Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	262	194	74	0	256
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	298	220	84	0	291
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			715			385
pX, platoon unblocked	0.97					
vC, conflicting volume	553	262			305	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	524	262			305	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	62			100	
cM capacity (veh/h)	502	779			1268	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	298	305	291
Volume Left	0	0	0
Volume Right	298	84	0
cSH	779	1700	1700
Volume to Capacity	0.38	0.18	0.17
Queue Length 95th (ft)	45	0	0
Control Delay (s)	12.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.5	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	39.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	28	214	12	30	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	0	0		0	175	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1707	0	1660	1714
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1710	1530	1707	0	1660	1714
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		33	6			
Link Speed (mph)	25		40			25
Link Distance (ft)	1176		606			715
Travel Time (s)	32.1		10.3			19.5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	85%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Adj. Flow (vph)	46	33	252	14	35	218
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	33	266	0	35	218
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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		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
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			Prot	
Protected Phases	8	8	2		1	6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases						
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		8.0	20.0
Total Split (s)	20.0	20.0	22.0	0.0	8.0	30.0
Total Split (%)	40.0%	40.0%	44.0%	0.0%	16.0%	60.0%
Maximum Green (s)	16.0	16.0	18.0		4.0	26.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	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 Effct Green (s)	6.7	6.7	35.5		4.0	37.2
Actuated g/C Ratio	0.14	0.14	0.77		0.09	0.80
v/c Ratio	0.19	0.13	0.20		0.24	0.16
Control Delay	18.3	8.2	4.8		23.6	2.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.3	8.2	4.8		23.6	2.9
LOS	B	A	A		C	A
Approach Delay	14.1		4.8			5.8
Approach LOS	B		A			A

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 46.4

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

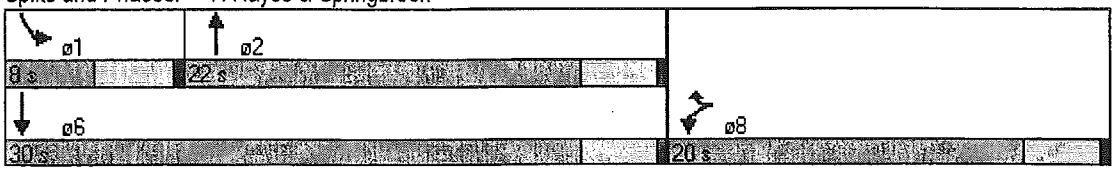
Maximum v/c Ratio: 0.24

Intersection Signal Delay: 6.5 Intersection LOS: A

Intersection Capacity Utilization 29.3% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: Hayes & Springbrook



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	28	214	12	30	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1530	1706		1660	1714
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1710	1530	1706		1660	1714
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor (vph)	85%	100%	100%	100%	100%	100%
Adj. Flow (vph)	46	33	252	14	35	218
RTOR Reduction (vph)	0	30	2	0	0	0
Lane Group Flow (vph)	46	3	264	0	35	218
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Turn Type		Prot			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	4.4	4.4	33.8		0.9	38.7
Effective Green, g (s)	4.4	4.4	33.8		0.9	38.7
Actuated g/C Ratio	0.09	0.09	0.66		0.02	0.76
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	147	132	1128		29	1298
v/s Ratio Prot	c0.03	0.00	c0.15		c0.02	0.13
v/s Ratio Perm						
v/c Ratio	0.31	0.02	0.23		1.21	0.17
Uniform Delay, d1	21.9	21.4	3.5		25.1	1.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.1	0.5		236.0	0.3
Delay (s)	23.2	21.4	4.0		261.1	2.0
Level of Service	C	C	A		F	A
Approach Delay (s)	22.4		4.0			37.8
Approach LOS	C		A			D

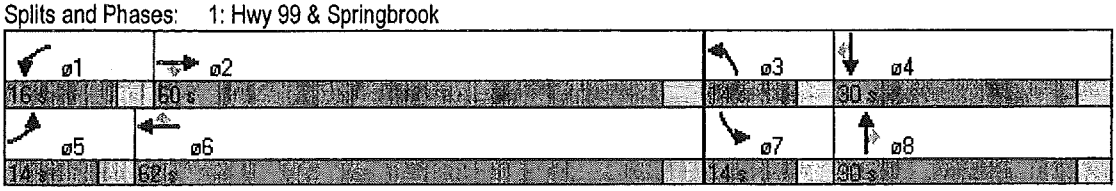
Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

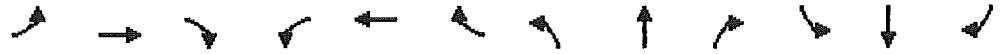
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	1437	77	170	1845	195	246	148	142	336	114	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	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)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			40			92			149			149
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Adj. Flow (vph)	178	1513	81	179	1942	205	259	156	149	354	120	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	1513	81	179	1942	205	259	156	149	354	120	149
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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4

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)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	6.0
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	30.0
Total Split (s)	14.0	60.0	60.0	16.0	62.0	62.0	14.0	30.0	30.0	14.0	30.0	30.0
Total Split (%)	11.7%	50.0%	50.0%	13.3%	51.7%	51.7%	11.7%	25.0%	25.0%	11.7%	25.0%	25.0%
Maximum Green (s)	10.0	55.5	55.5	12.0	57.5	57.5	10.0	26.0	26.0	10.0	26.0	26.0
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (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
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	0.5
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.0	66.1	66.1	12.0	68.1	68.1	10.0	15.4	15.4	10.0	15.4	15.4
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.08	0.13	0.13	0.08	0.13	0.13
v/c Ratio	1.27	0.83	0.09	1.14	1.03	0.23	0.95	0.70	0.48	1.31	0.56	0.46
Control Delay	210.6	28.5	8.3	131.6	50.5	13.4	97.0	65.9	12.2	205.0	58.2	11.8
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	210.6	28.5	8.3	131.6	50.5	13.4	97.0	65.9	12.2	205.0	58.2	11.8
LOS	F	C	A	F	D	B	F	E	B	F	E	B
Approach Delay		45.8			53.5			66.0			130.5	
Approach LOS		D			D			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 70.5 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.31			
Intersection Signal Delay: 61.3		Intersection LOS: E	
Intersection Capacity Utilization 95.8%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Hwy 99 & Springbrook





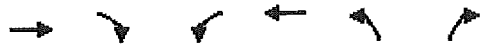
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	1437	77	170	1845	195	246	148	142	336	114	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	178	1513	81	179	1942	205	259	156	149	354	120	149
RTOR Reduction (vph)	0	0	18	0	0	40	0	0	130	0	0	130
Lane Group Flow (vph)	178	1513	63	179	1942	165	259	156	19	354	120	19
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4
Actuated Green, G (s)	10.0	66.1	66.1	12.0	68.1	68.1	10.0	15.4	15.4	10.0	15.4	15.4
Effective Green, g (s)	10.0	66.1	66.1	12.0	68.1	68.1	10.0	15.4	15.4	10.0	15.4	15.4
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.08	0.13	0.13	0.08	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	140	1811	843	157	1884	868	274	224	184	271	216	193
v/s Ratio Prot	0.11	0.46		c0.11	c0.58		0.08	c0.09		c0.11	0.07	
v/s Ratio Perm			0.04			0.11			0.01			0.01
v/c Ratio	1.27	0.84	0.07	1.14	1.03	0.19	0.95	0.70	0.10	1.31	0.56	0.10
Uniform Delay, d1	55.0	22.4	12.6	54.0	26.0	12.6	54.7	50.1	46.2	55.0	49.1	46.2
Progression Factor	1.00	1.00	1.00	0.84	1.10	1.72	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	166.4	4.7	0.2	89.1	21.8	0.2	39.3	8.0	0.1	161.9	2.2	0.1
Delay (s)	221.4	27.2	12.8	134.7	50.4	21.9	94.0	58.0	46.3	216.9	51.3	46.3
Level of Service	F	C	B	F	D	C	F	E	D	F	D	D
Approach Delay (s)		46.0			54.4			71.5			144.2	
Approach LOS		D			D			E			F	

Intersection Summary				
HCM Average Control Delay	64.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (vph)	1478	237	0	2252	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)		200	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		100	100		100	100
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3257	1500	0	3288	0	1557
Flt Permitted						
Satd. Flow (perm)	3257	1500	0	3288	0	1557
Link Speed (mph)	30			30	30	
Link Distance (ft)	435			490	248	
Travel Time (s)	9.9			11.1	5.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	4%	0%	0%
Adj. Flow (vph)	1556	249	0	2371	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1556	249	0	2371	0	26
Enter Blocked Intersection	Yes	Yes	No	Yes	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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	1478	237	0	2252	0	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1556	249	0	2371	0	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	875			490		
pX, platoon unblocked			0.68		0.59	0.68
vC, conflicting volume			1805		2741	778
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1254		151	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			384		490	747

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	778	778	249	1185	1185	26
Volume Left	0	0	0	0	0	0
Volume Right	0	0	249	0	0	26
cSH	1700	1700	1700	1700	1700	747
Volume to Capacity	0.46	0.46	0.15	0.70	0.70	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		10.0
Approach LOS						A

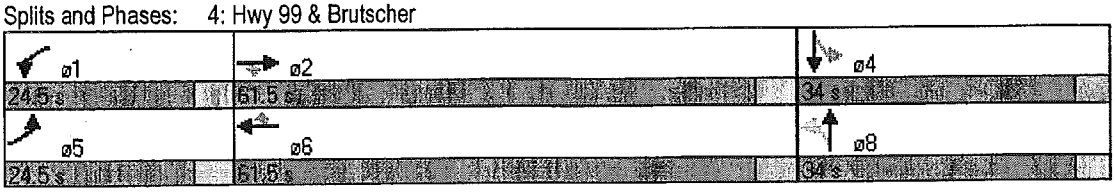
Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	69.0%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1358	64	179	1877	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	0		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
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		0.870			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1518	0	1660	1500	0
Flt Permitted	0.950			0.950			0.602			0.382		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1062	1518	0	668	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			46			17		216			108	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			465			315			277	
Travel Time (s)		8.4			7.9			8.6			7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Adj. Flow (vph)	69	1400	66	185	1935	74	246	34	216	37	22	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	1400	66	185	1935	74	246	250	0	37	130	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	6	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	24.5	61.5	61.5	24.5	61.5	61.5	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	20.4%	51.3%	51.3%	20.4%	51.3%	51.3%	28.3%	28.3%	0.0%	28.3%	28.3%	0.0%
Maximum Green (s)	20.5	57.0	57.0	20.5	57.0	57.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	9.5	61.5	61.5	17.0	70.8	70.8	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.08	0.51	0.51	0.14	0.59	0.59	0.24	0.24		0.24	0.24	
v/c Ratio	0.51	0.84	0.08	0.78	0.99	0.09	0.96	0.47		0.23	0.29	
Control Delay	56.3	23.0	8.0	71.3	43.4	10.3	91.2	10.6		40.2	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	56.3	23.0	8.0	71.3	43.4	10.3	91.2	10.6		40.2	11.5	
LOS	E	C	A	E	D	B	F	B		D	B	
Approach Delay		23.9			44.6			50.6			17.9	
Approach LOS		C			D			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 81.5 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Hwy 99 & Brutscher



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1358	64	179	1877	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1519		1660	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00		0.38	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1063	1519		667	1501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	1400	66	185	1935	74	246	34	216	37	22	108
RTOR Reduction (vph)	0	0	22	0	0	7	0	164	0	0	82	0
Lane Group Flow (vph)	69	1400	44	185	1935	67	246	86	0	37	48	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	8.4	61.5	61.5	17.0	70.1	70.1	29.0	29.0		29.0	29.0	
Effective Green, g (s)	8.4	61.5	61.5	17.0	70.1	70.1	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.07	0.51	0.51	0.14	0.58	0.58	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	120	1669	769	237	1939	835	257	367		161	363	
v/s Ratio Prot	0.04	0.43		c0.11	c0.58			0.06			0.03	
v/s Ratio Perm			0.03			0.05	c0.23			0.06		
v/c Ratio	0.57	0.84	0.06	0.78	1.00	0.08	0.96	0.23		0.23	0.13	
Uniform Delay, d1	54.1	25.0	14.7	49.7	24.9	10.9	44.9	36.6		36.5	35.6	
Progression Factor	0.95	0.76	1.09	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	2.6	0.1	14.5	20.0	0.2	43.9	0.2		0.5	0.1	
Delay (s)	54.0	21.6	16.1	64.2	44.8	11.1	88.8	36.8		37.1	35.8	
Level of Service	D	C	B	E	D	B	F	D		D	D	
Approach Delay (s)		22.8			45.3			62.6			36.1	
Approach LOS		C			D			E			D	

Intersection Summary				
HCM Average Control Delay	39.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	94.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	261	268	72	0	349
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.971			
Flt Protected						
Satd. Flow (prot)	0	1542	1675	0	0	1731
Flt Permitted						
Satd. Flow (perm)	0	1542	1675	0	0	1731
Link Speed (mph)	30		30			30
Link Distance (ft)	1394		715			385
Travel Time (s)	31.7		16.3			8.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	5%	2%	0%	4%
Adj. Flow (vph)	0	275	282	76	0	367
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	275	358	0	0	367
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		24			12
Link Offset(ft)	0		6			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	261	268	72	0	349
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	275	282	76	0	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			715			385
pX, platoon unblocked	0.95					
vC, conflicting volume	687	320			358	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	644	320			358	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	62			100	
cM capacity (veh/h)	418	723			1212	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	275	358	367
Volume Left	0	0	0
Volume Right	275	76	0
cSH	723	1700	1700
Volume to Capacity	0.38	0.21	0.22
Queue Length 95th (ft)	45	0	0
Control Delay (s)	13.0	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.0	0.0	0.0
Approach LOS	B		

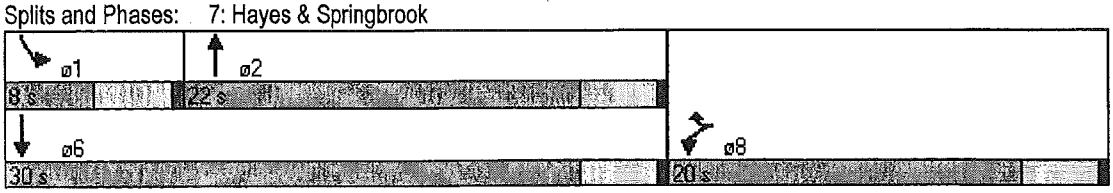
Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	43.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	39	30	278	15	87	261
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	0	0		0	175	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1706	0	1660	1714
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1710	1530	1706	0	1660	1714
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32	6			
Link Speed (mph)	25		40			25
Link Distance (ft)	1176		606			715
Travel Time (s)	32.1		10.3			19.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Adj. Flow (vph)	41	32	293	16	39	275
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	32	309	0	39	275
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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		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
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			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		8.0	20.0
Total Split (s)	20.0	20.0	22.0	0.0	8.0	30.0
Total Split (%)	40.0%	40.0%	44.0%	0.0%	16.0%	60.0%
Maximum Green (s)	16.0	16.0	18.0		4.0	26.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	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 Effct Green (s)	6.7	6.7	32.7		4.0	36.3
Actuated g/C Ratio	0.15	0.15	0.72		0.09	0.80
v/c Ratio	0.16	0.13	0.25		0.27	0.20
Control Delay	17.4	8.0	6.3		23.4	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.4	8.0	6.3		23.4	3.1
LOS	B	A	A		C	A
Approach Delay	13.3		6.3			5.6
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 45.5			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

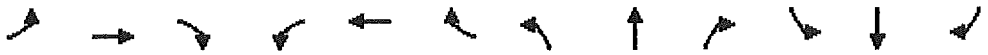
Splits and Phases: 7: Hayes & Springbrook



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	39	30	278	15	37	261
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1530	1707		1660	1714
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1710	1530	1707		1660	1714
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	32	293	16	39	275
RTOR Reduction (vph)	0	29	2	0	0	0
Lane Group Flow (vph)	41	3	307	0	39	275
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Turn Type		Prot			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	4.4	4.4	31.2		1.8	37.0
Effective Green, g (s)	4.4	4.4	31.2		1.8	37.0
Actuated g/C Ratio	0.09	0.09	0.63		0.04	0.75
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	152	186	1078		60	1284
v/s Ratio Prot	c0.02	0.00	c0.18		c0.02	0.16
v/s Ratio Perm						
v/c Ratio	0.27	0.02	0.28		0.65	0.21
Uniform Delay, d1	21.0	20.5	4.1		23.5	1.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.1	0.7		22.4	0.4
Delay (s)	22.0	20.6	4.8		45.9	2.2
Level of Service	C	C	A		D	A
Approach Delay (s)	21.4		4.8			7.7
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

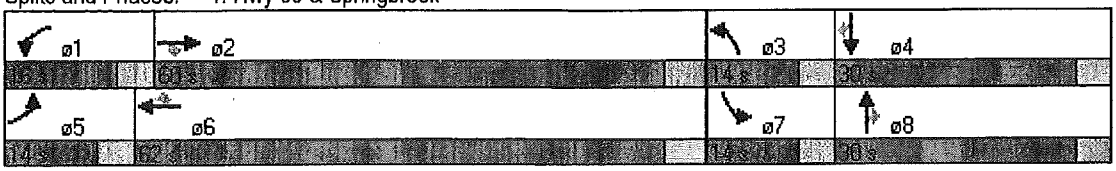


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	1454	76	167	1831	192	276	161	143	351	111	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	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)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39			92			149			147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Adj. Flow (vph)	175	1515	79	174	1907	200	288	168	149	366	116	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	1515	79	174	1907	200	288	168	149	366	116	147
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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4

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)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	6.0
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	30.0
Total Split (s)	14.0	60.0	60.0	16.0	62.0	62.0	14.0	30.0	30.0	14.0	30.0	30.0
Total Split (%)	11.7%	50.0%	50.0%	13.3%	51.7%	51.7%	11.7%	25.0%	25.0%	11.7%	25.0%	25.0%
Maximum Green (s)	10.0	55.5	55.5	12.0	57.5	57.5	10.0	26.0	26.0	10.0	26.0	26.0
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (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
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	0.5
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Actuated g/C Ratio	0.08	0.54	0.54	0.10	0.56	0.56	0.08	0.14	0.14	0.08	0.14	0.14
v/c Ratio	1.25	0.85	0.09	1.11	1.02	0.22	1.05	0.71	0.46	1.35	0.51	0.45
Control Delay	203.1	29.6	8.6	122.2	49.1	13.6	121.1	65.6	11.7	221.9	55.2	11.3
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	203.1	29.6	8.6	122.2	49.1	13.6	121.1	65.6	11.7	221.9	55.2	11.3
LOS	F	C	A	F	D	B	F	E	B	F	E	B
Approach Delay		45.9			51.6			78.8			141.9	
Approach LOS		D			D			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 70.5 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 63.5		Intersection LOS: E	
Intersection Capacity Utilization 96.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Hwy 99 & Springbrook



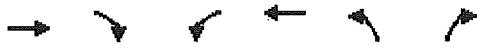
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	1454	76	167	1831	192	276	161	143	351	111	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	175	1515	79	174	1907	200	288	168	149	366	116	147
RTOR Reduction (vph)	0	0	18	0	0	40	0	0	129	0	0	127
Lane Group Flow (vph)	175	1515	61	174	1907	160	288	168	20	366	116	20
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4
Actuated Green, G (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Effective Green, g (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Actuated g/C Ratio	0.08	0.54	0.54	0.10	0.56	0.56	0.08	0.13	0.13	0.08	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	140	1789	833	157	1862	858	274	236	193	271	227	203
v/s Ratio Prot	0.10	0.46		c0.11	c0.57		0.09	c0.10		c0.11	0.07	
v/s Ratio Perm			0.04			0.10			0.01			0.01
v/c Ratio	1.25	0.85	0.07	1.11	1.02	0.19	1.05	0.71	0.10	1.35	0.51	0.10
Uniform Delay, d1	55.0	23.1	13.0	54.0	26.4	12.9	55.0	49.7	45.5	55.0	48.2	45.5
Progression Factor	1.00	1.00	1.00	0.85	1.10	1.72	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	158.2	5.2	0.2	78.3	19.9	0.2	68.4	8.7	0.1	180.2	1.2	0.1
Delay (s)	213.2	28.3	13.2	124.3	48.9	22.5	123.4	58.4	45.7	235.2	49.4	45.6
Level of Service	F	C	B	F	D	C	F	E	D	F	D	D
Approach Delay (s)		45.9			52.3			86.2			156.6	
Approach LOS		D			D			F			F	

Intersection Summary				
HCM Average Control Delay	66.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (vph)	1464	237	0	2232	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)		200	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		100	100		100	100
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3257	1500	0	3288	0	1557
Flt Permitted						
Satd. Flow (perm)	3257	1500	0	3288	0	1557
Link Speed (mph)	30			30	30	
Link Distance (ft)	435			490	248	
Travel Time (s)	9.9			11.1	5.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	4%	0%	0%
Adj. Flow (vph)	1541	249	0	2349	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1541	249	0	2349	0	47
Enter Blocked Intersection	Yes	Yes	No	Yes	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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

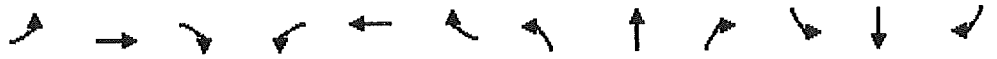
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.5%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	1464	237	0	2282	0	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1541	249	0	2349	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	875			490		
pX, platoon unblocked			0.69		0.59	0.69
vC, conflicting volume			1791		2716	771
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1242		152	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			390		492	751

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	771	771	249	1175	1175	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	249	0	0	47
cSH	1700	1700	1700	1700	1700	751
Volume to Capacity	0.45	0.45	0.15	0.69	0.69	0.06
Queue Length 95th (ft)	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.1
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		



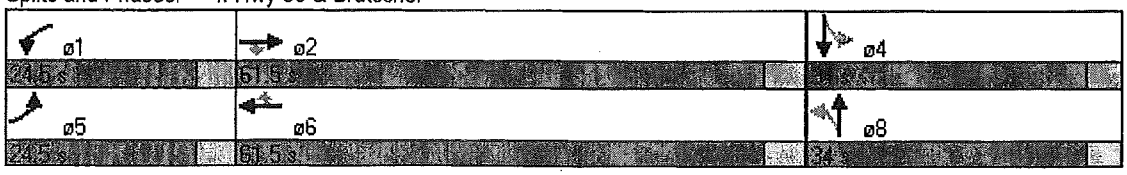
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1364	64	205	1857	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	0		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
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		0.870			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1518	0	1660	1500	0
Flt Permitted	0.950			0.950			0.602			0.382		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1062	1518	0	668	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			46			17		216			108	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			465			315			277	
Travel Time (s)		8.4			7.9			8.6			7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Adj. Flow (vph)	69	1406	66	211	1914	74	246	34	216	37	22	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	1406	66	211	1914	74	246	250	0	37	130	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		

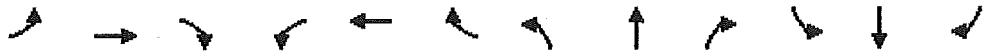
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	24.5	61.5	61.5	24.5	61.5	61.5	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	20.4%	51.3%	51.3%	20.4%	51.3%	51.3%	28.3%	28.3%	0.0%	28.3%	28.3%	0.0%
Maximum Green (s)	20.5	57.0	57.0	20.5	57.0	57.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	9.5	60.2	60.2	18.2	70.8	70.8	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.08	0.50	0.50	0.15	0.59	0.59	0.24	0.24		0.24	0.24	
v/c Ratio	0.51	0.86	0.09	0.83	0.98	0.09	0.96	0.47		0.23	0.29	
Control Delay	55.8	24.7	8.2	74.9	41.1	10.3	91.2	10.6		40.2	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	55.8	24.7	8.2	74.9	41.1	10.3	91.2	10.6		40.2	11.5	
LOS	E	C	A	E	D	B	F	B		D	B	
Approach Delay		25.4			43.3			50.6			17.9	
Approach LOS		C			D			D			B	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 81.5 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 36.9 Intersection LOS: D
Intersection Capacity Utilization 93.8% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Hwy 99 & Brutscher





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1364	64	205	1857	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1519		1660	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00		0.38	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1063	1519		667	1501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	1406	66	211	1914	74	246	34	216	37	22	108
RTOR Reduction (vph)	0	0	23	0	0	7	0	164	0	0	82	0
Lane Group Flow (vph)	69	1406	43	211	1914	67	246	86	0	37	48	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	8.4	60.3	60.3	18.2	70.1	70.1	29.0	29.0		29.0	29.0	
Effective Green, g (s)	8.4	60.3	60.3	18.2	70.1	70.1	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.07	0.50	0.50	0.15	0.58	0.58	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	120	1637	754	254	1939	835	257	367		161	363	
v/s Ratio Prot	0.04	0.43		c0.13	c0.58			0.06			0.03	
v/s Ratio Perm			0.03			0.05	c0.23			0.06		
v/c Ratio	0.57	0.86	0.06	0.83	0.99	0.08	0.96	0.23		0.23	0.13	
Uniform Delay, d1	54.1	26.1	15.3	49.4	24.5	10.9	44.9	36.6		36.6	35.6	
Progression Factor	0.94	0.77	1.12	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	3.1	0.1	19.5	17.6	0.2	43.9	0.2		0.5	0.1	
Delay (s)	53.4	23.3	17.1	68.9	42.1	11.1	88.8	36.8		37.1	35.8	
Level of Service	D	C	B	E	D	B	F	D		D	D	
Approach Delay (s)		24.3			43.6			62.6			36.1	
Approach LOS		C			D			E			D	

Intersection Summary				
HCM Average Control Delay	38.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	93.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	312	263	88	0	342
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.966			
Flt Protected						
Satd. Flow (prot)	0	1542	1668	0	0	1731
Flt Permitted						
Satd. Flow (perm)	0	1542	1668	0	0	1731
Link Speed (mph)	30		30			30
Link Distance (ft)	1394		715			385
Travel Time (s)	31.7		16.3			8.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	1%	5%	2%	0%	4%
Adj. Flow (vph)	0	355	299	100	0	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	355	399	0	0	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		24			12
Link Offset(ft)	0		6			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	312	263	88	0	342
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	355	299	100	0	389
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			715			385
pX, platoon unblocked	0.95					
vC, conflicting volume	738	349			399	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	697	349			399	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	49			100	
cM capacity (veh/h)	389	697			1171	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	355	399	389
Volume Left	0	0	0
Volume Right	355	100	0
cSH	697	1700	1700
Volume to Capacity	0.51	0.23	0.23
Queue Length 95th (ft)	73	0	0
Control Delay (s)	15.4	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.4	0.0	0.0
Approach LOS	C		

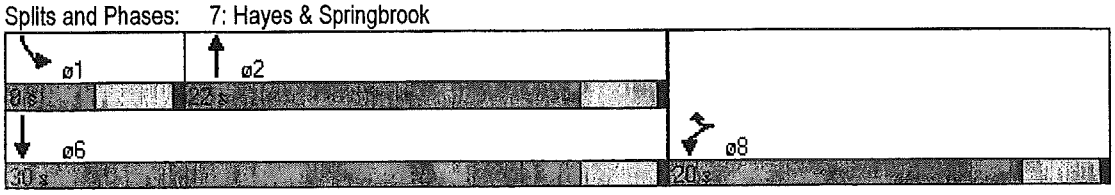
Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	47.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	53	34	285	15	37	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	0	0		0	175	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1706	0	1660	1714
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1710	1530	1706	0	1660	1714
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		36	6			
Link Speed (mph)	25		40			25
Link Distance (ft)	1176		606			715
Travel Time (s)	32.1		10.3			19.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Adj. Flow (vph)	56	36	300	16	39	267
Shared Lane Traffic (%)						
Lane Group Flow (vph)	56	36	316	0	39	267
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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		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
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			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		8.0	20.0
Total Split (s)	20.0	20.0	22.0	0.0	8.0	30.0
Total Split (%)	40.0%	40.0%	44.0%	0.0%	16.0%	60.0%
Maximum Green (s)	16.0	16.0	18.0		4.0	26.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	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 Effct Green (s)	7.0	7.0	32.2		4.0	35.6
Actuated g/C Ratio	0.16	0.16	0.71		0.09	0.79
v/c Ratio	0.21	0.13	0.26		0.26	0.20
Control Delay	17.7	7.6	6.5		23.3	3.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.7	7.6	6.5		23.3	3.3
LOS	B	A	A		C	A
Approach Delay	13.7		6.5			5.8
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 45.1			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

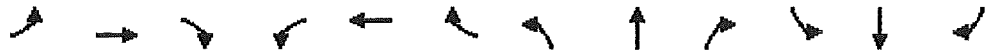
Splits and Phases: 7: Hayes & Springbrook



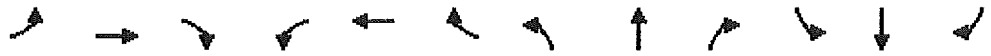
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	53	34	285	15	37	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1530	1707		1660	1714
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1710	1530	1707		1660	1714
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	36	300	16	39	267
RTOR Reduction (vph)	0	33	2	0	0	0
Lane Group Flow (vph)	56	3	314	0	39	267
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Turn Type		Prot			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	4.7	4.7	30.6		1.7	36.3
Effective Green, g (s)	4.7	4.7	30.6		1.7	36.3
Actuated g/C Ratio	0.10	0.10	0.62		0.03	0.74
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	164	147	1066		58	1270
v/s Ratio Prot	c0.03	0.00	c0.18		c0.02	0.16
v/s Ratio Perm						
v/c Ratio	0.34	0.02	0.29		0.67	0.21
Uniform Delay, d1	20.7	20.1	4.2		23.4	1.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.1	0.7		26.6	0.4
Delay (s)	22.0	20.1	4.9		49.9	2.3
Level of Service	C	C	A		D	A
Approach Delay (s)	21.2		4.9			8.4
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



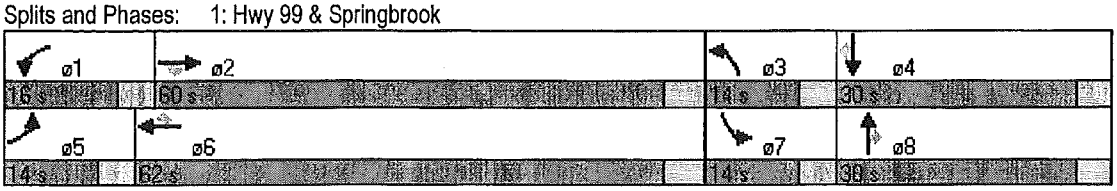
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	898	77	170	1153	195	246	148	142	336	114	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	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)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64			148			148			148
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Adj. Flow (vph)	176	935	80	177	1201	203	256	154	148	350	119	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	935	80	177	1201	203	256	154	148	350	119	148
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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4



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)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	6.0
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	30.0
Total Split (s)	14.0	60.0	60.0	16.0	62.0	62.0	14.0	30.0	30.0	14.0	30.0	30.0
Total Split (%)	11.7%	50.0%	50.0%	13.3%	51.7%	51.7%	11.7%	25.0%	25.0%	11.7%	25.0%	25.0%
Maximum Green (s)	10.0	55.5	55.5	12.0	57.5	57.5	10.0	26.0	26.0	10.0	26.0	26.0
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (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
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	0.5
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.0	66.3	66.3	12.0	68.3	68.3	10.0	15.2	15.2	10.0	15.2	15.2
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.08	0.13	0.13	0.08	0.13	0.13
v/c Ratio	1.26	0.51	0.09	1.13	0.64	0.22	0.93	0.70	0.48	1.29	0.56	0.46
Control Delay	205.6	18.7	5.2	150.5	19.3	6.6	94.8	65.9	12.3	199.4	58.4	11.9
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	205.6	18.7	5.2	150.5	19.3	6.6	94.8	65.9	12.3	199.4	58.4	11.9
LOS	F	B	A	F	B	A	F	E	B	F	E	B
Approach Delay		45.4			32.4			64.9			127.2	
Approach LOS		D			C			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 70.5 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 55.8		Intersection LOS: E	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Hwy 99 & Springbrook



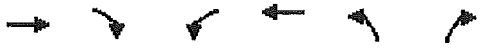
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	898	77	170	1153	195	246	148	142	336	114	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.86	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	176	935	80	177	1201	203	256	154	148	350	119	148
RTOR Reduction (vph)	0	0	29	0	0	64	0	0	129	0	0	129
Lane Group Flow (vph)	176	935	51	177	1201	139	256	154	19	350	119	19
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4
Actuated Green, G (s)	10.0	66.3	66.3	12.0	68.3	68.3	10.0	15.2	15.2	10.0	15.2	15.2
Effective Green, g (s)	10.0	66.3	66.3	12.0	68.3	68.3	10.0	15.2	15.2	10.0	15.2	15.2
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.08	0.13	0.13	0.08	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	140	1817	845	157	1890	871	274	221	181	271	213	190
v/s Ratio Prot	0.10	0.28		c0.11	c0.36		0.08	c0.09		c0.11	0.07	
v/s Ratio Perm			0.03			0.09			0.01			0.01
v/c Ratio	1.26	0.51	0.06	1.13	0.64	0.16	0.93	0.70	0.10	1.29	0.56	0.10
Uniform Delay, d1	55.0	16.8	12.4	54.0	17.4	12.3	54.7	50.2	46.4	55.0	49.2	46.3
Progression Factor	1.00	1.00	1.00	0.96	0.97	1.40	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	160.9	1.0	0.1	103.1	1.3	0.3	36.8	8.1	0.1	155.9	2.2	0.1
Delay (s)	215.9	17.8	12.6	155.1	18.3	17.4	91.4	58.3	46.5	210.9	51.5	46.5
Level of Service	F	B	B	F	B	B	F	E	D	F	D	D
Approach Delay (s)		46.8			33.5			70.4			140.7	
Approach LOS		D			C			E			F	

Intersection Summary					
HCM Average Control Delay	59.5	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.74				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	75.6%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (vph)	924	237	0	1408	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)		200	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		100	100		100	100
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3257	1500	0	3288	0	1557
Flt Permitted						
Satd. Flow (perm)	3257	1500	0	3288	0	1557
Link Speed (mph)	30			30	30	
Link Distance (ft)	435			490	248	
Travel Time (s)	9.9			11.1	5.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	4%	0%	0%
Adj. Flow (vph)	973	249	0	1482	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	973	249	0	1482	0	26
Enter Blocked Intersection	Yes	Yes	No	Yes	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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

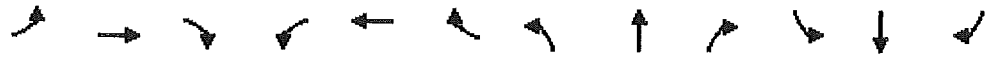
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.4%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	924	237	0	1408	0	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	973	249	0	1482	0	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	875			490		
pX, platoon unblocked					0.77	
vC, conflicting volume			1222		1714	486
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1222		1324	486
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			577		115	532

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	486	486	249	741	741	26
Volume Left	0	0	0	0	0	0
Volume Right	0	0	249	0	0	26
cSH	1700	1700	1700	1700	1700	532
Volume to Capacity	0.29	0.29	0.15	0.44	0.44	0.05
Queue Length 95th (ft)	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.1
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

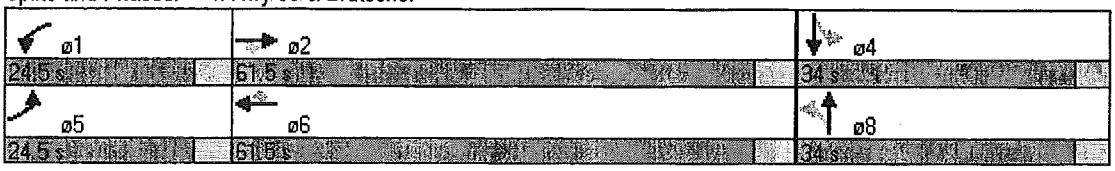


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	849	64	179	1173	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	0		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
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		0.870			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1518	0	1660	1500	0
Flt Permitted	0.950			0.950			0.602			0.382		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1062	1518	0	668	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66			27		216			108	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			465			315			277	
Travel Time (s)		8.4			7.9			8.6			7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Adj. Flow (vph)	69	875	66	185	1209	74	246	34	216	37	22	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	875	66	185	1209	74	246	250	0	37	130	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	24.5	61.5	61.5	24.5	61.5	61.5	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	20.4%	51.3%	51.3%	20.4%	51.3%	51.3%	28.3%	28.3%	0.0%	28.3%	28.3%	0.0%
Maximum Green (s)	20.5	57.0	57.0	20.5	57.0	57.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	9.5	61.5	61.5	17.0	70.8	70.8	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.08	0.51	0.51	0.14	0.59	0.59	0.24	0.24		0.24	0.24	
v/c Ratio	0.51	0.52	0.08	0.78	0.62	0.09	0.96	0.47		0.23	0.29	
Control Delay	62.1	18.6	4.7	71.3	18.9	8.9	91.2	10.6		40.2	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	62.1	18.6	4.7	71.3	18.9	8.9	91.2	10.6		40.2	11.5	
LOS	E	B	A	E	B	A	F	B		D	B	
Approach Delay		20.6			25.0			50.6			17.9	
Approach LOS		C			C			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 81.5 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Hwy 99 & Brutscher



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	849	64	179	1173	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1519		1660	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00		0.38	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1063	1519		667	1501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	875	66	185	1209	74	246	34	216	37	22	108
RTOR Reduction (vph)	0	0	32	0	0	11	0	164	0	0	82	0
Lane Group Flow (vph)	69	875	34	185	1209	63	246	86	0	37	48	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	8.4	61.5	61.5	17.0	70.1	70.1	29.0	29.0		29.0	29.0	
Effective Green, g (s)	8.4	61.5	61.5	17.0	70.1	70.1	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.07	0.51	0.51	0.14	0.58	0.58	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	120	1669	769	237	1939	835	257	367		161	363	
v/s Ratio Prot	0.04	0.27		c0.11	c0.36			0.06			0.03	
v/s Ratio Perm			0.02			0.04	c0.23			0.06		
v/c Ratio	0.57	0.52	0.04	0.78	0.62	0.08	0.96	0.23		0.23	0.13	
Uniform Delay, d1	54.1	19.5	14.6	49.7	16.3	10.9	44.9	36.6		36.5	35.6	
Progression Factor	0.99	0.86	1.09	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	0.9	0.1	14.5	1.5	0.2	43.9	0.2		0.5	0.1	
Delay (s)	57.4	17.6	16.0	64.2	17.8	11.0	88.8	36.8		37.1	35.8	
Level of Service	E	B	B	E	B	B	F	D		D	D	
Approach Delay (s)		20.2			23.3			62.6			36.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	29.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	261	268	72	0	349
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.971			
Flt Protected						
Satd. Flow (prot)	0	1542	1675	0	0	1731
Flt Permitted						
Satd. Flow (perm)	0	1542	1675	0	0	1731
Link Speed (mph)	30		30			30
Link Distance (ft)	1394		715			385
Travel Time (s)	31.7		16.3			8.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	5%	2%	0%	4%
Adj. Flow (vph)	0	275	282	76	0	367
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	275	358	0	0	367
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		24			12
Link Offset(ft)	0		6			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	261	268	72	0	349
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	275	282	76	0	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			715			385
pX, platoon unblocked	0.95					
vC, conflicting volume	687	320			358	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	644	320			358	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	62			100	
cM capacity (veh/h)	418	723			1212	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	275	358	367
Volume Left	0	0	0
Volume Right	275	76	0
cSH	723	1700	1700
Volume to Capacity	0.38	0.21	0.22
Queue Length 95th (ft)	45	0	0
Control Delay (s)	13.0	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.0	0.0	0.0
Approach LOS	B		

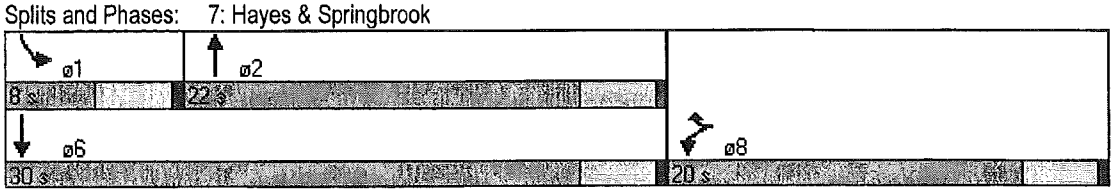
Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	39	30	278	15	37	261
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	0	0		0	175	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1706	0	1660	1714
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1710	1530	1706	0	1660	1714
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32	6			
Link Speed (mph)	25		40			25
Link Distance (ft)	1176		606			715
Travel Time (s)	32.1		10.3			19.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Adj. Flow (vph)	41	32	293	16	39	275
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	32	309	0	39	275
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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		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
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			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		8.0	20.0
Total Split (s)	20.0	20.0	22.0	0.0	8.0	30.0
Total Split (%)	40.0%	40.0%	44.0%	0.0%	16.0%	60.0%
Maximum Green (s)	16.0	16.0	18.0		4.0	26.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	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 Effct Green (s)	6.7	6.7	32.7		4.0	36.3
Actuated g/C Ratio	0.15	0.15	0.72		0.09	0.80
v/c Ratio	0.16	0.13	0.25		0.27	0.20
Control Delay	17.4	8.0	6.3		23.4	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.4	8.0	6.3		23.4	3.1
LOS	B	A	A		C	A
Approach Delay	13.3		6.3			5.6
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 45.5			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

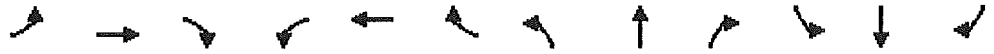
Splits and Phases: 7: Hayes & Springbrook



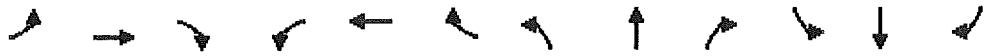
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	39	30	278	15	37	261
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1530	1707		1660	1714
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1710	1530	1707		1660	1714
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	32	293	16	39	275
RTOR Reduction (vph)	0	29	2	0	0	0
Lane Group Flow (vph)	41	3	307	0	39	275
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Turn Type		Prot			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	4.4	4.4	31.2		1.8	37.0
Effective Green, g (s)	4.4	4.4	31.2		1.8	37.0
Actuated g/C Ratio	0.09	0.09	0.63		0.04	0.75
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	152	136	1078		60	1284
v/s Ratio Prot	c0.02	0.00	c0.18		c0.02	0.16
v/s Ratio Perm						
v/c Ratio	0.27	0.02	0.28		0.65	0.21
Uniform Delay, d1	21.0	20.5	4.1		23.5	1.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.1	0.7		22.4	0.4
Delay (s)	22.0	20.6	4.8		45.9	2.2
Level of Service	C	C	A		D	A
Approach Delay (s)	21.4		4.8			7.7
Approach LOS	C		A			A

Intersection Summary				
HCM Average Control Delay	7.8	HCM Level of Service		A
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	49.4	Sum of lost time (s)		12.0
Intersection Capacity Utilization	33.1%	ICU Level of Service		A
Analysis Period (min)	15			

c Critical Lane Group



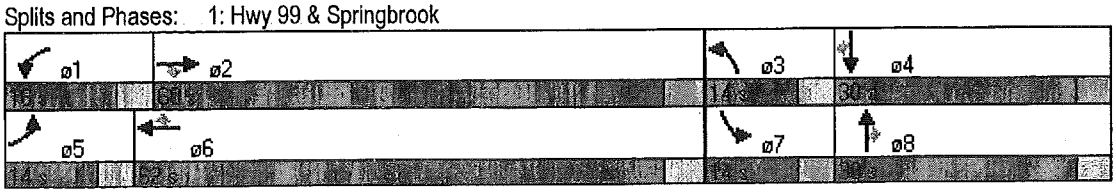
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	909	76	167	1144	192	276	161	143	351	111	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	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)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62			147			149			147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Adj. Flow (vph)	175	947	79	174	1192	200	288	168	149	366	116	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	947	79	174	1192	200	288	168	149	366	116	147
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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4

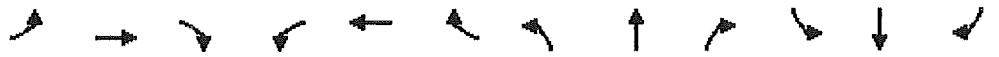


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	6.0
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	30.0
Total Split (s)	14.0	60.0	60.0	16.0	62.0	62.0	14.0	30.0	30.0	14.0	30.0	30.0
Total Split (%)	11.7%	50.0%	50.0%	13.3%	51.7%	51.7%	11.7%	25.0%	25.0%	11.7%	25.0%	25.0%
Maximum Green (s)	10.0	55.5	55.5	12.0	57.5	57.5	10.0	26.0	26.0	10.0	26.0	26.0
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (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
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	0.5
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Actuated g/C Ratio	0.08	0.54	0.54	0.10	0.56	0.56	0.08	0.14	0.14	0.08	0.14	0.14
v/c Ratio	1.25	0.53	0.09	1.11	0.64	0.22	1.05	0.71	0.46	1.35	0.51	0.45
Control Delay	203.1	19.5	5.5	145.0	19.4	6.4	121.1	65.6	11.7	221.9	55.2	11.3
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	203.1	19.5	5.5	145.0	19.4	6.4	121.1	65.6	11.7	221.9	55.2	11.3
LOS	F	B	A	F	B	A	F	E	B	F	E	B
Approach Delay		45.4			31.7			78.8			141.9	
Approach LOS		D			C			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 70.5 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 60.3		Intersection LOS: E	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Hwy 99 & Springbrook





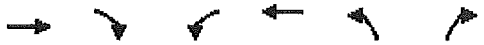
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	909	76	167	1144	192	276	161	143	351	111	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1682	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	175	947	79	174	1192	200	288	168	149	366	116	147
RTOR Reduction (vph)	0	0	28	0	0	65	0	0	129	0	0	127
Lane Group Flow (vph)	175	947	51	174	1192	135	288	168	20	366	116	20
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	4
Actuated Green, G (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Effective Green, g (s)	10.0	65.3	65.3	12.0	67.3	67.3	10.0	16.2	16.2	10.0	16.2	16.2
Actuated g/C Ratio	0.08	0.54	0.54	0.10	0.56	0.56	0.08	0.13	0.13	0.08	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	140	1789	833	157	1862	858	274	236	193	271	227	203
v/s Ratio Prot	0.10	0.29		c0.11	c0.36		0.09	c0.10		c0.11	0.07	
v/s Ratio Perm			0.03			0.09			0.01			0.01
v/c Ratio	1.25	0.53	0.06	1.11	0.64	0.16	1.05	0.71	0.10	1.35	0.51	0.10
Uniform Delay, d1	55.0	17.5	12.9	54.0	18.1	12.7	55.0	49.7	45.6	55.0	48.2	45.5
Progression Factor	1.00	1.00	1.00	0.97	0.95	1.32	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	158.2	1.1	0.1	96.7	1.4	0.3	68.4	8.7	0.1	180.2	1.2	0.1
Delay (s)	213.2	18.6	13.0	149.1	18.5	17.1	123.4	58.4	45.7	235.2	49.4	45.6
Level of Service	F	B	B	F	B	B	F	E	D	F	D	D
Approach Delay (s)		46.6			32.8			86.2			156.6	
Approach LOS		D			C			F			F	

Intersection Summary				
HCM Average Control Delay	64.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (vph)	915	237	0	1395	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)		200	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		100	100		100	100
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3257	1500	0	3288	0	1557
Flt Permitted						
Satd. Flow (perm)	3257	1500	0	3288	0	1557
Link Speed (mph)	30			30	30	
Link Distance (ft)	435			490	248	
Travel Time (s)	9.9			11.1	5.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	4%	0%	0%
Adj. Flow (vph)	963	249	0	1468	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	963	249	0	1468	0	47
Enter Blocked Intersection	Yes	Yes	No	Yes	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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

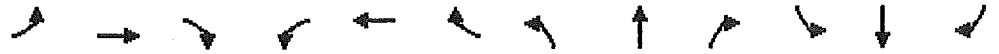
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		



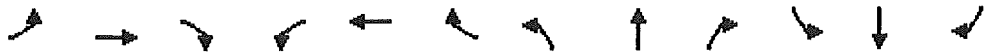
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	915	237	0	1395	0	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	963	249	0	1468	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	875			490		
pX, platoon unblocked					0.77	
vC, conflicting volume			1213		1697	482
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1213		1312	482
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			582		118	536

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	482	482	249	734	734	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	249	0	0	47
cSH	1700	1700	1700	1700	1700	536
Volume to Capacity	0.28	0.28	0.15	0.43	0.43	0.09
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		



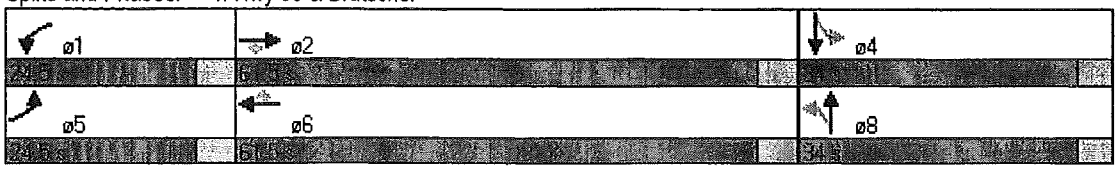
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	853	64	205	1161	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	0		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
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		0.870			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1518	0	1660	1500	0
Flt Permitted	0.950			0.950			0.602			0.382		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1062	1518	0	668	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66			27		216			108	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			465			315			277	
Travel Time (s)		8.4			7.9			8.6			7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Adj. Flow (vph)	69	879	66	211	1197	74	246	34	216	37	22	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	879	66	211	1197	74	246	250	0	37	130	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		

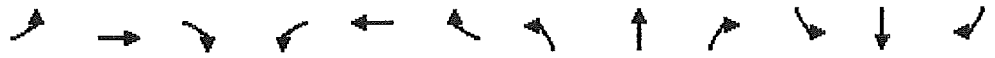


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	24.5	61.5	61.5	24.5	61.5	61.5	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	20.4%	51.3%	51.3%	20.4%	51.3%	51.3%	28.3%	28.3%	0.0%	28.3%	28.3%	0.0%
Maximum Green (s)	20.5	57.0	57.0	20.5	57.0	57.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	9.5	60.2	60.2	18.2	70.8	70.8	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.08	0.50	0.50	0.15	0.59	0.59	0.24	0.24		0.24	0.24	
v/c Ratio	0.51	0.54	0.08	0.83	0.61	0.09	0.96	0.47		0.23	0.29	
Control Delay	60.7	19.3	4.8	74.9	18.7	8.9	91.2	10.6		40.2	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	60.7	19.3	4.8	74.9	18.7	8.9	91.2	10.6		40.2	11.5	
LOS	E	B	A	E	B	A	F	B		D	B	
Approach Delay		21.2			26.2			50.6			17.9	
Approach LOS		C			C			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 81.5 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 28.0		Intersection LOS: C	
Intersection Capacity Utilization 73.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Hwy 99 & Brutscher

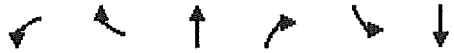




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	853	64	205	1161	72	239	33	210	36	21	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1676	1519		1660	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00		0.38	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1063	1519		667	1501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	879	66	211	1197	74	246	34	216	37	22	108
RTOR Reduction (vph)	0	0	33	0	0	11	0	164	0	0	82	0
Lane Group Flow (vph)	69	879	33	211	1197	63	246	86	0	37	48	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	8.4	60.3	60.3	18.2	70.1	70.1	29.0	29.0		29.0	29.0	
Effective Green, g (s)	8.4	60.3	60.3	18.2	70.1	70.1	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.07	0.50	0.50	0.15	0.58	0.58	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	120	1637	754	254	1939	835	257	367		161	363	
v/s Ratio Prot	0.04	0.27		c0.13	c0.36			0.06			0.03	
v/s Ratio Perm			0.02			0.04	c0.23			0.06		
v/c Ratio	0.57	0.54	0.04	0.83	0.62	0.08	0.96	0.23		0.23	0.13	
Uniform Delay, d1	54.1	20.3	15.2	49.4	16.2	10.9	44.9	36.6		36.5	35.6	
Progression Factor	0.97	0.86	1.11	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.0	0.1	19.5	1.5	0.2	43.9	0.2		0.5	0.1	
Delay (s)	56.2	18.4	17.0	68.9	17.7	11.0	88.8	36.8		37.1	35.8	
Level of Service	E	B	B	E	B	B	F	D		D	D	
Approach Delay (s)		20.9			24.7			62.6			36.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	30.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	312	263	88	0	342
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.966			
Flt Protected						
Satd. Flow (prot)	0	1542	1668	0	0	1731
Flt Permitted						
Satd. Flow (perm)	0	1542	1668	0	0	1731
Link Speed (mph)	30		30			30
Link Distance (ft)	1394		715			385
Travel Time (s)	31.7		16.3			8.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	5%	2%	0%	4%
Adj. Flow (vph)	0	328	277	93	0	360
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	328	370	0	0	360
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		24			12
Link Offset(ft)	0		6			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	312	263	88	0	342
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	328	277	93	0	360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			715			385
pX, platoon unblocked	0.95					
vC, conflicting volume	683	323			369	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	323			369	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	54			100	
cM capacity (veh/h)	420	720			1200	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	328	369	360
Volume Left	0	0	0
Volume Right	328	93	0
cSH	720	1700	1700
Volume to Capacity	0.46	0.22	0.21
Queue Length 95th (ft)	60	0	0
Control Delay (s)	14.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.1	0.0	0.0
Approach LOS	B		

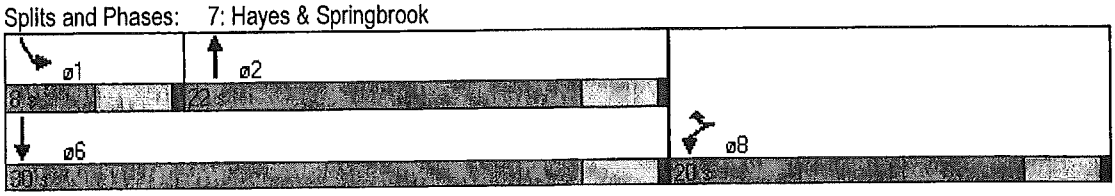
Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	53	34	285	15	37	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	0	0		0	175	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1706	0	1660	1714
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1710	1530	1706	0	1660	1714
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		36	6			
Link Speed (mph)	25		40			25
Link Distance (ft)	1176		606			715
Travel Time (s)	32.1		10.3			19.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Adj. Flow (vph)	56	36	300	16	39	267
Shared Lane Traffic (%)						
Lane Group Flow (vph)	56	36	316	0	39	267
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	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		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
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			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		8.0	20.0
Total Split (s)	20.0	20.0	22.0	0.0	8.0	30.0
Total Split (%)	40.0%	40.0%	44.0%	0.0%	16.0%	60.0%
Maximum Green (s)	16.0	16.0	18.0		4.0	26.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	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 Effct Green (s)	7.0	7.0	32.2		4.0	35.6
Actuated g/C Ratio	0.16	0.16	0.71		0.09	0.79
v/c Ratio	0.21	0.13	0.26		0.26	0.20
Control Delay	17.7	7.6	6.5		23.3	3.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.7	7.6	6.5		23.3	3.3
LOS	B	A	A		C	A
Approach Delay	13.7		6.5			5.8
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 45.1			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Hayes & Springbrook



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	53	34	285	15	37	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1710	1530	1707		1660	1714
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1710	1530	1707		1660	1714
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	36	300	16	39	267
RTOR Reduction (vph)	0	33	2	0	0	0
Lane Group Flow (vph)	56	3	314	0	39	267
Heavy Vehicles (%)	0%	0%	5%	0%	3%	5%
Turn Type		Prot			Prot	
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	4.7	4.7	30.6		1.7	36.3
Effective Green, g (s)	4.7	4.7	30.6		1.7	36.3
Actuated g/C Ratio	0.10	0.10	0.62		0.03	0.74
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	164	147	1066		58	1270
v/s Ratio Prot	c0.03	0.00	c0.18		c0.02	0.16
v/s Ratio Perm						
v/c Ratio	0.34	0.02	0.29		0.67	0.21
Uniform Delay, d1	20.7	20.1	4.2		23.4	1.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.1	0.7		26.6	0.4
Delay (s)	22.0	20.1	4.9		49.9	2.3
Level of Service	C	C	A		D	A
Approach Delay (s)	21.2		4.9			8.4
Approach LOS	C		A			A

Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service		A
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	49.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	33.5%	ICU Level of Service		A
Analysis Period (min)	15			

c Critical Lane Group

APPENDIX H

Queuing Calculations

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	341	486	525	250	227	438	428	275	212	265	324	263
Average Queue (ft)	196	257	297	14	108	379	396	108	97	113	236	95
95th Queue (ft)	393	418	459	107	207	483	493	320	175	200	368	209
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)						11	15			0	25	1
Queuing Penalty (veh)						66	89			0	37	1
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	3	0	23				30					
Queuing Penalty (veh)	16	0	10				66					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	274	306	313	192
Average Queue (ft)	155	183	102	70
95th Queue (ft)	255	280	212	136
Link Distance (ft)			428	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	2	6	2	0
Queuing Penalty (veh)	4	14	9	2

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	15	16	51	78	46
Average Queue (ft)	1	1	2	4	10
95th Queue (ft)	9	11	33	44	34
Link Distance (ft)	391	391	424	424	188
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	129	443	464	300	288	324	300	172	136	132	100	112
Average Queue (ft)	37	224	254	35	157	256	261	20	122	62	25	41
95th Queue (ft)	92	394	428	144	269	350	346	78	150	124	68	85
Link Distance (ft)		424	424			270	270					215
Upstream Blk Time (%)		0	1		1	10	12					
Queuing Penalty (veh)		1	6		0	0	0					
Storage Bay Dist (ft)	200			200	250			75	225		50	
Storage Blk Time (%)		8	10		3	11	28				4	8
Queuing Penalty (veh)		3	7		20	20	13				3	2

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	522	450
Average Queue (ft)	231	123
95th Queue (ft)	614	397
Link Distance (ft)		661
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	94	51	201	99	150
Average Queue (ft)	37	21	63	38	37
95th Queue (ft)	74	47	141	77	108
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 390

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	381	588	617	196	252	432	443	275	200	238	326	246
Average Queue (ft)	234	334	372	12	91	374	395	108	102	116	246	94
95th Queue (ft)	487	700	711	98	179	497	503	325	171	194	364	202
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		5	1			13	16			0	21	1
Queuing Penalty (veh)		0	0			79	98			0	32	1
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	12	0	25				30	0				
Queuing Penalty (veh)	66	0	11				69	0				

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	268	320	418	201
Average Queue (ft)	166	200	138	67
95th Queue (ft)	265	311	316	137
Link Distance (ft)			428	
Upstream Blk Time (%)			2	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	4	11	4	0
Queuing Penalty (veh)	9	26	16	1

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	WB	WB	NB
Directions Served	T	T	T	R
Maximum Queue (ft)	29	179	199	50
Average Queue (ft)	1	12	13	9
95th Queue (ft)	13	103	111	36
Link Distance (ft)	391	424	424	188
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	1	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	214	438	476	299	288	313	301	175	139	129	62	103
Average Queue (ft)	40	232	248	40	197	254	262	23	125	61	16	43
95th Queue (ft)	115	399	424	146	310	345	342	88	145	121	46	80
Link Distance (ft)		424	424			270	270					215
Upstream Blk Time (%)		0	1		4	10	13					
Queuing Penalty (veh)		2	4		0	0	0					
Storage Bay Dist (ft)	200			200	250			75	225		50	
Storage Blk Time (%)		8	10		8	11	27				1	9
Queuing Penalty (veh)		3	7		63	20	13				1	3

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	493	394
Average Queue (ft)	194	101
95th Queue (ft)	549	360
Link Distance (ft)		661
Upstream Blk Time (%)		0
Queuing Penalty (veh)		1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	99	63	139	89	144
Average Queue (ft)	37	23	49	36	34
95th Queue (ft)	77	48	105	76	104
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 525

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	316	460	484	200	246	459	444	275	263	281	332	286
Average Queue (ft)	169	254	302	20	96	382	394	97	113	141	261	102
95th Queue (ft)	332	395	460	133	193	507	509	309	204	252	366	215
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)						16	20		0	0	26	1
Queuing Penalty (veh)						96	117		0	0	41	2
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	0	0	24				32					
Queuing Penalty (veh)	2	0	11				72					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	264	309	383	167
Average Queue (ft)	165	200	134	70
95th Queue (ft)	270	315	306	132
Link Distance (ft)			428	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	5	11	2	0
Queuing Penalty (veh)	11	26	9	1

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	33	39	239	299	83
Average Queue (ft)	1	1	18	26	18
95th Queue (ft)	15	16	125	145	51
Link Distance (ft)	391	391	424	424	188
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	172	483	489	300	289	313	306	146	150	132	72	110
Average Queue (ft)	37	242	259	38	235	271	270	21	125	66	21	47
95th Queue (ft)	100	425	443	152	334	342	347	90	147	130	56	98
Link Distance (ft)		424	424			270	270					215
Upstream Blk Time (%)		1	1		10	18	17					
Queuing Penalty (veh)		4	6		0	0	0					
Storage Bay Dist (ft)	200			200	250			75	225		50	
Storage Blk Time (%)		8	11		22	16	27				4	12
Queuing Penalty (veh)		3	7		168	35	13				3	3

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	566	316
Average Queue (ft)	240	81
95th Queue (ft)	577	252
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	102	60	168	95	118
Average Queue (ft)	40	23	58	40	35
95th Queue (ft)	79	48	119	78	95
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 630

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	946	939	249	296	451	434	275	292	319	322	299
Average Queue (ft)	505	769	771	19	136	415	419	89	151	166	295	143
95th Queue (ft)	652	1110	1095	127	259	469	470	295	278	302	357	257
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		30	13		0	24	27		4	4	46	1
Queuing Penalty (veh)		0	0		0	183	208		7	8	87	2
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	69	7	34				35					
Queuing Penalty (veh)	512	11	19				98					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	449	190
Average Queue (ft)	260	323	443	68
95th Queue (ft)	296	327	451	141
Link Distance (ft)			428	
Upstream Blk Time (%)			51	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	54	80	4	0
Queuing Penalty (veh)	161	240	25	1

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	EB	WB	WB	NB
Directions Served	T	T	R	T	T	R
Maximum Queue (ft)	226	283	60	360	407	62
Average Queue (ft)	24	31	2	63	83	18
95th Queue (ft)	157	177	43	284	329	55
Link Distance (ft)	391	391		424	424	188
Upstream Blk Time (%)	0	0		1	1	
Queuing Penalty (veh)	1	2		6	8	
Storage Bay Dist (ft)			200			
Storage Blk Time (%)		1				
Queuing Penalty (veh)		2				

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	261	504	502	300	456	476	453	147	161	139	98	176
Average Queue (ft)	54	339	359	62	375	361	357	25	130	73	33	62
95th Queue (ft)	156	514	535	218	516	606	611	109	145	148	79	125
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		6	8		28	23	22					0
Queuing Penalty (veh)		54	72		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		29	31				34				8	20
Queuing Penalty (veh)		14	26				19				7	7

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	662	672
Average Queue (ft)	558	382
95th Queue (ft)	872	771
Link Distance (ft)		661
Upstream Blk Time (%)		7
Queuing Penalty (veh)		36
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	107	66	446	102	196
Average Queue (ft)	39	27	152	36	38
95th Queue (ft)	79	52	413	77	118
Link Distance (ft)			569		661
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 1816

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	942	937	250	311	445	431	275	319	328	322	325
Average Queue (ft)	517	795	795	23	163	401	410	112	190	205	292	147
95th Queue (ft)	641	1104	1087	140	293	492	488	327	342	360	361	283
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		34	16		0	22	26		7	11	44	2
Queuing Penalty (veh)		0	0		2	168	193		15	22	89	5
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	77	5	34				34					
Queuing Penalty (veh)	578	7	19				95					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	462	176
Average Queue (ft)	259	322	442	67
95th Queue (ft)	291	335	475	139
Link Distance (ft)			428	
Upstream Blk Time (%)			48	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	54	75	7	1
Queuing Penalty (veh)	161	223	38	4

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	86	118	407	419	118
Average Queue (ft)	6	10	46	58	40
95th Queue (ft)	56	67	242	270	124
Link Distance (ft)	391	391	424	424	188
Upstream Blk Time (%)			0	0	4
Queuing Penalty (veh)			4	5	0
Storage Bay Dist (ft)					
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	298	472	506	252	451	460	447	172	145	147	98	155
Average Queue (ft)	50	322	344	61	404	316	307	17	127	86	33	61
95th Queue (ft)	147	479	515	215	509	596	588	78	144	156	78	126
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		3	6		36	19	16					0
Queuing Penalty (veh)		25	54		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		27	29				30				8	18
Queuing Penalty (veh)		13	24				17				8	6

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	676	674
Average Queue (ft)	631	448
95th Queue (ft)	805	843
Link Distance (ft)		661
Upstream Blk Time (%)		16
Queuing Penalty (veh)		82
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	128	91	460	120	189
Average Queue (ft)	48	33	279	47	57
95th Queue (ft)	95	69	663	94	138
Link Distance (ft)			569		661
Upstream Blk Time (%)			19		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)				175	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Zone Summary

Zone wide Queuing Penalty: 1857

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	422	473	485	248	267	420	429	272	239	280	325	295
Average Queue (ft)	264	224	256	22	126	221	241	62	125	141	297	137
95th Queue (ft)	477	386	406	139	234	387	423	236	220	247	348	273
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)					0	2	3		0	0	51	2
Queuing Penalty (veh)					1	8	13		0	0	97	4
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	4	0	23				16	0				
Queuing Penalty (veh)	20	0	13				46	1				

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	274	324	446	214
Average Queue (ft)	198	252	241	68
95th Queue (ft)	290	360	478	144
Link Distance (ft)			428	
Upstream Blk Time (%)			7	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	8	21	6	0
Queuing Penalty (veh)	24	65	34	0

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	NB
Directions Served	T	T	R
Maximum Queue (ft)	17	38	59
Average Queue (ft)	1	2	14
95th Queue (ft)	8	21	41
Link Distance (ft)	391	391	188
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	187	452	487	283	451	443	443	90	137	130	126	168
Average Queue (ft)	49	238	258	37	439	130	101	5	126	79	38	59
95th Queue (ft)	116	412	445	137	454	412	348	42	145	162	91	127
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		1	2		66	7	1					0
Queuing Penalty (veh)		4	9		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		12	13				8				12	19
Queuing Penalty (veh)		6	11				4				11	6

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	673	605
Average Queue (ft)	607	394
95th Queue (ft)	854	796
Link Distance (ft)		661
Upstream Blk Time (%)		11
Queuing Penalty (veh)		56
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	92	65	444	116	195
Average Queue (ft)	37	27	230	46	56
95th Queue (ft)	72	54	596	93	146
Link Distance (ft)			569		661
Upstream Blk Time (%)			13		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)				175	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Zone Summary

Zone wide Queuing Penalty: 435

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	906	904	100	267	380	410	273	274	306	327	280
Average Queue (ft)	515	662	572	3	135	135	146	24	141	163	299	101
95th Queue (ft)	627	1171	1101	51	256	295	303	146	274	303	349	216
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		35	3		0	0	0		3	4	55	1
Queuing Penalty (veh)		0	0		2	2	2		5	9	111	2
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	74	1	13				4	0				
Queuing Penalty (veh)	344	1	7				10	0				

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	450	181
Average Queue (ft)	250	322	443	54
95th Queue (ft)	304	329	451	123
Link Distance (ft)			428	
Upstream Blk Time (%)			52	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	37	79	7	0
Queuing Penalty (veh)	111	236	41	1

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	10	80
Average Queue (ft)	0	22
95th Queue (ft)	0	56
Link Distance (ft)	391	188
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	140	396	405	206	452	446	440	34	142	138	93	149
Average Queue (ft)	37	206	222	36	439	95	73	3	127	76	33	58
95th Queue (ft)	102	374	393	135	450	371	307	18	146	158	78	118
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		0	0		73	4	1					0
Queuing Penalty (veh)		1	2		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)	0	6	8				5				10	21
Queuing Penalty (veh)	0	3	7				3				9	7

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	673	676
Average Queue (ft)	642	502
95th Queue (ft)	782	880
Link Distance (ft)		661
Upstream Blk Time (%)		22
Queuing Penalty (veh)		117
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	106	86	535	93	187
Average Queue (ft)	44	32	332	38	62
95th Queue (ft)	84	70	725	81	147
Link Distance (ft)			569		661
Upstream Blk Time (%)			25		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 1031

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	252	459	480	200	220	429	441	275	132	141	208	147
Average Queue (ft)	114	224	271	14	105	337	361	80	73	84	96	59
95th Queue (ft)	214	387	434	108	192	479	502	285	124	131	170	117
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)						7	10					
Queuing Penalty (veh)						39	57					
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)		0	21				25	0				
Queuing Penalty (veh)		0	13				39	0				

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	227	256	224	172
Average Queue (ft)	110	143	88	74
95th Queue (ft)	208	239	189	137
Link Distance (ft)			428	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	1	4	0	0
Queuing Penalty (veh)	2	7	2	2

Intersection: 3: Hwy 99 & FM RIRO

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	61	73	41
Average Queue (ft)	4	5	15
95th Queue (ft)	53	50	38
Link Distance (ft)	424	424	188
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	162	343	373	198	178	404	419	175	133	134	88	180
Average Queue (ft)	49	164	188	22	88	210	231	26	106	75	27	62
95th Queue (ft)	109	304	336	101	152	353	375	94	149	136	71	128
Link Distance (ft)		424	424		545	545	545					214
Upstream Blk Time (%)		0	0									0
Queuing Penalty (veh)		0	0									0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		4	6				25	0			4	14
Queuing Penalty (veh)		2	3				14	0			4	4

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	90	11
Average Queue (ft)	48	0
95th Queue (ft)	74	4
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	61	40	109	75	114
Average Queue (ft)	23	16	26	28	22
95th Queue (ft)	53	39	73	63	73
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 189

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	303	364	465	249	231	436	433	275	124	136	203	140
Average Queue (ft)	144	207	251	29	100	358	383	87	68	80	96	56
95th Queue (ft)	273	331	381	159	188	481	492	294	113	126	180	108
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)						10	13					
Queuing Penalty (veh)						56	77					
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)		0	20				27	0				
Queuing Penalty (veh)		0	12				42	0				

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	191	213	152	162
Average Queue (ft)	99	131	71	73
95th Queue (ft)	176	203	131	139
Link Distance (ft)			428	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	0	1	0	0
Queuing Penalty (veh)	0	2	0	1

Intersection: 3: Hwy 99 & FM RIRO

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	65	87	35
Average Queue (ft)	3	4	11
95th Queue (ft)	36	41	32
Link Distance (ft)	424	424	188
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	179	381	382	110	304	454	476	175	158	129	87	175
Average Queue (ft)	42	169	188	20	103	230	243	25	113	70	23	64
95th Queue (ft)	97	294	318	69	209	403	416	95	156	128	63	128
Link Distance (ft)		424	424		545	545	545					214
Upstream Blk Time (%)		0	0		0	0	0					0
Queuing Penalty (veh)		0	1		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		4	5				24	0			4	16
Queuing Penalty (veh)		2	3				14	0			4	5

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	100	12
Average Queue (ft)	48	0
95th Queue (ft)	77	6
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	61	40	80	65	115
Average Queue (ft)	21	15	23	23	19
95th Queue (ft)	50	40	61	56	71
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 220

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	252	406	466	250	278	438	437	275	163	182	215	128
Average Queue (ft)	139	218	266	17	125	345	370	77	90	104	104	53
95th Queue (ft)	258	355	406	121	239	487	504	277	148	165	179	102
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)					0	8	11					
Queuing Penalty (veh)					0	47	65					
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)			20				27					
Queuing Penalty (veh)			12				42					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	232	262	266	145
Average Queue (ft)	127	163	92	64
95th Queue (ft)	231	268	243	113
Link Distance (ft)			428	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	2	7	0	0
Queuing Penalty (veh)	4	15	0	0

Intersection: 3: Hwy 99 & FM RIRO

Movement	NB
Directions Served	R
Maximum Queue (ft)	66
Average Queue (ft)	22
95th Queue (ft)	47
Link Distance (ft)	188
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	95	371	414	296	354	459	458	175	134	135	78	157
Average Queue (ft)	38	168	189	30	164	230	248	31	109	80	24	57
95th Queue (ft)	78	303	331	126	306	396	410	114	153	145	62	112
Link Distance (ft)		424	424		545	545	545					214
Upstream Blk Time (%)		0	0			0	0					
Queuing Penalty (veh)		0	1			0	0					
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		4	5				25				3	15
Queuing Penalty (veh)		2	3				15				3	4

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	110	15
Average Queue (ft)	56	1
95th Queue (ft)	91	6
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	69	43	73	78	118
Average Queue (ft)	25	17	25	22	26
95th Queue (ft)	54	42	63	58	84
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 214

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	927	926	250	422	431	442	275	235	256	276	239
Average Queue (ft)	483	725	730	35	262	404	418	84	147	158	141	97
95th Queue (ft)	689	1122	1102	175	457	475	467	290	255	266	256	188
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		31	13		19	25	28		1	3	1	0
Queuing Penalty (veh)		0	0		142	186	212		2	4	2	0
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	69	2	29				35					
Queuing Penalty (veh)	489	3	22				68					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	324	464	239
Average Queue (ft)	250	312	408	94
95th Queue (ft)	306	368	583	187
Link Distance (ft)			428	
Upstream Blk Time (%)			45	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	44	75	5	2
Queuing Penalty (veh)	112	191	26	9

Intersection: 3: Hwy 99 & FM RIRO

Movement	EB	EB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	8	7	446	460	44
Average Queue (ft)	0	0	235	262	17
95th Queue (ft)	6	5	543	562	41
Link Distance (ft)	391	391	424	424	188
Upstream Blk Time (%)			3	4	
Queuing Penalty (veh)			32	39	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	234	410	449	300	390	475	468	175	133	144	135	226
Average Queue (ft)	64	241	254	41	171	443	443	36	123	92	32	94
95th Queue (ft)	150	358	375	160	327	459	455	138	143	157	86	178
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		0	1		0	37	39					1
Queuing Penalty (veh)		1	4		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		16	19				45				7	33
Queuing Penalty (veh)		11	12				32				9	12

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	203	83
Average Queue (ft)	73	6
95th Queue (ft)	191	56
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	70	45	102	74	154
Average Queue (ft)	26	18	34	28	29
95th Queue (ft)	57	43	80	61	95
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 1618

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	902	902	250	434	436	447	275	282	291	268	209
Average Queue (ft)	499	740	745	31	312	396	412	81	175	185	151	88
95th Queue (ft)	653	1133	1103	165	484	491	489	286	289	300	244	165
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		32	7		25	21	26		1	3	1	
Queuing Penalty (veh)		0	0		183	153	193		2	5	1	
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	68	2	28				33					
Queuing Penalty (veh)	490	4	21				64					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	479	216
Average Queue (ft)	257	322	443	84
95th Queue (ft)	298	329	495	173
Link Distance (ft)			428	
Upstream Blk Time (%)			54	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	42	81	5	1
Queuing Penalty (veh)	105	204	24	7

Intersection: 3: Hwy 99 & FM RIRO

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	472	450	84
Average Queue (ft)	195	206	26
95th Queue (ft)	510	519	69
Link Distance (ft)	424	424	188
Upstream Blk Time (%)	2	3	
Queuing Penalty (veh)	26	29	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	228	396	411	250	440	451	480	175	156	133	84	204
Average Queue (ft)	57	234	244	33	283	425	429	23	123	92	27	96
95th Queue (ft)	139	350	368	120	487	524	526	104	152	155	69	181
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		0	0		10	32	33					1
Queuing Penalty (veh)		0	1		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		15	17				43	0			6	31
Queuing Penalty (veh)		10	11				31	0			7	11

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	221	76
Average Queue (ft)	78	7
95th Queue (ft)	205	51
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	69	46	161	70	153
Average Queue (ft)	33	19	43	26	35
95th Queue (ft)	62	44	106	60	101
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 1582

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	549	798	786	150	444	400	424	275	228	229	257	141
Average Queue (ft)	459	598	556	9	365	200	221	31	135	146	149	69
95th Queue (ft)	703	1153	1090	84	473	339	375	168	228	240	244	118
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		26	3		35	1	2		0	0	0	
Queuing Penalty (veh)		0	0		161	3	8		0	0	0	
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	63	0	13				12					
Queuing Penalty (veh)	280	0	10				24					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	458	202
Average Queue (ft)	248	316	420	79
95th Queue (ft)	316	363	565	155
Link Distance (ft)			428	
Upstream Blk Time (%)			47	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	36	77	6	1
Queuing Penalty (veh)	91	196	29	4

Intersection: 3: Hwy 99 & FM RIRO

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	50	45	46
Average Queue (ft)	10	8	16
95th Queue (ft)	83	69	39
Link Distance (ft)	424	424	188
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	191	262	286	108	363	434	444	173	139	151	105	201
Average Queue (ft)	60	147	161	20	219	226	237	34	120	87	31	75
95th Queue (ft)	127	243	257	69	383	395	411	110	151	156	75	152
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)					2	0	1					0
Queuing Penalty (veh)					0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)	0	3	3				24	0			7	20
Queuing Penalty (veh)	0	2	2				17	0			9	7

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	119	31
Average Queue (ft)	58	1
95th Queue (ft)	95	14
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	66	40	143	63	148
Average Queue (ft)	26	16	38	27	34
95th Queue (ft)	56	41	94	57	104
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 845

Intersection: 1: Hwy 99 & Springbrook

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	550	927	912	248	436	404	416	275	298	302	283	177
Average Queue (ft)	530	719	643	9	366	220	236	42	177	190	160	74
95th Queue (ft)	609	1175	1136	84	487	363	382	200	300	310	263	144
Link Distance (ft)		882	882		361	361	361		299	299	299	299
Upstream Blk Time (%)		34	4		40	1	1		2	4	0	0
Queuing Penalty (veh)		0	0		185	3	6		2	6	0	0
Storage Bay Dist (ft)	450			150				175				
Storage Blk Time (%)	78	0	14				13					
Queuing Penalty (veh)	353	1	11				24					

Intersection: 1: Hwy 99 & Springbrook

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	275	325	455	184
Average Queue (ft)	242	321	437	72
95th Queue (ft)	319	340	510	146
Link Distance (ft)			428	
Upstream Blk Time (%)			51	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	225		175
Storage Blk Time (%)	27	81	6	1
Queuing Penalty (veh)	68	204	29	3

Intersection: 3: Hwy 99 & FM RIRO

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	58	57	68
Average Queue (ft)	5	4	24
95th Queue (ft)	59	53	51
Link Distance (ft)	424	424	188
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Hwy 99 & Brutscher

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	136	313	321	57	451	448	431	175	156	141	112	218
Average Queue (ft)	59	150	160	21	337	186	184	26	124	89	29	80
95th Queue (ft)	119	249	267	51	528	416	411	109	147	160	75	156
Link Distance (ft)		424	424		424	424	424					214
Upstream Blk Time (%)		0	0		28	2	1					0
Queuing Penalty (veh)		0	0		0	0	0					0
Storage Bay Dist (ft)	200			200				75	225		50	
Storage Blk Time (%)		2	3				18	0			5	24
Queuing Penalty (veh)		1	2				13	0			7	9

Intersection: 5: FM Main & Springbrook

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	177	82
Average Queue (ft)	69	6
95th Queue (ft)	133	55
Link Distance (ft)		661
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hayes & Springbrook

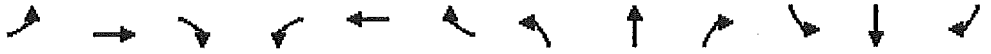
Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	72	40	103	89	167
Average Queue (ft)	31	20	35	28	40
95th Queue (ft)	63	43	80	67	114
Link Distance (ft)			569		661
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				175	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Zone Summary

Zone wide Queuing Penalty: 928

APPENDIX I

Mitigation Calculations



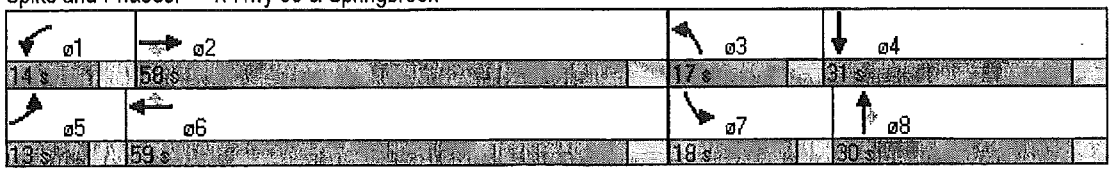
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	1174	44	95	1414	224	282	225	127	370	131	109
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.932	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1660	3257	1500	1555	3320	1530	3285	1782	1378	3285	1652	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1660	3257	1500	1555	3320	1530	3285	1782	1378	3285	1652	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			27			133			130		32	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	5%	2%	10%	3%	0%	1%	1%	11%	1%	2%	1%
Adj. Flow (vph)	123	1198	45	97	1443	229	288	230	130	378	134	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	1198	45	97	1443	229	288	230	130	378	245	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			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
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	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	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		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	

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	
Switch Phase												
Minimum Initial (s)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	
Total Split (s)	13.0	58.0	58.0	14.0	59.0	59.0	17.0	30.0	30.0	18.0	31.0	0.0
Total Split (%)	10.8%	48.3%	48.3%	11.7%	49.2%	49.2%	14.2%	25.0%	25.0%	15.0%	25.8%	0.0%
Maximum Green (s)	9.0	53.5	53.5	10.0	54.5	54.5	13.0	26.0	26.0	14.0	27.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	9.0	52.2	52.2	9.5	52.7	52.7	12.5	18.8	18.8	14.1	20.4	
Actuated g/C Ratio	0.08	0.47	0.47	0.09	0.47	0.47	0.11	0.17	0.17	0.13	0.18	
v/c Ratio	0.91	0.78	0.06	0.73	0.92	0.29	0.78	0.76	0.38	0.91	0.74	
Control Delay	109.8	30.0	9.9	81.7	38.3	8.9	64.7	61.1	10.1	75.8	52.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	109.8	30.0	9.9	81.7	38.3	8.9	64.7	61.1	10.1	75.8	52.0	
LOS	F	C	A	F	D	A	E	E	B	E	D	
Approach Delay		36.5			36.9			52.5			66.4	
Approach LOS		D			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 111.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 85.7% ICU Level of Service E
Analysis Period (min) 15

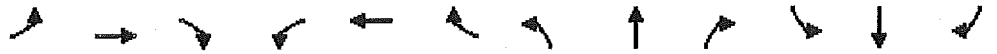
Splits and Phases: 1: Hwy 99 & Springbrook



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	1174	44	95	1414	224	282	225	127	370	131	109
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1660	3257	1500	1555	3320	1530	3285	1782	1378	3285	1652	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1660	3257	1500	1555	3320	1530	3285	1782	1378	3285	1652	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	123	1198	45	97	1443	229	288	230	130	378	134	111
RTOR Reduction (vph)	0	0	14	0	0	70	0	0	108	0	26	0
Lane Group Flow (vph)	123	1198	31	97	1443	159	288	230	22	378	219	0
Heavy Vehicles (%)	3%	5%	2%	10%	3%	0%	1%	1%	11%	1%	2%	1%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	
Actuated Green, G (s)	9.0	52.2	52.2	9.5	52.7	52.7	12.5	18.8	18.8	14.1	20.4	
Effective Green, g (s)	9.0	52.2	52.2	9.5	52.7	52.7	12.5	18.8	18.8	14.1	20.4	
Actuated g/C Ratio	0.08	0.47	0.47	0.09	0.47	0.47	0.11	0.17	0.17	0.13	0.18	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	
Lane Grp Cap (vph)	134	1530	705	133	1575	726	370	302	233	417	303	
v/s Ratio Prot	c0.07	0.37		0.06	c0.43		0.09	0.13		c0.12	c0.13	
v/s Ratio Perm			0.02			0.10			0.02			
v/c Ratio	0.92	0.78	0.04	0.73	0.92	0.22	0.78	0.76	0.09	0.91	0.72	
Uniform Delay, d1	50.7	24.7	15.9	49.5	27.1	17.1	48.0	44.0	39.0	47.8	42.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	52.6	2.9	0.0	17.0	8.9	0.2	9.4	10.1	0.1	22.6	7.5	
Delay (s)	103.3	27.6	16.0	66.6	36.1	17.4	57.3	54.1	39.1	70.5	50.1	
Level of Service	F	C	B	E	D	B	E	D	D	E	D	
Approach Delay (s)		34.0			35.3			52.5			62.5	
Approach LOS		C			D			D			E	

Intersection Summary				
HCM Average Control Delay	41.3	HCM Level of Service		D
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	111.1	Sum of lost time (s)		8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service		E
Analysis Period (min)	15			

c Critical Lane Group



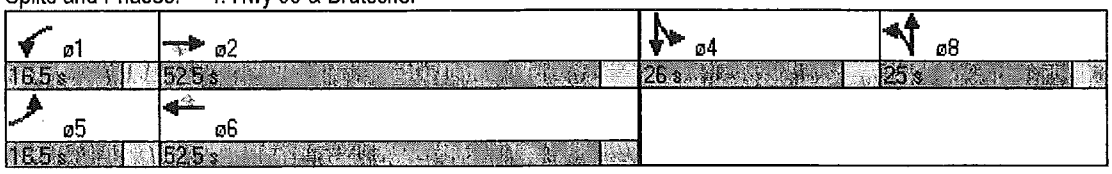
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	1245	69	213	1519	46	266	20	144	27	18	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	250		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.895			0.886	
Flt Protected	0.950			0.950			0.950	0.990		0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1530	1608	1495	0	1598	1595	0
Flt Permitted	0.950			0.950			0.950	0.990		0.950		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1530	1608	1495	0	1598	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47			12		85			57	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			310			315			277	
Travel Time (s)		8.4			5.3			8.6			7.6	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	5%	2%	2%	3%	0%	1%	5%	1%	7%	0%	0%
Adj. Flow (vph)	39	1270	70	217	1550	47	271	20	147	28	18	57
Shared Lane Traffic (%)							16%					
Lane Group Flow (vph)	39	1270	70	217	1550	47	228	210	0	28	75	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Split			Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						

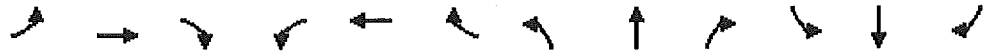
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	16.5	52.5	52.5	16.5	52.5	52.5	25.0	25.0	0.0	26.0	26.0	0.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	43.8%	20.8%	20.8%	0.0%	21.7%	21.7%	0.0%
Maximum Green (s)	12.5	48.0	48.0	12.5	48.0	48.0	21.0	21.0		22.0	22.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	7.1	45.8	45.8	12.8	55.8	55.8	18.3	18.3		7.4	7.4	
Actuated g/C Ratio	0.07	0.47	0.47	0.13	0.57	0.57	0.19	0.19		0.08	0.08	
v/c Ratio	0.31	0.84	0.10	1.00	0.82	0.05	0.77	0.61		0.23	0.43	
Control Delay	53.1	30.4	8.1	108.0	25.7	11.5	57.2	30.9		50.7	26.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	53.1	30.4	8.1	108.0	26.7	11.5	57.2	30.9		50.7	26.4	
LOS	D	C	A	F	C	B	E	C		D	C	
Approach Delay		29.9			35.2			44.6			33.0	
Approach LOS		C			D			D			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 98.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 34.3 Intersection LOS: C
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Hwy 99 & Brutscher





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	1245	69	213	1519	46	266	20	144	27	18	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1530	1608	1494		1598	1595	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99		0.95	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1530	1608	1494		1598	1595	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	39	1270	70	217	1550	47	271	20	147	28	18	57
RTOR Reduction (vph)	0	0	25	0	0	5	0	70	0	0	54	0
Lane Group Flow (vph)	39	1270	45	217	1550	42	228	140	0	28	21	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	0%	1%	5%	1%	7%	0%	0%
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						
Actuated Green, G (s)	4.7	47.7	47.7	12.8	55.8	55.8	18.3	18.3		5.8	5.8	
Effective Green, g (s)	4.7	47.7	47.7	12.8	55.8	55.8	18.3	18.3		5.8	5.8	
Actuated g/C Ratio	0.05	0.47	0.47	0.13	0.55	0.55	0.18	0.18		0.06	0.06	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	79	1537	708	212	1832	844	291	270		92	92	
v/s Ratio Prot	0.02	0.39		c0.13	c0.47		c0.14	0.09		c0.02	0.01	
v/s Ratio Perm			0.03			0.03						
v/c Ratio	0.49	0.83	0.06	1.02	0.85	0.05	0.78	0.52		0.30	0.23	
Uniform Delay, d1	47.0	23.1	14.5	44.1	19.0	10.4	39.5	37.4		45.7	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	4.2	0.1	68.1	4.2	0.0	12.5	1.3		1.4	0.9	
Delay (s)	49.8	27.3	14.6	112.2	23.2	10.5	52.0	38.7		47.1	46.5	
Level of Service	D	C	B	F	C	B	D	D		D	D	
Approach Delay (s)		27.3			33.5			45.6			46.6	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM Average Control Delay	33.0	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	101.1	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	80.5%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

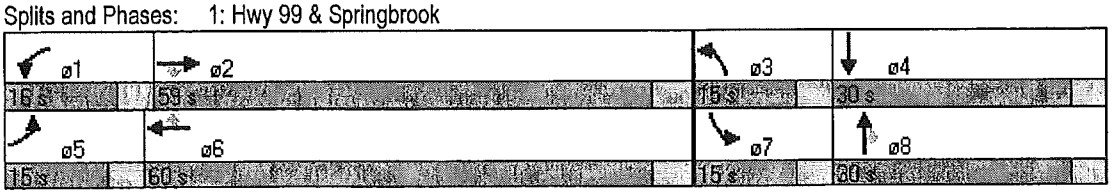
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	136	1136	61	115	1431	155	229	133	98	287	89	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	450		150	0		175	0		0	225		175
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.916	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1582	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			40			92			102		49	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		931			440			385			481	
Travel Time (s)		15.9			7.5			10.5			13.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Adj. Flow (vph)	142	1183	64	120	1491	161	239	139	102	299	93	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	1183	64	120	1491	161	239	139	102	299	212	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			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
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	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
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	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	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		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	

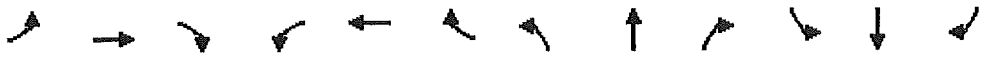
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	1.0	10.0	10.0	1.0	10.0	10.0	1.0	6.0	6.0	1.0	6.0	
Minimum Split (s)	5.0	35.5	35.5	5.0	35.5	35.5	5.0	30.0	30.0	5.0	30.0	
Total Split (s)	15.0	59.0	59.0	16.0	60.0	60.0	15.0	30.0	30.0	15.0	30.0	0.0
Total Split (%)	12.5%	49.2%	49.2%	13.3%	50.0%	50.0%	12.5%	25.0%	25.0%	12.5%	25.0%	0.0%
Maximum Green (s)	11.0	54.5	54.5	12.0	55.5	55.5	11.0	26.0	26.0	11.0	26.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	
Minimum Gap (s)	0.5	2.2	2.2	1.0	2.2	2.2	0.5	0.5	0.5	0.5	0.5	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		26.0	26.0		26.0	26.0		21.0	21.0		21.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	11.1	53.6	53.6	11.2	53.7	53.7	10.6	16.0	16.0	11.1	16.4	
Actuated g/C Ratio	0.10	0.49	0.49	0.10	0.50	0.50	0.10	0.15	0.15	0.10	0.15	
v/c Ratio	0.83	0.73	0.08	0.74	0.91	0.20	0.74	0.54	0.34	0.90	0.75	
Control Delay	85.9	26.0	8.5	75.6	35.1	8.2	63.7	50.8	11.1	79.4	51.2	
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	85.9	26.0	8.5	75.6	35.1	8.2	63.7	50.8	11.1	79.4	51.2	
LOS	F	C	A	E	D	A	E	D	B	E	D	
Approach Delay		31.3			35.4			48.8			47.7	
Approach LOS		C			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108.4
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Hwy 99 & Springbrook

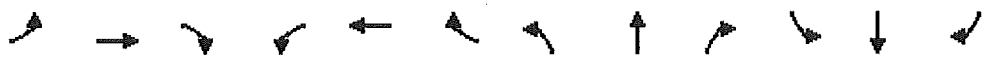




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	136	1136	61	115	1431	155	229	133	98	287	89	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1582	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3288	1530	1569	3320	1530	3285	1748	1430	3252	1582	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	142	1183	64	120	1491	161	239	139	102	299	93	119
RTOR Reduction (vph)	0	0	20	0	0	46	0	0	87	0	42	0
Lane Group Flow (vph)	142	1183	44	120	1491	115	239	139	15	299	170	0
Heavy Vehicles (%)	2%	4%	0%	9%	3%	0%	1%	3%	7%	2%	7%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases		2	2		6	6		8	8		4	
Actuated Green, G (s)	11.1	53.6	53.6	11.2	53.7	53.7	10.6	16.0	16.0	11.1	16.5	
Effective Green, g (s)	11.1	53.6	53.6	11.2	53.7	53.7	10.6	16.0	16.0	11.1	16.5	
Actuated g/C Ratio	0.10	0.49	0.49	0.10	0.50	0.50	0.10	0.15	0.15	0.10	0.15	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.3	4.2	4.2	2.5	4.2	4.2	2.3	2.3	2.3	2.3	2.3	
Lane Grp Cap (vph)	172	1626	757	162	1645	758	321	258	211	333	241	
v/s Ratio Prot	c0.08	0.36		0.08	c0.45		0.07	0.08		c0.09	c0.11	
v/s Ratio Perm			0.03			0.07			0.01			
v/c Ratio	0.83	0.73	0.06	0.74	0.91	0.15	0.74	0.54	0.07	0.90	0.71	
Uniform Delay, d1	47.7	21.6	14.3	47.2	25.0	14.9	47.6	42.8	39.8	48.1	43.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.7	1.8	0.0	15.8	7.8	0.1	8.3	1.4	0.1	25.0	8.1	
Delay (s)	73.4	23.5	14.3	63.0	32.8	15.1	55.9	44.2	39.9	73.1	51.7	
Level of Service	E	C	B	E	C	B	E	D	D	E	D	
Approach Delay (s)		28.1			33.2			49.1			64.3	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM Average Control Delay	37.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



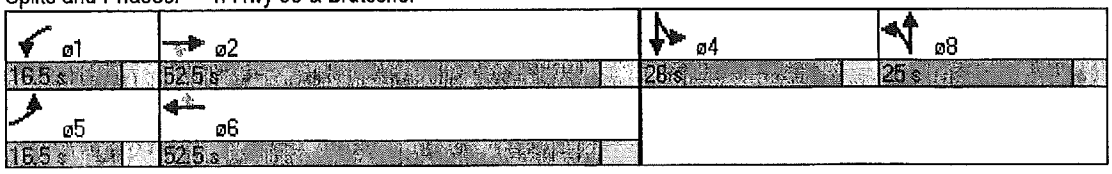
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	1043	53	163	1431	58	194	27	162	29	17	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		200	0		75	225		225	50		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.883			0.875	
Flt Protected	0.950			0.950			0.950	0.995		0.950		
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1593	1458	0	1660	1500	0
Flt Permitted	0.950			0.950			0.950	0.995		0.950		
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1593	1458	0	1660	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			44			15		127			88	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		490			586			315			277	
Travel Time (s)		8.4			10.0			8.6			7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Adj. Flow (vph)	56	1075	55	168	1475	60	200	28	167	30	18	88
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	56	1075	55	168	1475	60	180	215	0	30	106	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	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		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	20	6		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		Perm	Prot		Perm	Split			Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						

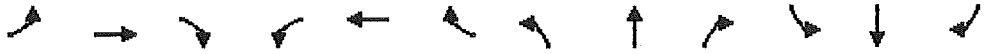
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	24.5	55.0	55.0	24.5	55.0	55.0	33.0	33.0		34.0	34.0	
Total Split (s)	16.5	52.5	52.5	16.5	52.5	52.5	25.0	25.0	0.0	26.0	26.0	0.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	43.8%	20.8%	20.8%	0.0%	21.7%	21.7%	0.0%
Maximum Green (s)	12.5	48.0	48.0	12.5	48.0	48.0	21.0	21.0		22.0	22.0	
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
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)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Minimum Gap (s)	0.5	2.8	2.8	0.5	2.8	2.8	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	8.0	10.0	10.0	8.0	10.0	10.0	5.0	5.0		5.0	5.0	
Time To Reduce (s)	3.0	20.0	20.0	3.0	20.0	20.0	5.0	5.0		5.0	5.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		16.0	16.0		17.0	17.0	24.0	24.0		25.0	25.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	7.9	42.2	42.2	12.7	49.2	49.2	15.2	15.2		7.7	7.7	
Actuated g/C Ratio	0.08	0.45	0.45	0.13	0.52	0.52	0.16	0.16		0.08	0.08	
v/c Ratio	0.39	0.74	0.08	0.75	0.85	0.08	0.70	0.63		0.22	0.52	
Control Delay	52.0	26.0	7.1	63.7	28.3	12.4	54.0	25.5		47.9	23.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	52.0	26.0	7.1	63.7	28.3	12.4	54.0	25.5		47.9	23.7	
LOS	D	C	A	E	C	B	D	C		D	C	
Approach Delay		26.4			31.3			38.5			29.1	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 94.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.3 Intersection LOS: C
Intersection Capacity Utilization 77.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Hwy 99 & Brutscher





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	1043	53	163	1431	58	194	27	162	29	17	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3257	1500	1676	3320	1430	1593	1459		1660	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1710	3257	1500	1676	3320	1430	1593	1459		1660	1501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	56	1075	55	168	1476	60	200	28	167	30	18	88
RTOR Reduction (vph)	0	0	24	0	0	7	0	107	0	0	81	0
Lane Group Flow (vph)	56	1075	31	168	1476	53	180	108	0	30	25	0
Heavy Vehicles (%)	0%	5%	2%	2%	3%	7%	2%	4%	3%	3%	0%	6%
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						
Actuated Green, G (s)	6.7	43.2	43.2	12.7	49.2	49.2	15.2	15.2		7.7	7.7	
Effective Green, g (s)	6.7	43.2	43.2	12.7	49.2	49.2	15.2	15.2		7.7	7.7	
Actuated g/C Ratio	0.07	0.45	0.45	0.13	0.52	0.52	0.16	0.16		0.08	0.08	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	120	1476	680	223	1714	738	254	233		134	121	
v/s Ratio Prot	0.03	0.33		c0.10	c0.44		c0.11	0.07		c0.02	0.02	
v/s Ratio Perm			0.02			0.04						
v/c Ratio	0.47	0.73	0.05	0.75	0.86	0.07	0.71	0.46		0.22	0.21	
Uniform Delay, d1	42.6	21.3	14.5	39.8	20.1	11.6	38.0	36.4		41.0	40.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	2.2	0.1	12.5	5.1	0.1	8.1	1.1		0.6	0.6	
Delay (s)	44.3	23.4	14.6	52.3	25.1	11.7	46.1	37.4		41.6	41.6	
Level of Service	D	C	B	D	C	B	D	D		D	D	
Approach Delay (s)		24.0			27.3			41.4			41.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service		C
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	95.3	Sum of lost time (s)		12.0
Intersection Capacity Utilization	77.0%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

APPENDIX J

ODOT Volume Adjustment

GROUP MACKENZIE
PORTLAND, OR | SEATTLE, WA | VANCOUVER, WA
RiverEast Center | 1515 Water Avenue, Suite 100 | Portland, OR 97214
P.O. Box 14310 | Portland, OR 97293
T: 503.224.9560 | F: 503.228.1285 | www.groupmackenzie.com

MEMORANDUM

PROJECT NUMBER: 2080406.00 DATE: October 28, 2008
PROJECT NAME: Fred Meyer Newberg Fuel Facility

TO: File
FROM: Scott Miller – Transportation and Planning

SUBJECT: ODOT 30th Highest Hour Adjustment

The information in this memo follows the ODOT methodology 30th Highest Hour Volumes for proposed Fred Meyer Fuel Facility in Newberg, OR. Below presents the traffic volumes to be seasonally adjusted to represent 30th Highest Hour Volumes (30HV) for current year and year of opening "background traffic" conditions. It was found after the adjusted volumes that a seasonal factor of 1.06 would be applied for this section of Highway 99.

30th Highest Hour (30th HV) Adjustment
To evaluate intersections for existing and future operational deficiencies, ODOT requires that traffic study analyses represent traffic conditions during the 30th highest hour, which is the hourly volume of traffic that is only exceeded 29 hours over a period of one year, by means of adjusting typical peak hour volumes with a seasonal factor. This is typically performed using data from a nearby ATR station (On-Site ATR Method).

Following the ODOT methodology contained in ODOT's *March 2008 Analysis Procedures Manual*, a seasonal factor was developed based on the most recent five years (2003-2007) of available Average Weekday Traffic data during the peak hour count month (Oct.) and peak months (July/Aug.) at the 36-004 ATR expressed as a percent of the ADT as presented in ***Table 1***. The highest and lowest percentages were thrown out for each ATR and the remaining percentages averaged. The seasonal adjustment factor required to calculate a 30th HV is defined by ODOT as the Average Peak Month divided by the Average Count Month percentages of ADT for the most recent five years of data available from the ATR.

TABLE 1 - SEASONAL ADJUSTMENT USING NEWBERG ATR #36-004

	2007	2006	2005	2004	2003	Average
Oct. % of ADT (Peak hour count month)	103%	104%	102%	103%	102%	103%
% of ADT (Highest AWT)	109% Aug.	109% Aug.	108% Aug.	108% (July)	109% (July)	109%

** Shaded cells indicate highest and lowest values that were discarded for calculating the average.*

Thus, the seasonal adjustment is computed as the average October percentage (count month) divided by the average July and August percentages. At the Newberg ATR, this results in a factor of 1.06 (103%/109% = 1.06). Therefore, this yields a final seasonal factor of 1.06.

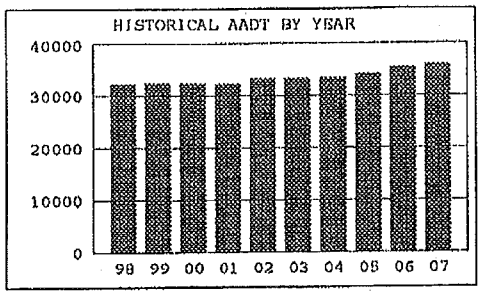
Milepoint	2007 AADT All Vehicles	Location Description
		PACIFIC HIGHWAY WEST NO. 91 (Continued)
		North city limits of Sherwood
14.90	*34600*	0.10 mile northeast of Tualatin Sherwood Road
15.60	*42200*	0.25 mile southwest of N. Sherwood Boulevard
		South city limits of Sherwood
16.77	*36700*	0.10 mile southwest of Sunset Boulevard
		Equation: MP 19.00 BK = MP Z18.99 AH
19.86	*31100*	Washington-Yamhill County Line
		East city limits of Newberg
21.81	*36000*	* Newberg Automatic Traffic Recorder, Sta. 36-004, 0.01 mile west of Brutscher Street (Site location)
22.15	*38300*	0.10 mile west of Springbrook Road
22.79	*40400*	0.01 mile east of Everest Road
22.89	*41800*	0.01 mile west of Villa Road
23.05	*40000*	0.01 mile west of Hillsboro-Silverton Highway (OR219), on 1st Street
		WESTBOUND - ONE-WAY TRAFFIC
		On Hancock Street
23.21	*22000*	0.02 mile north of 1st Street on River Street
23.44	*22200*	0.01 mile east of Hillsboro-Silverton Highway (OR219)
23.46	*18000*	0.01 mile west of Hillsboro-Silverton Highway (OR219)
23.75	*19000*	0.01 mile east of Yamhill-Newberg Highway (OR240)
23.77	*14400*	0.01 mile west of Yamhill-Newberg Highway (OR240)
		EASTBOUND - ONE-WAY TRAFFIC
		On First Street
23.40	*19800*	0.01 mile east of Hillsboro-Silverton Highway (OR219)
23.42	*20600*	0.01 mile west of Hillsboro-Silverton Highway (OR219)
23.70	*19500*	0.01 mile east of Yamhill-Newberg Highway (OR240)
23.72	*19000*	0.01 mile west of Yamhill-Newberg Highway (OR240)
		RESUME TWO-WAY TRAFFIC
		West city limits of Newberg
		Equation: MP 24.58 BK = MP Z24.49 AH
25.52	*28900*	East city limits of Dundee
26.10	*26700*	0.01 mile northeast of 9th Street
26.46	*22700*	South city limits of Dundee
28.89	*23300*	0.01 mile north of Riverwood Road
29.59	*23200*	0.20 mile north of Salmon River Highway (OR18)
29.99	*9100*	0.20 mile west of Salmon River Highway (OR18)
		East city limits of Lafayette
32.30	*14200*	0.01 mile west of Madison Street
32.75	*15800*	West city limits of Lafayette
34.75	*16700*	0.10 mile east of Tualatin Valley Highway (OR47)
34.95	*24800*	0.10 mile west of Tualatin Valley Highway (OR47)
35.15	*29000*	East city limits of McMinnville, 0.03 mile east of Riverside Drive
35.49	*23600*	0.01 mile west of Lafayette Ave
36.35	*25400*	0.01 mile east of McDonald Lane
36.99	*28300*	0.01 mile northeast of Baker Street
37.01	*34000*	0.01 mile south of Baker Street

Location: OR99W MP 21.81, PACIFIC HIGHWAY WEST, NO. 91
0.01 mile west of Brutscher Street

Recorder: NEWBERG, 36-004
Installed: July, 1952

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent of ADT: Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1998	32174	122	10.1	9.2	9.1	9.1
1999	32417	***	****	****	****	****
2000	32292	***	****	****	****	****
2001	32158	***	****	****	****	****
2002	33361	120	9.4	9.0	8.9	8.8
2003	33269	121	9.3	9.0	8.9	8.8
2004	33463	122	9.3	9.0	8.9	8.8
2005	34128	121	9.3	8.9	8.8	8.8
2006	35302	122	8.9	8.8	8.8	8.7
2007	35985	120	8.9	8.7	8.7	8.6



2007 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT	
January	32510	90	32151	89	
February	36600	102	35300	98	
March	37115	103	36015	100	
April	36715	102	36173	101	
May	37302	104	36556	102	
June	38569	107	37364	104	
July	38748	108	37987	106	
August	39361	109	38361	107	—
September	37485	104	36787	102	
October	37131	103	36267	101	—
November	36082	100	34929	97	
December	34771	97	33926	94	

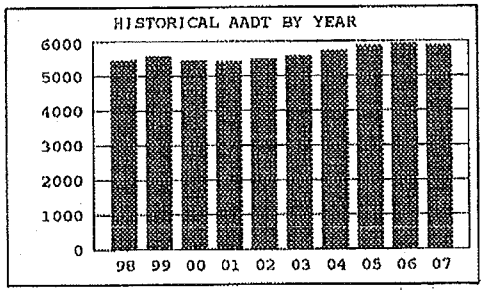
Classification Breakdown	Percent of ADT
Passenger Cars	40.6
Other 2 axle 4 tire vehicles	52.8
Single Unit 2 axle 6 tire	3.1
Single Unit 3 axle	0.7
Single Unit 4 axle or more	0.2
Single Trailer Truck 4 axle or less	0.4
Single Trailer Truck 5 axle	0.9
Single Trailer Truck 6 axle or more	0.5
Dbl-Trailer Truck 5 axle or less	0.1
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.6
Triple Trailer Trucks	0.0
Buses	0.2
Motorcycles & Scooters	0.1

Location: OR99W MP 47.15, PACIFIC HIGHWAY WEST, NO. 91
0.37 mile north of Polk-Yamhill County Line

Recorder: AMITY, 36-005
Installed: September, 1956

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent of ADT: Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1998	5462	129	11.8	11.3	11.1	10.9
1999	5566	***	****	****	****	****
2000	5451	140	12.1	11.2	11.0	10.9
2001	5425	131	13.1	11.2	10.7	10.5
2002	5483	137	14.1	12.1	11.3	11.1
2003	5571	140	13.2	11.5	11.0	10.9
2004	5731	132	13.3	11.4	11.1	10.9
2005	5858	***	****	****	****	****
2006	5940	137	13.2	11.5	11.1	10.7
2007	5874	132	13.2	11.3	10.9	10.7



2007 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	5133	87	5003	85
February	5871	100	5666	96
March	6076	103	5843	99
April	5934	101	5847	100
May	6129	104	5990	102
June	6541	111	6291	107
July	6405	109	6175	105
August	6681	114	6407	109
September	6303	107	6262	107
October	6098	104	6087	104
November	5921	101	5822	99
December	5300	90	5100	87

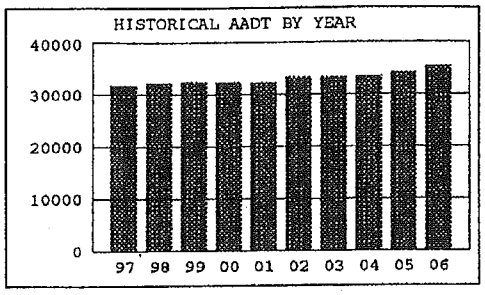
Classification Breakdown	Percent of ADT
Passenger Cars	58.3
Other 2 axle 4 tire vehicles	29.5
Single Unit 2 axle 6 tire	2.6
Single Unit 3 axle	2.2
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.7
Single Trailer Truck 5 axle	4.8
Single Trailer Truck 6 axle or more	0.3
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.4
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	1.0

Location: OR99W MP 21.81, PACIFIC HIGHWAY WEST, NO. 91
0.01 mile west of Brutscher Street

Recorder: NEWBERG, 36-004
Installed: July, 1952

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1997	31824	122	9.8	9.4	9.2	9.1
1998	32174	122	10.1	9.2	9.1	9.1
1999	32417	***	****	****	****	****
2000	32292	***	****	****	****	****
2001	32158	***	****	****	****	****
2002	33361	120	9.4	9.0	8.9	8.8
2003	33269	121	9.3	9.0	8.9	8.8
2004	33463	122	9.3	9.0	8.9	8.8
2005	34128	121	9.3	8.9	8.8	8.8
2006	35302	122	8.9	8.8	8.8	8.7



2006 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	33399	95	32369	92
February	34853	99	34059	96
March	35076	99	34370	97
April	36492	103	35699	101
May	35205	100	34957	99
June	37627	107	35971	102
July	37556	106	37093	105
August	38442	109	37807	107
September	36989	105	36487	103
October	36767	104	36122	102
November	35278	100	34217	97
December	35682	101	34476	98

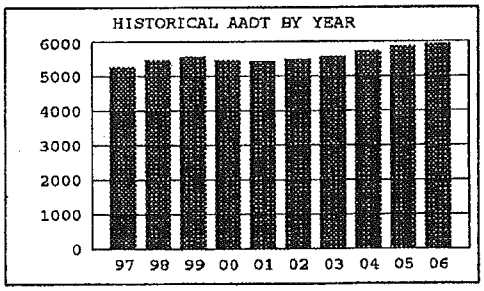
Classification Breakdown	Percent of ADT
Passenger Cars	80.4
Other 2 axle 4 tire vehicles	14.1
Single Unit 2 axle 6 tire	2.1
Single Unit 3 axle	0.6
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	1.2
Single Trailer Truck 6 axle or more	0.7
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.2
Triple Trailer Trucks	0.0
Buses	0.1
Motorcycles & Scooters	0.0

Location: OR99W MP 47.15, PACIFIC HIGHWAY WEST, NO. 91
0.37 mile north of the Polk-Yamhill County Line

Recorder: AMITY, 36-005
Installed: September, 1956

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1997	5267	133	13.2	11.2	10.8	10.7
1998	5462	129	11.8	11.3	11.1	10.9
1999	5566	***	****	****	****	****
2000	5451	140	12.1	11.2	11.0	10.9
2001	5425	131	13.1	11.2	10.7	10.5
2002	5483	137	14.1	12.1	11.3	11.1
2003	5571	140	13.2	11.5	11.0	10.9
2004	5731	132	13.3	11.4	11.1	10.9
2005	5858	141	****	****	****	10.9
2006	5940	137	13.2	11.5	11.1	10.7



2006 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	5799	98	5470	92
February	6045	102	5932	98
March	6096	103	5862	99
April	6240	105	6044	102
May	6119	103	6037	102
June	6355	107	6200	104
July	6348	107	6181	104
August	6682	112	6421	108
September	6314	106	6279	106
October	6300	106	6200	104
November	5912	100	5750	97
December	5200	88	5000	84

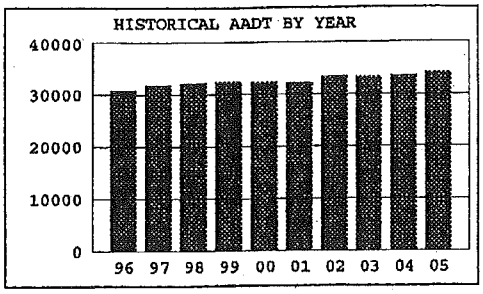
Classification Breakdown	Percent of ADT
Passenger Cars	66.6
Other 2 axle 4 tire vehicles	21.5
Single Unit 2 axle 6 tire	3.2
Single Unit 3 axle	2.1
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	3.6
Single Trailer Truck 6 axle or more	0.9
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.7
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.4

Location: ORE99W MP 21.65, PACIFIC HIGHWAY WEST, NO. 1W
0.3 mile east of Newberg

Recorder: NEWBERG, 36-004
Installed: July, 1952

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1996	30770	121	9.9	9.6	9.5	9.3
1997	31824	122	9.8	9.4	9.2	9.1
1998	32174	122	10.1	9.2	9.1	9.1
1999	32417	***	****	****	****	****
2000	32292	***	****	****	****	****
2001	32158	***	****	****	****	****
2002	33361	120	9.4	9.0	8.9	8.8
2003	33269	121	9.3	9.0	8.9	8.8
2004	33463	122	9.3	9.0	8.9	8.8
2005	34128	121	9.3	8.9	8.8	8.8



2005 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	32995	97	30868	90
February	33974	100	33570	98
March	34326	101	33713	99
April	34705	102	34021	100
May	34372	101	34362	101
June	36040	106	35416	104
July	36433	107	36016	106
August	36758	108	36508	107
September	35193	103	34724	102
October	34735	102	34181	100
November	34252	100	33339	98
December	34127	100	32819	96

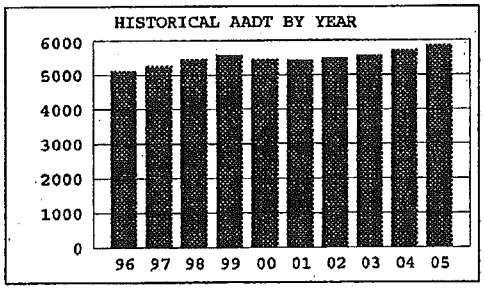
Classification Breakdown	Percent of ADT
Passenger Cars	80.3
Other 2 axle 4 tire vehicles	14.1
Single Unit 2 axle 6 tire	2.1
Single Unit 3 axle	0.6
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	1.2
Single Trailer Truck 6 axle or more	0.7
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.2
Triple Trailer Trucks	0.0
Buses	0.1
Motorcycles & Scooters	0.0

Location: ORE99W MP 47.15, PACIFIC HIGHWAY WEST, NO. 1W
2.4 miles south of Amity

Recorder: AMITY, 36-005
Installed: September, 1956

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1996	5118	129	11.8	11.3	11.0	10.8
1997	5267	133	13.2	11.2	10.8	10.7
1998	5462	129	11.8	11.3	11.1	10.9
1999	5566	***	****	****	****	****
2000	5451	140	12.1	11.2	11.0	10.9
2001	5425	131	13.1	11.2	10.7	10.5
2002	5483	137	14.1	12.1	11.3	11.1
2003	5571	140	13.2	11.5	11.0	10.9
2004	5731	132	13.3	11.4	11.1	10.9
2005	5858	141	14.2	11.6	11.1	10.9



2005 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	5664	97	5255	90
February	5920	101	5768	98
March	5942	101	5749	98
April	5988	102	5795	99
May	5961	102	5959	102
June	6258	107	6157	105
July	6366	109	6159	105
August	6492	111	6279	107
September	6305	108	6270	107
October	6177	105	6071	104
November	5943	101	5734	98
December	5314	91	5097	87

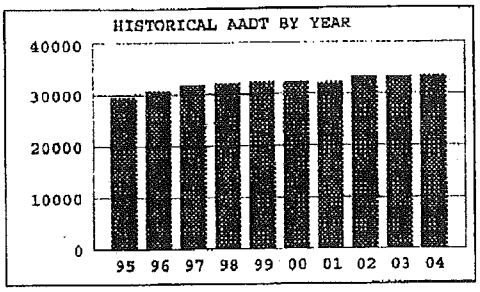
Classification Breakdown	Percent of ADT
Passenger Cars	66.6
Other 2 axle 4 tire vehicles	21.5
Single Unit 2 axle 6 tire	3.2
Single Unit 3 axle	2.1
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	3.6
Single Trailer Truck 6 axle or more	0.9
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.7
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.4

Location: OR 99W MP 21.65, PACIFIC HIGHWAY WEST, NO. 1W
0.3 mile east of Newberg

Recorder: NEWBERG, 36-004
Installed: July, 1952

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1995	29440	125	10.3	10.0	9.7	9.6
1996	30770	121	9.9	9.6	9.5	9.3
1997	31824	122	9.8	9.4	9.2	9.1
1998	32174	122	10.1	9.2	9.1	9.1
1999	32417	***	****	****	****	****
2000	32292	***	****	****	****	****
2001	32158	***	****	****	****	****
2002	33361	120	9.4	9.0	8.9	8.8
2003	33269	121	9.3	9.0	8.9	8.8
2004	33463	122	9.3	9.0	8.9	8.8



2004 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	26788	80	27344	82
February	33209	99	32754	98
March	34217	102	33781	101
April	34549	103	34218	102
May	33633	101	33589	100
June	34996	105	34441	103
July	36068	108	35460	106
August	35914	107	35598	106
September	34791	104	34356	103
October	34552	103	33905	101
November	33610	100	33064	99
December	34749	104	33051	99

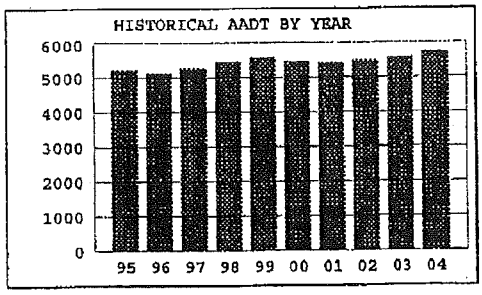
Classification Breakdown	Percent of ADT
Passenger Cars	81.0
Other 2 axle 4 tire vehicles	13.9
Single Unit 2 axle 6 tire	1.9
Single Unit 3 axle	0.6
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.4
Single Trailer Truck 5 axle	1.1
Single Trailer Truck 6 axle or more	0.6
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.2
Triple Trailer Trucks	0.0
Buses	0.1
Motorcycles & Scooters	0.2

Location: OR 99W MP 47.15, PACIFIC HIGHWAY WEST, NO. 1W
2.4 miles south of Amity

Recorder: AMITY, 36-005
Installed: September, 1956

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1995	5215	132	12.5	11.5	11.1	10.8
1996	5118	129	11.8	11.3	11.0	10.8
1997	5267	133	13.2	11.2	10.8	10.7
1998	5462	129	11.8	11.3	11.1	10.9
1999	5566	***	****	****	****	****
2000	5451	140	12.1	11.2	11.0	10.9
2001	5425	131	13.1	11.2	10.7	10.5
2002	5483	137	14.1	12.1	11.3	11.1
2003	5571	140	13.2	11.5	11.0	10.9
2004	5731	132	13.3	11.4	11.1	10.9



2004 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	4421	77	4429	77
February	5550	97	5450	95
March	5919	103	5751	100
April	6127	107	6017	105
May	6111	107	5999	105
June	6158	107	5993	105
July	6074	106	5861	102
August	6179	108	6034	105
September	6256	109	6122	107
October	6108	107	6011	105
November	5903	103	5828	102
December	5535	97	5273	92

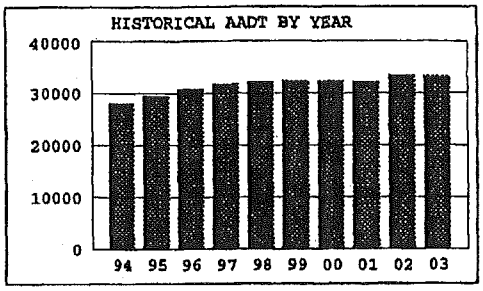
Classification Breakdown	Percent of ADT
Passenger Cars	66.6
Other 2 axle 4 tire vehicles	21.5
Single Unit 2 axle 6 tire	3.2
Single Unit 3 axle	2.1
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	3.6
Single Trailer Truck 6 axle or more	0.9
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.7
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.4

Location: OR 99W MP 21.65, PACIFIC HIGHWAY WEST, NO. 1W
0.3 mile east of Newberg

Recorder: NEWBERG, 36-004
Installed: July, 1952

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1994	28049	126	10.2	9.8	9.7	9.6
1995	29440	125	10.3	10.0	9.7	9.6
1996	30770	121	9.9	9.6	9.5	9.3
1997	31824	122	9.8	9.4	9.2	9.1
1998	32174	122	10.1	9.2	9.1	9.1
1999	32417	***	****	****	****	****
2000	32292	***	****	****	****	****
2001	32158	***	****	****	****	****
2002	33361	120	9.4	9.0	8.9	8.8
2003	33269	121	9.3	9.0	8.9	8.8



2003 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	31445	95	30742	92
February	32880	99	32521	98
March	32508	98	31940	96
April	33395	100	33020	99
May	33958	102	33893	102
June	34300	103	34100	102
July	36301	109	36015	108
August	35738	107	35298	106
September	34154	103	34298	103
October	33897	102	33459	101
November	32944	99	32238	97
December	32700	98	31700	95

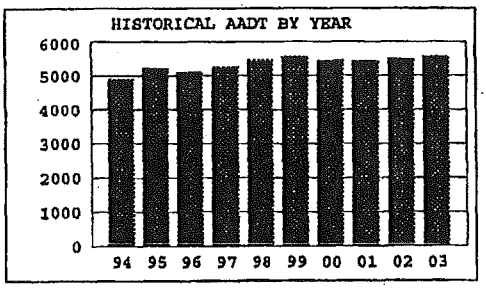
Classification Breakdown	Percent of ADT
Passenger Cars	81.0
Other 2 axle 4 tire vehicles	13.9
Single Unit 2 axle 6 tire	1.9
Single Unit 3 axle	0.6
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.4
Single Trailer Truck 5 axle	1.1
Single Trailer Truck 6 axle or more	0.6
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.2
Triple Trailer Trucks	0.0
Buses	0.1
Motorcycles & Scooters	0.2

Location: OR 99W MP 47.15, PACIFIC HIGHWAY WEST, NO. 1W
2.4 miles south of Amity

Recorder: AMITY, 36-005
Installed: September, 1956

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1994	4909	127	12.5	11.3	11.0	10.9
1995	5215	132	12.5	11.5	11.1	10.8
1996	5118	129	11.8	11.3	11.0	10.8
1997	5267	133	13.2	11.2	10.8	10.7
1998	5462	129	11.8	11.3	11.1	10.9
1999	5566	***	****	****	****	****
2000	5451	140	12.1	11.2	11.0	10.9
2001	5425	131	13.1	11.2	10.7	10.5
2002	5483	137	14.1	12.1	11.3	11.1
2003	5571	140	13.2	11.5	11.0	10.9



2003 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	5140	92	4963	89
February	5525	99	5361	96
March	5445	98	5297	95
April	5702	102	5560	100
May	5828	105	5730	103
June	5954	107	5857	105
July	6089	109	5785	104
August	6089	109	5866	105
September	5896	106	5977	107
October	5940	107	5856	105
November	5745	103	5604	101
December	5176	93	5000	90

Classification Breakdown	Percent of ADT
Passenger Cars	66.6
Other 2 axle 4 tire vehicles	21.5
Single Unit 2 axle 6 tire	3.2
Single Unit 3 axle	2.1
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.5
Single Trailer Truck 5 axle	3.6
Single Trailer Truck 6 axle or more	0.9
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.1
Dbl-Trailer Truck 7 axle or more	0.7
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.4

the Oregon 99W corridor. This represents a 30 to 70 percent increase over existing levels. ADT is estimated to range from approximately 40,000 to 56,000 vpd in year 2025. The increased traffic levels in 2025 will result in further congestion along this already congested corridor. For example, east of Rex Hill traffic volumes will increase by 70 percent.

Modified 3J and Other Build Alternatives

Table 4-1 shows that all of the Build Alternatives would reduce the ADT over the No Build in 2025. It is predicted that the Build Alternatives would reduce traffic volumes by 3,000 to 35,000 vpd compared to the No Build depending on location along the Oregon 99W corridor (see Table 4-1). The preferred alternative, Modified 3J, also reduces traffic volumes compared to the No Build and decreases traffic volumes and the resulting congestion at least as much as the other build alternatives. Modified 3J would reduce traffic volumes in year 2025 by 3,000 to 16,000 vpd in the Newberg area and 31,000 to 35,000 vpd in the Dundee area over the No Build (it would also reduce traffic volumes by 24,000 vpd between Newberg and Dundee).

$\frac{30}{48} = .625$

Table 4-1 Summary of Average Daily Traffic (ADT)

Location	Existing ADT Volumes (2002)	Year 2025 ADT Volumes (in thousands of vehicles per day)							
		No Build	Alternatives 3C and 3D	Alternatives 3G and 3H	Alternative 3I	Alternative 3J	Modified 3J	Alternative 3K	Alternative 4C
Oregon 99W									
East of Rex Hill	32	55	52	52	52	52	52	52	52
East Newberg	36	48	28.5	29.5	33	28.5	28.5	30	33
Newberg Couplet (both directions)	40	56	36.5	28	35	30	30	38	39
Between Newberg and Dundee	34	49	25.5	18	25	20	20	27	33
Dundee at Fifth Street	32	47	13	13	16	13	13	25	13
South of Dundee	25	40	5	5	8	5	5	13	5
Bypass									
East Segment	N/A	N/A	26.5	25.5	22	26.5	26.5	25	19.5
Central Segment	N/A	N/A	26.5	30.5	23	33	33	25	19.5
West Segment	N/A	N/A	33	33	30	33	33	25	33

Avg

30.1

Modified 3J and Build Alternatives 3C, 3D, 3G, 3H, 3J and 4C remove the most traffic from downtown Dundee. The highest traffic volumes in downtown Dundee occur under the No Build (47,000 ADT), followed by the Southern Build Alternative 3K (25,000 ADT).

The least traffic in downtown Newberg will occur under Alternatives 3G and 3H, followed by Modified 3J and 3J. The highest traffic volumes in downtown Newberg occur under the No Build (56,000 ADT), followed by Northern Build Alternative 4C (39,000 ADT).

APPENDIX K

Project Scoping Correspondence

Oregon
Theodore R. Kulongoski, Governor

Department of Transportation
Region 2 Tech Center
455 Airport Road SE Building A
Salem, Oregon 97301-5397
Telephone (503) 986-2990
Fax (503) 986-2839

DATE: February 20, 2009 **File: T1W-**

TO: Brent Ahrend
Group Mackenzie
Heritage Building
601 Main Street, Suite 101
Vancouver WA 98660
(360) 695-7879
BAhrend@grpmack.com

FROM: Stephen B. Wilson, PE
Region 2 Senior Traffic Analyst

SUBJECT: Fred Meyer Fuel Facility
Traffic Impact Study Review Comments
ODOT Region 2 – District 3
Pacific Highway West – OR 99W (Highway #1W)
Milepost 21.80 – 22.05
City of Newberg
Yamhill County

These are review comments for the ***Fred Meyer Fuel Facility*** Traffic Impact Study (TIS), prepared by ***Group Mackenzie***. The focus of this review is the analysis methodologies and assumptions. The review of this TIS was undertaken by ***STJ, Inc.*** under a work-order contract managed by Region 2 Traffic.

The Department agrees with the findings and conclusions of this review. The Consultant will need to confirm their previously unscoped TIS meets the requirements identified in the attached Scope of Work. If the submitted TIS does not meet one or more of these requirements, then it will need to be revised to accommodate these changes. If the TIS does fully meet the requirements of the attached scope, then a letter will need to be submitted to the record, stating such.

If you have any questions regarding these comments, please contact me by phone at (503) 986-2857 or by e-mail at stephen.b.wilson@odot.state.or.us.

Cc: Barton Brierley (Newberg), Don Jordan, Dan Fricke, David Warren, Cindy Buswell, Aref Bozorgnia, Mike Rose, Janet Lundeen, Ann Batten, File

STJ
INCORPORATED
"Professional Results, Creative Solutions"

Sam Johnston, PE
(503) 999-1213
Fax (503) 371-1460
samjohnston@stjinc.org

Date: February 20, 2009

ODOT - Region 2 Tech Center
455 Airport Road SE - Building 'A'
Salem, OR 97301-5397

Attn: Stephen B. Wilson, PE
Senior Transportation Analyst

Subject: Traffic Impact Study (TIS) Review Findings and TIS Scope of Work
Fred Meyer Fuel Facility
ODOT Region 2 – District 3
Pacific Highway West – OR 99W (Highway #1W)
Milepost 21.80 - 22.05
City of Newberg
Yamhill County

This letter discusses the review findings related to the Traffic Impact Study (TIS), completed by Group Mackenzie on December 4, 2008, to analyze the transportation system impacts of the subject proposed Fred Meyer Fuel Facility development. This letter also provides a Scope of Work to define requirements for a revised Traffic Impact Study under the requirements of Oregon Administrative Rules Chapter 734 Division 51.

The proposed fuel facility will be located in the existing Fred Meyer parking lot along the south side of Oregon Pacific Highway West (OR 99W) between MPs 21.80 - 22.05 in the community of Newberg. The property is currently zoned Community Commercial (C-2) in which "Fuel Facility" is a conditional use. The fuel facility will have 14 fueling positions with a kiosk for an attendant and is planned to be constructed in one phase with completion expected in 2009.

The *Oregon Highway Plan* classifies OR 99W as a Statewide Highway, Freight Route, and Truck Route on the National Highway System (NHS). The mobility standard is 0.75 volume to capacity (v/c) for this urban 40 mph section of OR 99W located in the City of Newberg and Yamhill County.

Generally the initial December, 4, 2008 TIS adequately meets ODOT TIS criteria. However, requirements from the following Scope of Work need to be reviewed and necessary changes incorporated into a revised TIS. Specific TIS review comments are noted in the "Specific December 4, 2008 Review Comments" section on page 8 of this document.

Scope of Work:

I. GENERAL

ODOT Road Approach Permit
A Central Highway Approach/Maintenance Permit System (CHAMPS) number will need to be associated with this TIS. Access along OR 99W in this area is controlled and only allowed by permit. The proposed fuel facility may constitute a change of use for the existing permitted driveways therefore, an ODOT *Road Approach Permit*[1] application will need to be submitted for access connections with OR 99W and for any other intersections where improvements will be made, before the revised traffic study will be accepted by Region 2 Traffic for review.

The Developer or the Developer's representative should make application on behalf of the City of Newberg. If you have any questions regarding this application, please contact Cynthia Buswell in ODOT's Region 2 office.

Executive Summary
Provide a description of the development, site location, existing zoning, and study area (including a site map). Briefly describe the purpose of the analysis, principal findings, recommendations and conclusions.

Analysis Study Area
Provide a text description (including tax-lot descriptions) of the proposed development; and a graphic showing the intersections and accesses to be evaluated as part of this analysis. A list of study area Intersections noted in the initial TIS on the state transportation system are:

1. OR 99W at North Springbrook Road (MP 22.05)
2. OR 99W at Fred Meyer Right-In Access (MP 21.93)
3. OR 99W at Fred Meyer East Access (MP 21.88)
4. OR 99W at Brutscher Street (MP 21.80)

A list of study area Intersections noted in the initial TIS on the local transportation system are:

1. North Springbrook Road at Hayes St.
2. North Springbrook Road at Fred Meyer Access

II. TRAFFIC DATA

Traffic Counts
Traffic data will be developed from *3-hour, Three Vehicle Classification* counts, with 15-minute breakdowns during the AM and PM peak periods. They are to be collected at the noted study-area intersections.

Raw traffic data will not be accepted for use in this traffic analysis. All traffic volumes in the base-year will be seasonally adjusted to represent 30th Highest Hour. If any of the manual count is collected between mid-July and mid-August, no seasonal adjustment will be required. For guidance, please refer to Chapter 4 in ODOT's *Analysis Procedures Manual*[2] *(APM)*.

Site Trip Generation, Distribution and Assignment
Site trip generation will utilize the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual to estimate daily (ADT), plus AM and PM peak hour trip volumes, originating from and destined to the subject development. All assumptions, raw data and adjustments will be documented and discussed in the body of the TIS, or in the appendix.

Approved computer models, such as *Traffix*, or manual calculations may be used for determining trip assignments for site-generated traffic volumes on roadways within the study area. Please refer to the comment regarding *Traffix* output in the section titled **Intersection Capacity Analysis.**

III. ANALYSIS PROCEDURES

Capacity Analysis
Capacity analysis of signalized intersections, unsignalized intersections, and roadway segments will follow the established methodologies of the current Highway Capacity Manual (HCM2000). For signalized intersections, the overall intersection v/c must be reported, while the highest approach v/c will be reported for unsignalized intersections, along with an indication of its corresponding movement.

ODOT's *Development Review Guidelines*[3] (DGM), in Table 3.3.8, lists standard default values for use in signalized intersection analysis; specifically the recommended Peak Hour Volumes for all future-year analyses. All intersection capacity analyses will account for heavy vehicles by approach, as determined from manual counts. Project level mobility results (v/c) from the TIS will be compared against the *2003 Highway Design Manual*[4] (HDM) mobility requirements (Table 10-1). Planning level mobility results (v/c) from this study will be compared against Highway Mobility Standards (Policy 1F) and the Maximum V/C Ratios provided in Table 6 of the *1999 Oregon Highway Plan*[5] (OHP).

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[2] http://www.oregon.gov/ODOT/TD/TP/TAPM.shtml
[3] http://www.oregon.gov/ODOT/TD/TP/DRG.shtml
[4] http://www.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml
[5] http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml

Intersection Capacity Software Analysis
Application of computer analysis software will follow all ODOT-approved methodologies, and all electronic analysis files will be made available to Region 2 Traffic for review, as part of this study's submittal. Transfer of all electronic files will be made via ODOT's FTP[6] site. Contact Region 2 Traffic for any FTP assistance. HCS2000 and Synchro are examples of approved analysis software. The Traffix analysis software package may be used for this analysis, but the Department can only review electronic files up through version 7.5. If a newer version of Traffix is used, hard-copy outputs of all non-default variable inputs will be submitted to Region 2 Traffic for review; along with all analysis summary sheets.

Queue Length Analysis
Intersection operational analysis will include the effects of queuing and blocking. Average queue lengths and 95th Percentile queue lengths will be reported for all study area intersections. The 95th Percentile queuing is used for design purposes, and will be reported to the next highest 25 foot increment. For signalized intersections, SimTraffic is an acceptable queuing analysis software package, while the *AASHTO 2-Minute Rule* or SimTraffic are examples of acceptable queuing analysis methodologies for unsignalized intersection. HCM2000 or Traffix queuing analysis results will not be accepted.

IV. ANALYSIS REQUIREMENTS

Intersection Sight Distance
Adequate intersection sight distance will be verified for all proposed intersections and highway approaches as set forth in Chapter 5.2 in the HDM. For further guidance, please contact the ODOT Region 2 Access Management Engineer.

Access Management:
Demonstrate how the proposed access, or accesses meet the minimum spacing criteria of OAR 734-051; or how it coincides with the current access management plan/strategy in this vicinity.

Alternate Access:
If alternate access is available to the property other than direct access to the State highway, then this study must clearly demonstrate how the alternate access is not reasonable and cannot be made reasonable in accordance with OAR 734-051-0080 Section 8. The same justification must be demonstrated for multiple approaches to the State highway. For guidance, please contact the Region Access Management Engineer.

Right & Left Turn Lane Criteria
Proposed right or left turn lanes and private approach roads must meet volume criteria contained in *Chapter 7.2* in the APM and warrant criteria in Appendix F of the ODOT Highway Design Manual.

[6] ftp://ftp.odot.state.or.us/incoming/

Truck Turning Templates
A truck turning analysis will be developed for all study-area intersections, using an appropriate design vehicle (i.e. WB-67). This analysis will need to determine if turning trucks could potentially impede oncoming traffic, and what mitigations may be required to prevent such a conflict. If you have any questions regarding this analysis or appropriate design vehicle, please contact Craig Black from ODOT's Region 2 Tech Center.

Traffic Signal Installations & Modifications
Analysis and recommendations related to new and/or modified traffic signals must follow ODOT's *Traffic Signal Policy and Guidelines*[7], and all subsequent revisions.

Any recommendations for traffic signals to be installed or modified as part of future mitigation must be supported by a Preliminary Signal Warrant (PSW), as specified in Chapter 7.4.1 of the APM. Any new traffic signal proposal for the Day of Opening must also show, but is not limited to the following:

- A clear indication for the traffic signal; only after other enhancements to nearby signals or intersections are shown to be insufficient to mitigate the new highway related impacts resulting from the proposed development.
- An assessment of the ability of the existing, planned, and proposed public roads to accommodate development traffic at another location.
- A detailed description how the proposed development will affect the existing and proposed study area intersections.
- Documentation of traffic volumes and signal warrant satisfaction; if a new signal is determined to be the correct solution.

All proposed signals must indicate a need, as well as meet a warrant as described in *Oregon Administrative Rule 734-020-0400-0500,* Section 6.34 of the *Oregon Traffic Manual*[7], and the aforementioned *Traffic Signal Policy and Guidelines*.

Note: It is ultimately up to the State Traffic Engineer to approve all signal installations, modifications and deviations. Meeting a Preliminary Signal Warrant does not necessarily insure it will be approved by the State Traffic Engineer.

V. ANALYSIS OUTPUT

Existing Conditions
Identify current year site conditions at the proposed development location. This includes, but is not limited to the following:

- A description of the site location, zoning, existing use(s), and proposed use(s) of subject property.
- A description of surrounding vacant or re-developable properties, with anticipated land uses.
- A graphic identifying existing lane configurations and traffic control devices at all study area intersections.

[7] http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/publications_traffic.shtml

- A graphic showing existing 30HV traffic; reported as average daily traffic (ADT), as well as AM and PM Peak Hour Volumes (PHV). Also include in this graphic, a list of heavy vehicle percentages by approach, seasonal adjustment factors (if any), and all growth rates used to determine future volumes.
- Identify all proposed road segments, public intersections, public or private approaches where the proposed project can be expected to add additional traffic volumes greater than 10 percent of the current traffic, or at a minimum 300 daily trips, or more than 50 additional trips in any single hour.
- An analysis of existing intersection operations, reported in terms of both Volume to Capacity (v/c) and Level of Service (LOS).
- A comparison of ODOT crash rates against at least 3-years worth of crash data, over at least a 1-mile segment. This analysis will also include information on any SPIS sites adjacent to or within the study area.

Traffic Volumes & Operations – Year of Opening

An analysis will be made of the study area intersections, for an assumed *Year of Opening*, under both "*background traffic*" and "*total traffic*" scenarios. The "*Total traffic*" scenario is considered "*background traffic*" volumes plus site generated trips. If this park is to be developed in multiple phases, then a Year of Opening analysis will need to be developed for each phase of the park development. For each *Year of Opening* analysis scenario, this traffic study will provide the following data:

- A graphic showing *Year of Opening* traffic volume, for both "*background traffic*" and "*total traffic*" scenarios.
- A graphic or table showing V/C and LOS analysis results for both "*background traffic*" and "*total traffic*" scenarios.
- A graphic or table itemizing 95th percentile storage length requirements for all approaches, rounded to the next nearest 25 foot increment.
- A graphic showing the existing left turn lane with storage length dimensions.

Traffic Volumes & Operations – Future Year (If Necessary)

Based on the daily trips determined from this development's trip generation analysis, a *Future Year* analysis may be required. Please refer to Table 3.3.1 in the DRG to determine what Future Year scenario may be required. An analysis will be made for all study area intersections, under both *Future Year* "*background traffic*" and "*total traffic*" scenarios. The "*Total traffic*" scenario is considered *Future Year* "*background traffic*" volumes plus the peak hour site generated trips. For each potential *Future Year* analysis scenario, this traffic study will provide the following data:

- A graphic showing Future Year traffic volumes, for both "*background traffic*" and "*total traffic*" scenarios.
- A graphic or table showing V/C and LOS analysis results for both "*background traffic*" and "*total traffic*" scenarios.
- A graphic or table itemizing 95th percentile storage length requirements for all approaches, rounded to the next nearest 25 foot increment.
- A graphic showing the existing left turn lane with storage length dimensions.

Conclusions and Recommendations

Summarize existing and future conditions and discuss the proposed development's potential impacts. Identify any operational or safety deficiencies, and recommend

mitigation, along with a conclusion on the effectiveness of the mitigation. Summarize how the proposed development will comply with all operational and safety standards.

Digital versions of this TIS and all supporting analysis work, is preferred. These files may be e-mailed to ODOT Region 2. However, if the sum-total of all digital files is greater than 3 MB, we request you notify Region 2 Traffic staff, and they will setup an FTP site on the ODOT server. Also, please submit one stamped hard copy version of the TIS to ODOT and one final hard copy version to the City of Newberg, for review. Region 2 Traffic staff should require no more than 30 days to review and comment on the draft TIS. *Note: This time-frame may be adjusted, based on staffing and shifting workloads.*

Please include this scope of work as an appendix item in the revised TIS.

It is hoped that this scope or work will provide enough information to get started on the analysis. ODOT staff is prepared to work with you and your staff, as necessary, to answer any questions that may arise during the course of your work. Additional coordination of traffic analysis data may be required during the TIS review process.

If you have any questions or comments regarding this scope of work, please contact Stephen Wilson, ODOT Region 2 Traffic, at (503) 986-2857, or by e-mail at stephen.b.wilson@odot.state.or.us. Mike Rose is the ODOT District #3 Permits Specialist, and may be reached at (503) 986-2639, or by e-mail at mike.rose@state.or.us. Cynthia Buswell is the ODOT Development Review Coordinator for this project, and may be reached at (503) 986-2654 or by e-mail at Cynthia.D.BUSWELL@odot.state.or.us. If you have any questions, or require additional information regarding land use issues, please contact Dan Fricke ODOT Region 2 Area Planner, at (503) 986-2663, or by e-mail at daniel.l.fricke@state.or.us.

Specific December 4, 2008 TIS Review Comments

As previously noted, the initial December, 4, 2008 TIS generally meets ODOT TIS criteria. However, requirements from this Scope of Work need to be reviewed and changes incorporated into a revised TIS. Also, specific TIS review comments follow.

- **Peak Hour Factors:** The TIS developed Peak Hour Factors (PHF) using the same 15 minute peak hour period for all intersections. For some intersections the uniform peak 15 minute volumes were also the peak 15 minute volumes. The ODOT *Analysis Procedures Manual* requires that PHFs be developed using the highest 15 minute peak hour volume. Synchro analysis, conducted as part of this review using highest 15 minute peak volumes, resulted in either slightly increased or slightly decreased v/c ratios. Therefore, this review recommends that Synchro analyses, for those intersections that did not use peak 15 minute developed PHF, be re-done using ODOT *Analysis Procedures Manual* procedures for PHF development. Results should be incorporated in a revised TIS.

- **Traffic Counts:** This TIS utilized 2-hour weekday and weekend traffic counts to support TIS analyses. The ODOT Analysis Procedures Manual (APM) acknowledges that critical peak hour volumes are usually identified in the PM hours. Also, the critical weekday and weekend peak hours for this study were identified, prior to the completing the 2-hour counts, by 24-hour weekday and weekend tube counts. Therefore, this review recommends accepting the 2-hour counts used for this TIS.

- **TIS Capacity Analysis:** The TIS was completed using existing conditions during year 2008, and background conditions/future conditions for years 2009 and 2025, during weekend and weekday PM peak hours. This TIS period complies with *ODOT Development Review Guideline* requirements. Year 2025 background and with development analyses were completed both with and without traffic impacts resulting from the proposed Newberg bypass.

  The TIS noted that during the critical weekend and weekday PM peak hours, for both background and total development build out, most state highway intersections fail to meet the required *Oregon Highway Plan* mobility standard of 0.75. The following table shows expected v/c ratios for state highway intersections. Note, that Fred Meyer driveway intersections with OR 99W, will meet the required highway mobility standard for all TIS years and conditions.

Intersection	Time Period	2008 Existing v/c	2009 Background v/c	2009 w/Devel. v/c	2025 Background v/c	2025 w/Devel. v/c	2025 Background w/Bypass v/c	2025 w/Bypass & Devel. v/c
OR 99W at N Springbrook	Weekday PM Peak	0.88	0.89	0.91	1.13	1.13	0.88	0.89
OR 99W at N Springbrook	Weekend Peak	0.81	0.82	0.83	0.98	0.99	0.74	0.76
OR 99W at Brutscher St.	Weekday PM Peak	0.87	0.90	0.92	1.14	1.15	0.91	0.93
OR 99W at Brutscher St.	Weekend Peak	0.73	0.75	0.75	1.04	1.04	0.74	0.76

* Shaded v/c ratios exceed required mobility standard of 0.75

As the increases in development related v/c ratios compared to existing and background conditions show some degree of facility performance degradation, this review recommends that mitigations to improve identified operational deficiencies be developed and included in a revised TIS.

- **Queuing Analysis:** The initial TIS queuing analysis noted that:
  - For year 2009 background conditions, the OR 99W/N. Springbrook Rd. intersection will experience weekday PM peak queues that exceed storage capacity for the northbound through movement (exceed by 65') and right turn movement (exceed by 50').
  - For year 2009 with development, the OR 99W/N. Springbrook Rd. intersection will experience weekday PM peak queues that exceed storage capacity for the northbound through movement (exceed by 90'), right turn movement (exceed by 100'), and left turn movement (exceed by 50').
  - For year 2009 for both background and with development conditions, the OR 99W/Brutscher St. intersection will have weekday PM peak queues that exceed storage capacity for the eastbound through movement. These queues will exceed storage capacity by 50' for both background and with development conditions.

  The initial TIS did not propose mitigations to address queuing deficiencies resulting from development traffic. This review recommends that:
  - The initial TIS *Queuing Calculations* section is revised to include a description of expected queues for all traffic movements at all study state highway intersections.
  - Mitigations to improve identified traffic queuing deficiencies, such as relocating accesses, alternate access, or other measures be proposed and included in a revised TIS.

Sincerely,

Samuel A. Johnston, P.E.
STJ Inc.

cc: David Warren
Cynthia Buswell
Dan Fricke

GROUP MACKENZIE

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Group Mackenzie, Incorporated
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Interiors
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Locations:
Portland, Oregon
Seattle, Washington
Vancouver, Washington

February 25, 2009

ODOT Region 2 Tech Center
Attention: Stephen Wilson; PE
455 Airport Road SE
Salem, Oregon 97301-5397

Re: **Fred Meyer Fuel Facility Newberg**
Response to TIS Review Comments
Project Number 2080406.00

Dear Mr. Wilson:

This letter is provided to address the ODOT and STJ, Inc. comments provided in its February 20, 2009 letter regarding the December 4, 2008 Group Mackenzie Newberg Fred Meyer Fuel Facility Transportation Impact Statement (TIS). Generally, we agree with the statements of STJ, Inc. regarding the Scope of Work and specific review comments. Areas to be addressed and issues with which we specifically disagree are presented below. This letter format presents the ODOT comment in *italics* followed by the Group Mackenzie response.

1. *The TIS developed Peak Hour Factors (PHF) using the same 15 minute peak hour period for all intersections...*

Response: The TIS' intersection turning movement raw data utilized a system wide peak hour to determine peak hour volumes, but incorrectly also used a system wide 15-minute peak period to calculate the PHF. The PHF will be recalculated at the study area intersections to reflect the proper peak 15 minutes. Also, the PHF will be applied to the intersection consistent with Chapter 3.3 of ODOT's 2005 *Development Review Guidelines*.

Capacity and queuing analysis will be updated to reflect the correct PHF.

2. *Traffic data will be developed ... with 15-minute breakdowns during the AM and PM peak periods.*

Response: The December 4, 2008 TIS performed analysis for the weekday PM and Saturday peak hours. Due to roadway and retail trip volumes these periods are considered the critical analysis scenarios. As shown in the following table, both the roadway volumes and the Fueling Facility total trip generation volumes are lower in the AM peak hour.

	Roadway Volume[1]	Fuel Facility
Weekday AM (7:00 – 8:00 am)	2,559	157 trips
Weekday PM (4:00 – 5:00 pm)	3,170	194 trips
Saturday Peak (12:00 – 1:00 pm)	2,826	226 trips

[1] Highway 99W tube count data, October 2nd and October 4th 2008.

With Highway 99W AM peak hour roadway volumes approximately 20% less than the PM peak hour, an AM peak hour analysis would only support this conclusion, and not serve any beneficial purpose.

3. *A truck turning analysis will be developed for all study area intersections using an appropriate design vehicle (i.e. WB-67).*

Response: Since the existing Fred Meyer Store already has WB-67 delivery trucks accessing the property and using the study area intersections, no on-site or off-site modifications are necessary or proposed for this project. There are no reports of the existing delivery vehicles impeding traffic. On-site truck turning templates will be provided for the fueling station in the study update.

4. *A comparison of ODOT crash rates against at least 3-years worth of crash data over at least a 1-mile segment. This analysis will also include information on any SPIS sites adjacent to or within the study area.*

Response: Intersection and segment crash data will be included in the updated analysis. The analysis will include information on the SPIS site on Highway 99W near the study area.

Please contact me if you have any questions.

Sincerely,

Brent Ahrend, P.E., Transportation Engineer
Senior Associate

C: Steve Olson, City of Newberg
Chris Ferko – Barghausen Consulting Engineers, Inc.
Jim Coombes – Fred Meyer

Oregon
Theodore R. Kulongoski, Governor

Department of Transportation
Region 2 Tech Center
455 Airport Road SE Building A
Salem, Oregon 97301-5397
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DATE: March 9, 2009 **File: T1W-**

TO: Sean Morrison
Group Mackenzie
RiverEast Center
1515 SE Water Avenue, Suite 100
Portland, OR 97214
(503) 224-9560
seanmorrison@grpmack.com

FROM: Stephen B. Wilson, PE
Region 2 Senior Traffic Analyst

SUBJECT: Fred Meyer Fuel Facility
Traffic Impact Study Review Comments
ODOT Region 2 – District 3
Pacific Highway West – OR 99W (Highway #1W)
Milepost 21.80 – 22.05
City of Newberg
Yamhill County

This is our reply to Group Mackenzie's response to the TIS review comments from 20 February 2009, for the ***Newberg Fred Meyer Fueling Facility***.

Comment	Page	Response
1	1	An updated PHF, and capacity and queuing analysis will be sufficient.
2	1	It is agreed; the AM Peak Hour will not be necessary for this analysis.
3	2	It is agreed; since the existing site is already designed to accommodate WB-67 delivery trucks, no further truck turning analysis will be necessary.
4	2	An updated TIS, with intersection and segment crash analysis, along with any SPIS information, will be sufficient.

If you have any questions regarding my comments, please contact me by phone at (503) 986-2857 or by e-mail at *stephen.b.wilson@odot.state.or.us*.

Cc: Brent Ahrend – Group Mackenzie
Sam Johnston – STJ, Inc.
Steve Olson – City of Newberg
David Knitowski
Cyndi Buswell
Aref Bozorgnia
Mike Rose
File