

Memorandum

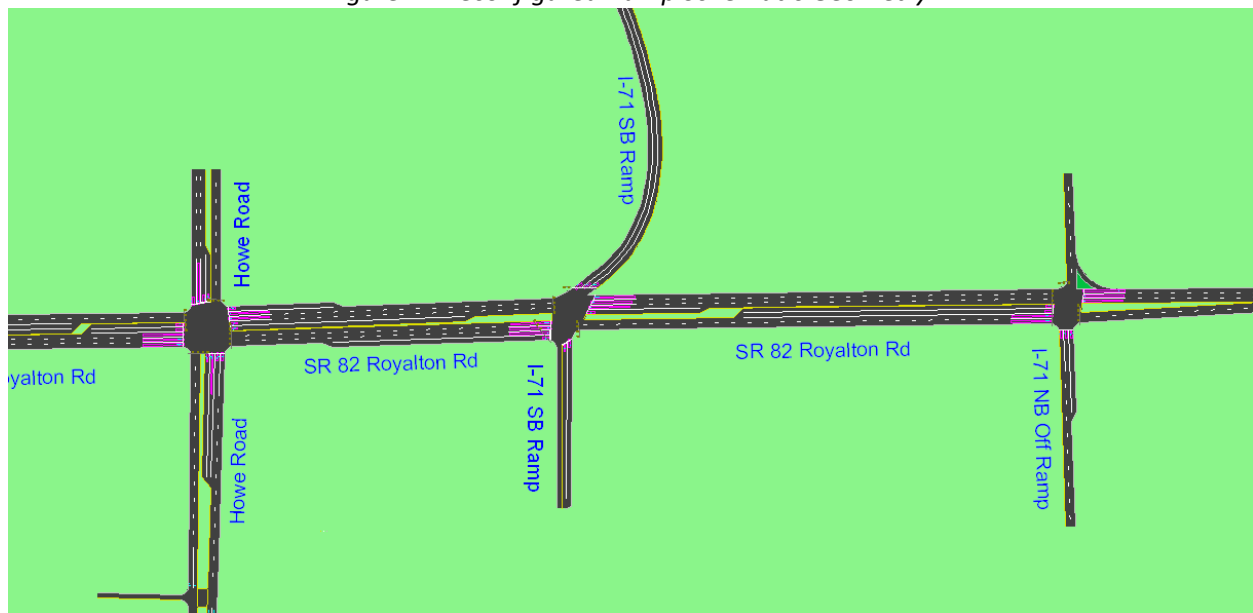
Date: 3/25/2014
Project: CUY-82 Royalton Road System Timing
Subject: Possible Geometric Improvements for Improved Lane Utilization
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Recipients: Brian Blayney, PE, ODOT District 12

The results of the signal timing analysis indicate the revised timing has overall improved travel conditions through the SR 82 (Royalton Road) signal system. As part of the project scope, TEC is required to provide geometric alternatives which could help to alleviate congestion at any intersection for which a LOS D or better was not achieved through the timing project. During typical traffic (non-holiday), this condition occurs during the AM peak hour at the intersection of SR 82 & Howe Road. During the PM peak hour, this condition occurs at the intersection of SR 82 & Howe Road and the intersection of SR 82 & the I-71 SB Ramp.

During the AM and PM peak hours, the greatest problem area is generally though the interchange area and including the intersection at Howe Road. Because both interstate ramps are on the right side of the roadway in the eastbound direction, lane utilization is not optimized. To improve intersection capacity through the critical area, TEC looked at the possibility of adding lanes at the Howe Road intersection, as well as the possibility of modifying the interchange to improve lane utilization. The intersection of SR 82 & Howe Road is quite large and dual lanes are provided for all critical turning movements. Adding lanes to this intersection would have limited practical benefit. Therefore, TEC evaluated the possibility of modifying the interchange so that the ramp from eastbound SR 82 to I-71 northbound were located on the left side of the roadway. This would significantly improve lane utilization in the eastbound direction and improve intersection capacity at both Howe Road and at the I-71 SB Ramp intersection.

Capacity analysis results for the proposed interchange modification are shown in *Table 2* and *Table 3*. A screenshot of the geometry as evaluated in synchro is provided below.

Figure 1: Reconfigured Ramp Schematic Geometry



Memorandum

Table 1: SR 82 & I-71 NB Ramp Peak Hour Comparison Intersection LOS

SR 82 & I-71 NB Ramp	Peak	Eastbound		Westbound		Northbound		Overall Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Existing Optimized	AM	B	10.3	A	7.6	E	57.8	B	18.2
	PM	A	8.3	A	7.8	E	59.5	B	16.1
With Interchange Modification	AM	E	56.1	E	73.8	E	67.4	E	64.4
	PM	C	21.4	C	32.7	E	61.5	C	29.6

Table 2: SR 82 & I-71 SB Ramp Peak Hour Comparison Intersection LOS

SR 82 & I-71 SB Ramp	Peak	Eastbound		Westbound		Northbound		Southbound		Overall Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Existing Optimized	AM	D	38.4	C	29.7	D	51.6	D	52.9	D	40.7
	PM	F	108.3	D	39.6	F	187.3	E	72.5	F	91.7
With Interchange Modification	AM	A	9.5	C	24.4	D	50.2	D	52.9	C	25.7
	PM	C	28.5	D	36.0	F	115.3	D	49.3	D	46.0

Table 3: SR 82 & Howe Road Peak Hour Comparison Intersection LOS

SR 82 & Howe Road	Peak	Eastbound		Westbound		Northbound		Southbound		Overall Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Existing Optimized	AM	F	102.1	C	25.6	F	151.7	E	59.0	F	80.5
	PM	F	209.7	E	61.5	D	44.1	E	71.3	F	102.8
With Interchange Modification	AM	C	29.0	C	33.1	D	49.6	E	59.0	D	36.3
	PM	F	83.8	E	61.5	D	41.7	E	71.3	E	66.2

HCM Signalized Intersection Capacity Analysis

1: I-71 NB Off Ramp

3/25/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↖			↖↖↖		↖↗		↖			
Volume (vph)	1373	662	0	0	846	782	266	0	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4			3.8		4.6		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		1.00			
Frt	1.00	1.00			0.93		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3438			4626		3273		1509			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3438			4626		3273		1509			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.91	0.92	0.67	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	1492	720	0	0	930	850	397	0	149	0	0	0
RTOR Reduction (vph)	0	0	0	0	117	0	0	0	129	0	0	0
Lane Group Flow (vph)	1492	720	0	0	1663	0	397	0	20	0	0	0
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	7%	2%	7%	2%	2%	2%
Turn Type	Prot	NA			NA		Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases									8			
Actuated Green, G (s)	58.5	109.7			47.2		18.5		18.5			
Effective Green, g (s)	58.5	111.1			49.2		19.9		18.5			
Actuated g/C Ratio	0.42	0.79			0.35		0.14		0.13			
Clearance Time (s)	4.0	5.8			5.8		6.0		6.0			
Vehicle Extension (s)	3.0	2.0			2.0		2.5		2.5			
Lane Grp Cap (vph)	1434	2728			1625		465		199			
v/s Ratio Prot	c0.43	0.21			c0.36		c0.12					
v/s Ratio Perm									0.01			
v/c Ratio	1.04	0.26			1.24dr		0.85		0.10			
Uniform Delay, d1	40.8	3.8			45.4		58.6		53.4			
Progression Factor	1.17	1.58			1.00		1.00		1.00			
Incremental Delay, d2	32.5	0.2			28.4		14.0		0.2			
Delay (s)	80.2	6.2			73.8		72.6		53.6			
Level of Service	F	A			E		E		D			
Approach Delay (s)		56.1			73.8			67.4			0.0	
Approach LOS		E			E			E			A	

Intersection Summary

HCM 2000 Control Delay	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: I-71 SB Ramp & SR 82 Royalton Rd

3/25/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations		↑↑↑	↑	↑	↑↑↑				↑↑		↑↑↑
Volume (vph)	0	1717	230	107	739	0	0	0	318	0	908
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.6	6.6	6.6				6.0		6.6
Lane Util. Factor		*0.91	1.00	1.00	0.91				0.88		0.76
Frt		1.00	0.85	1.00	1.00				0.85		0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00		1.00
Satd. Flow (prot)		4940	1538	1703	4893				2656		3441
Flt Permitted		1.00	1.00	0.95	1.00				1.00		1.00
Satd. Flow (perm)		4940	1538	1703	4893				2656		3441
Peak-hour factor, PHF	0.92	0.85	0.77	0.76	0.77	0.92	0.92	0.92	0.89	0.92	0.82
Adj. Flow (vph)	0	2020	299	141	960	0	0	0	357	0	1107
RTOR Reduction (vph)	0	0	60	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2020	239	141	960	0	0	0	357	0	1107
Heavy Vehicles (%)	2%	5%	5%	6%	6%	2%	2%	2%	7%	2%	7%
Turn Type		NA	custom	Prot	NA				custom		custom
Protected Phases		6	7	5	2				4 5		1 4
Permitted Phases		6	6 7		2						1 4
Actuated Green, G (s)		89.3	102.7	17.5	71.1				38.1		55.7
Effective Green, g (s)		89.3	102.7	17.5	71.1				31.5		49.7
Actuated g/C Ratio		0.64	0.73	0.12	0.51				0.22		0.36
Clearance Time (s)		6.6	6.6	6.6	6.6						
Vehicle Extension (s)		5.0	3.0	3.0	5.0						
Lane Grp Cap (vph)		3151	1200	212	2484				597		1221
v/s Ratio Prot		c0.41	0.02	c0.08	0.20				0.13		c0.32
v/s Ratio Perm			0.14								
v/c Ratio		0.64	0.20	0.67	0.39				0.60		0.91
Uniform Delay, d1		15.5	5.8	58.5	21.1				48.6		42.9
Progression Factor		0.61	1.23	0.84	0.96				1.00		1.00
Incremental Delay, d2		0.5	0.1	2.3	0.1				1.6		10.0
Delay (s)		9.9	7.2	51.1	20.5				50.2		52.9
Level of Service		A	A	D	C				D		D
Approach Delay (s)		9.5			24.4		50.2			52.9	
Approach LOS		A			C		D			D	

Intersection Summary

HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Howe Road & SR 82 Royalton Rd

3/25/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕↖↗		↖↗	↕↕	↖	↖	↕	↖↗	↖↗	↕	↖
Volume (vph)	28	1062	59	400	1227	48	116	32	846	39	3	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	5.0	5.0	5.0	5.0	5.0	4.4
Lane Util. Factor	0.97	*0.91		0.97	0.95	1.00	0.95	0.95	*0.88	0.97	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	4858		3433	3438	1583	1665	1742	2814	3433	1881	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	4858		3433	3438	1583	1665	1742	2814	3433	1881	1599
Peak-hour factor, PHF	0.78	0.87	0.36	0.81	0.86	0.80	0.85	0.50	0.92	0.81	0.38	0.46
Adj. Flow (vph)	36	1221	164	494	1427	60	136	64	920	48	8	24
RTOR Reduction (vph)	0	12	0	0	0	22	0	0	0	0	0	21
Lane Group Flow (vph)	36	1373	0	494	1427	38	98	102	920	48	8	3
Heavy Vehicles (%)	1%	5%	4%	2%	5%	2%	3%	1%	1%	2%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pt+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	8	8	8	1	4	5
Permitted Phases						6						4
Actuated Green, G (s)	8.0	62.1		22.0	76.1	84.1	22.1	22.1	50.7	8.0	8.0	16.0
Effective Green, g (s)	10.0	64.1		24.0	78.1	88.1	23.7	23.7	52.3	9.6	9.6	19.2
Actuated g/C Ratio	0.07	0.46		0.17	0.56	0.63	0.17	0.17	0.37	0.07	0.07	0.14
Clearance Time (s)	6.0	6.6		6.0	6.6	6.6	6.6	6.6		6.6	6.6	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	247	2224		588	1917	996	281	294	1051	235	128	269
v/s Ratio Prot	0.01	c0.28		0.14	c0.42	0.00	0.06	0.06	c0.33	c0.01	0.00	0.00
v/s Ratio Perm						0.02						0.00
v/c Ratio	0.15	0.62		0.84	0.74	0.04	0.35	0.35	0.88	0.20	0.06	0.01
Uniform Delay, d1	61.0	28.7		56.1	23.4	9.9	51.3	51.3	40.8	61.6	61.0	52.2
Progression Factor	0.97	0.94		0.83	1.03	1.14	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.3		8.6	2.2	0.0	0.8	0.7	8.3	0.4	0.2	0.0
Delay (s)	59.2	28.2		55.4	26.2	11.3	52.1	52.0	49.1	62.0	61.2	52.2
Level of Service	E	C		E	C	B	D	D	D	E	E	D
Approach Delay (s)		29.0			33.1			49.6			59.0	
Approach LOS		C			C			D			E	

Intersection Summary

HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: I-71 NB Off Ramp

3/25/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↖			↖↖↖		↖↗		↖			
Volume (vph)	886	1665	0	0	946	314	327	0	170	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4			3.8		4.6	4.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	1.00	1.00			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3433	3438			4754		3273	0	1509			
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	3433	3438			4754		3273	0	1509			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.92	0.86	0.92	0.82	0.92	0.92	0.92
Adj. Flow (vph)	963	1810	0	0	1017	341	380	0	207	0	0	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	21	45	0	0	0
Lane Group Flow (vph)	963	1810	0	0	1319	0	380	0	141	0	0	0
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	7%	2%	7%	2%	2%	2%
Turn Type	Prot	NA			NA		Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases									8			
Actuated Green, G (s)	44.9	107.5			58.6		20.7	0.0	20.7			
Effective Green, g (s)	44.9	108.9			60.6		22.1	0.0	20.7			
Actuated g/C Ratio	0.32	0.78			0.43		0.16	0.00	0.15			
Clearance Time (s)	4.0	5.8			5.8		6.0		6.0			
Vehicle Extension (s)	3.0	2.0			2.0		2.5		2.5			
Lane Grp Cap (vph)	1101	2674			2057		516	0	223			
v/s Ratio Prot	c0.28	c0.53			0.28		c0.12					
v/s Ratio Perm									0.09			
v/c Ratio	0.87	0.68			0.64		0.74	0.00	0.63			
Uniform Delay, d1	44.9	7.3			31.2		56.2	70.0	56.1			
Progression Factor	1.04	0.59			1.00		1.00	1.00	1.00			
Incremental Delay, d2	5.0	0.8			1.6		5.1	0.0	5.0			
Delay (s)	51.8	5.2			32.7		61.3	70.0	61.1			
Level of Service	D	A			C		E	E	E			
Approach Delay (s)		21.4			32.7			61.5			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: I-71 SB Ramp & SR 82 Royalton Rd

3/25/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations		↑↑↑	↑	↑	↑↑↑				↑↑		↑↑↑
Volume (vph)	0	1850	381	85	1188	0	0	0	701	0	1779
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.6	6.6	6.6				6.0		6.6
Lane Util. Factor		*0.91	1.00	1.00	0.91				0.88		0.76
Frt		1.00	0.85	1.00	1.00				0.85		0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00		1.00
Satd. Flow (prot)		4940	1538	1703	4893				2656		3441
Flt Permitted		1.00	1.00	0.95	1.00				1.00		1.00
Satd. Flow (perm)		4940	1538	1703	4893				2656		3441
Peak-hour factor, PHF	0.92	0.87	0.87	0.46	0.86	0.92	0.92	0.92	0.90	0.92	0.96
Adj. Flow (vph)	0	2126	438	185	1381	0	0	0	779	0	1853
RTOR Reduction (vph)	0	0	177	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2126	261	185	1381	0	0	0	779	0	1853
Heavy Vehicles (%)	2%	5%	5%	6%	6%	2%	2%	2%	7%	2%	7%
Turn Type		NA	Perm	Prot	NA				custom		custom
Protected Phases		6		5	2				4 5		1 4
Permitted Phases		6	6		2						1 4
Actuated Green, G (s)		83.4	83.4	18.4	44.5				44.0		82.3
Effective Green, g (s)		83.4	83.4	18.4	44.5				37.4		76.3
Actuated g/C Ratio		0.60	0.60	0.13	0.32				0.27		0.54
Clearance Time (s)		6.6	6.6	6.6	6.6						
Vehicle Extension (s)		5.0	5.0	3.0	5.0						
Lane Grp Cap (vph)		2942	916	223	1555				709		1875
v/s Ratio Prot		0.43		0.11	c0.28				c0.29		c0.54
v/s Ratio Perm			0.17								
v/c Ratio		0.72	0.28	0.83	0.89				1.10		0.99
Uniform Delay, d1		20.1	13.8	59.3	45.4				51.3		31.4
Progression Factor		1.16	3.76	0.67	0.58				1.00		1.00
Incremental Delay, d2		0.4	0.1	18.6	6.7				64.0		17.9
Delay (s)		23.7	51.9	58.3	33.1				115.3		49.3
Level of Service		C	D	E	C				F		D
Approach Delay (s)		28.5			36.0		115.3			49.3	
Approach LOS		C			D		F			D	

Intersection Summary

































HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.2
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Howe Road & SR 82 Royalton Rd

3/25/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	 			 	 	 	 	
Volume (vph)	191	1412	77	867	1779	321	170	102	597	222	140	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	5.0	5.0	5.0	5.0	5.0	4.4
Lane Util. Factor	0.97	*0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	4886		3433	3438	1583	1665	1757	2814	3433	1881	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	4886		3433	3438	1583	1665	1757	2814	3433	1881	1599
Peak-hour factor, PHF	0.88	0.82	0.53	0.80	0.95	0.69	0.92	0.88	0.90	0.80	0.83	0.69
Adj. Flow (vph)	217	1722	145	1084	1873	465	185	116	663	278	169	351
RTOR Reduction (vph)	0	7	0	0	0	76	0	0	0	0	0	99
Lane Group Flow (vph)	217	1860	0	1084	1873	389	148	153	663	278	169	252
Heavy Vehicles (%)	1%	5%	4%	2%	5%	2%	3%	1%	1%	2%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pt+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	8	8	8	4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	14.0	47.4		39.0	72.4	84.8	15.4	15.4	61.0	12.4	12.4	26.4
Effective Green, g (s)	16.0	49.4		41.0	74.4	88.8	17.0	17.0	62.6	14.0	14.0	29.6
Actuated g/C Ratio	0.11	0.35		0.29	0.53	0.63	0.12	0.12	0.45	0.10	0.10	0.21
Clearance Time (s)	6.0	6.6		6.0	6.6	6.6	6.6	6.6		6.6	6.6	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	396	1724		1005	1827	1004	202	213	1258	343	188	388
v/s Ratio Prot	0.06	c0.38		c0.32	0.54	0.04	c0.09	0.09	0.24	0.08	c0.09	0.07
v/s Ratio Perm						0.21						0.09
v/c Ratio	0.55	1.08		1.08	1.03	0.39	0.73	0.72	0.53	0.81	0.90	0.65
Uniform Delay, d1	58.6	45.3		49.5	32.8	12.4	59.3	59.2	28.0	61.7	62.3	50.4
Progression Factor	0.94	0.92		0.97	1.03	0.89	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	45.3		44.9	21.6	0.1	12.8	11.0	0.4	13.5	38.2	3.7
Delay (s)	56.2	87.0		92.8	55.3	11.1	72.2	70.2	28.4	75.2	100.5	54.2
Level of Service	E	F		F	E	B	E	E	C	E	F	D
Approach Delay (s)		83.8			61.2			41.7			71.3	
Approach LOS		F			E			D			E	
Intersection Summary												
HCM 2000 Control Delay			66.2			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)					19.0			
Intersection Capacity Utilization			87.2%	ICU Level of Service			E					
Analysis Period (min)			15									

c Critical Lane Group