											
Crosswalk Width(ft)											
Two way Left Turn Lane											
Headway Factor											
Turning Speed (mph)											
Number of Detectors											
Detector Template											
Leading Detector (ft)											
Trailing Detector (ft)											
Detector 1 Position(ft)											
Detector 1 Size(ft)											
Detector 1 Type											
Detector 1 Channel											
Detector 1 Extend (s)											
Detector 1 Queue (s)											
Detector 1 Delay (s)											
Detector 2 Position(ft)											
Detector 2 Size(ft)											
Detector 2 Type											
Detector 2 Channel											
Detector 2 Extend (s)											
Turn Type											
Protected Phases	1	3	4	5	6	7	8	11	15	16	21
Permitted Phases											
Detector Phase											
Switch Phase											
Minimum Initial (s)	3.0	1.0	5.0	3.0	8.0	1.0	1.0	3.0	3.0	4.0	1.0

Alternative O: Widening Northpark + Northpark Grade Separation  
 104: US 59 SBFR & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		13.0										
Total Split (s)		24.0										
Total Split (%)		16.7%										
Maximum Green (s)		18.0										
Yellow Time (s)		4.0										
All-Red Time (s)		2.0										
Lost Time Adjust (s)		0.0										
Total Lost Time (s)		6.0										
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0										
Recall Mode		None										
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		18.0		83.3	94.3					24.7	24.7	24.7
Actuated g/C Ratio		0.12		0.58	0.65					0.17	0.17	0.17
v/c Ratio		0.43		0.94	0.40					0.89	0.90	0.46
Control Delay		55.4		34.6	6.1					91.4	70.4	5.8
Queue Delay		0.0		16.0	0.4					60.2	51.1	2.5
Total Delay		55.4		50.6	6.4					151.6	121.5	8.3
LOS		E		D	A					F	F	A
Approach Delay		55.4			35.9						107.2	
Approach LOS		E			D						F	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	0 (0%), Referenced to phase 1:WBTL and 6:, Start of Green
Natural Cycle:	95
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	56.4
Intersection LOS:	E
Intersection Capacity Utilization	67.4%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 104: US 59 SBFR & Kingwood Dr.

#104 ← ρ2 24 s	#104 ↓ ρ4 11.7 s	#104 ↓ ρ3 19 s	#104 ↙ ρ1 (R) 62.6 s	#104   #104 ↙ ρ21 ρ11 7 s   19.7 s
#105 ↑ ρ7 15 s	#105 ↗ ρ5 9 s	#105 ↗ ρ15 11.7 s	#105 ↖ ρ6 (R) 71.6 s	#105 ← ρ16 10 s
#105 ↑ ρ8 26.7 s				

Lane Group	ø1	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21
Minimum Split (s)	9.0	7.0	11.7	9.0	26.0	7.0	26.7	9.0	9.0	10.0	7.0
Total Split (s)	62.6	19.0	11.7	9.0	71.6	15.0	26.7	19.7	11.7	10.0	7.0
Total Split (%)	43%	13%	8%	6%	50%	10%	19%	14%	8%	7%	5%
Maximum Green (s)	56.6	13.0	5.7	3.0	65.6	9.0	20.7	13.7	5.7	4.0	1.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)											
Total Lost Time (s)											
Lead/Lag	Lag	Lead		Lag	Lead	Lead		Lag		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	Max	None	None	None	None	None
Walk Time (s)					5.0		6.0				
Flash Dont Walk (s)					15.0		14.0				
Pedestrian Calls (#/hr)					0		0				
Act Effect Green (s)											
Actuated g/C Ratio											
v/c Ratio											
Control Delay											
Queue Delay											
Total Delay											
LOS											
Approach Delay											
Approach LOS											
Intersection Summary											



Alternative O: Widening Northpark + Northpark Grade Separation  
 105: US 59 NBFR & Kingwood Dr.

AM Peak Hour

Lane Group	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21
Lane Configurations												
Volume (vph)												
Ideal Flow (vphpl)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Right Turn on Red												
Satd. Flow (RTOR)												
Link Speed (mph)												
Link Distance (ft)												
Travel Time (s)												
Peak Hour Factor												
Growth Factor												
Adj. Flow (vph)												
Shared Lane Traffic (%)												
Lane Group Flow (vph)												
Enter Blocked Intersection												
Lane Alignment												
Median Width(ft)												
Link Offset(ft)												
Crosswalk Width(ft)												
Two way Left Turn Lane												
Headway Factor												
Turning Speed (mph)												
Number of Detectors												
Detector Template												
Leading Detector (ft)												
Trailing Detector (ft)												
Detector 1 Position(ft)												
Detector 1 Size(ft)												
Detector 1 Type												
Detector 1 Channel												
Detector 1 Extend (s)												
Detector 1 Queue (s)												
Detector 1 Delay (s)												
Detector 2 Position(ft)												
Detector 2 Size(ft)												
Detector 2 Type												
Detector 2 Channel												
Detector 2 Extend (s)												
Turn Type												
Protected Phases	1	2	3	4	5	6	7	8	11	15	16	21
Permitted Phases												
Detector Phase												
Switch Phase												
Minimum Initial (s)	3.0	7.0	1.0	5.0	3.0	8.0	1.0	1.0	3.0	3.0	4.0	1.0

Alternative O: Widening Northpark + Northpark Grade Separation  
 105: US 59 NBFR & Kingwood Dr.

AM Peak Hour

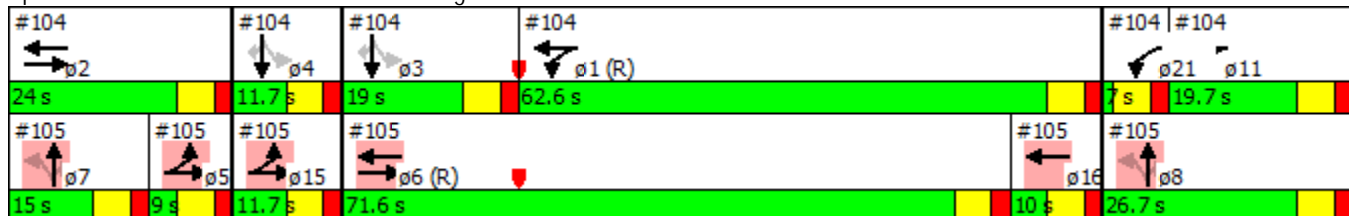


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Maximum Green (s)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)												
Recall Mode												
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	14.7	86.3			75.6		35.7	35.7	35.7			
Actuated g/C Ratio	0.10	0.60			0.52		0.25	0.25	0.25			
v/c Ratio	0.26	0.27			0.52		0.74	0.34	0.43			
Control Delay	82.0	3.9			39.2		62.8	45.5	5.0			
Queue Delay	0.0	2.0			0.1		65.5	37.6	1.8			
Total Delay	82.0	6.0			39.3		128.3	83.2	6.8			
LOS	F	A			D		F	F	A			
Approach Delay		16.5			39.3			64.3				
Approach LOS		B			D			E				

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	0 (0%), Referenced to phase 1:WBTL and 6:, Start of Green
Natural Cycle:	95
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	43.0
Intersection LOS:	D
Intersection Capacity Utilization:	67.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 105: US 59 NBFR & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 105: US 59 NBFR & Kingwood Dr.

AM Peak Hour

Lane Group	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø11	ø15	ø16	ø21				
Minimum Split (s)	9.0	13.0	7.0	11.7	9.0	26.0	7.0	26.7	9.0	9.0	10.0	7.0				
Total Split (s)	62.6	24.0	19.0	11.7	9.0	71.6	15.0	26.7	19.7	11.7	10.0	7.0				
Total Split (%)	43%	17%	13%	8%	6%	50%	10%	19%	14%	8%	7%	5%				
Maximum Green (s)	56.6	18.0	13.0	5.7	3.0	65.6	9.0	20.7	13.7	5.7	4.0	1.0				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
Lost Time Adjust (s)																
Total Lost Time (s)																
Lead/Lag	Lag		Lead		Lag		Lead		Lead		Lag		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	None	C-Max	Max	None	None	None	None	None	None	None	None	None
Walk Time (s)							5.0		6.0							
Flash Dont Walk (s)							15.0		14.0							
Pedestrian Calls (#/hr)							0		0							
Act Effect Green (s)																
Actuated g/C Ratio																
v/c Ratio																
Control Delay																
Queue Delay																
Total Delay																
LOS																
Approach Delay																
Approach LOS																
<b>Intersection Summary</b>																

Alternative O: Widening Northpark + Northpark Grade Separation  
107: Kingwood Dr.

AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	245	114	17	56	162
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	0.870		0.982			
Flt Protected	0.998					0.987
Satd. Flow (prot)	1617	0	1829	0	0	1839
Flt Permitted	0.998					0.987
Satd. Flow (perm)	1617	0	1829	0	0	1839
Link Speed (mph)	40		35			35
Link Distance (ft)	2012		3652			1853
Travel Time (s)	34.3		71.1			36.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	12	301	140	21	69	199
Shared Lane Traffic (%)						
Lane Group Flow (vph)	313	0	161	0	0	268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Stop			Stop













Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.8%
Analysis Period (min)	15
	ICU Level of Service A



Alternative O: Widening Northpark + Northpark Grade Separation  
 110: Hidden Pines & Northpark Dr.

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑	↗	↘	↑	
Volume (vph)	42	1137	49	0	0	0	0	125	65	32	62	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994							0.850			
Flt Protected		0.998								0.950		
Satd. Flow (prot)	0	5045	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted		0.998								0.950		
Satd. Flow (perm)	0	5045	0	0	0	0	0	1863	1583	1770	1863	0
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		2967			1422			1041			125	
Travel Time (s)		45.0			21.5			23.7			2.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	52	1397	60	0	0	0	0	154	80	39	76	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1509	0	0	0	0	0	154	80	39	76	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	102.8%
ICU Level of Service	G
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 111: Lake Houston Parkway & Rustic Woods

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑	↑↑				
Volume (vph)	24	33	0	0	131	28	72	854	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.974			0.995				
Flt Protected		0.980					0.950					
Satd. Flow (prot)	0	3468	0	0	3447	0	1770	3522	0	0	0	0
Flt Permitted		0.980					0.950					
Satd. Flow (perm)	0	3468	0	0	3447	0	1770	3522	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					14			3				
Link Speed (mph)		30			30			40				40
Link Distance (ft)		82			559			1308				4598
Travel Time (s)		1.9			12.7			22.3				78.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	29	41	0	0	161	34	88	1049	37	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	195	0	88	1086	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA		Prot	NA				
Protected Phases	14	4			8		15	2				
Permitted Phases												
Minimum Split (s)		11.0			19.0		11.0	20.0				
Total Split (s)		17.0			21.0		22.0	71.0				
Total Split (%)		11.8%			14.6%		15.3%	49.3%				
Maximum Green (s)		11.0			15.0		16.0	65.0				
Yellow Time (s)		4.0			4.0		4.0	4.0				
All-Red Time (s)		2.0			2.0		2.0	2.0				
Lost Time Adjust (s)		0.0			0.0		0.0	0.0				
Total Lost Time (s)		6.0			6.0		6.0	6.0				
Lead/Lag		Lead			Lag			Lead				
Lead-Lag Optimize?		Yes			Yes			Yes				
Walk Time (s)					6.0			4.0				
Flash Dont Walk (s)					7.0			10.0				
Pedestrian Calls (#/hr)					0			0				
Act Effct Green (s)		24.0			15.0		16.0	65.0				
Actuated g/C Ratio		0.17			0.10		0.11	0.45				
v/c Ratio		0.12			0.53		0.45	0.68				

Alternative O: Widening Northpark + Northpark Grade Separation  
 111: Lake Houston Parkway & Rustic Woods

AM Peak Hour

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	1	6
Permitted Phases		
Minimum Split (s)	11.0	10.0
Total Split (s)	13.0	84.0
Total Split (%)	9%	58%
Maximum Green (s)	7.0	78.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Alternative O: Widening Northpark + Northpark Grade Separation  
 111: Lake Houston Parkway & Rustic Woods

AM Peak Hour

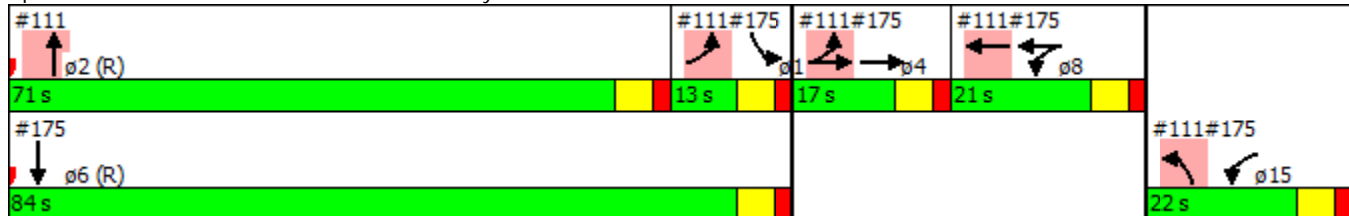


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		27.0			62.2		67.8	34.0				
Queue Delay		0.0			0.0		0.0	0.0				
Total Delay		27.0			62.2		67.8	34.0				
LOS		C			E		E	C				
Approach Delay		27.0			62.2			36.5				
Approach LOS		C			E			D				

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	90 (63%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	39.5
Intersection LOS:	D
Intersection Capacity Utilization	52.0%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 111: Lake Houston Parkway & Rustic Woods



Lane Group	ø1	ø6
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 115: Loop 494 & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	457	95	161	1195	66	16	41	264	88	168	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		150	160		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.086			0.351			0.528			0.651		
Satd. Flow (perm)	160	3539	1583	654	3539	1583	984	1863	1583	1213	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			114			304			122
Link Speed (mph)		40			40			45				45
Link Distance (ft)		1514			523			675				922
Travel Time (s)		25.8			8.9			10.2				14.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%
Adj. Flow (vph)	8	581	121	205	1520	84	20	52	336	112	214	285
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	581	121	205	1520	84	20	52	336	112	214	285
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4

Alternative O: Widening Northpark + Northpark Grade Separation  
 115: Loop 494 & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0
Total Split (s)	10.0	80.0	80.0	16.0	86.0	86.0	10.0	36.0	36.0	12.0	38.0	38.0
Total Split (%)	6.9%	55.6%	55.6%	11.1%	59.7%	59.7%	6.9%	25.0%	25.0%	8.3%	26.4%	26.4%
Maximum Green (s)	4.0	74.0	74.0	10.0	80.0	80.0	4.0	30.0	30.0	6.0	32.0	32.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	78.2	74.2	74.2	90.0	88.0	88.0	34.0	30.0	30.0	39.6	36.0	36.0
Actuated g/C Ratio	0.54	0.52	0.52	0.62	0.61	0.61	0.24	0.21	0.21	0.28	0.25	0.25
v/c Ratio	0.06	0.32	0.14	0.42	0.70	0.08	0.08	0.13	0.59	0.31	0.46	0.59
Control Delay	21.1	39.3	17.9	23.9	37.4	6.4	37.7	47.6	12.1	42.4	50.8	33.0
Queue Delay	0.0	0.0	0.0	0.0	48.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	39.3	17.9	23.9	86.2	6.4	37.7	47.6	12.1	42.4	50.8	33.0
LOS	C	D	B	C	F	A	D	D	B	D	D	C
Approach Delay		35.5			75.4			17.9			41.0	
Approach LOS		D			E			B			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 49 (34%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 54.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 73.2%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 115: Loop 494 & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 118: Royal Forest /Royal Forest & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	576	44	18	1485	18	33	5	8	1	2	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998				0.850		0.870	
Flt Protected	0.950			0.950				0.958				
Satd. Flow (prot)	1770	3539	1583	1770	3532	0	0	1785	1583	0	1621	0
Flt Permitted	0.950			0.950				0.474			0.998	
Satd. Flow (perm)	1770	3539	1583	1770	3532	0	0	883	1583	0	1617	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			68		2				114		112	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		523			284			392			750	
Travel Time (s)		8.9			4.8			8.9			17.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%
Adj. Flow (vph)	176	733	56	23	1889	23	42	6	10	1	3	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	733	56	23	1912	0	0	48	10	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		



Alternative O: Widening Northpark + Northpark Grade Separation  
 118: Royal Forest /Royal Forest & Kingwood Dr.

AM Peak Hour

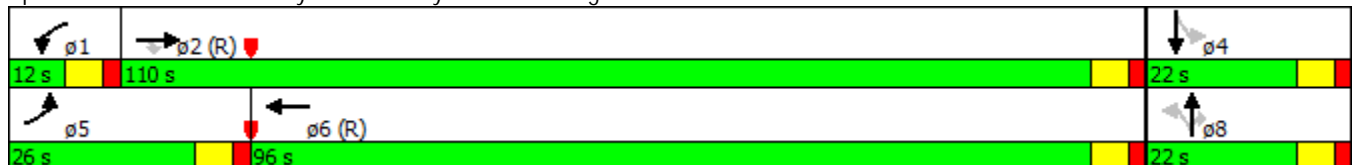


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	22.0	22.0	10.0	22.0		22.0	22.0	22.0	22.0	22.0	
Total Split (s)	26.0	110.0	110.0	12.0	96.0		22.0	22.0	22.0	22.0	22.0	
Total Split (%)	18.1%	76.4%	76.4%	8.3%	66.7%		15.3%	15.3%	15.3%	15.3%	15.3%	
Maximum Green (s)	20.0	104.0	104.0	6.0	90.0		16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0		6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	Max	Max	
Walk Time (s)		5.0	5.0		5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0	11.0		11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effect Green (s)	18.0	108.8	108.8	5.9	92.0		16.0	16.0	16.0		16.0	
Actuated g/C Ratio	0.12	0.76	0.76	0.04	0.64		0.11	0.11	0.11		0.11	
v/c Ratio	0.80	0.27	0.05	0.32	0.85		0.49	0.04	0.04		0.42	
Control Delay	69.1	13.1	5.9	82.8	40.4		78.0	0.2	0.2		15.6	
Queue Delay	0.0	0.2	0.0	0.0	13.6		10.8	0.0	0.0		1.7	
Total Delay	69.1	13.3	5.9	82.8	54.1		88.9	0.2	0.2		17.3	
LOS	E	B	A	F	D		F	A	A		B	
Approach Delay		23.1			54.4		73.6				17.3	
Approach LOS		C			D		E				B	

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 100 (69%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 43.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 81.8%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 118: Royal Forest /Royal Forest & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 121: US 59 SBFR

AM Peak Hour



Lane Group	NBT	NBR	SBU	SBL	SBT	NWL	NWR
Lane Configurations			↻		↑↑↑↑		
Volume (vph)	0	0	104	0	918	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.81	1.00	1.00
Frt							
Flt Protected			0.950				
Satd. Flow (prot)	0	0	1770	0	7544	0	0
Flt Permitted			0.950				
Satd. Flow (perm)	0	0	1770	0	7544	0	0
Right Turn on Red		Yes		Yes		Yes	Yes
Satd. Flow (RTOR)							
Link Speed (mph)	55				55	30	
Link Distance (ft)	202				6181	296	
Travel Time (s)	2.5				76.6	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	128	0	1128	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	128	0	1128	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Turn Type			Perm		NA		
Protected Phases					6		
Permitted Phases			6				
Minimum Split (s)			22.0		22.0		
Total Split (s)			22.0		22.0		
Total Split (%)			100.0%		100.0%		
Maximum Green (s)			16.0		16.0		
Yellow Time (s)			4.0		4.0		
All-Red Time (s)			2.0		2.0		
Lost Time Adjust (s)			0.0		0.0		
Total Lost Time (s)			6.0		6.0		
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)			5.0		5.0		
Flash Dont Walk (s)			11.0		11.0		
Pedestrian Calls (#/hr)			0		0		
Act Effect Green (s)			22.0		22.0		
Actuated g/C Ratio			1.00		1.00		
v/c Ratio			0.07		0.15		
Control Delay			0.1		0.0		
Queue Delay			0.0		0.0		
Total Delay			0.1		0.0		

Alternative O: Widening Northpark + Northpark Grade Separation  
 121: US 59 SBFR

AM Peak Hour



Lane Group	NBT	NBR	SBU	SBL	SBT	NWL	NWR
LOS			A		A		
Approach Delay					0.0		
Approach LOS					A		

Intersection Summary

Area Type:	Other
Cycle Length:	22
Actuated Cycle Length:	22
Offset:	0 (0%), Referenced to phase 2: and 6:SBTU, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.15
Intersection Signal Delay:	0.0
Intersection LOS:	A
Intersection Capacity Utilization	46.0%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 121: US 59 SBFR



Alternative O: Widening Northpark + Northpark Grade Separation  
 122: US 59 NBFR

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	104	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	5085	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	5085	0	0
Right Turn on Red	Yes	Yes				Yes
Satd. Flow (RTOR)	1091					
Link Speed (mph)	30			55	55	
Link Distance (ft)	296			199	6172	
Travel Time (s)	6.7			2.5	76.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	128	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	NA					
Protected Phases	4			2		
Permitted Phases						
Minimum Split (s)	22.0			22.0		
Total Split (s)	22.0			22.0		
Total Split (%)	50.0%			50.0%		
Maximum Green (s)	16.0			16.0		
Yellow Time (s)	4.0			4.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	0.0			0.0		
Total Lost Time (s)	6.0			6.0		
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	5.0			5.0		
Flash Dont Walk (s)	11.0			11.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	16.0					
Actuated g/C Ratio	0.36					
v/c Ratio	0.10					
Control Delay	0.1					
Queue Delay	0.0					
Total Delay	0.1					

Alternative O: Widening Northpark + Northpark Grade Separation  
 122: US 59 NBFR

AM Peak Hour

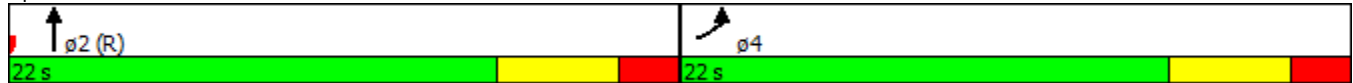


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A					
Approach Delay	0.1					
Approach LOS	A					

Intersection Summary

Area Type:	Other
Cycle Length:	44
Actuated Cycle Length:	44
Offset:	0 (0%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.10
Intersection Signal Delay:	0.1
Intersection LOS:	A
Intersection Capacity Utilization	19.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 122: US 59 NBFR



Alternative O: Widening Northpark + Northpark Grade Separation  
 123: US 59 SBFR

AM Peak Hour



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑↑	↘	
Volume (vph)	0	0	0	1888	317	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	5085	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	5085	1770	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	30	
Link Distance (ft)	6715			184	304	
Travel Time (s)	83.2			2.3	6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	2319	389	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2319	389	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type				NA	NA	
Protected Phases				6	8	
Permitted Phases						
Minimum Split (s)				22.0	22.0	
Total Split (s)				22.0	22.0	
Total Split (%)				50.0%	50.0%	
Maximum Green (s)				16.0	16.0	
Yellow Time (s)				4.0	4.0	
All-Red Time (s)				2.0	2.0	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)				5.0	5.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effect Green (s)				16.0	16.0	
Actuated g/C Ratio				0.36	0.36	
v/c Ratio				1.25	0.60	
Control Delay				137.8	16.3	
Queue Delay				0.9	0.0	
Total Delay				138.7	16.3	

Alternative O: Widening Northpark + Northpark Grade Separation  
 123: US 59 SBFR

AM Peak Hour

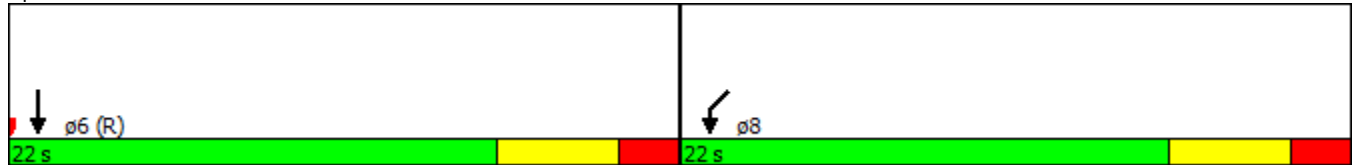


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
LOS				F	B	
Approach Delay				138.7	16.3	
Approach LOS				F	B	

Intersection Summary

Area Type:	Other
Cycle Length:	44
Actuated Cycle Length:	44
Offset:	0 (0%), Referenced to phase 2: and 6:SBT, Start of Green
Natural Cycle:	60
Control Type:	Pretimed
Maximum v/c Ratio:	1.25
Intersection Signal Delay:	121.1
Intersection Capacity Utilization	62.2%
Analysis Period (min)	15
Intersection LOS:	F
ICU Level of Service	B

Splits and Phases: 123: US 59 SBFR



Alternative O: Widening Northpark + Northpark Grade Separation  
 124: US 59 NBFR

AM Peak Hour



Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations	<b>A</b>		<b>B</b>				
Volume (vph)	317	0	1002	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.76	1.00	1.00	1.00	1.00
Frt							
Flt Protected	0.950						
Satd. Flow (prot)	1770	0	8494	0	0	0	0
Flt Permitted	0.950						
Satd. Flow (perm)	1770	0	8494	0	0	0	0
Right Turn on Red		Yes			Yes	Yes	Yes
Satd. Flow (RTOR)							
Link Speed (mph)			55	55		30	
Link Distance (ft)			423	180		304	
Travel Time (s)			5.2	2.2		6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	389	0	1231	0	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	389	0	1231	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(ft)			12	12		0	
Link Offset(ft)			0	0		0	
Crosswalk Width(ft)			16	16		16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15			9	15	9
Turn Type	Perm		NA				
Protected Phases			2				
Permitted Phases	2						
Minimum Split (s)	22.0		22.0				
Total Split (s)	22.0		22.0				
Total Split (%)	100.0%		100.0%				
Maximum Green (s)	16.0		16.0				
Yellow Time (s)	4.0		4.0				
All-Red Time (s)	2.0		2.0				
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		6.0				
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)	5.0		5.0				
Flash Dont Walk (s)	11.0		11.0				
Pedestrian Calls (#/hr)	0		0				
Act Effect Green (s)	22.0		22.0				
Actuated g/C Ratio	1.00		1.00				
v/c Ratio	0.22		0.14				
Control Delay	0.3		0.0				
Queue Delay	0.0		0.0				
Total Delay	0.3		0.0				





Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
LOS	A		A				
Approach Delay			0.1				
Approach LOS			A				

**Intersection Summary**

Area Type:	Other
Cycle Length:	22
Actuated Cycle Length:	22
Offset:	0 (0%), Referenced to phase 2:NBTU and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.22
Intersection Signal Delay:	0.1
Intersection LOS:	A
Intersection Capacity Utilization	62.2%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 124: US 59 NBFR





Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	2	15
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 125: Chestnut Ridge Dr. & Kingwood Dr.

AM Peak Hour

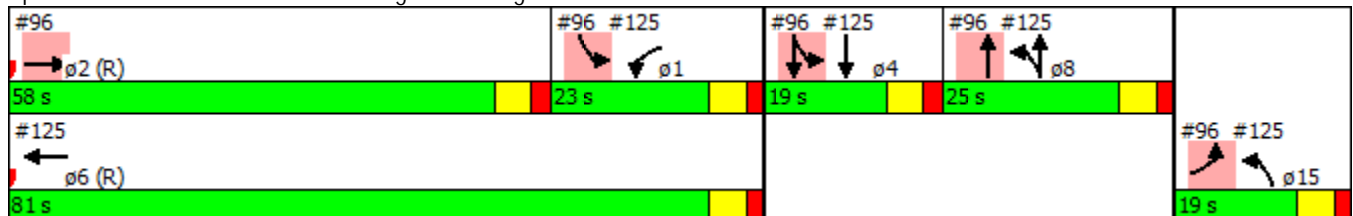


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				1	6		15	8				4
Switch Phase												
Minimum Initial (s)				5.0	4.0			5.0				5.0
Minimum Split (s)				11.0	10.0			19.0				11.0
Total Split (s)				23.0	81.0			25.0				19.0
Total Split (%)				16.0%	56.3%			17.4%				13.2%
Maximum Green (s)				17.0	75.0			19.0				13.0
Yellow Time (s)				4.0	4.0			4.0				4.0
All-Red Time (s)				2.0	2.0			2.0				2.0
Lost Time Adjust (s)				0.0	0.0			0.0				0.0
Total Lost Time (s)				6.0	6.0			6.0				6.0
Lead/Lag				Lag				Lag				Lead
Lead-Lag Optimize?				Yes				Yes				Yes
Vehicle Extension (s)				3.0	3.0			3.0				3.0
Recall Mode				None	C-Max			None				None
Walk Time (s)								6.0				
Flash Dont Walk (s)								7.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)				17.0	79.8			35.6				10.5
Actuated g/C Ratio				0.12	0.55			0.25				0.07
v/c Ratio				0.55	0.81			0.21				0.79
Control Delay				51.7	16.9			7.1				53.2
Queue Delay				0.0	0.0			0.0				0.0
Total Delay				51.7	16.9			7.1				53.2
LOS				D	B			A				D
Approach Delay					19.2			7.1				53.2
Approach LOS					B			A				D

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	20 (14%), Referenced to phase 2:EBT and 6:, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	21.5
Intersection LOS:	C
Intersection Capacity Utilization	69.6%
ICU Level of Service	C
Analysis Period (min)	15

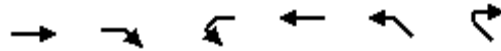
Splits and Phases: 125: Chestnut Ridge Dr. & Kingwood Dr.



Lane Group	ø2	ø15
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	5.0
Minimum Split (s)	20.0	11.0
Total Split (s)	58.0	19.0
Total Split (%)	40%	13%
Maximum Green (s)	52.0	13.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	None
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
<b>Intersection Summary</b>		

Alternative O: Widening Northpark + Northpark Grade Separation  
 126: Kingwood Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑			↑↑		
Volume (vph)	832	0	0	1842	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	0
Link Speed (mph)	40			40	40	
Link Distance (ft)	1032			502	532	
Travel Time (s)	17.6			8.6	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	1022	0	0	2262	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1022	0	0	2262	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.9%
Analysis Period (min)	15
	ICU Level of Service B

Alternative O: Widening Northpark + Northpark Grade Separation  
 128: Green Oak Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	72	1201	413	79	75	0	0	112	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		150	0		0	0		0
Storage Lanes	0		0	1		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt						0.850					0.959	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	3539	1583	1770	1863	0	0	3394	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	3539	1583	1770	1863	0	0	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						261						29
Link Speed (mph)		40			40			30				30
Link Distance (ft)		558			1500			89				282
Travel Time (s)		9.5			25.6			2.0				6.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%	117%
Adj. Flow (vph)	0	0	0	92	1527	525	100	95	0	0	142	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	92	1527	525	100	95	0	0	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2				2
Detector Template				Left	Thru	Right	Left	Thru				Thru
Leading Detector (ft)				20	100	20	20	100				100
Trailing Detector (ft)				0	0	0	0	0				0
Detector 1 Position(ft)				0	0	0	0	0				0
Detector 1 Size(ft)				20	6	20	20	6				6
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type				Prot	NA	Perm	Prot	NA				NA
Protected Phases				1	6		15	8				4
Permitted Phases							6					

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	2	15
Permitted Phases		



Alternative O: Widening Northpark + Northpark Grade Separation  
 128: Green Oak Dr. & Kingwood Dr.

AM Peak Hour

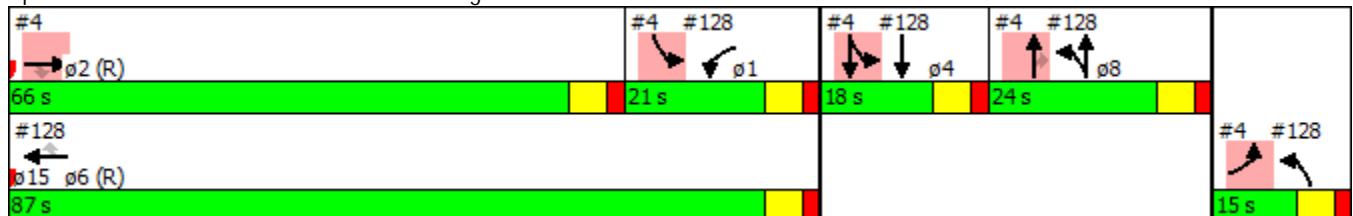


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				1	6	6	15	8				4
Switch Phase												
Minimum Initial (s)				5.0	4.0	4.0		5.0				5.0
Minimum Split (s)				11.0	10.0	10.0		19.0				11.0
Total Split (s)				21.0	87.0	87.0		24.0				18.0
Total Split (%)				14.6%	60.4%	60.4%		16.7%				12.5%
Maximum Green (s)				15.0	81.0	81.0		18.0				12.0
Yellow Time (s)				4.0	4.0	4.0		4.0				4.0
All-Red Time (s)				2.0	2.0	2.0		2.0				2.0
Lost Time Adjust (s)				0.0	0.0	0.0		0.0				0.0
Total Lost Time (s)				6.0	6.0	6.0		6.0				6.0
Lead/Lag				Lag				Lag				Lead
Lead-Lag Optimize?				Yes				Yes				Yes
Vehicle Extension (s)				3.0	3.0	3.0		3.0				3.0
Recall Mode				None	C-Max	C-Max		None				None
Walk Time (s)								6.0				
Flash Dont Walk (s)								7.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)				15.0	85.7	85.7	29.2	14.8				11.1
Actuated g/C Ratio				0.10	0.60	0.60	0.20	0.10				0.08
v/c Ratio				0.50	0.72	0.50	0.28	0.50				0.68
Control Delay				71.0	24.2	10.1	5.6	44.5				67.1
Queue Delay				1.2	0.0	0.0	0.0	0.0				0.0
Total Delay				72.3	24.2	10.1	5.6	44.5				67.1
LOS				E	C	B	A	D				E
Approach Delay					22.8			24.5				67.1
Approach LOS					C			C				E

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 26.3      Intersection LOS: C  
 Intersection Capacity Utilization 81.5%      ICU Level of Service D  
 Analysis Period (min) 15

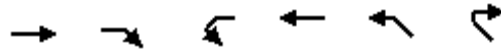
Splits and Phases: 128: Green Oak Dr. & Kingwood Dr.



Lane Group	ø2	ø15
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	5.0
Minimum Split (s)	20.0	11.0
Total Split (s)	66.0	15.0
Total Split (%)	46%	10%
Maximum Green (s)	60.0	9.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	None
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
130: Kingwood Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations		↑↑		↑↑		
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	3278	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	3278	0	3539	0	0
Link Speed (mph)	40			30	40	
Link Distance (ft)	355			392	393	
Travel Time (s)	6.1			8.9	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	40			40	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 132: Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑				
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	3539	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	0	0	0	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		393	799		60	
Travel Time (s)		6.7	13.6		1.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 133: Kingwood Dr.

AM Peak Hour



Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations		↑↑				↑↑
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	0	3278	0	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	3278	0	0	0	3539
Link Speed (mph)	40		30			40
Link Distance (ft)	902		887			1898
Travel Time (s)	15.4		20.2			32.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15



Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphp)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	2	15
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 136: Lake Kingwood Trail & Kingwood Dr.

AM Peak Hour

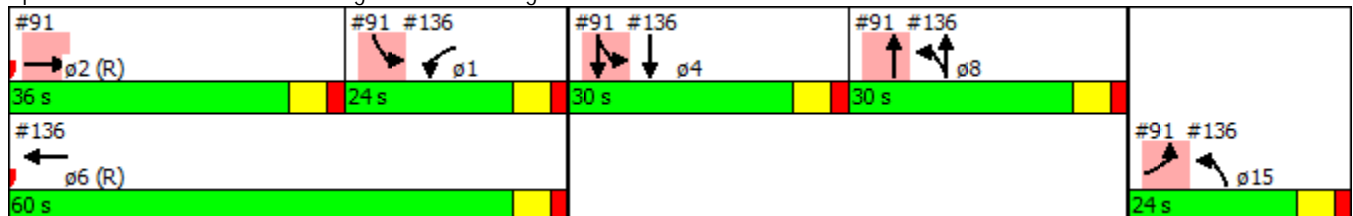


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				1	6		15	8				4
Switch Phase												
Minimum Initial (s)				5.0	4.0			5.0				5.0
Minimum Split (s)				11.0	10.0			19.0				11.0
Total Split (s)				24.0	60.0			30.0				30.0
Total Split (%)				16.7%	41.7%			20.8%				20.8%
Maximum Green (s)				18.0	54.0			24.0				24.0
Yellow Time (s)				4.0	4.0			4.0				4.0
All-Red Time (s)				2.0	2.0			2.0				2.0
Lost Time Adjust (s)				0.0	0.0			0.0				0.0
Total Lost Time (s)				6.0	6.0			6.0				6.0
Lead/Lag				Lag				Lag				Lead
Lead-Lag Optimize?				Yes				Yes				Yes
Vehicle Extension (s)				3.0	3.0			3.0				3.0
Recall Mode				None	C-Max			None				None
Walk Time (s)								6.0				
Flash Dont Walk (s)								7.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)				18.0	102.5			13.5				10.0
Actuated g/C Ratio				0.12	0.71			0.09				0.07
v/c Ratio				0.42	0.74			0.18				0.47
Control Delay				64.5	16.9			26.1				67.6
Queue Delay				0.0	0.0			0.2				0.0
Total Delay				64.5	16.9			26.2				67.6
LOS				E	B			C				E
Approach Delay					19.2			26.3				67.6
Approach LOS					B			C				E

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 22.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 66.4%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 136: Lake Kingwood Trail & Kingwood Dr.





Lane Group	ø2	ø15
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	5.0
Minimum Split (s)	20.0	11.0
Total Split (s)	36.0	24.0
Total Split (%)	25%	17%
Maximum Green (s)	30.0	18.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	None
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
 139: Kingwood Dr. & Kingwood High School

AM Peak Hour



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑	↑		↑						↑↑	↑
Volume (vph)	0	94	33	1	73	0	0	0	0	0	1525	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	0		150
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Fr <sub>t</sub>			0.850									0.850
Fl <sub>t</sub> Protected					0.999							
Satd. Flow (prot)	0	3539	1583	0	1861	0	0	0	0	0	3539	1583
Fl <sub>t</sub> Permitted					0.999							
Satd. Flow (perm)	0	3539	1583	0	1861	0	0	0	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113									222
Link Speed (mph)		30			30			40				30
Link Distance (ft)		317			110			202				887
Travel Time (s)		7.2			2.5			3.4				20.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	115	41	1	90	0	0	0	0	0	1873	435
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	115	41	0	91	0	0	0	0	0	1873	435
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA						NA	Perm
Protected Phases		4		15	8							6
Permitted Phases			4									6
Minimum Split (s)		11.0	11.0		11.0						10.0	10.0
Total Split (s)		13.0	13.0		11.0						101.0	101.0
Total Split (%)		9.0%	9.0%		7.6%						69.7%	69.7%
Maximum Green (s)		7.0	7.0		5.0						95.0	95.0
Yellow Time (s)		4.0	4.0		4.0						4.0	4.0
All-Red Time (s)		2.0	2.0		2.0						2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0						6.0	6.0
Lead/Lag		Lead	Lead		Lag							
Lead-Lag Optimize?		Yes	Yes		Yes							
Act Effect Green (s)		7.0	7.0		25.0						95.0	95.0
Actuated g/C Ratio		0.05	0.05		0.17						0.66	0.66
v/c Ratio		0.68	0.22		0.28						0.81	0.39
Control Delay		87.5	2.8		6.8						21.9	6.2
Queue Delay		0.6	0.0		3.4						0.0	0.0
Total Delay		88.1	2.8		10.1						21.9	6.2

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	2	15
Permitted Phases		
Minimum Split (s)	10.0	10.0
Total Split (s)	101.0	20.0
Total Split (%)	70%	14%
Maximum Green (s)	95.0	14.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		

Alternative O: Widening Northpark + Northpark Grade Separation  
 139: Kingwood Dr. & Kingwood High School

AM Peak Hour



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS		F	A		B						C	A
Approach Delay		65.7			10.1						19.0	
Approach LOS		E			B						B	

Intersection Summary

Area Type:	Other
Cycle Length:	145
Actuated Cycle Length:	145
Offset:	0 (0%), Referenced to phase 2:NET and 6:, Start of Green
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	21.5
Intersection LOS:	C
Intersection Capacity Utilization	71.2%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 139: Kingwood Dr. & Kingwood High School

#88 ϕ2 (R)	#88 #139 ϕ4	#139 ϕ8	
101 s	13 s	11 s	
#139 ϕ6 (R)		#88 #139 ϕ15	
101 s		20 s	

Lane Group	ø2	ø15
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 141: Lake Houston Parkway & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	298	331	154	791	135	450	642	60	169	807	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			313			159			114			159
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		513			546			450			568	
Travel Time (s)		8.7			9.3			7.7			9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	189	366	407	189	972	166	553	789	74	208	991	325
Shared Lane Traffic (%)												
Lane Group Flow (vph)	189	366	407	189	972	166	553	789	74	208	991	325
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Minimum Split (s)	10.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0
Total Split (s)	16.0	45.0	45.0	18.0	47.0	47.0	32.0	62.0	62.0	19.0	49.0	49.0
Total Split (%)	11.1%	31.3%	31.3%	12.5%	32.6%	32.6%	22.2%	43.1%	43.1%	13.2%	34.0%	34.0%
Maximum Green (s)	10.0	39.0	39.0	12.0	41.0	41.0	26.0	56.0	56.0	13.0	43.0	43.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	10.0	39.0	39.0	12.0	41.0	41.0	26.0	56.0	56.0	13.0	43.0	43.0
Actuated g/C Ratio	0.07	0.27	0.27	0.08	0.28	0.28	0.18	0.39	0.39	0.09	0.30	0.30
v/c Ratio	0.79	0.38	0.62	0.66	0.97	0.29	0.89	0.57	0.11	0.67	0.94	0.56

Alternative O: Widening Northpark + Northpark Grade Separation  
 141: Lake Houston Parkway & Kingwood Dr.

AM Peak Hour

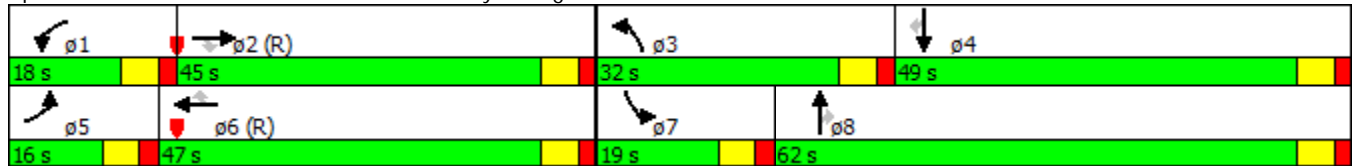


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	89.1	44.1	15.3	76.8	63.6	7.5	75.4	36.6	1.4	75.0	65.5	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.1	44.1	15.3	76.8	63.6	7.5	75.4	36.6	1.4	75.0	65.5	25.0
LOS	F	D	B	E	E	A	E	D	A	E	E	C
Approach Delay		40.8			58.5			49.9			58.2	
Approach LOS		D			E			D			E	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	67 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.97
Intersection Signal Delay:	52.8
Intersection LOS:	D
Intersection Capacity Utilization	89.4%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 141: Lake Houston Parkway & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 144: Forest Garden Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	437	44	10	1006	80	107	44	16	78	30	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.986			0.989			0.985			0.897	
Flt Protected	0.950			0.950				0.969			0.989	
Satd. Flow (prot)	1770	3490	0	1770	3500	0	0	3378	0	0	3140	0
Flt Permitted	0.150			0.429				0.617			0.824	
Satd. Flow (perm)	279	3490	0	799	3500	0	0	2151	0	0	2616	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			21			15			74	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		821			549			426			481	
Travel Time (s)		14.0			9.4			9.7			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	152	537	54	12	1236	98	131	54	20	96	37	294
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	591	0	12	1334	0	0	205	0	0	427	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	22.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	
Total Split (s)	50.0	50.0		50.0	50.0		22.0	22.0		22.0	22.0	
Total Split (%)	69.4%	69.4%		69.4%	69.4%		30.6%	30.6%		30.6%	30.6%	
Maximum Green (s)	44.0	44.0		44.0	44.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	44.0	44.0		44.0	44.0			16.0			16.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.22			0.22	
v/c Ratio	0.89	0.28		0.02	0.62			0.42			0.67	



Alternative O: Widening Northpark + Northpark Grade Separation  
 144: Forest Garden Dr. & Kingwood Dr.

AM Peak Hour

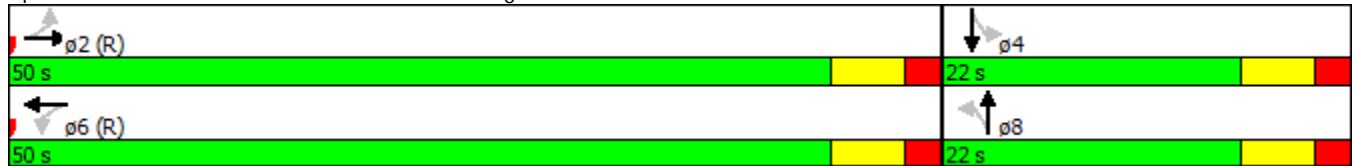


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	84.6	8.8		5.7	10.2			25.3			26.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	84.6	8.8		5.7	10.2			25.3			26.9	
LOS	F	A		A	B			C			C	
Approach Delay		24.3			10.2			25.3			26.9	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	72
Offset:	22 (31%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	80
Control Type:	Pretimed
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	17.8
Intersection LOS:	B
Intersection Capacity Utilization	81.0%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 144: Forest Garden Dr. & Kingwood Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 146: Northpark Dr. & Woodridge Pkwy

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑		↑	↑			↑	↑
Volume (vph)	0	0	0	82	2437	49	122	40	0	0	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997							0.850
Flt Protected					0.998		0.950					
Satd. Flow (prot)	0	0	0	0	5060	0	1770	1863	0	0	1863	1583
Flt Permitted					0.998		0.950					
Satd. Flow (perm)	0	0	0	0	5060	0	1770	1863	0	0	1863	1583
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		2961			325			125			384	
Travel Time (s)		44.9			4.9			2.8			8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	101	2993	60	150	49	0	0	12	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	3154	0	150	49	0	0	12	12
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	102.8%
ICU Level of Service	G
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 147: Timber Shade Dr. & Kingwood Dr.

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	11	994	11	36	38	0	0	16	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95
Frt					0.998						0.875	
Flt Protected				0.950				0.976				
Satd. Flow (prot)	0	0	0	1770	3532	0	0	3454	0	0	3097	0
Flt Permitted				0.950				0.976				
Satd. Flow (perm)	0	0	0	1770	3532	0	0	3454	0	0	3097	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1							99
Link Speed (mph)		40			40			30				30
Link Distance (ft)		839			1628			83				459
Travel Time (s)		14.3			27.8			1.9				10.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	14	1221	14	44	47	0	0	20	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	14	1235	0	0	91	0	0	119	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Prot	NA		Prot	NA				NA
Protected Phases				1	6		15	8				4
Permitted Phases												
Minimum Split (s)				11.0	10.0			19.0				11.0
Total Split (s)				13.0	91.0			20.0				16.0
Total Split (%)				9.0%	63.2%			13.9%				11.1%
Maximum Green (s)				7.0	85.0			14.0				10.0
Yellow Time (s)				4.0	4.0			4.0				4.0
All-Red Time (s)				2.0	2.0			2.0				2.0
Lost Time Adjust (s)				0.0	0.0			0.0				0.0
Total Lost Time (s)				6.0	6.0			6.0				6.0
Lead/Lag				Lag				Lag				Lead
Lead-Lag Optimize?				Yes				Yes				Yes
Walk Time (s)								6.0				
Flash Dont Walk (s)								7.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)				7.0	85.0			31.0				10.0
Actuated g/C Ratio				0.05	0.59			0.22				0.07
v/c Ratio				0.16	0.59			0.12				0.39

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	2	15
Permitted Phases		
Minimum Split (s)	20.0	11.0
Total Split (s)	78.0	17.0
Total Split (%)	54%	12%
Maximum Green (s)	72.0	11.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Alternative O: Widening Northpark + Northpark Grade Separation  
 147: Timber Shade Dr. & Kingwood Dr.

AM Peak Hour

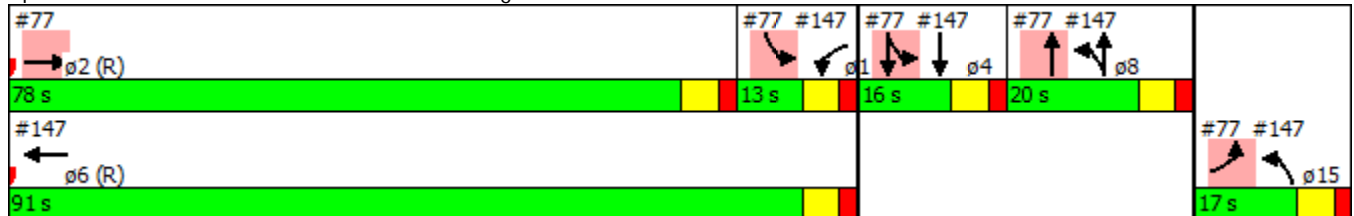


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay				53.3	11.4			4.7			20.7	
Queue Delay				0.0	0.0			0.0			0.0	
Total Delay				53.3	11.4			4.7			20.7	
LOS				D	B			A			C	
Approach Delay					11.9			4.7			20.7	
Approach LOS					B			A			C	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	12 (8%), Referenced to phase 2:EBT and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	12.2
Intersection LOS:	B
Intersection Capacity Utilization	50.4%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 147: Timber Shade Dr. & Kingwood Dr.

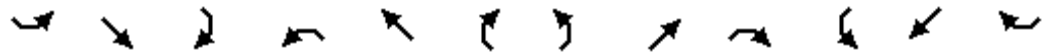


Lane Group	ø2	ø15
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 149: Kingwood Dr. & Willow Terrace

AM Peak Hour



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑		↖	↖					↖	↑↑	
Volume (vph)	0	23	52	424	40	0	0	0	0	32	574	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.896										0.996
Flt Protected				0.950	0.960					0.950		
Satd. Flow (prot)	0	3171	0	1681	1699	0	0	0	0	1770	3525	0
Flt Permitted				0.950	0.960					0.950		
Satd. Flow (perm)	0	3171	0	1681	1699	0	0	0	0	1770	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64										2
Link Speed (mph)		30			30			40				40
Link Distance (ft)		359			105			1388				466
Travel Time (s)		8.2			2.4			23.7				7.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	28	64	521	49	0	0	0	0	39	705	21
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	0	92	0	281	289	0	0	0	0	39	726	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Prot	NA					Prot	NA	
Protected Phases		4		15 8	8					1	6	
Permitted Phases												
Minimum Split (s)		11.0			19.0					11.0	10.0	
Total Split (s)		14.0			46.0					16.0	58.0	
Total Split (%)		9.7%			31.9%					11.1%	40.3%	
Maximum Green (s)		8.0			40.0					10.0	52.0	
Yellow Time (s)		4.0			4.0					4.0	4.0	
All-Red Time (s)		2.0			2.0					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0					0.0	0.0	
Total Lost Time (s)		6.0			6.0					6.0	6.0	
Lead/Lag		Lead			Lag					Lag		
Lead-Lag Optimize?		Yes			Yes					Yes		
Walk Time (s)					6.0							
Flash Dont Walk (s)					7.0							
Pedestrian Calls (#/hr)					0							
Act Effect Green (s)		8.0		66.0	66.0					10.0	52.0	
Actuated g/C Ratio		0.06		0.46	0.46					0.07	0.36	
v/c Ratio		0.39		0.36	0.37					0.32	0.57	

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	2	15
Permitted Phases		
Minimum Split (s)	20.0	11.0
Total Split (s)	42.0	26.0
Total Split (%)	29%	18%
Maximum Green (s)	36.0	20.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		



Alternative O: Widening Northpark + Northpark Grade Separation  
 149: Kingwood Dr. & Willow Terrace

AM Peak Hour

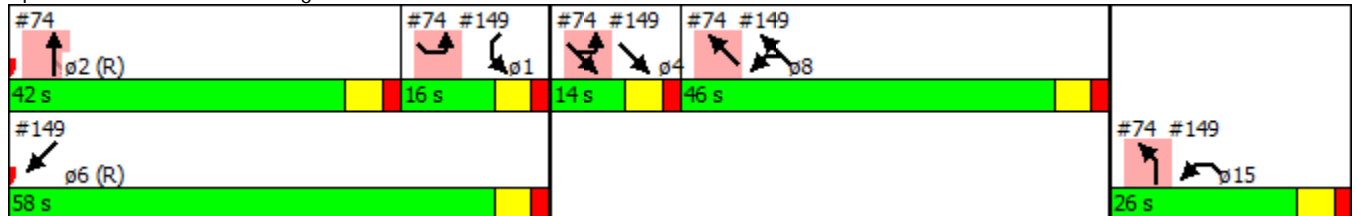


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay		29.5		1.5	1.6					72.6	40.3	
Queue Delay		0.0		1.0	1.0					0.0	0.0	
Total Delay		29.5		2.5	2.6					72.6	40.3	
LOS		C		A	A					E	D	
Approach Delay		29.5			2.5						42.0	
Approach LOS		C			A						D	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	12 (8%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	25.4
Intersection LOS:	C
Intersection Capacity Utilization	49.7%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 149: Kingwood Dr. & Willow Terrace



Lane Group	ø2	ø15
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 151: Kingwood Dr. & High Valley

AM Peak Hour

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	2	15
Permitted Phases		
Minimum Split (s)	20.0	11.0
Total Split (s)	67.0	16.0
Total Split (%)	47%	11%
Maximum Green (s)	61.0	10.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effect Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		

Alternative O: Widening Northpark + Northpark Grade Separation  
 151: Kingwood Dr. & High Valley

AM Peak Hour

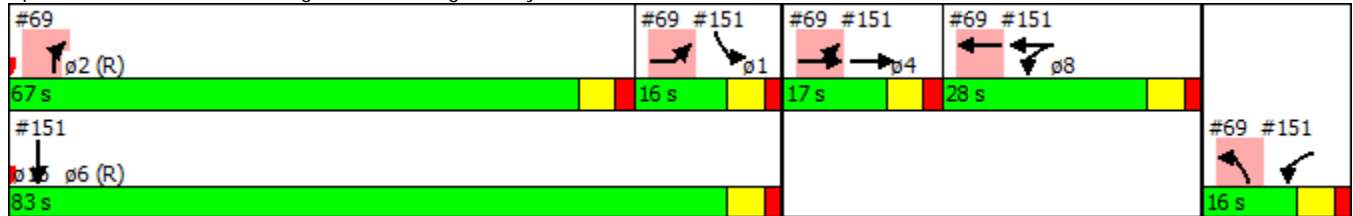


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		D		A	A							C
Approach Delay		47.2			7.5							26.0
Approach LOS		D			A							C

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	90 (63%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	Err
Intersection Signal Delay:	24.7
Intersection LOS:	C
Intersection Capacity Utilization Err%	
ICU Level of Service	H
Analysis Period (min)	15

Splits and Phases: 151: Kingwood Dr. & High Valley



Lane Group	ø2	ø15
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 157: US 59 NBFR

AM Peak Hour



Lane Group	NBU	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	<b>A</b>	<b>B</b>					
Volume (vph)	233	705	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.76	1.00	1.00	1.00	1.00	1.00
Frt							
Flt Protected	0.950						
Satd. Flow (prot)	1770	8494	0	0	0	0	0
Flt Permitted	0.950						
Satd. Flow (perm)	1770	8494	0	0	0	0	0
Link Speed (mph)		55			30	55	
Link Distance (ft)		6172			362	365	
Travel Time (s)		76.5			8.2	4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	286	866	0	0	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	286	866	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	0	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Sign Control		Free			Stop	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.0%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 159: Russel Palmer & Northpark Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2	ø4
Lane Configurations								
Volume (vph)	0	0	77	2424	126	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		0	150		0	0		
Storage Lanes		0	1		1	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	0.91	1.00	1.00		
Fr <sub>t</sub>								
Fl <sub>t</sub> Protected			0.950		0.950			
Satd. Flow (prot)	0	0	1770	5085	1770	0		
Fl <sub>t</sub> Permitted			0.950		0.950			
Satd. Flow (perm)	0	0	1770	5085	1770	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)								
Link Speed (mph)	45			45	30			
Link Distance (ft)	128			2961	106			
Travel Time (s)	1.9			44.9	2.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Growth Factor	113%	113%	113%	113%	113%	113%		
Adj. Flow (vph)	0	0	95	2977	155	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	95	2977	155	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	12			12	12			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)		9	15		15	9		
Number of Detectors			1	2	1			
Detector Template			Left	Thru	Left			
Leading Detector (ft)			20	100	20			
Trailing Detector (ft)			0	0	0			
Detector 1 Position(ft)			0	0	0			
Detector 1 Size(ft)			20	6	20			
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)			0.0	0.0	0.0			
Detector 1 Queue (s)			0.0	0.0	0.0			
Detector 1 Delay (s)			0.0	0.0	0.0			
Detector 2 Position(ft)				94				
Detector 2 Size(ft)				6				
Detector 2 Type				Cl+Ex				
Detector 2 Channel								
Detector 2 Extend (s)				0.0				
Turn Type			custom	NA	NA			
Protected Phases				6	8		2	4
Permitted Phases			1					



Alternative O: Widening Northpark + Northpark Grade Separation  
 159: Russel Palmer & Northpark Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2	ø4
Detector Phase			1	6	8			
Switch Phase								
Minimum Initial (s)			5.0	15.0	5.0		15.0	5.0
Minimum Split (s)			11.3	21.3	11.6		21.3	11.3
Total Split (s)			21.0	116.0	28.0		95.0	28.0
Total Split (%)			14.6%	80.6%	19.4%		66%	19%
Maximum Green (s)			15.0	110.0	22.0		89.0	22.0
Yellow Time (s)			4.0	4.0	4.0		4.0	4.0
All-Red Time (s)			2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)			0.0	0.0	0.0			
Total Lost Time (s)			6.0	6.0	6.0			
Lead/Lag			Lead				Lag	
Lead-Lag Optimize?			Yes				Yes	
Vehicle Extension (s)			3.0	3.0	3.0		3.0	3.0
Recall Mode			None	C-Max	Max		C-Max	None
Act Effect Green (s)			12.4	110.0	22.0			
Actuated g/C Ratio			0.09	0.76	0.15			
v/c Ratio			0.62	0.77	0.57			
Control Delay			80.9	11.4	9.7			
Queue Delay			125.2	0.0	0.2			
Total Delay			206.1	11.4	9.9			
LOS			F	B	A			
Approach Delay				17.4	9.9			
Approach LOS				B	A			

Intersection Summary

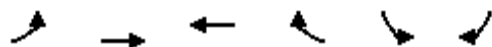
Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 17.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 70.8%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 159: Russel Palmer & Northpark Dr.



Alternative O: Widening Northpark + Northpark Grade Separation  
 161: Northpark Dr.

AM Peak Hour



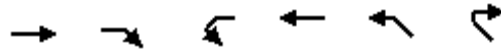
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑				
Volume (vph)	41	986	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00
Frt						
Flt Protected		0.998				
Satd. Flow (prot)	0	5075	0	0	0	0
Flt Permitted		0.998				
Satd. Flow (perm)	0	5075	0	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		2834	117		111	
Travel Time (s)		42.9	1.8		2.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	50	1211	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1261	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.4%
Analysis Period (min)	15
	ICU Level of Service C

Alternative O: Widening Northpark + Northpark Grade Separation  
 162: Northpark Dr.

AM Peak Hour



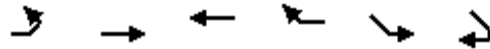
Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑↑	↑	
Volume (vph)	0	0	0	1891	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	5085	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	5085	1770	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	2834			128	111	
Travel Time (s)	42.9			1.9	2.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	2323	50	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2323	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Yield	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 163: Northpark Dr.

AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑↑	↑↑↑			
Volume (vph)	0	993	2522	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	5085	5085	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5085	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		1422	944		1100	
Travel Time (s)		21.5	14.3		25.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	1220	3098	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1220	3098	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.4%
Analysis Period (min)	15
	ICU Level of Service B

Alternative O: Widening Northpark + Northpark Grade Separation  
 164: Northpark Dr.

AM Peak Hour



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations			↑↑			↑↑
Volume (vph)	0	0	360	0	0	561
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	3539	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3539	0	0	3539
Link Speed (mph)	40		40			40
Link Distance (ft)	609		2651			576
Travel Time (s)	10.4		45.2			9.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	442	0	0	689
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	442	0	0	689
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Free			Free

Intersection Summary

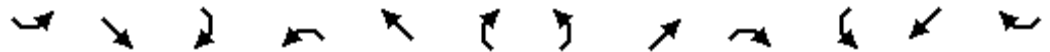
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.9%
Analysis Period (min)	15
	ICU Level of Service A



Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		
Turn Type		
Protected Phases	1	6
Permitted Phases		

Alternative O: Widening Northpark + Northpark Grade Separation  
 165: Northpark Dr. & Rock Springs

AM Peak Hour

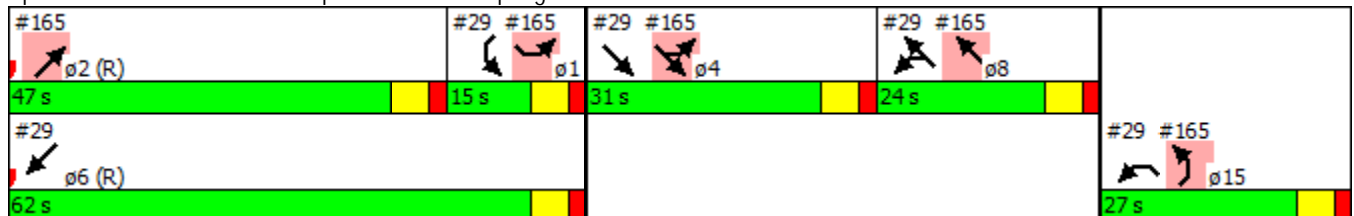


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	1 4	4			8		15	2				
Switch Phase												
Minimum Initial (s)		5.0			5.0		5.0	4.0				
Minimum Split (s)		22.0			21.0		11.0	18.0				
Total Split (s)		31.0			24.0		27.0	47.0				
Total Split (%)		21.5%			16.7%		18.8%	32.6%				
Maximum Green (s)		25.0			18.0		21.0	41.0				
Yellow Time (s)		4.0			4.0		4.0	4.0				
All-Red Time (s)		2.0			2.0		2.0	2.0				
Lost Time Adjust (s)		0.0			0.0		0.0	0.0				
Total Lost Time (s)		6.0			6.0		6.0	6.0				
Lead/Lag		Lead			Lag			Lead				
Lead-Lag Optimize?		Yes			Yes			Yes				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Recall Mode		None			Max		Max	C-Max				
Walk Time (s)		5.0			5.0			5.0				
Flash Dont Walk (s)		11.0			10.0			7.0				
Pedestrian Calls (#/hr)		0			0			0				
Act Effct Green (s)	24.9	9.9			33.1		21.0	41.0				
Actuated g/C Ratio	0.17	0.07			0.23		0.15	0.28				
v/c Ratio	0.18	0.13			0.17		0.36	0.35				
Control Delay	35.5	42.7			42.5		60.0	40.9				
Queue Delay	0.3	0.0			0.0		0.0	0.0				
Total Delay	35.8	42.7			42.5		60.0	40.9				
LOS	D	D			D		E	D				
Approach Delay		38.3			42.5			44.9				
Approach LOS		D			D			D				

Intersection Summary

Area Type: Other  
 Cycle Length: 144  
 Actuated Cycle Length: 144  
 Offset: 114 (79%), Referenced to phase 2:NET and 6:, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 43.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 47.3%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 165: Northpark Dr. & Rock Springs





Lane Group	ø1	ø6
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	4.0
Minimum Split (s)	11.0	18.0
Total Split (s)	15.0	62.0
Total Split (%)	10%	43%
Maximum Green (s)	9.0	56.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	Max	C-Max
Walk Time (s)		5.0
Flash Dont Walk (s)		7.0
Pedestrian Calls (#/hr)		0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Alternative O: Widening Northpark + Northpark Grade Separation  
 167: Northpark Dr. & Mills Branch

AM Peak Hour



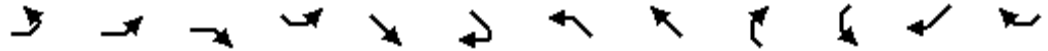
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	3	146	0	0	434	22	115	43	136	0	0	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.988			0.888				
Flt Protected		0.999					0.950					
Satd. Flow (prot)	0	1861	0	0	1840	0	1770	3143	0	0	0	0
Flt Permitted		0.999					0.950					
Satd. Flow (perm)	0	1861	0	0	1840	0	1770	3143	0	0	0	0
Link Speed (mph)		30			30			40				30
Link Distance (ft)		163			1511			1786				359
Travel Time (s)		3.7			34.3			30.4				8.2
Peak Hour Factor	0.75	0.78	0.92	0.92	0.92	0.50	0.72	0.83	0.89	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	5	212	0	0	533	50	180	59	173	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	0	0	583	0	180	232	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Stop			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.2%
ICU Level of Service	A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 168: Lake Houston Parkway & Kings Crossing

AM Peak Hour



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations		<del>RT</del>						<del>LT</del>			<del>RT</del>	
Volume (vph)	57	28	0	0	0	0	11	1070	155	0	290	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.97	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.88	1.00
Frt								0.981			0.850	
Flt Protected		0.950										
Satd. Flow (prot)	0	3433	0	0	0	0	0	3472	0	0	2787	0
Flt Permitted		0.950										
Satd. Flow (perm)	0	3433	0	0	0	0	0	3472	0	0	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								17			157	
Link Speed (mph)		30			40			40		30		
Link Distance (ft)		148			829			954		813		
Travel Time (s)		3.4			14.1			16.3		18.5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	70	34	0	0	0	0	14	1314	190	0	356	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	0	0	0	1518	0	0	397	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24			0			0		0		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Turn Type	Prot	NA					Prot	NA			custom	
Protected Phases	1 4	4					15	2			8	
Permitted Phases												
Minimum Split (s)		22.0					11.0	17.0			22.0	
Total Split (s)		22.0					11.0	80.0			22.0	
Total Split (%)		15.1%					7.5%	54.8%			15.1%	
Maximum Green (s)		16.0					5.0	74.0			16.0	
Yellow Time (s)		4.0					4.0	4.0			4.0	
All-Red Time (s)		2.0					2.0	2.0			2.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		6.0						6.0			6.0	
Lead/Lag		Lead						Lead			Lag	
Lead-Lag Optimize?		Yes						Yes			Yes	
Walk Time (s)		5.0						4.0			4.0	
Flash Dont Walk (s)		11.0						7.0			12.0	
Pedestrian Calls (#/hr)		0						0			0	
Act Effct Green (s)		27.0						79.0			16.0	
Actuated g/C Ratio		0.18						0.54			0.11	
v/c Ratio		0.16						2.68dr			0.89	
Control Delay		46.4						282.5			61.2	
Queue Delay		3.9						0.3			30.2	
Total Delay		50.3						282.7			91.4	

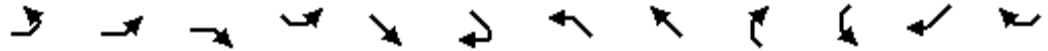
Alternative O: Widening Northpark + Northpark Grade Separation  
 168: Lake Houston Parkway & Kings Crossing

AM Peak Hour

Lane Group	ø1	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	1	6
Permitted Phases		
Minimum Split (s)	11.0	17.0
Total Split (s)	11.0	91.0
Total Split (%)	8%	62%
Maximum Green (s)	5.0	85.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Walk Time (s)		4.0
Flash Dont Walk (s)		7.0
Pedestrian Calls (#/hr)		0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		

Alternative O: Widening Northpark + Northpark Grade Separation  
 168: Lake Houston Parkway & Kings Crossing

AM Peak Hour

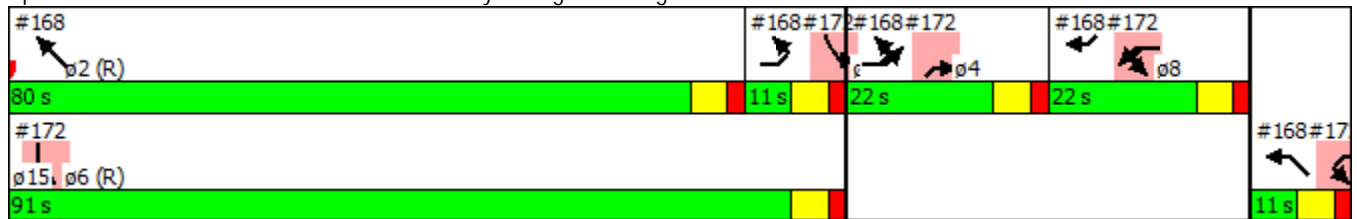


Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
LOS		D						F				F
Approach Delay		50.3						282.7				
Approach LOS		D						F				

Intersection Summary

Area Type:	Other
Cycle Length:	146
Actuated Cycle Length:	146
Offset:	48 (33%), Referenced to phase 2:NWT and 6:, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.56
Intersection Signal Delay:	233.1
Intersection LOS:	F
Intersection Capacity Utilization	62.1%
ICU Level of Service	B
Analysis Period (min)	15
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 168: Lake Houston Parkway & Kings Crossing



Lane Group	ø1	ø6
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 171: Lake Houston Parkway

AM Peak Hour



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations		↑↑				↑↑
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88
Frt						
Flt Protected						
Satd. Flow (prot)	0	3539	0	0	0	3278
Flt Permitted						
Satd. Flow (perm)	0	3539	0	0	0	3278
Link Speed (mph)		40	40		40	
Link Distance (ft)		568	1308		1315	
Travel Time (s)		9.7	22.3		22.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 172: Kings Crossing & Lake Houston Parkway

AM Peak Hour



Lane Group	WBL2	WBL	WBR	SBL2	SBL	SBR	NWL	NWR	NEL	NER	NER2	ø2
Lane Configurations		<del>57</del>			<del>57</del>					<del>76</del>		
Volume (vph)	284	31	0	27	1080	18	0	0	0	59	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	0.97	1.00	0.95	0.97	0.95	1.00	1.00	1.00	0.88	1.00	
Frt					0.998					0.850		
Flt Protected		0.950			0.953							
Satd. Flow (prot)	0	3433	0	0	3437	0	0	0	0	2787	0	
Flt Permitted		0.950			0.953							
Satd. Flow (perm)	0	3433	0	0	3437	0	0	0	0	2787	0	
Right Turn on Red			Yes			Yes					Yes	
Satd. Flow (RTOR)					112					157		
Link Speed (mph)		30			40		40		30			
Link Distance (ft)		148			871		719		472			
Travel Time (s)		3.4			14.8		12.3		10.7			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	
Adj. Flow (vph)	349	38	0	33	1327	22	0	0	0	72	5	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	0	0	1382	0	0	0	0	77	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Right	Right	
Median Width(ft)		24			24		0		0			
Link Offset(ft)		0			0		0		0			
Crosswalk Width(ft)		16			16		16		16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	15	9	15	15	9	15	9	15	9	9	
Turn Type	Prot	NA		Prot	NA					custom		
Protected Phases	15 8	8		1	6					4	2	
Permitted Phases												
Minimum Split (s)		22.0		11.0	17.0					22.0	17.0	
Total Split (s)		22.0		11.0	91.0					22.0	80.0	
Total Split (%)		15.1%		7.5%	62.3%					15.1%	55%	
Maximum Green (s)		16.0		5.0	85.0					16.0	74.0	
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0					0.0		
Total Lost Time (s)		6.0			6.0					6.0		
Lead/Lag		Lag		Lag						Lead	Lead	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Walk Time (s)		4.0			4.0					5.0	4.0	
Flash Dont Walk (s)		12.0			7.0					11.0	7.0	
Pedestrian Calls (#/hr)		0			0					0	0	
Act Effct Green (s)		27.0			85.0					16.0		
Actuated g/C Ratio		0.18			0.58					0.11		
v/c Ratio		1.07dl			1.30					0.17		
Control Delay		27.4			171.2					0.8		
Queue Delay		38.1			0.3					0.0		
Total Delay		65.5			171.5					0.9		



Lane Group	ø15
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Growth Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	15
Permitted Phases	
Minimum Split (s)	11.0
Total Split (s)	11.0
Total Split (%)	8%
Maximum Green (s)	5.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Alternative O: Widening Northpark + Northpark Grade Separation  
 172: Kings Crossing & Lake Houston Parkway

AM Peak Hour

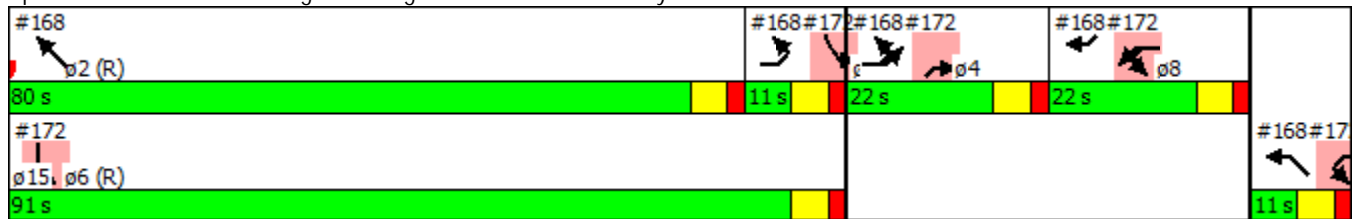


Lane Group	WBL2	WBL	WBR	SBL2	SBL	SBR	NWL	NWR	NEL	NER	NER2	ø2
LOS		E			F						A	
Approach Delay		65.5			171.5							
Approach LOS		E			F							

Intersection Summary

Area Type:	Other
Cycle Length:	146
Actuated Cycle Length:	146
Offset:	48 (33%), Referenced to phase 2:NWT and 6:, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.56
Intersection Signal Delay:	142.2
Intersection LOS:	F
Intersection Capacity Utilization	64.1%
ICU Level of Service	C
Analysis Period (min)	15
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 172: Kings Crossing & Lake Houston Parkway

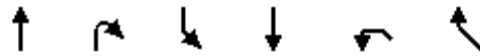


Lane Group	ø15
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

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Alternative O: Widening Northpark + Northpark Grade Separation  
 174: Lake Houston Parkway

AM Peak Hour



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations				↑↑		↑↑
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	3278
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	3278
Link Speed (mph)	40			40	30	
Link Distance (ft)	672			450	712	
Travel Time (s)	11.5			7.7	16.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 175: Lake Houston Parkway & Rustic Woods

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↑	↑↑	
Volume (vph)	0	42	134	113	92	0	0	0	0	15	1093	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.886									0.998	
Flt Protected					0.973					0.950		
Satd. Flow (prot)	0	3136	0	0	3444	0	0	0	0	1770	3532	0
Flt Permitted					0.973					0.950		
Satd. Flow (perm)	0	3136	0	0	3444	0	0	0	0	1770	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		165									1	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		576			82			1315			563	
Travel Time (s)		13.1			1.9			22.4			9.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	52	165	139	113	0	0	0	0	18	1342	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	0	0	252	0	0	0	0	18	1357	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Prot	NA					Prot	NA	
Protected Phases		4		15	8					1	6	
Permitted Phases												
Minimum Split (s)		11.0			19.0					11.0	10.0	
Total Split (s)		17.0			21.0					13.0	84.0	
Total Split (%)		11.8%			14.6%					9.0%	58.3%	
Maximum Green (s)		11.0			15.0					7.0	78.0	
Yellow Time (s)		4.0			4.0					4.0	4.0	
All-Red Time (s)		2.0			2.0					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0					0.0	0.0	
Total Lost Time (s)		6.0			6.0					6.0	6.0	
Lead/Lag		Lead			Lag					Lag		
Lead-Lag Optimize?		Yes			Yes					Yes		
Walk Time (s)					6.0							
Flash Dont Walk (s)					7.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)		11.0			37.0					7.0	78.0	
Actuated g/C Ratio		0.08			0.26					0.05	0.54	
v/c Ratio		0.55			0.29					0.21	0.71	

Lane Group	ø2	ø15
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Growth Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	2	15
Permitted Phases		
Minimum Split (s)	20.0	11.0
Total Split (s)	71.0	22.0
Total Split (%)	49%	15%
Maximum Green (s)	65.0	16.0
Yellow Time (s)	4.0	4.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Walk Time (s)	4.0	
Flash Dont Walk (s)	10.0	
Pedestrian Calls (#/hr)	0	
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Alternative O: Widening Northpark + Northpark Grade Separation  
 175: Lake Houston Parkway & Rustic Woods

AM Peak Hour

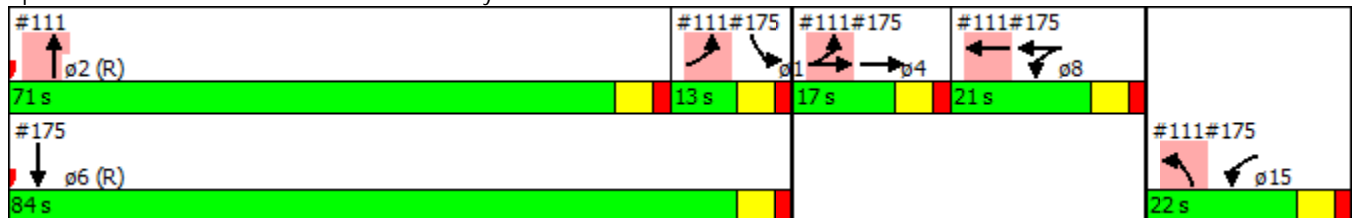


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		23.3			3.5					71.8	27.1	
Queue Delay		0.0			0.0					0.0	0.0	
Total Delay		23.3			3.5					71.8	27.1	
LOS		C			A					E	C	
Approach Delay		23.3			3.5						27.7	
Approach LOS		C			A						C	

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	144
Offset:	90 (63%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	23.9
Intersection LOS:	C
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 175: Lake Houston Parkway & Rustic Woods



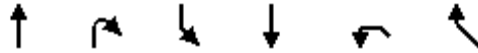
Lane Group	ø2	ø15
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

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Alternative O: Widening Northpark + Northpark Grade Separation  
 178: Lake Houston Parkway

AM Peak Hour



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations			TT			TT
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	0.88
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	3614	0	0	3278
Flt Permitted						
Satd. Flow (perm)	0	0	3614	0	0	3278
Link Speed (mph)	40			40	40	
Link Distance (ft)	216			426	4598	
Travel Time (s)	3.7			7.3	78.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	48			48	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0% ICU Level of Service A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
185: Hamblen

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	121	4	305	217	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected			0.950			
Satd. Flow (prot)	1855	0	1770	1863	1863	0
Flt Permitted			0.950			
Satd. Flow (perm)	1855	0	1770	1863	1863	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	123			358	309	
Travel Time (s)	2.4			7.0	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	149	5	375	267	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	0	375	267	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.2%
ICU Level of Service	A
Analysis Period (min)	15

Alternative O: Widening Northpark + Northpark Grade Separation  
 188: Sorters & Northpark Dr.

AM Peak Hour



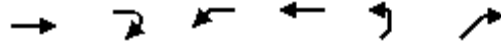
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↑
Volume (vph)	0	0	71	15	0	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			
Flt Protected						
Satd. Flow (prot)	0	0	1820	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	0	1820	0	0	1863
Link Speed (mph)	40		35			30
Link Distance (ft)	1492		3855			70
Travel Time (s)	25.4		75.1			1.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	87	18	0	419
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	105	0	0	419
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.6%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 189: Northpark Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations				↑↑		↑↑
Volume (vph)	0	0	0	213	0	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	40			40	30	
Link Distance (ft)	1488			3907	1492	
Travel Time (s)	25.4			66.6	33.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	262	0	463
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	262	0	463
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.2%
Analysis Period (min)	15
	ICU Level of Service A

Alternative O: Widening Northpark + Northpark Grade Separation  
 190: Kingwood Dr.

AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑		
Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	392			804	60	
Travel Time (s)	6.7			13.7	1.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15		9	
Sign Control	Stop			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A