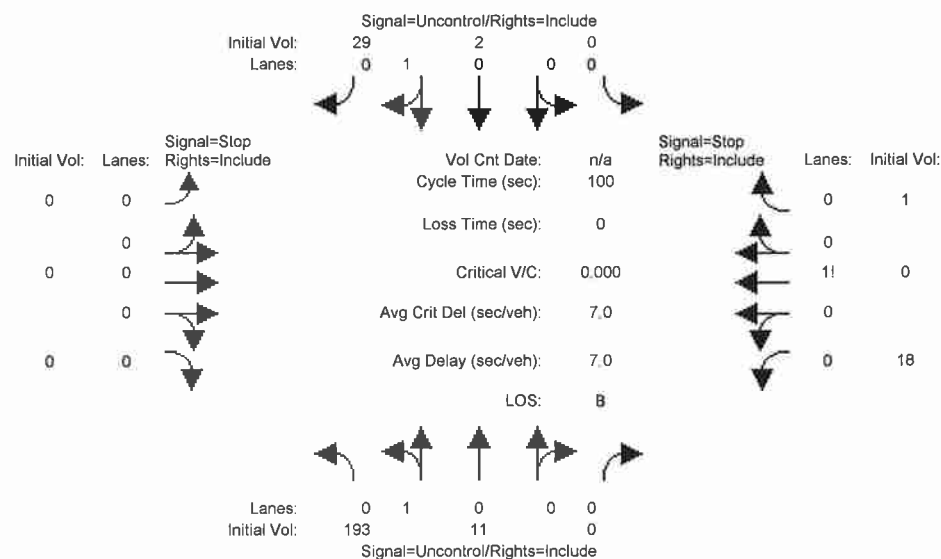


APPENDIX H: TRAFFIC DATA

Existing Conditions

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

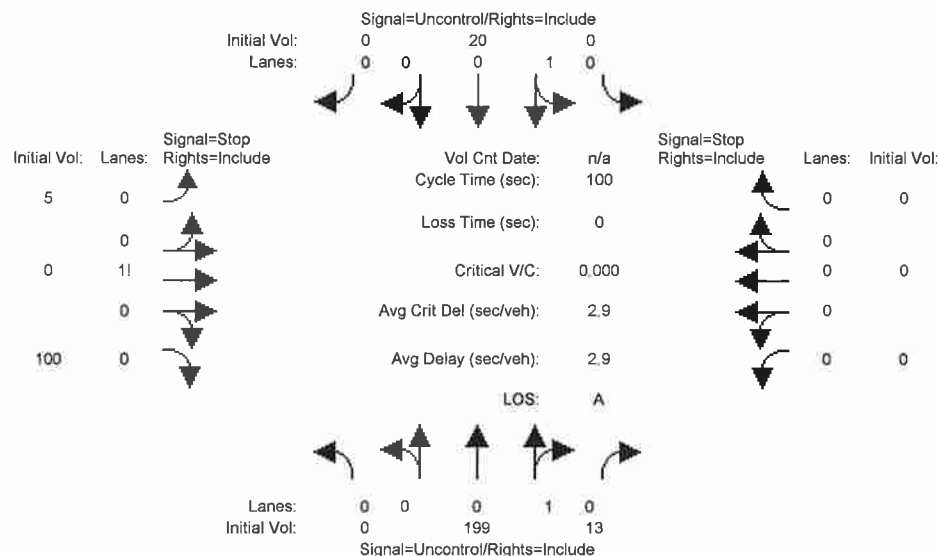
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	193	11	0	0	2	29	0	0	0	18	0	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	11	0	0	2	29	0	0	0	18	0	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	193	11	0	0	2	29	0	0	0	18	0	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
PHF Volume:	276	16	0	0	3	41	0	0	0	26	0	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	276	16	0	0	3	41	0	0	0	26	0	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	44	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	591	611	16
Potent Cap.:	1577	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	473	411	1069
Move Cap.:	1577	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	398	326	1069
Volume/Cap:	0.17	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.06	0.00	0.00
Level Of Service Module:												
2Way95thQ:	0.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxx	411	xxxxx
SharedQueue:	0.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx
Shrd ConDel:	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	14.4	xxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			14.4		
ApproachLOS:	*			*			*			B		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

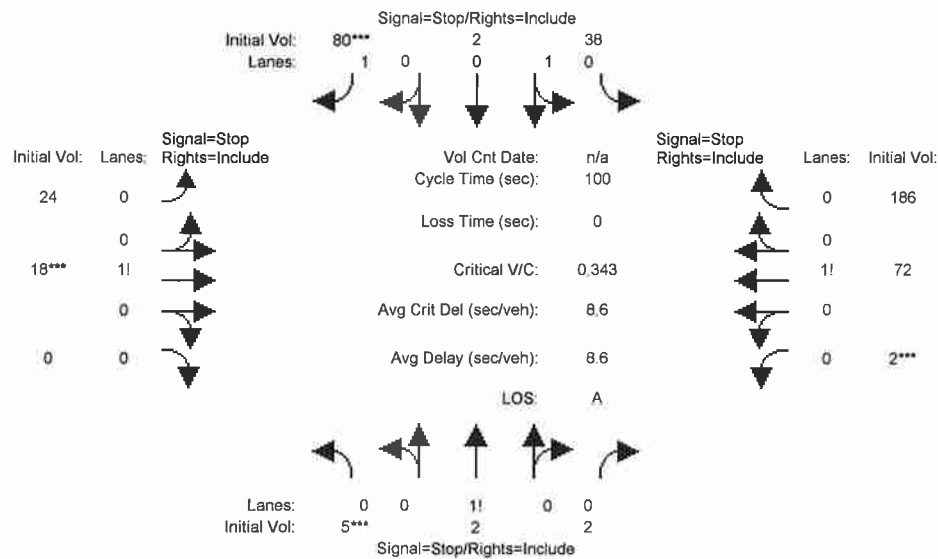
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	199	13	0	20	0	5	0	100	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	199	13	0	20	0	5	0	100	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	199	13	0	20	0	5	0	100	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PHF Volume:	0	302	20	0	30	0	8	0	152	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	302	20	0	30	0	8	0	152	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	342	352	30	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	659	576	1050	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	659	576	1050	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	0.00	0.14	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1021	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx				9.2		xxxxxx		
ApproachLOS:	*			*				A		*		

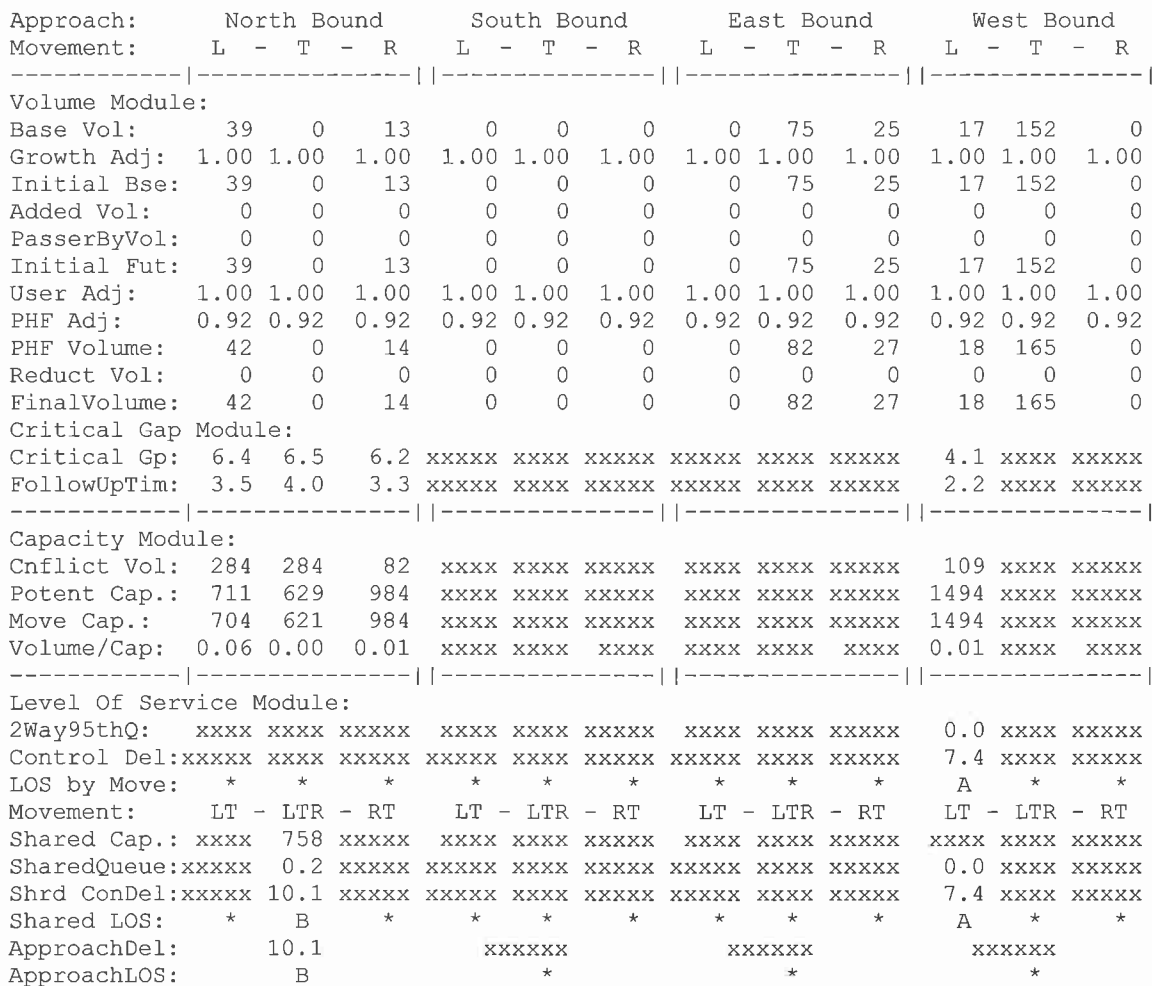
Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #3: Point View Dr./Broadway/Monterey Rd.



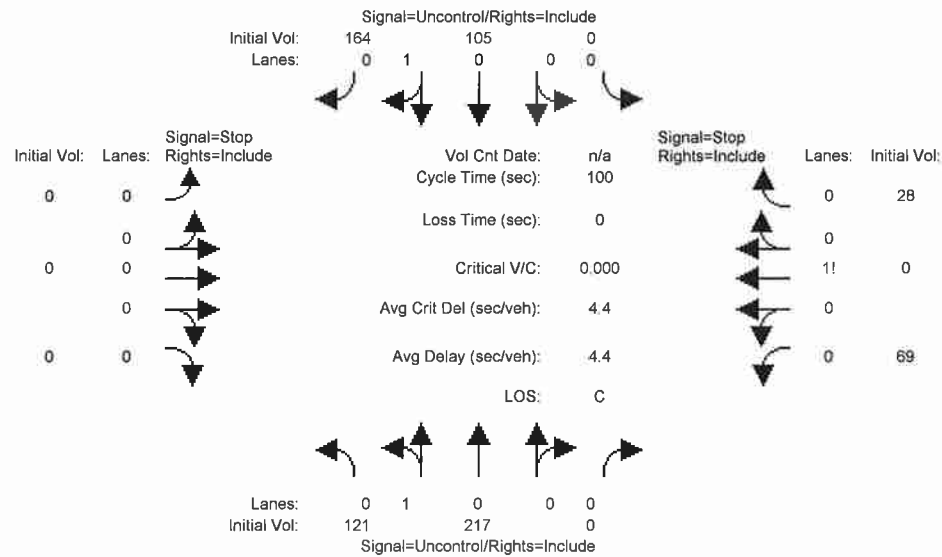
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	5	2	2	38	2	80	24	18	0	2	72	186
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	5	2	2	38	2	80	24	18	0	2	72	186
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	5	2	2	38	2	80	24	18	0	2	72	186
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	6	2	2	45	2	95	29	21	0	2	86	221
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	2	2	45	2	95	29	21	0	2	86	221
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	2	2	45	2	95	29	21	0	2	86	221
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.56	0.22	0.22	0.95	0.05	1.00	0.57	0.43	0.00	0.01	0.28	0.71
Final Sat.:	381	152	152	571	30	748	424	318	0	7	250	645
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.02	0.08	0.08	0.13	0.07	0.07	xxxx	0.34	0.34	0.34
Crit Moves:	****					****			****			
Delay/Veh:	7.9	7.9	7.9	8.9	8.9	7.8	8.0	8.0	0.0	8.8	8.8	8.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.9	7.9	7.9	8.9	8.9	7.8	8.0	8.0	0.0	8.8	8.8	8.8
LOS by Move:	A	A	A	A	A	A	A	A	*	A	A	A
ApproachDel:		7.9			8.2			8.0			8.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.9			8.2			8.0			8.8	
LOS by Appr:		A			A			A			A	
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5

Intersection #4: Airport Rd./Broadway



Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:

Base Vol:	121	217	0	0	105	164	0	0	0	69	0	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	121	217	0	0	105	164	0	0	0	69	0	28
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	121	217	0	0	105	164	0	0	0	69	0	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
PHF Volume:	164	293	0	0	142	222	0	0	0	93	0	38
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	164	293	0	0	142	222	0	0	0	93	0	38

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3

Capacity Module:

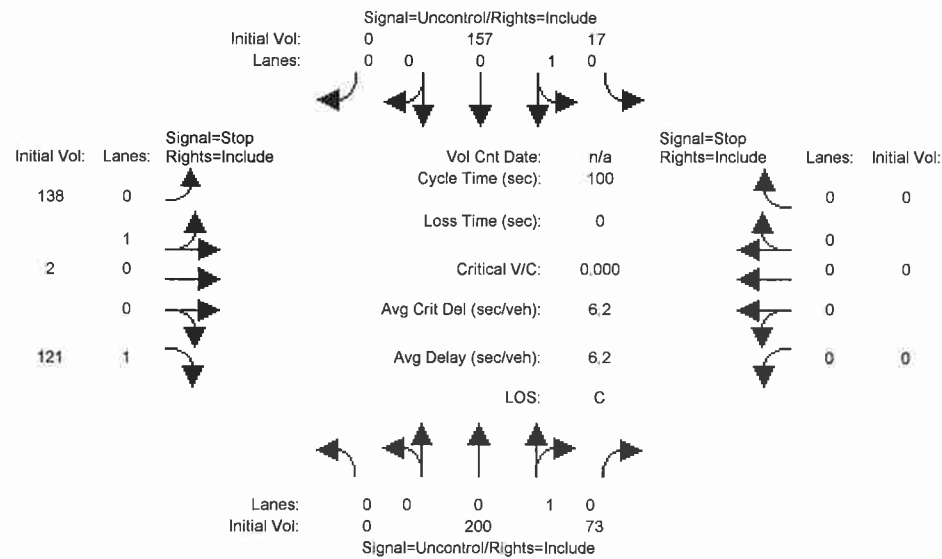
Cnflct Vol:	364	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	873	984	293
Potent Cap.:	1206	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	323	250	751
Move Cap.:	1206	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	286	213	751
Volume/Cap:	0.14	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	0.33	0.00	0.05

Level Of Service Module:

2Way95thQ:	0.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx
Control Del:	8.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	349	xxxxxx
Shared Queue:	0.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	1.7	xxxxxx
Shrd ConDel:	8.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	21.4	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	C	*
ApproachDel:	xxxxxx				xxxxxx			xxxxxx			21.4	
ApproachLOS:	*				*			*			C	

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	200	73	17	157	0	138	2	121	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	200	73	17	157	0	138	2	121	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	200	73	17	157	0	138	2	121	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PHF Volume:	0	303	111	26	238	0	209	3	183	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	303	111	26	238	0	209	3	183	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	414	xxxx	xxxxx	648	703	238	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1156	xxxx	xxxxx	438	364	806	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1156	xxxx	xxxxx	431	356	806	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	xxxx	xxxx	0.49	0.01	0.23	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxx	xxxx	0.9	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx	xxxxx	xxxx	10.8	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	429	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	2.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx	21.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	C	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			16.4			xxxxxx		
ApproachLOS:	*			*			C			*		

SimTraffic Performance Report
Existing Conditions - AM Peak Hour

9/11/2007

(5.7) A

1: External Performance by approach

Approach	WB	All
Delay / Veh (s)	0.4	0.4
Vehicles Exited	105	105
Hourly Exit Rate	420	420

2: External Performance by approach

Approach	EB	All
Delay / Veh (s)	1.4	1.4
Vehicles Exited	53	53
Hourly Exit Rate	212	212

3: External Performance by approach

Approach	SB	All
Delay / Veh (s)	1.4	1.4
Vehicles Exited	2	2
Hourly Exit Rate	8	8

4: External Performance by approach

Approach	SB	All
Delay / Veh (s)	0.2	0.2
Vehicles Exited	7	7
Hourly Exit Rate	28	28

6: External Performance by approach

Approach	NB	All
Delay / Veh (s)	0.7	0.7
Vehicles Exited	78	78
Hourly Exit Rate	312	312

7: Broadway & Schnell School Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT	SBR	All
Delay / Veh (s)	6.2	6.2		4.1	7.2	4.2	2.2	5.3	9.9	4.5	5.6
Vehicles Exited	50	34	0	1	46	28	1	18	1	58	237
Hourly Exit Rate	200	136	0	4	184	112	4	72	4	232	948

8: Broadway & Wilste Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Delay / Veh (s)	6.1	3.0	1.2	1.1	5.5	3.0	3.3
Vehicles Exited	82	4	3	101	5	4	199
Hourly Exit Rate	328	16	12	404	20	16	796

Total Network Performance

Delay / Veh (s)	8.8
Vehicles Exited	245
Hourly Exit Rate	980

$\frac{7}{FBL = 6.1 + 6.2 = 12.3 (s)}$
 $FBT = 6.1 + 6.2 = 12.3 (s)$
 $FBR = \emptyset$

5.7

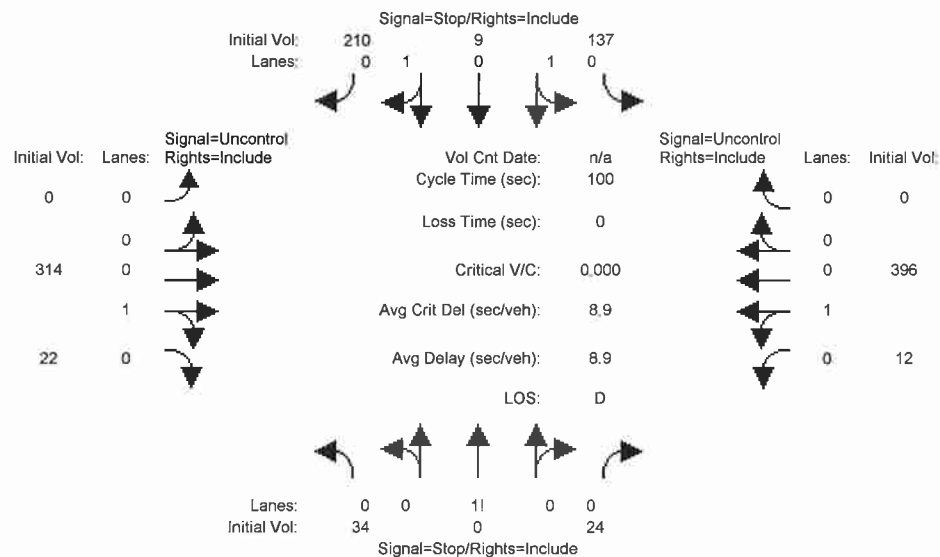
HCM Unsignalized Intersection Capacity Analysis
9: Broadway & Blairs Ln

Existing Conditions - AM Peak Hour
11/18/2008

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	231	24	9	254	10	40	1	17	5	1	9
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
Hourly flow rate (vph)	14	243	25	9	267	11	42	1	18	5	1	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	278			268			579	580	256	581	587	273
vC1, stage 1 conf vol							283	283		292	292	
vC2, stage 2 conf vol							296	297		289	296	
vCu, unblocked vol	278			268			579	580	256	581	587	273
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			93	100	98	99	100	99
cM capacity (veh/h)	1285			1295			589	565	783	587	563	766
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	268	9	278	61	16						
Volume Left	14	0	9	0	42	5						
Volume Right	0	25	0	11	18	9						
cSH	1285	1700	1295	1700	635	680						
Volume to Capacity	0.01	0.16	0.01	0.16	0.10	0.02						
Queue Length 95th (ft)	1	0	1	0	8	2						
Control Delay (s)	7.8	0.0	7.8	0.0	11.3	10.4						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.4		0.3		11.3	10.4						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			27.0%		ICU Level of Service		A					
Analysis Period (min)			15									

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

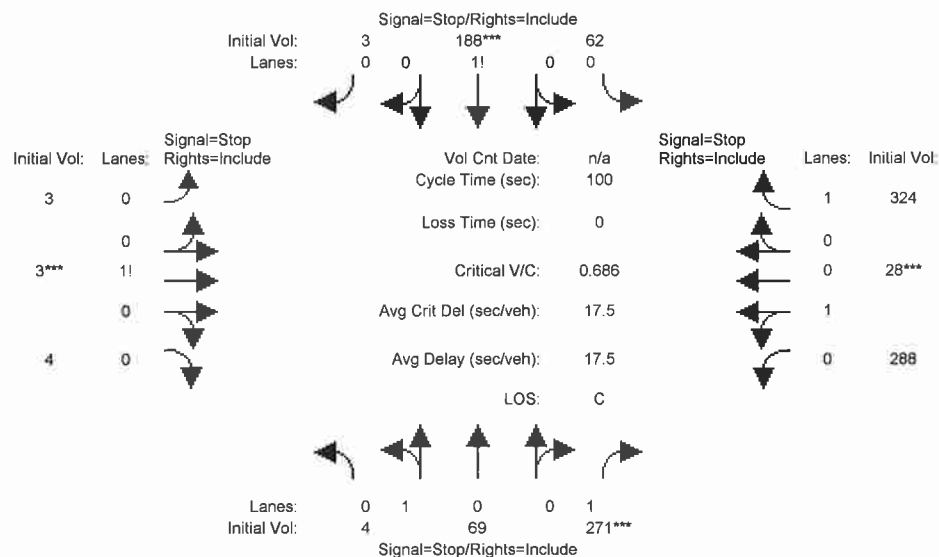
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	34	0	24	137	9	210	0	314	22	12	396	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	0	24	137	9	210	0	314	22	12	396	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	34	0	24	137	9	210	0	314	22	12	396	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	38	0	27	154	10	236	0	353	25	13	445	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	38	0	27	154	10	236	0	353	25	13	445	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	960	837	365	851	849	445	xxxxx	xxxxx	xxxxx	378	xxxxx	xxxxx
Potent Cap.:	238	305	684	282	300	617	xxxxx	xxxxx	xxxxx	1192	xxxxx	xxxxx
Move Cap.:	142	302	684	269	297	617	xxxxx	xxxxx	xxxxx	1192	xxxxx	xxxxx
Volume/Cap:	0.27	0.00	0.04	0.57	0.03	0.38	xxxxx	xxxxx	xxxxx	0.01	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	211	xxxxx	271	xxxxx	591	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	1.3	xxxxx	3.6	xxxxx	2.0	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Shrd ConDel:	xxxxx	29.4	xxxxx	36.9	xxxxx	15.4	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
Shared LOS:	*	D	*	E	*	C	*	*	*	A	*	*
ApproachDel:	29.4			24.0			xxxxxxx			xxxxxxx		
ApproachLOS:	D			C			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound				South Bound				East Bound				West Bound							
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Min. Green:	0		0		0	0		0		0	0		0		0	0		0		0

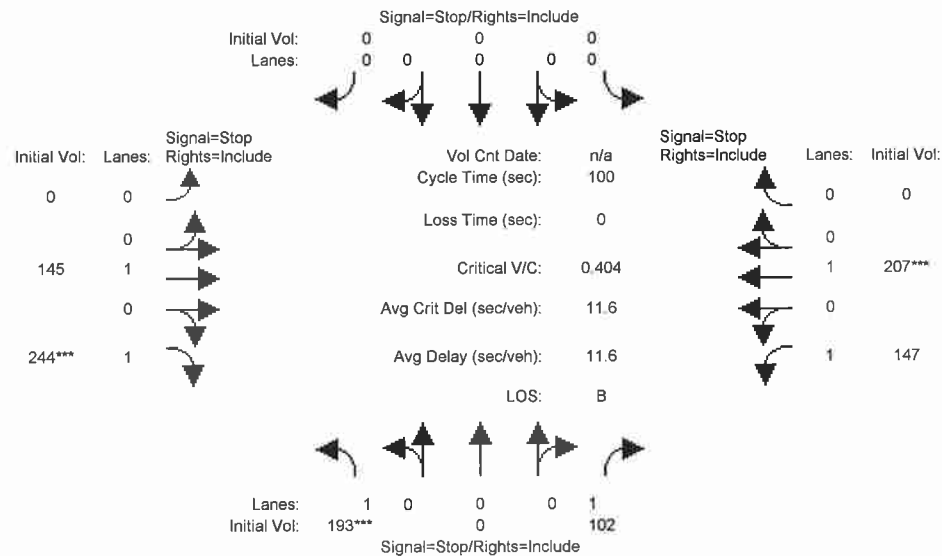
Volume Module:												
Base Vol:	4	69	271	62	188	3	3	3	4	288	28	324
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	69	271	62	188	3	3	3	4	288	28	324
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	69	271	62	188	3	3	3	4	288	28	324
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	4	78	304	70	211	3	3	3	4	324	31	364
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	78	304	70	211	3	3	3	4	324	31	364
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	78	304	70	211	3	3	3	4	324	31	364

Saturation Flow Module:											
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	0.25	0.74	0.01	0.30	0.30	0.40	0.91	0.09
Final Sat.:	28	480	568	127	384	6	131	131	174	471	46

Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.54	0.55	0.55	0.55	0.03	0.03	0.03	0.69	0.69	0.59
Crit Moves:			****		****			****			****	
Delay/Veh:	10.9	10.9	15.4	17.5	17.5	17.5	10.6	10.6	10.6	22.8	22.8	15.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.9	10.9	15.4	17.5	17.5	17.5	10.6	10.6	10.6	22.8	22.8	15.9
LOS by Move:	B	B	C	C	C	C	B	B	B	C	C	C
ApproachDel:		14.4			17.5			10.6			19.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		14.4			17.5			10.6			19.3	
LOS by Appr:		B			C			B			C	
AllWayAvgQ:	0.2	0.2	1.0	1.1	1.1	1.1	0.0	0.0	0.0	1.9	1.9	1.3

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	193	0	102	0	0	0	0	145	244	147	207	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	0	102	0	0	0	0	145	244	147	207	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	193	0	102	0	0	0	0	145	244	147	207	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	205	0	109	0	0	0	0	154	260	156	220	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	205	0	109	0	0	0	0	154	260	156	220	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	205	0	109	0	0	0	0	154	260	156	220	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	508	0	607	0	0	0	0	588	667	544	590	0
Capacity Analysis Module:												
Vol/Sat:	0.40	xxxx	0.18	xxxx	xxxx	xxxx	xxxx	0.26	0.39	0.29	0.37	xxxx
Crit Moves:	****								****		****	
Delay/Veh:	13.8	0.0	9.5	0.0	0.0	0.0	0.0	10.7	11.1	11.6	12.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.8	0.0	9.5	0.0	0.0	0.0	0.0	10.7	11.1	11.6	12.0	0.0
LOS by Move:	B	*	A	*	*	*	*	B	B	B	B	*
ApproachDel:	12.3			xxxxxx				10.9			11.8	
Delay Adj:	1.00			xxxxxx				1.00			1.00	
ApprAdjDel:	12.3			xxxxxx				10.9			11.8	
LOS by Appr:	B			*				B			B	
AllWayAvgQ:	0.6	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.6	0.4	0.5	0.0

HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR

Existing Conditions - AM Peak Hour

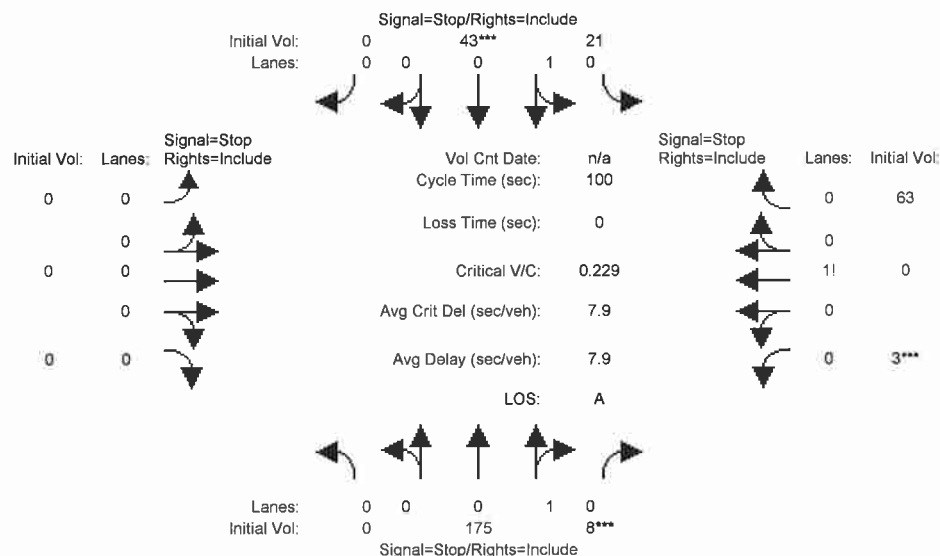
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97		0.95	1.00	
Satd. Flow (prot)	1770	3313		1770	3382		1681	1682		1770	1744	
Flt Permitted	0.95	1.00		0.95	1.00		0.65	0.69		0.52	1.00	
Satd. Flow (perm)	1770	3313		1770	3382		1144	1198		966	1744	
Volume (vph)	17	762	241	46	1444	93	184	28	16	91	58	43
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	19	866	274	52	1641	106	209	32	18	103	66	49
RTOR Reduction (vph)	0	27	0	0	3	0	0	4	0	0	24	0
Lane Group Flow (vph)	19	1113	0	52	1744	0	105	150	0	103	91	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5		2	1		6			8			4
Permitted Phases							8			4		
Actuated Green, G (s)	2.2	44.8		12.6	55.2		13.8	13.8		13.8	13.8	
Effective Green, g (s)	2.2	44.8		12.6	55.2		13.8	13.8		13.8	13.8	
Actuated g/C Ratio	0.03	0.54		0.15	0.66		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	47	1784		268	2244		190	199		160	289	
v/s Ratio Prot	0.01	c0.34		0.03	c0.52						0.05	
v/s Ratio Perm							0.09	c0.13		0.11		
v/c Ratio	0.40	0.62		0.19	0.78		0.55	0.75		0.64	0.31	
Uniform Delay, d1	39.9	13.3		30.9	9.7		31.9	33.1		32.4	30.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	0.7		0.4	1.8		3.5	14.8		8.6	0.6	
Delay (s)	45.5	14.0		31.2	11.5		35.3	47.9		41.0	31.2	
Level of Service	D	B		C	B		D	D		D	C	
Approach Delay (s)		14.5			12.0			42.8			35.8	
Approach LOS		B			B			D			D	

Intersection Summary

HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

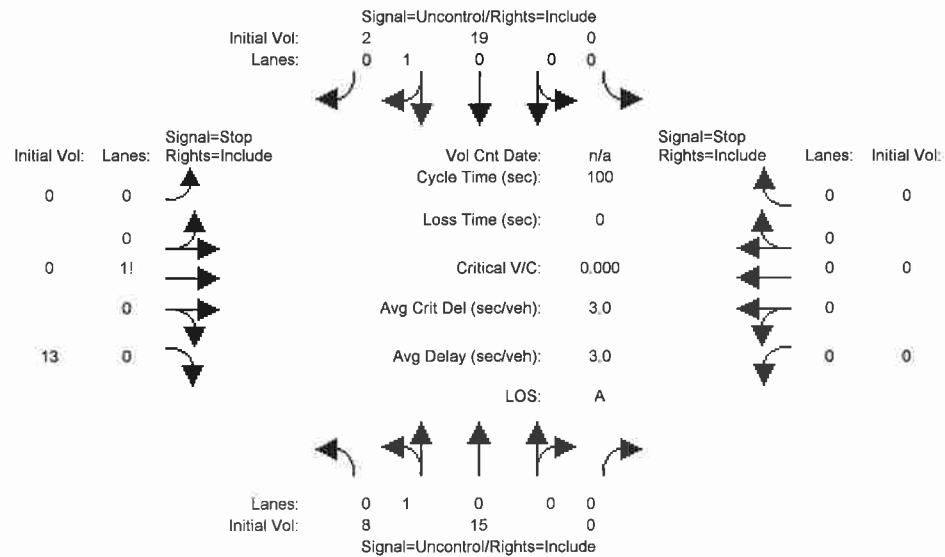
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	175	8	21	43	0	0	0	0	3	0	63
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	175	8	21	43	0	0	0	0	3	0	63
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	175	8	21	43	0	0	0	0	3	0	63
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	190	9	23	47	0	0	0	0	3	0	68
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	190	9	23	47	0	0	0	0	3	0	68
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	190	9	23	47	0	0	0	0	3	0	68
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.96	0.04	0.33	0.67	0.00	0.00	0.00	0.00	0.05	0.00	0.95
Final Sat.:	0	830	38	269	551	0	0	0	0	40	0	836
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.23	0.23	0.08	0.08	xxxx	xxxx	xxxx	xxxx	0.08	xxxx	0.08
Crit Moves:			****		****						****	
Delay/Veh:	0.0	8.3	8.3	7.7	7.7	0.0	0.0	0.0	0.0	7.2	0.0	7.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	8.3	8.3	7.7	7.7	0.0	0.0	0.0	0.0	7.2	0.0	7.2
LOS by Move:	*	A	A	A	A	*	*	*	*	A	*	A
ApproachDel:		8.3			7.7		xxxxxx				7.2	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		8.3			7.7		xxxxxx				7.2	
LOS by Appr:		A			A		*				A	
AllWayAvgQ:	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

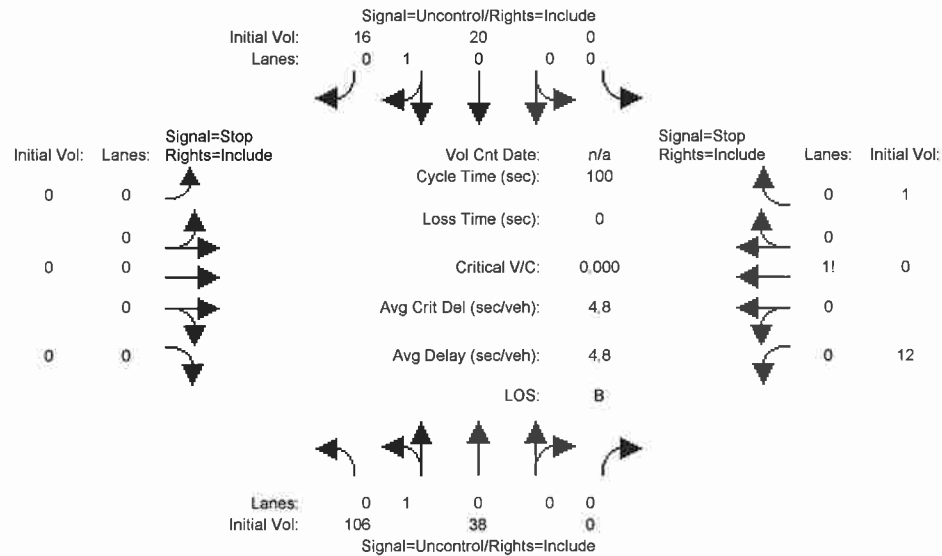
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	8	15	0	0	19	2	0	0	13	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	15	0	0	19	2	0	0	13	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	8	15	0	0	19	2	0	0	13	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
PHF Volume:	13	24	0	0	31	3	0	0	21	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	13	24	0	0	31	3	0	0	21	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	6.2	xxxxxx	xxxx	xxxxxx
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	3.3	xxxxxx	xxxx	xxxxxx
Capacity Module:												
Cnflct Vol:	34	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	32	xxxxxx	xxxx	xxxxxx
Potent Cap.:	1591	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	1047	xxxxxx	xxxx	xxxxxx
Move Cap.:	1591	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	1047	xxxxxx	xxxx	xxxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	0.02	xxxxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	0.1	xxxxxx	xxxx	xxxxxx
Control Del:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	8.5	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	A	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx
SharedQueue:	0.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx
Shrd ConDel:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	A	*	*	*
ApproachDel:	xxxxxx			xxxxxx					8.5	xxxxxx		
ApproachLOS:	*			*					A	*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

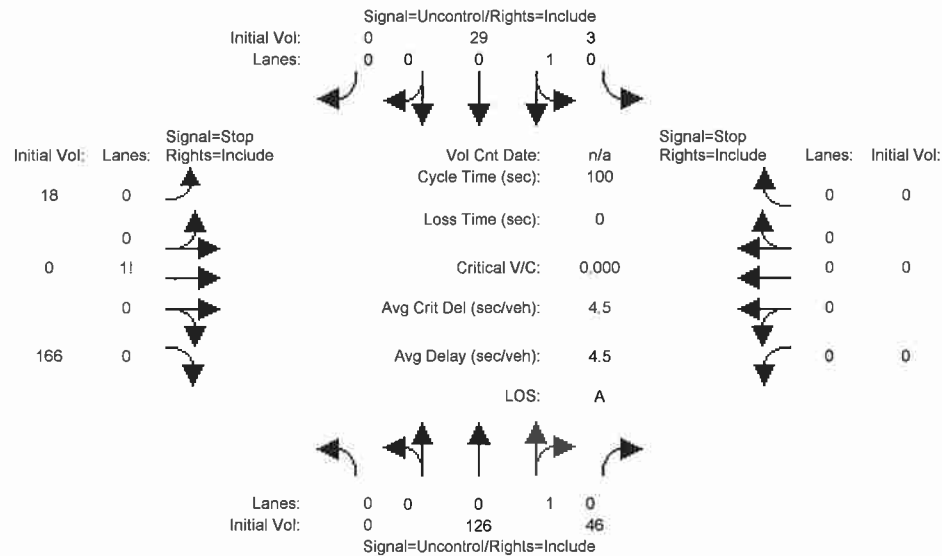
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	106	38	0	0	20	16	0	0	0	12	0	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	38	0	0	20	16	0	0	0	12	0	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	106	38	0	0	20	16	0	0	0	12	0	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
PHF Volume:	131	47	0	0	25	20	0	0	0	15	0	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	131	47	0	0	25	20	0	0	0	15	0	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	44	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	343	353	47
Potent Cap.:	1577	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	657	575	1028
Move Cap.:	1577	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	612	524	1028
Volume/Cap:	0.08	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	0.00	0.00
Level Of Service Module:												
2Way95thQ:	0.3	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	7.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	632	xxxxxx
SharedQueue:	0.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.1	xxxxxx
Shrd ConDel:	7.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	10.8	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			10.8		
ApproachLOS:	*			*			*			B		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

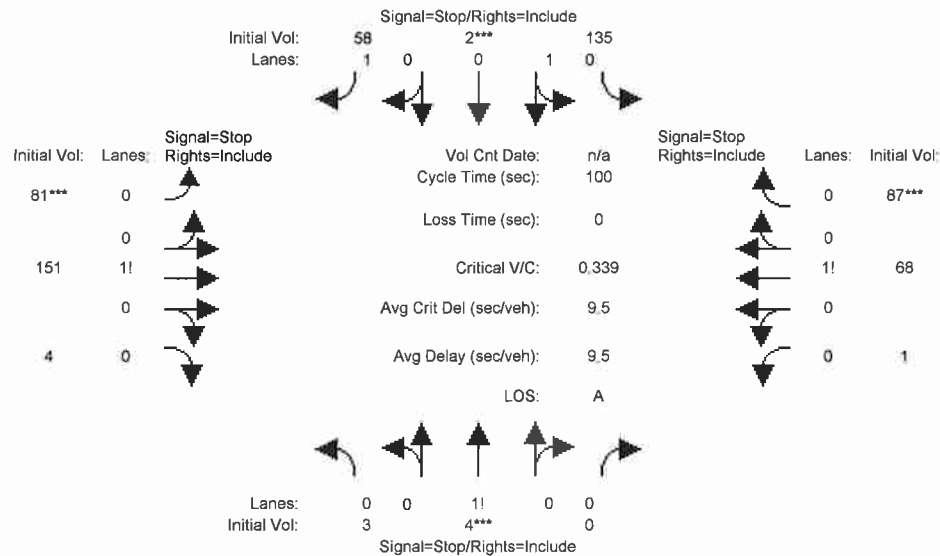
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	126	46	3	29	0	18	0	166	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	126	46	3	29	0	18	0	166	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	126	46	3	29	0	18	0	166	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	142	52	3	33	0	20	0	187	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	142	52	3	33	0	20	0	187	0	0	0
Critical Gap Module:												
Critical Gp:xxxxx	xxxx	xxxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:xxxxx	xxxx	xxxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	193	xxxx	xxxxx	207	233	33	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1392	xxxx	xxxxx	786	671	1047	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1392	xxxx	xxxxx	785	669	1047	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.03	0.00	0.18	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:xxxxx	xxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1014	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	0.8	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:xxxxx	xxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	9.5	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	9.5	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx
ApproachLOS:	*	*	*	*	*	*	A	*	*	*	*	*

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

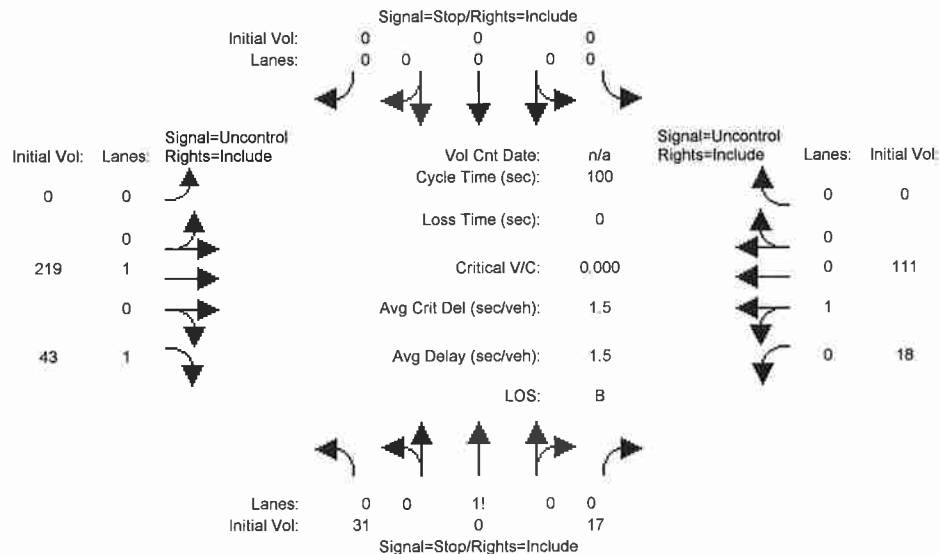
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	3	4	0	135	2	58	81	151	4	1	68	87
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	4	0	135	2	58	81	151	4	1	68	87
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	4	0	135	2	58	81	151	4	1	68	87
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	3	4	0	144	2	62	86	161	4	1	72	93
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	4	0	144	2	62	86	161	4	1	72	93
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	4	0	144	2	62	86	161	4	1	72	93
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.43	0.57	0.00	0.99	0.01	1.00	0.34	0.64	0.02	0.01	0.43	0.56
Final Sat.:	265	353	0	571	8	718	254	474	13	5	339	434
Capacity Analysis Module:												
Vol/Sat:	0.01	0.01	xxxx	0.25	0.25	0.09	0.34	0.34	0.34	0.21	0.21	0.21
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Delay/Veh:	8.4	8.4	0.0	10.5	10.5	7.9	10.0	10.0	10.0	8.6	8.6	8.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.4	8.4	0.0	10.5	10.5	7.9	10.0	10.0	10.0	8.6	8.6	8.6
LOS by Move:	A	A	*	B	B	A	B	B	B	A	A	A
ApproachDel:	8.4	8.4	0.0	10.5	10.5	7.9	10.0	10.0	10.0	8.6	8.6	8.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ApprAdjDel:	8.4	8.4	0.0	10.5	10.5	7.9	10.0	10.0	10.0	8.6	8.6	8.6
LOS by Appr:	A	A	*	B	B	A	B	B	B	A	A	A
AllWayAvgQ:	0.0	0.0	0.0	0.3	0.3	0.1	0.5	0.5	0.5	0.2	0.2	0.2

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

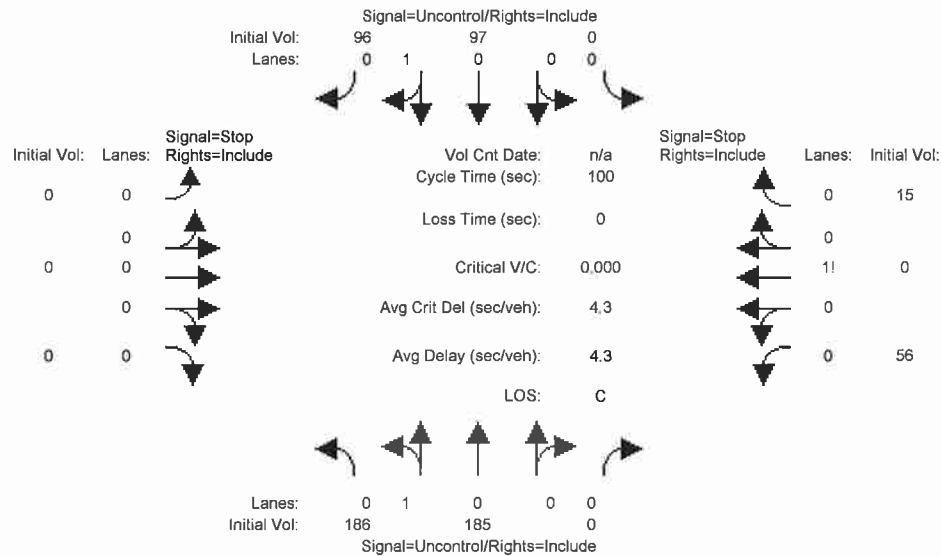
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	31	0	17	0	0	0	0	219	43	18	111	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	0	17	0	0	0	0	219	43	18	111	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	31	0	17	0	0	0	0	219	43	18	111	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	34	0	18	0	0	0	0	238	47	20	121	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	34	0	18	0	0	0	0	238	47	20	121	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx
FollowUpTim:	3.5	4.0	3.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx
Capacity Module:												
Cnflict Vol:	398	398	238	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	285	xxxx	xxxx
Potent Cap.:	611	543	806	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1289	xxxx	xxxx
Move Cap.:	604	535	806	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1289	xxxx	xxxx
Volume/Cap:	0.06	0.00	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.0	xxxx	xxxx
Control Del:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.8	xxxx	xxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	663	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:	xxxx	0.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.0	xxxx	xxxx
Shrd ConDel:	xxxx	10.9	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.8	xxxx	xxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:	10.9			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

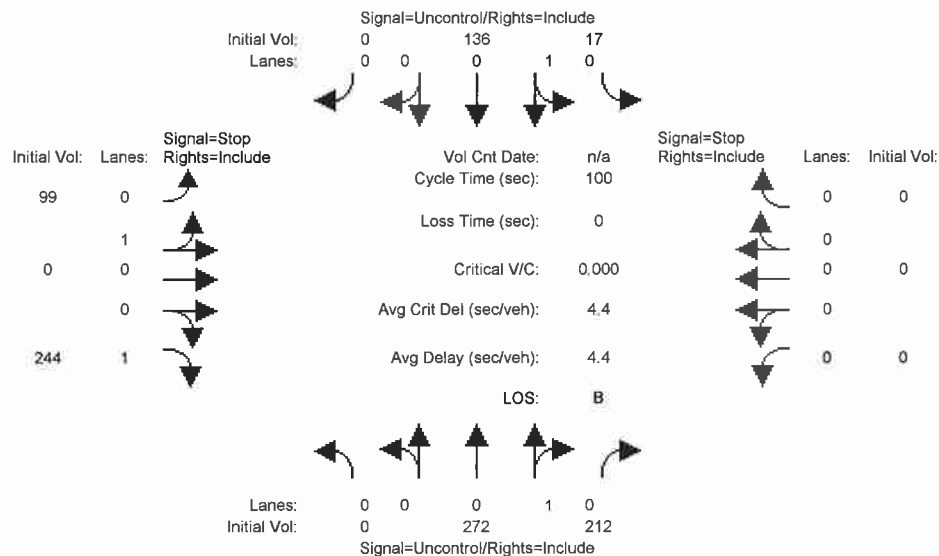
Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	186	185	0	0	97	96	0	0	0	56	0	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	186	185	0	0	97	96	0	0	0	56	0	15
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	186	185	0	0	97	96	0	0	0	56	0	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	202	201	0	0	105	104	0	0	0	61	0	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	202	201	0	0	105	104	0	0	0	61	0	16
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	210	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	763	815	201
Potent Cap.:	1373	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	375	314	845
Move Cap.:	1373	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	327	262	845
Volume/Cap:	0.15	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.19	0.00	0.02
Level Of Service Module:												
2Way95thQ:	0.5	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	8.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR	- RT		LT - LTR	- RT		LT - LTR	- RT		LT - LTR	- RT	
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	376	xxxxxx
SharedQueue:	0.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.8	xxxxxx
Shrd ConDel:	8.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	17.0	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	C	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			17.0		
ApproachLOS:	*			*			*			C		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	272	212	17	136	0	99	0	244	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	272	212	17	136	0	99	0	244	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	272	212	17	136	0	99	0	244	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	302	236	19	151	0	110	0	271	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	302	236	19	151	0	110	0	271	0	0	0
Critical Gap Module:												
Critical Gp:xxxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx	6.4	6.5	6.2	xxxx	xxxx	xxxx
FollowUpTim:xxxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx	3.5	4.0	3.3	xxxx	xxxx	xxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxx	538	xxxx	xxxx	609	727	151	xxxx	xxxx	xxxx
Potent Cap.:	xxxx	xxxx	xxxx	1041	xxxx	xxxx	462	353	901	xxxx	xxxx	xxxx
Move Cap.:	xxxx	xxxx	xxxx	1041	xxxx	xxxx	455	347	901	xxxx	xxxx	xxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	xxxx	xxxx	0.24	0.00	0.30	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	0.1	xxxx	xxxx	xxxx	xxxx	1.3	xxxx	xxxx	xxxx
Control Del:xxxxx	xxxx	xxxx	xxxx	8.5	xxxx	xxxx	xxxx	xxxx	10.7	xxxx	xxxx	xxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	455	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:xxxxx	xxxx	xxxx	xxxx	0.1	xxxx	xxxx	0.9	xxxx	xxxx	xxxx	xxxx	xxxx
Shrd ConDel:xxxxx	xxxx	xxxx	xxxx	8.5	xxxx	xxxx	15.4	xxxx	xxxx	xxxx	xxxx	xxxx
Shared LOS:	*	*	*	A	*	*	C	*	*	*	*	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	12.1	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
ApproachLOS:	*	*	*	*	*	*	B	*	*	*	*	*

SimTraffic Performance Report
Existing Conditions - PM Peak Hour

9/11/2007

10.2 B

1: External Performance by approach

Approach	WB	All
Delay / Veh (s)	0.3	0.3
Vehicles Exited	87	87
Hourly Exit Rate	348	348

2: External Performance by approach

Approach	EB	All
Delay / Veh (s)	1.7	1.7
Vehicles Exited	129	129
Hourly Exit Rate	516	516

3: External Performance by approach

Approach	SB	All
Delay / Veh (s)	1.2	1.2
Vehicles Exited	4	4
Hourly Exit Rate	16	16

4: External Performance by approach

Approach	SB	All
Delay / Veh (s)	0.2	0.2
Vehicles Exited	16	16
Hourly Exit Rate	64	64

6: External Performance by approach

Approach	NB	All
Delay / Veh (s)	0.9	0.9
Vehicles Exited	126	126
Hourly Exit Rate	504	504

7: Broadway & Schnell School Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	9.9	8.8	7.1		9.7	6.2	3.8		10.0	13.7	4.8	8.7
Vehicles Exited	85	77	1	0	49	41	1	0	51	2	40	347
Hourly Exit Rate	340	308	4	0	196	164	4	0	204	8	160	1388

8: Broadway & Wilste Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Delay / Veh (s)	8.8	6.0	1.3	1.3	7.5	4.8	6.0
Vehicles Exited	156	7	9	81	6	8	267
Hourly Exit Rate	624	28	36	324	24	32	1068

Total Network Performance

Delay / Veh (s)	13.7
Vehicles Exited	362
Hourly Exit Rate	1448

7

$$EBL - 8.8 + 9.9 = 18.7 (83)$$

$$EBT - 8.8 + 8.8 = 17.6 (77)$$

$$EBR - 8.8 + 7.1 = 15.9 (1)$$

10.2

HCM Unsignalized Intersection Capacity Analysis
9: Broadway & Blairs Ln

Existing Conditions - PM Peak Hour
11/18/2008

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	565	30	14	301	15	25	0	34	9	0	31
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
Hourly flow rate (vph)	20	595	32	15	317	16	26	0	36	9	0	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	333			626			1029	1013	611	1025	1021	325
vC1, stage 1 conf vol							651	651		354	354	
vC2, stage 2 conf vol							379	362		671	666	
vCu, unblocked vol	333			626			1029	1013	611	1025	1021	325
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			93	100	93	97	100	95
cM capacity (veh/h)	1227			955			389	404	494	361	394	716

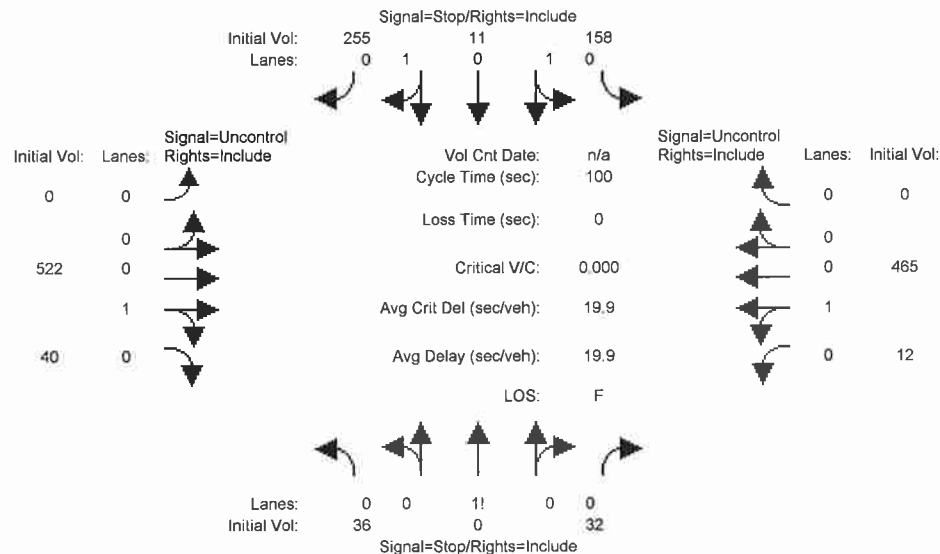
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	20	626	15	333	62	42
Volume Left	20	0	15	0	26	9
Volume Right	0	32	0	16	36	33
cSH	1227	1700	955	1700	443	586
Volume to Capacity	0.02	0.37	0.02	0.20	0.14	0.07
Queue Length 95th (ft)	1	0	1	0	12	6
Control Delay (s)	8.0	0.0	8.8	0.0	14.4	11.6
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.4		14.4	11.6
Approach LOS					B	B

Intersection Summary

Average Delay	1.5					
Intersection Capacity Utilization	44.5%			ICU Level of Service		A
Analysis Period (min)	15					

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

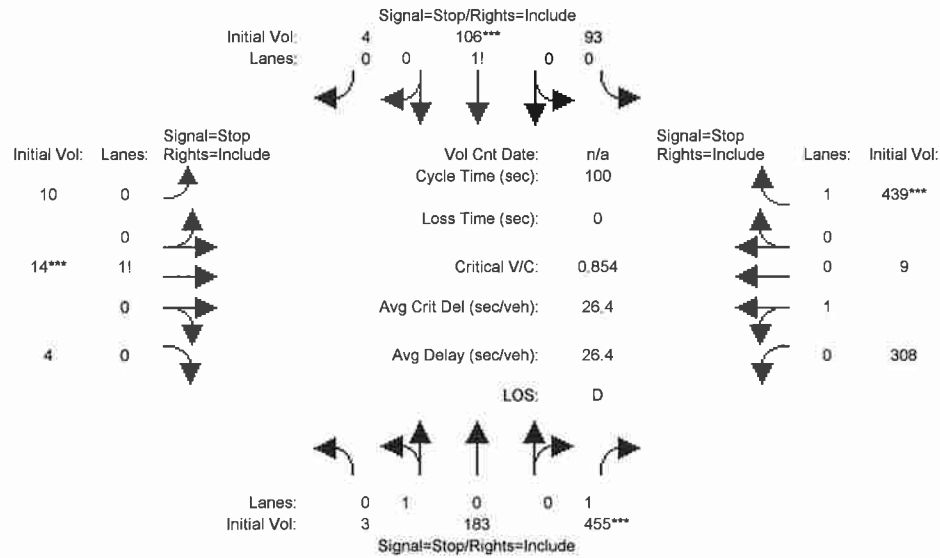
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	36	0	32	158	11	255	0	522	40	12	465	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	36	0	32	158	11	255	0	522	40	12	465	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	0	32	158	11	255	0	522	40	12	465	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	38	0	34	168	12	271	0	555	43	13	495	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	38	0	34	168	12	271	0	555	43	13	495	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxx	xxxxxx	4.1	xxxx	xxxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxxx	xxxx	xxxxxx	2.2	xxxx	xxxxxx
Capacity Module:												
Cnflct Vol:	1238	1097	577	1114	1118	495	xxxx	xxxx	xxxxxx	598	xxxx	xxxxxx
Potent Cap.:	154	215	520	187	209	579	xxxx	xxxx	xxxxxx	989	xxxx	xxxxxx
Move Cap.:	77	212	520	173	206	579	xxxx	xxxx	xxxxxx	989	xxxx	xxxxxx
Volume/Cap:	0.49	0.00	0.07	0.97	0.06	0.47	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	0.0	xxxx	xxxxxx
Control Del:	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	8.7	xxxx	xxxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	129	xxxxxx	175	xxxx	539	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
SharedQueue:	xxxxxx	2.8	xxxxxx	8.5	xxxx	3.0	xxxxxx	xxxx	xxxxxx	0.0	xxxx	xxxxxx
Shrd ConDel:	xxxxxx	63.6	xxxxxx	129.3	xxxx	18.8	xxxxxx	xxxx	xxxxxx	8.7	xxxx	xxxxxx
Shared LOS:	*	F	*	F	*	C	*	*	*	A	*	*
ApproachDel:	63.6			61.8			xxxxxx			xxxxxx		
ApproachLOS:	F			F			*			*		

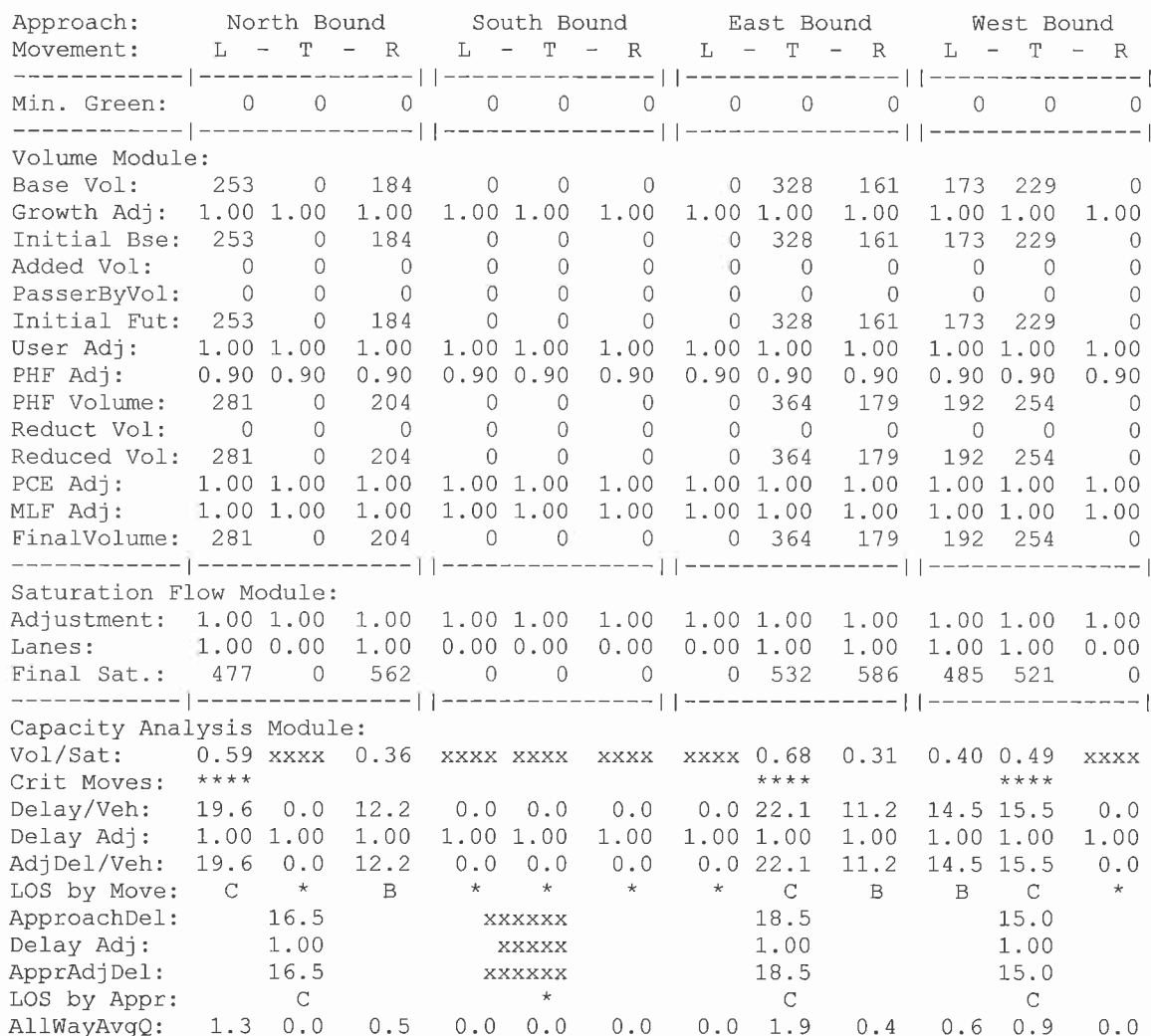
Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	3	183	455	93	106	4	10	14	4	308	9	439
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	183	455	93	106	4	10	14	4	308	9	439
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	183	455	93	106	4	10	14	4	308	9	439
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	3	193	479	98	112	4	11	15	4	324	9	462
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	193	479	98	112	4	11	15	4	324	9	462
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	193	479	98	112	4	11	15	4	324	9	462
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.02	0.98	1.00	0.46	0.52	0.02	0.36	0.50	0.14	0.97	0.03	1.00
Final Sat.:	8	494	561	217	248	9	147	206	59	467	14	572
Capacity Analysis Module:												
Vol/Sat:	0.39	0.39	0.85	0.45	0.45	0.45	0.07	0.07	0.07	0.69	0.69	0.81
Crit Moves:			****			****			****			****
Delay/Veh:	14.1	14.1	34.9	16.2	16.2	16.2	11.7	11.7	11.7	25.0	25.0	29.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.1	14.1	34.9	16.2	16.2	16.2	11.7	11.7	11.7	25.0	25.0	29.4
LOS by Move:	B	B	D	C	C	C	B	B	B	C	C	D
ApproachDel:												
Delay Adj:												
ApprAdjDel:												
LOS by Appr:			D			C			B			D
AllWayAvgQ:	0.6	0.6	4.0	0.8	0.8	0.8	0.1	0.1	0.1	2.0	2.0	3.3

Intersection #12: Cedar Ravine Rd./Main St.



HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Existing Conditions - PM Peak Hour

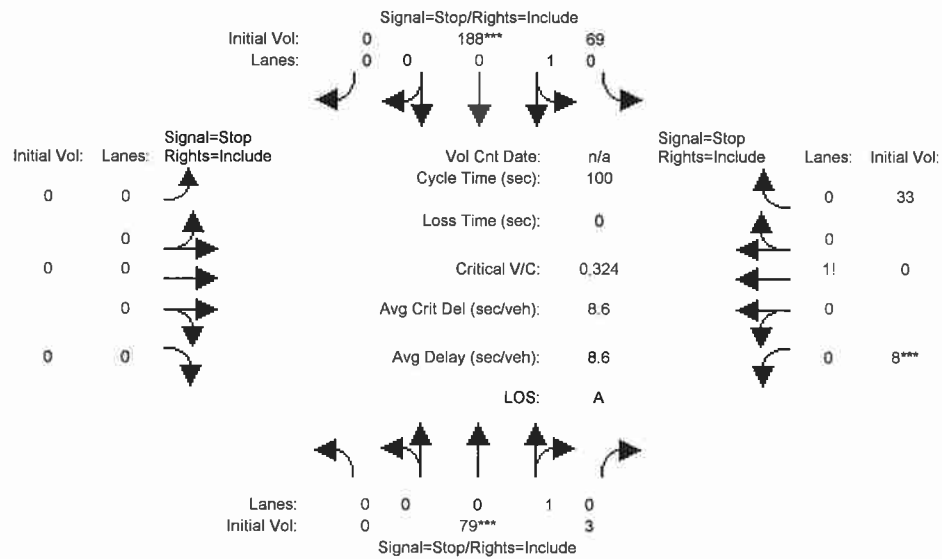
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97		0.95	1.00	
Satd. Flow (prot)	1770	3367		1770	3388		1681	1662		1770	1762	
Flt Permitted	0.95	1.00		0.95	1.00		0.69	0.76		0.34	1.00	
Satd. Flow (perm)	1770	3367		1770	3388		1223	1303		628	1762	
Volume (vph)	46	1599	179	27	1192	59	320	48	54	120	55	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1738	195	29	1296	64	348	52	59	130	60	34
RTOR Reduction (vph)	0	7	0	0	3	0	0	8	0	0	18	0
Lane Group Flow (vph)	50	1926	0	29	1357	0	192	259	0	130	76	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5		2	1		6			8			4
Permitted Phases							8			4		
Actuated Green, G (s)	3.9	61.5		2.0	59.6		23.4	23.4		23.4	23.4	
Effective Green, g (s)	3.9	61.5		2.0	59.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.04	0.62		0.02	0.60		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	70	2094		36	2042		289	308		149	417	
v/s Ratio Prot	0.03	c0.57		0.02	c0.40						0.04	
v/s Ratio Perm							0.16	0.20		c0.21		
v/c Ratio	0.71	0.92		0.81	0.66		0.66	0.84		0.87	0.18	
Uniform Delay, d1	46.9	16.5		48.3	13.0		34.2	36.0		36.3	30.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.1	7.1		75.6	0.8		5.7	17.9		39.0	0.2	
Delay (s)	76.0	23.6		123.8	13.9		39.8	53.8		75.3	30.3	
Level of Service	E	C		F	B		D	D		E	C	
Approach Delay (s)		24.9			16.1			48.0			56.4	
Approach LOS		C			B			D			E	

Intersection Summary

HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

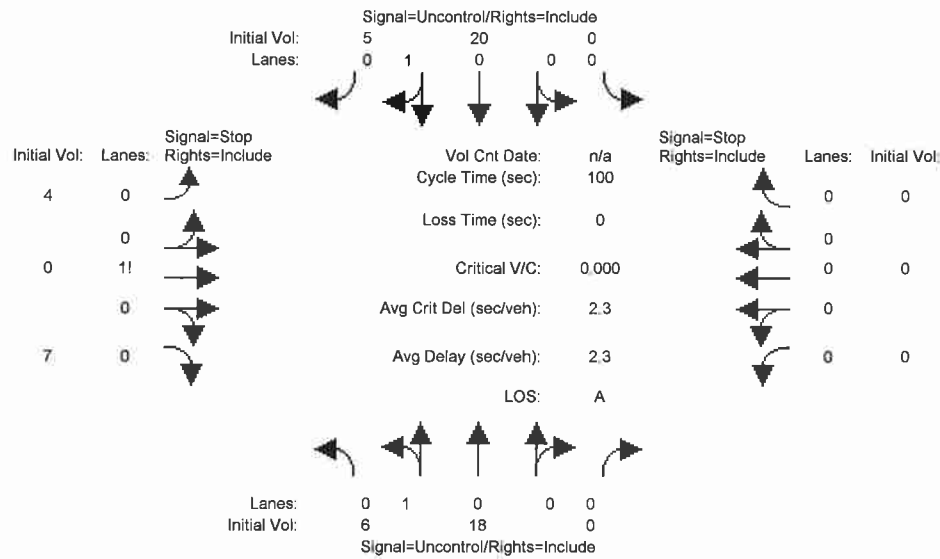
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound				South Bound			East Bound			West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
----- ----- ----- ----- -----															
Min. Green:	0		0		0	0		0		0	0		0		0
----- ----- ----- ----- -----															
Volume Module:															
Base Vol:	0		79		3	69		188		0	0		8		33
Growth Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	0		79		3	69		188		0	0		8		33
Added Vol:	0		0		0	0		0		0	0		0		0
PasserByVol:	0		0		0	0		0		0	0		0		0
Initial Fut:	0		79		3	69		188		0	0		8		33
User Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.92		0.92		0.92	0.92		0.92		0.92	0.92		0.92		0.92
PHF Volume:	0		86		3	75		204		0	0		9		36
Reduct Vol:	0		0		0	0		0		0	0		0		0
Reduced Vol:	0		86		3	75		204		0	0		9		36
PCE Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
MLF Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
FinalVolume:	0		86		3	75		204		0	0		9		36
----- ----- ----- ----- -----															
Saturation Flow Module:															
Adjustment:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
Lanes:	0.00		0.96		0.04	0.27		0.73		0.00	0.00		0.20		0.80
Final Sat.:	0		804		31	232		631		0	0		155		641
----- ----- ----- ----- -----															
Capacity Analysis Module:															
Vol/Sat:	xxxx		0.11		0.11	0.32		0.32		xxxx	xxxx		xxxx		0.06
Crit Moves:			****					****					****		
Delay/Veh:	0.0		7.7		7.7	9.1		9.1		0.0	0.0		0.0		7.4
Delay Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
AdjDel/Veh:	0.0		7.7		7.7	9.1		9.1		0.0	0.0		0.0		7.4
LOS by Move:	*		A		A	A		A		*	*		*		A
ApproachDel:			7.7					9.1			xxxxxx				7.4
Delay Adj:			1.00					1.00			xxxxxx				1.00
ApprAdjDel:			7.7					9.1			xxxxxx				7.4
LOS by Appr:			A					A			*				A
AllWayAvqQ:	0.1		0.1		0.1	0.5		0.5		0.0	0.0		0.0		0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	6	18	0	0	20	5	4	0	7	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	18	0	0	20	5	4	0	7	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	18	0	0	20	5	4	0	7	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
PHF Volume:	8	25	0	0	28	7	6	0	10	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	8	25	0	0	28	7	6	0	10	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	35	xxxx	xxxxx	xxxx	xxxx	xxxxx	74	74	32	xxxx	xxxx	xxxxx
Potent Cap.:	1589	xxxx	xxxxx	xxxx	xxxx	xxxxx	935	820	1048	xxxx	xxxx	xxxxx
Move Cap.:	1589	xxxx	xxxxx	xxxx	xxxx	xxxxx	931	816	1048	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	0.00	0.01	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1002	xxxxx	xxxx	xxxx	xxxxx
Shared Queue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	8.6	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			8.6			xxxxxx		
ApproachLOS:	*			*			A			*		

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/9/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Broadway EB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	869	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	356	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	869	356	vph
Peak-hour factor, PHF	0.92	0.62	
Peak 15-min volume, v15	236	144	v
Trucks and buses	6	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1030	591	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 1030 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1030	4500	No
v_{12}	1030	4400	No
$v_{FO} = v_F - v_R$	439	4500	No
v_R	591	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 11.0 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.351$	
	S	
Space mean speed in ramp influence area,	$S = 50.4$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.4$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/9/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Point View EB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	344	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	13	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	344	105	13	vph
Peak-hour factor, PHF	0.92	0.56	0.54	
Peak 15-min volume, v15	93	47	6	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	408	193	25	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 408 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	408	4500	No
v_{12}	408	4400	No
$v_{FO} = v_F - v_R$	215	4500	No
v_R	193	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 6.0 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D = 0.315$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
	R	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	0	
Space mean speed for all vehicles,	$S = 50.9$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
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Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	239	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	13	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	105	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	239	13	105	vph
Peak-hour factor, PHF	0.92	0.54	0.56	
Peak 15-min volume, v15	65	6	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	283	25	193	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 283 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	308	4500	No
v _{R12}	308	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 6.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	M = 0.299	
	S	
Space mean speed in ramp influence area,	S = 51.1	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 51.1	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	513	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	261	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	92	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	513	261	92	vph
Peak-hour factor, PHF	0.92	0.74	0.78	
Peak 15-min volume, v15	139	88	29	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	608	363	121	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 608 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	608	4500	No
v_{12}	608	4400	No
$v_{FO} = v_F - v_R$	245	4500	No
v_R	363	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 7.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D_S = 0.331$	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.7$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB ON
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	252	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	92	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	261	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	252	92	261	vph
Peak-hour factor, PHF	0.92	0.78	0.74	
Peak 15-min volume, v15	68	29	88	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	299	121	363	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 299$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	420	4500	No
v_{R12}	420	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 6.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.298$
 S
 Space mean speed in ramp influence area, $S = 51.1$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 51.1$ mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/9/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Broadway EB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1773	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	424	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1773	424	vph
Peak-hour factor, PHF	0.92	0.79	
Peak 15-min volume, v15	482	134	v
Trucks and buses	6	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2101	553	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2101$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2101	4500	No
v_{12}	2101	4400	No
$v_{FO} = v_F - v_R$	1548	4500	No
v_R	553	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 20.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.348$	
	S	
Space mean speed in ramp influence area,	$S = 50.5$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.5$	mph

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Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1235	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	184	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	49	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1235	184	49	vph
Peak-hour factor, PHF	0.92	0.80	0.78	
Peak 15-min volume, v15	336	57	16	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1463	237	65	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1463$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1463	4500	No
v_{12}	1463	4400	No
$v_{FO} = v_F - v_R$	1226	4500	No
v_R	237	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 15.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.319$	
	S	
Space mean speed in ramp influence area,	$S = 50.8$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.8$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1051	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	49	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	184	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1051	49	184	vph
Peak-hour factor, PHF	0.92	0.78	0.80	
Peak 15-min volume, v15	286	16	57	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1245	65	237	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1245 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1310	4500	No
v _{R12}	1310	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 13.8 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.308	
	S	
Space mean speed in ramp influence area,	S = 51.0	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 51.0	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	343	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	229	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1349	343	229	vph
Peak-hour factor, PHF	0.92	0.92	0.91	
Peak 15-min volume, v15	367	93	63	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1598	384	259	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1598 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1598	4500	No
v_{12}	1598	4400	No
$v_{FO} = v_F - v_R$	1214	4500	No
v_R	384	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 16.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.333$	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1006	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	229	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	343	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1006	229	343	vph
Peak-hour factor, PHF	0.92	0.91	0.92	
Peak 15-min volume, v15	273	63	93	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1192	259	384	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1192 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1451	4500	No
v _{R12}	1451	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.309	
	S	
Space mean speed in ramp influence area,	S _R = 51.0	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 51.0	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1366	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	214	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	431	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1366	214	431	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	371	58	117	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1618	240	483	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1618 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1618	4500	No
v_{12}	1618	4400	No
$v_{FO} = v_F - v_R$	1378	4500	No
v_R	240	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 16.9 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.320$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.8$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Broadway WB ON
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1152	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	431	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	214	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1152	431	214	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	313	117	58	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1365	483	240	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1365$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1848	4500	No
v_{R12}	1848	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.328$	
	S	
Space mean speed in ramp influence area,	$S = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	975	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	19	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	222	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	975	19	222	vph
Peak-hour factor, PHF	0.92	0.70	0.79	
Peak 15-min volume, v15	265	7	70	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1155	28	289	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1155 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1155	4500	No
v_{12}	1155	4400	No
$v_{FO} = v_F - v_R$	1127	4500	No
v_R	28	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.301$	
	S	
Space mean speed in ramp influence area,	$S = 51.1$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	0	
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	956	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	222	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	19	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	956	222	19	vph
Peak-hour factor, PHF	0.92	0.79	0.70	
Peak 15-min volume, v15	260	70	7	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1133	289	28	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1133 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1422	4500	No
v _{R12}	1422	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.4 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.308$	
	S	
Space mean speed in ramp influence area,	$S = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1178	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	97	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	285	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1178	97	285	vph
Peak-hour factor, PHF	0.92	0.84	0.73	
Peak 15-min volume, v15	320	29	98	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1396	119	402	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1396 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1396	4500	No
v_{12}	1396	4400	No
$v_{FO} = v_F - v_R$	1277	4500	No
v_R	119	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.309$	
	S	
Space mean speed in ramp influence area,	$S = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1081	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	285	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	97	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1081	285	97	vph
Peak-hour factor, PHF	0.92	0.73	0.84	
Peak 15-min volume, v15	294	98	29	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1281	402	119	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1281 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1683	4500	No
v_{R12}	1683	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.5 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.315$	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Mosquito WB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	133	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	509	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	902	133	509	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	245	36	138	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1069	149	570	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1069 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1069	4500	No
v_{12}	1069	4400	No
$v_{FO} = v_F - v_R$	920	4500	No
v_R	149	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.311$	
	S	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Broadway WB ON
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	769	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	509	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	133	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	769	509	133	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	209	138	36	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	911	570	149	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 911 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1481	4500	No
v _{R12}	1481	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.9 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.320	
	S	
Space mean speed in ramp influence area,	S = 50.8	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 50.8	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB OFF
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	582	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	13	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	122	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	582	13	122	vph
Peak-hour factor, PHF	0.92	0.65	0.75	
Peak 15-min volume, v15	158	5	41	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	690	21	168	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 690 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	690	4500	No
v_{12}	690	4400	No
$v_{FO} = v_F - v_R$	669	4500	No
v_R	21	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 8.1 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D_S = 0.300$	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB ON
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	569	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	122	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	13	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	569	122	13	vph
Peak-hour factor, PHF	0.92	0.75	0.65	
Peak 15-min volume, v15	155	41	5	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	674	168	21	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 674 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	842	4500	No
v_{R12}	842	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.0 - \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$M_S = 0.301$	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	691	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	71	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	282	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	691	71	282	vph
Peak-hour factor, PHF	0.92	0.77	0.84	
Peak 15-min volume, v15	188	23	84	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	819	95	346	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 819 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	819	4500	No
v_{12}	819	4400	No
$v_{FO} = v_F - v_R$	724	4500	No
v_R	95	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 9.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D = 0.307$	
	S	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	0	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Existing
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	282	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	71	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	620	282	71	vph
Peak-hour factor, PHF	0.92	0.84	0.77	
Peak 15-min volume, v15	168	84	23	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	735	346	95	pcph

Estimation of V12 Merge Areas

$$\begin{aligned}
 L &= \text{(Equation 25-2 or 25-3)} \\
 EQ & \\
 P &= 1.000 \quad \text{Using Equation 0} \\
 FM & \\
 v_{12} &= v_F (P_{FM}) = 735 \quad \text{pc/h}
 \end{aligned}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1081	4500	No
v_{R12}	1081	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 11.9 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

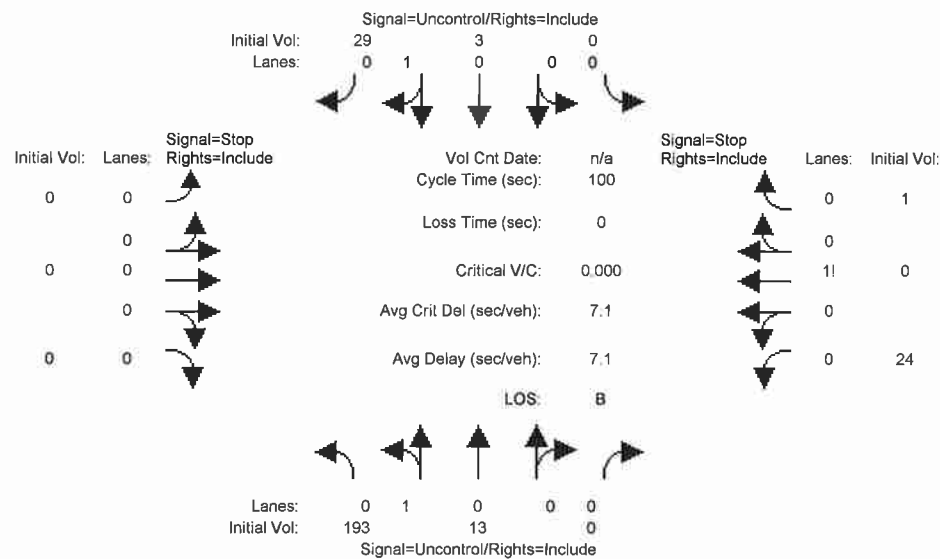
Speed Estimation

Intermediate speed variable,	$M_S = 0.305$	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 51.0$	mph

Existing Plus Project Conditions

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

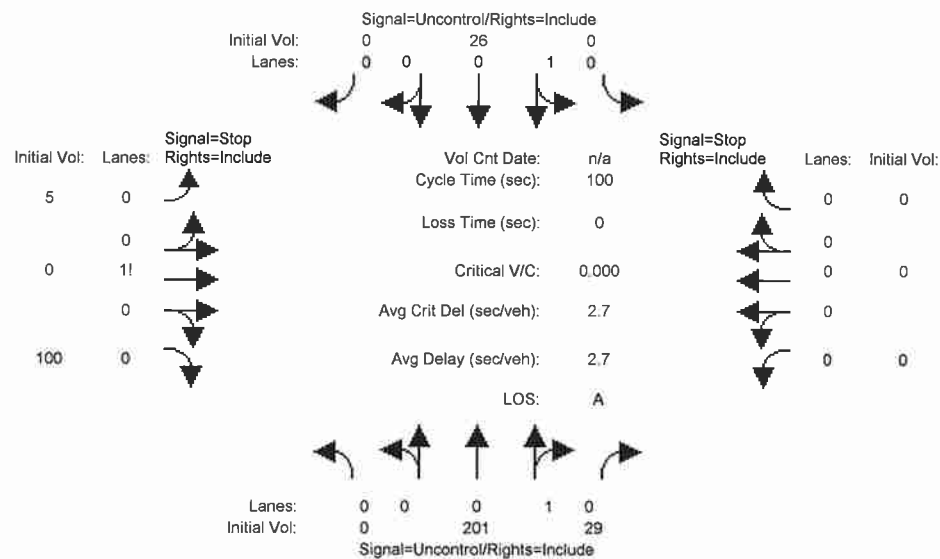
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	193	11	0	0	2	29	0	0	0	18	0	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	11	0	0	2	29	0	0	0	18	0	1
Added Vol:	0	2	0	0	1	0	0	0	0	6	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	193	13	0	0	3	29	0	0	0	24	0	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
PHF Volume:	276	19	0	0	4	41	0	0	0	34	0	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	276	19	0	0	4	41	0	0	0	34	0	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	46	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	595	616	19
Potent Cap.:	1575	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	470	409	1066
Move Cap.:	1575	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	396	324	1066
Volume/Cap:	0.18	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.09	0.00	0.00
Level Of Service Module:												
2Way95thQ:	0.6	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	7.8	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	406	xxxxxx
Shared Queue:	0.6	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.3	xxxxxx
Shrd ConDel:	7.8	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	14.7	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			14.7		
ApproachLOS:	*			*			*			B		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

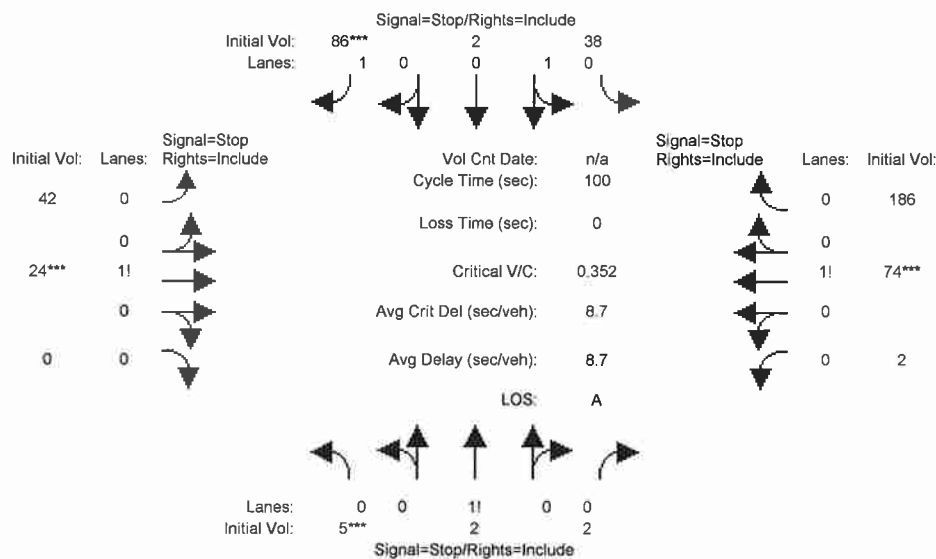
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	199	13	0	20	0	5	0	100	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	199	13	0	20	0	5	0	100	0	0	0
Added Vol:	0	2	16	0	6	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	201	29	0	26	0	5	0	100	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PHF Volume:	0	305	44	0	39	0	8	0	152	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	0	305	44	0	39	0	8	0	152	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	366	388	39	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	638	550	1038	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	638	550	1038	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	0.00	0.15	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1008	xxxxx	xxxx	xxxx	xxxxx
Shared Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxxx			xxxxxxx				9.2		xxxxxxx		
ApproachLOS:	*			*				A		*		

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Existing AM + Project

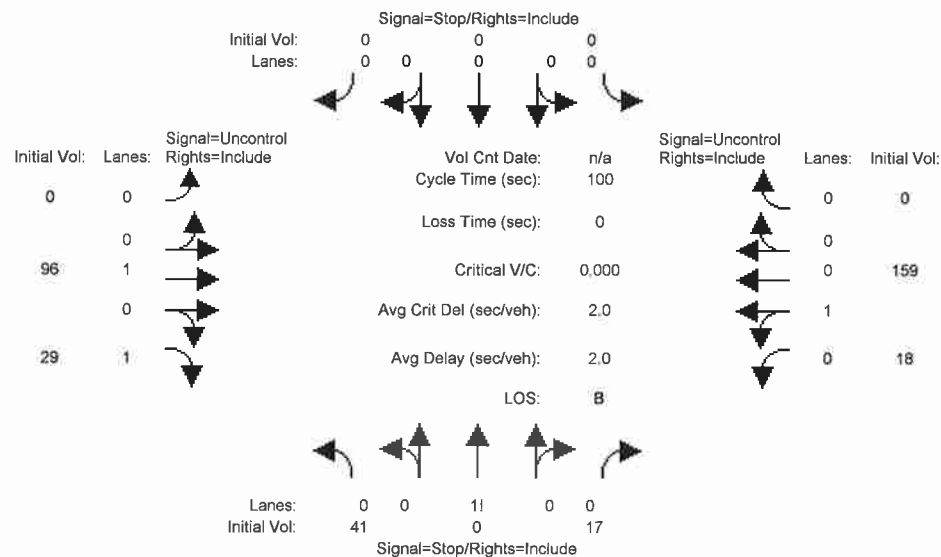
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	5	2	2	38	2	80	24	18	0	2	72	186
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	5	2	2	38	2	80	24	18	0	2	72	186
Added Vol:	0	0	0	0	0	6	18	6	0	0	2	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	5	2	2	38	2	86	42	24	0	2	74	186
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	6	2	2	45	2	102	50	29	0	2	88	221
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	2	2	45	2	102	50	29	0	2	88	221
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	2	2	45	2	102	50	29	0	2	88	221
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.56	0.22	0.22	0.95	0.05	1.00	0.64	0.36	0.00	0.01	0.28	0.71
Final Sat.:	371	149	149	563	30	734	467	267	0	7	251	630
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.02	0.08	0.08	0.14	0.11	0.11	xxxx	0.35	0.35	0.35
Crit Moves:	***					***		***			***	
Delay/Veh:	8.0	8.0	8.0	9.0	9.0	8.0	8.3	8.3	0.0	9.0	9.0	9.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.0	8.0	8.0	9.0	9.0	8.0	8.3	8.3	0.0	9.0	9.0	9.0
LOS by Move:	A	A	A	A	A	A	A	A	*	A	A	A
ApproachDel:		8.0			8.3			8.3			9.0	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		8.0			8.3			8.3			9.0	
LOS by Appr:		A			A			A			A	
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

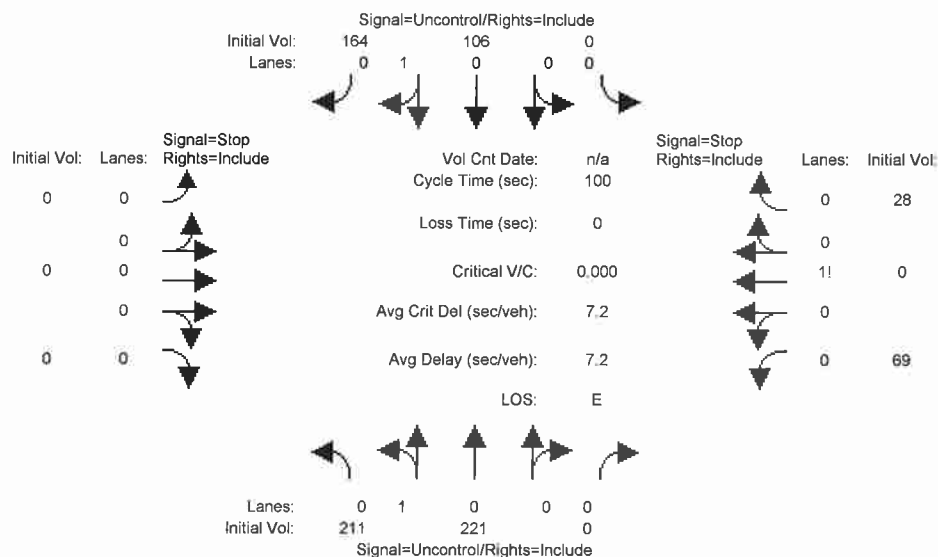
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	39	0	13	0	0	0	0	75	25	17	152	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	39	0	13	0	0	0	0	75	25	17	152	0
Added Vol:	2	0	4	0	0	0	0	21	4	1	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	41	0	17	0	0	0	0	96	29	18	159	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	45	0	18	0	0	0	0	104	32	20	173	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	45	0	18	0	0	0	0	104	32	20	173	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	316	316	104	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	136	xxxxx	xxxxx
Potent Cap.:	681	603	956	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1461	xxxxx	xxxxx
Move Cap.:	674	595	956	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1461	xxxxx	xxxxx
Volume/Cap:	0.07	0.00	0.02	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.01	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.5	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxxx	738	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	0.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Shrd ConDel:	xxxxx	10.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.5	xxxxx	xxxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:		10.3		xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:		B		*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

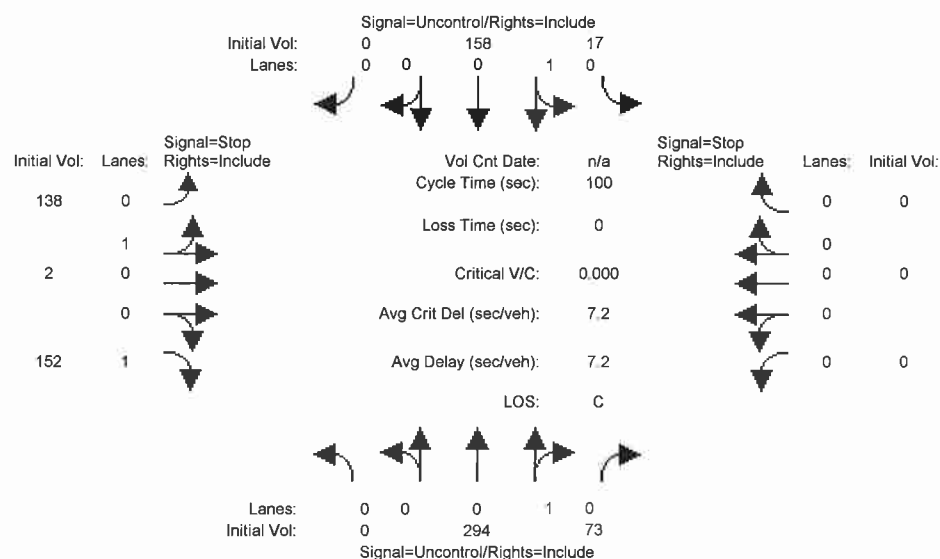
Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	121	217	0	0	105	164	0	0	0	69	0	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	121	217	0	0	105	164	0	0	0	69	0	28
Added Vol:	90	4	0	0	1	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	211	221	0	0	106	164	0	0	0	69	0	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
PHF Volume:	285	299	0	0	143	222	0	0	0	93	0	38
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	285	299	0	0	143	222	0	0	0	93	0	38
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	365	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	1123	1234	299
Potent Cap.:	1205	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	230	178	746
Move Cap.:	1205	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	180	128	746
Volume/Cap:	0.24	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.52	0.00	0.05
Level Of Service Module:												
2Way95thQ:	0.9	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	8.9	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	230	xxxxxx
SharedQueue:	0.9	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	3.2	xxxxxx
Shrd ConDel:	8.9	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	39.5	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	E	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			39.5		
ApproachLOS:	*			*			*			E		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	200	73	17	157	0	138	2	121	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	200	73	17	157	0	138	2	121	0	0	0
Added Vol:	0	94	0	0	1	0	0	0	31	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	294	73	17	158	0	138	2	152	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PHF Volume:	0	445	111	26	239	0	209	3	230	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	445	111	26	239	0	209	3	230	0	0	0
Critical Gap Module:												
Critical Gp:xxxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx	6.4	6.5	6.2	xxxx	xxxx	xxxx
FollowUpTim:xxxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx	3.5	4.0	3.3	xxxx	xxxx	xxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxx	556	xxxx	xxxx	792	847	239	xxxx	xxxx	xxxx
Potent Cap.:	xxxx	xxxx	xxxx	1025	xxxx	xxxx	361	301	804	xxxx	xxxx	xxxx
Move Cap.:	xxxx	xxxx	xxxx	1025	xxxx	xxxx	354	293	804	xxxx	xxxx	xxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	xxxx	xxxx	0.59	0.01	0.29	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	0.1	xxxx	xxxx	xxxx	xxxx	1.2	xxxx	xxxx	xxxx
Control Del:xxxxx	xxxx	xxxx	xxxx	8.6	xxxx	xxxx	xxxx	xxxx	11.3	xxxx	xxxx	xxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	353	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:xxxxx	xxxx	xxxx	xxxx	0.1	xxxx	xxxx	3.7	xxxx	xxxx	xxxx	xxxx	xxxx
Shrd ConDel:xxxxx	xxxx	xxxx	xxxx	8.6	xxxx	xxxx	29.4	xxxx	xxxx	xxxx	xxxx	xxxx
Shared LOS:	*	*	*	A	*	*	D	*	*	*	*	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	20.0	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
ApproachLOS:	*	*	*	*	*	*	C	*	*	*	*	*

SimTraffic Performance Report
Exisiting Conditions PP - AM Peak Hour

9/11/2007

1: External Performance by approach

Approach	WB	All
Delay / Veh (s)	0.4	0.4
Vehicles Exited	119	119
Hourly Exit Rate	476	476

2: External Performance by approach

Approach	EB	All
Delay / Veh (s)	1.4	1.4
Vehicles Exited	75	75
Hourly Exit Rate	300	300

3: External Performance by approach

Approach	SB	All
Delay / Veh (s)	1.2	1.2
Vehicles Exited	1	1
Hourly Exit Rate	4	4

4: External Performance by approach

Approach	SB	All
Delay / Veh (s)	0.2	0.2
Vehicles Exited	5	5
Hourly Exit Rate	20	20

6: External Performance by approach

Approach	NB	All
Delay / Veh (s)	0.8	0.8
Vehicles Exited	107	107
Hourly Exit Rate	428	428

7: Broadway & Schnell School Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	All
Delay / Veh (s)	7.5	6.5			9.3	5.9	7.1		5.7	7.1
Vehicles Exited	56	41	0	0	61	51	34	0	57	300
Hourly Exit Rate	224	164	0	0	244	204	136	0	228	1200

8: Broadway & Wilste Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Delay / Veh (s)	6.3	4.2	1.1	1.3	6.2	3.3	3.5
Vehicles Exited	92	2	3	115	5	5	222
Hourly Exit Rate	368	8	12	460	20	20	888

Total Network Performance

Delay / Veh (s)	10.3
Vehicles Exited	307
Hourly Exit Rate	1228

7

$$EBL - 6.3 + 7.5 = 13.8 \quad (36)$$

$$EBT - 6.3 + 6.5 = 12.8 \quad (41)$$

7.9

6.8

HCM Unsignalized Intersection Capacity Analysis Existing Conditions - AM Peak Hour - Plus Project 9: Broadway & Blairs Ln

11/18/2008

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	249	24	9	302	10	40	1	17	5	1	9
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
Hourly flow rate (vph)	14	262	25	9	318	11	42	1	18	5	1	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	328			287			649	649	275	650	657	323
vC1, stage 1 conf vol							302	302		342	342	
vC2, stage 2 conf vol							347	347		308	315	
vCu, unblocked vol	328			287			649	649	275	650	657	323
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	100	98	99	100	99
cM capacity (veh/h)	1231			1275			555	537	764	554	537	718
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	287	9	328	61	16						
Volume Left	14	0	9	0	42	5						
Volume Right	0	25	0	11	18	9						
cSH	1231	1700	1275	1700	603	640						
Volume to Capacity	0.01	0.17	0.01	0.19	0.10	0.02						
Queue Length 95th (ft)	1	0	1	0	8	2						
Control Delay (s)	8.0	0.0	7.8	0.0	11.6	10.8						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.4		0.2		11.6	10.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			29.5%		ICU Level of Service		A					
Analysis Period (min)			15									

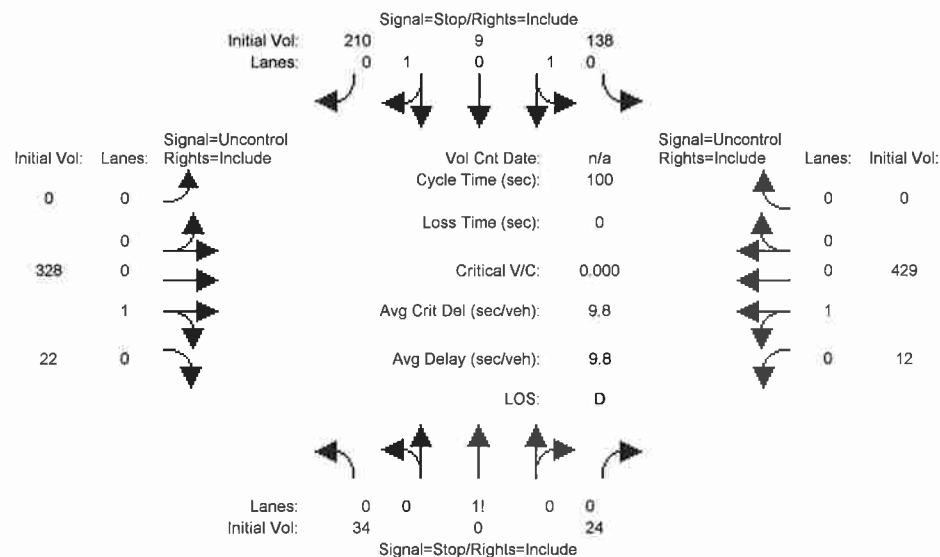
Synchro 6 Report

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Fehr & Peers Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

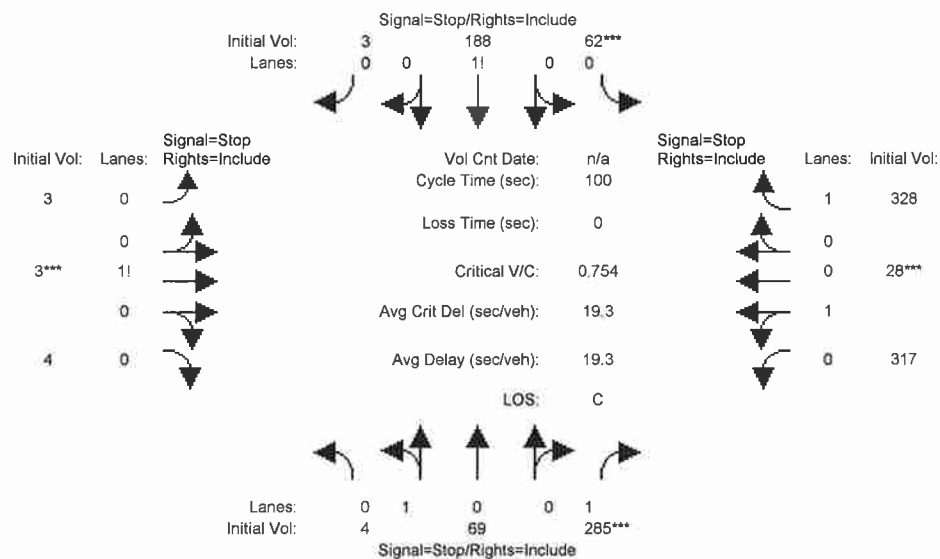
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	34	0	24	137	9	210	0	314	22	12	396	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	0	24	137	9	210	0	314	22	12	396	0
Added Vol:	0	0	0	1	0	0	0	14	0	0	33	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	34	0	24	138	9	210	0	328	22	12	429	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	38	0	27	155	10	236	0	369	25	13	482	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	38	0	27	155	10	236	0	369	25	13	482	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	1013	890	381	903	902	482	xxxxx	xxxxx	xxxxx	393	xxxxx	xxxxx
Potent Cap.:	219	284	671	260	280	588	xxxxx	xxxxx	xxxxx	1176	xxxxx	xxxxx
Move Cap.:	127	281	671	248	276	588	xxxxx	xxxxx	xxxxx	1176	xxxxx	xxxxx
Volume/Cap:	0.30	0.00	0.04	0.63	0.04	0.40	xxxxx	xxxxx	xxxxx	0.01	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	191	xxxxx	249	xxxxx	562	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	1.4	xxxxx	4.2	xxxxx	2.2	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Shrd ConDel:	xxxxx	33.4	xxxxx	43.9	xxxxx	16.3	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
Shared LOS:	*	D	*	E	*	C	*	*	*	A	*	*
ApproachDel:	33.4			27.4			xxxxxxx			xxxxxxx		
ApproachLOS:	D			D			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM + Project

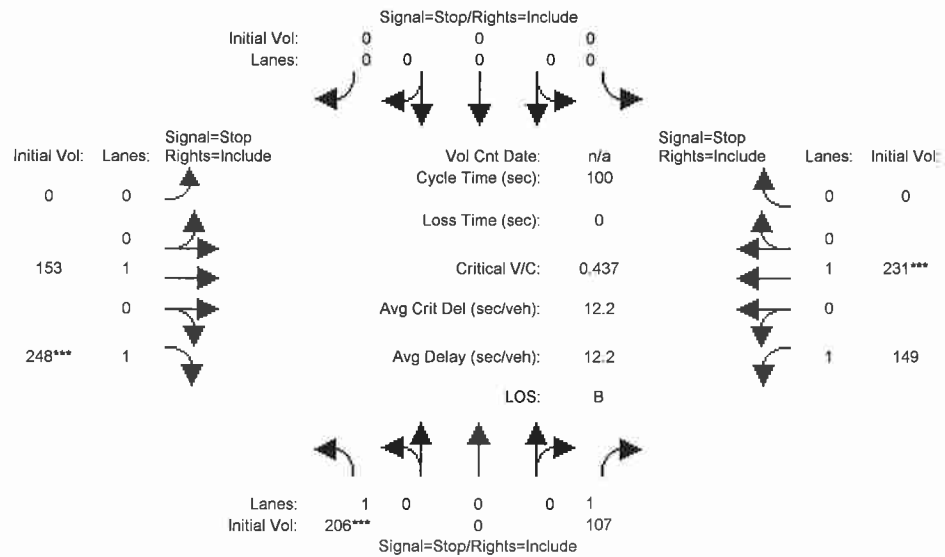
Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	4	69	271	62	188	3	3	3	4	288	28	324
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	69	271	62	188	3	3	3	4	288	28	324
Added Vol:	0	0	14	0	0	0	0	0	0	29	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	69	285	62	188	3	3	3	4	317	28	328
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	4	78	320	70	211	3	3	3	4	356	31	369
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	78	320	70	211	3	3	3	4	356	31	369
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	4	78	320	70	211	3	3	3	4	356	31	369
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	0.25	0.74	0.01	0.30	0.30	0.40	0.92	0.08	1.00
Final Sat.:	27	474	561	125	379	6	129	129	172	472	42	615
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.57	0.56	0.56	0.56	0.03	0.03	0.03	0.75	0.75	0.60
Crit Moves:			****	****			****			****		
Delay/Veh:	11.0	11.0	16.5	17.9	17.9	17.9	10.7	10.7	10.7	27.3	27.3	16.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.0	11.0	16.5	17.9	17.9	17.9	10.7	10.7	10.7	27.3	27.3	16.5
LOS by Move:	B	B	C	C	C	C	B	B	B	D	D	C
ApproachDel:		15.4			17.9			10.7			22.0	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		15.4			17.9			10.7			22.0	
LOS by Appr:		C			C			B			C	
AllWayAvgQ:	0.2	0.2	1.2	1.1	1.1	1.1	0.0	0.0	0.0	2.5	2.5	1.4

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM + Project

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	193	0	102	0	0	0	0	145	244	147	207	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	0	102	0	0	0	0	145	244	147	207	0
Added Vol:	13	0	5	0	0	0	0	8	4	2	24	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	206	0	107	0	0	0	0	153	248	149	231	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	219	0	114	0	0	0	0	163	264	159	246	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	219	0	114	0	0	0	0	163	264	159	246	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	219	0	114	0	0	0	0	163	264	159	246	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	502	0	598	0	0	0	0	577	653	536	581	0
Capacity Analysis Module:												
Vol/Sat:	0.44	xxxx	0.19	xxxx	xxxx	xxxx	xxxx	0.28	0.40	0.30	0.42	xxxx
Crit Moves:	****								****		****	
Delay/Veh:	14.5	0.0	9.7	0.0	0.0	0.0	0.0	11.0	11.5	11.9	12.9	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.5	0.0	9.7	0.0	0.0	0.0	0.0	11.0	11.5	11.9	12.9	0.0
LOS by Move:	B	*	A	*	*	*	*	B	B	B	B	*
ApproachDel:	12.9			xxxxxx				11.3			12.5	
Delay Adj:	1.00			xxxxxx				1.00			1.00	
ApprAdjDel:	12.9			xxxxxx				11.3			12.5	
LOS by Appr:	B			*				B			B	
AllWayAvgQ:	0.7	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.6	0.4	0.7	0.0

HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Existing Conditions PP - AM Peak Hour

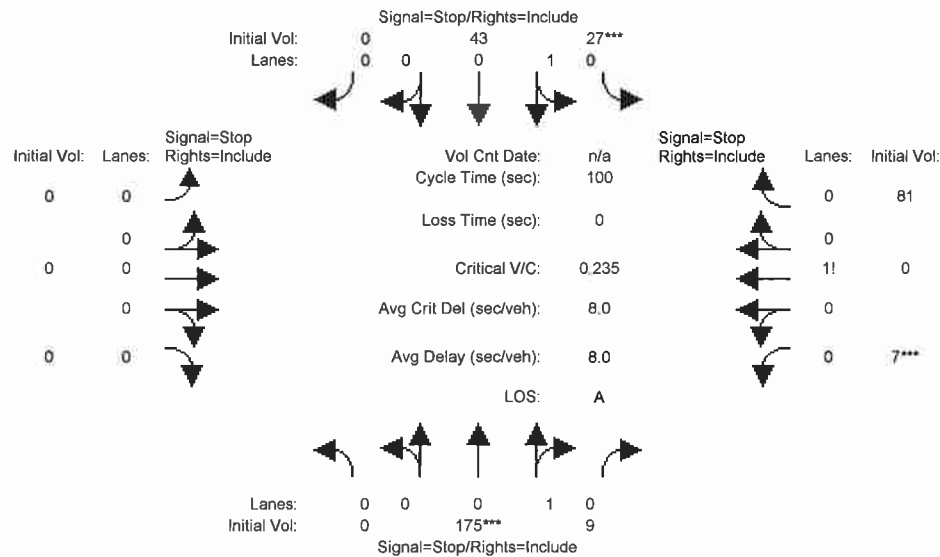
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95		1.00	1.00	
Flt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97		0.95	1.00	
Satd. Flow (prot)	1770	3315		1770	3382		1681	1683		1770	1745	
Flt Permitted	0.95	1.00		0.95	1.00		0.64	0.68		0.50	1.00	
Satd. Flow (perm)	1770	3315		1770	3382		1128	1182		926	1745	
Volume (vph)	17	791	242	46	1529	102	188	30	16	94	59	43
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	19	899	275	52	1738	116	214	34	18	107	67	49
RTOR Reduction (vph)	0	28	0	0	3	0	0	4	0	0	23	0
Lane Group Flow (vph)	19	1146	0	52	1851	0	107	155	0	107	93	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.1	45.9		13.7	58.5		14.1	14.1		14.1	14.1	
Effective Green, g (s)	1.1	45.9		13.7	58.5		14.1	14.1		14.1	14.1	
Actuated g/C Ratio	0.01	0.54		0.16	0.68		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	23	1775		283	2309		186	194		152	287	
v/s Ratio Prot	0.01	c0.35		0.03	c0.55						0.05	
v/s Ratio Perm							0.09	c0.13		0.12		
v/c Ratio	0.83	0.65		0.18	0.80		0.58	0.80		0.70	0.32	
Uniform Delay, d1	42.2	14.1		31.2	9.5		33.0	34.4		33.8	31.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	110.0	0.8		0.3	2.1		4.3	20.0		13.8	0.7	
Delay (s)	152.2	14.9		31.5	11.6		37.3	54.4		47.6	32.2	
Level of Service	F	B		C	B		D	D		D	C	
Approach Delay (s)		17.1			12.2			47.5			39.6	
Approach LOS		B			B			D			D	

Intersection Summary

HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM + Project

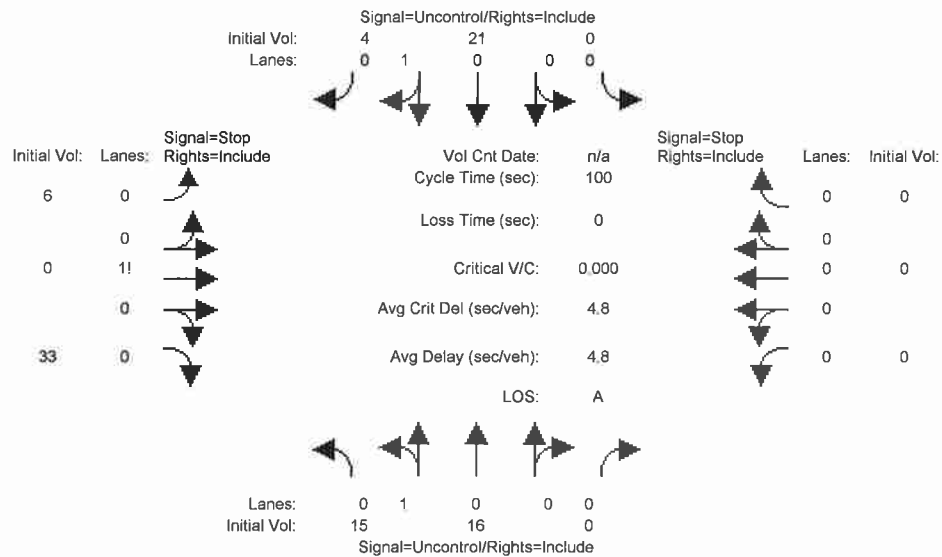
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	175	8	21	43	0	0	0	0	3	0	63
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	175	8	21	43	0	0	0	0	3	0	63
Added Vol:	0	0	1	6	0	0	0	0	0	4	0	18
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	175	9	27	43	0	0	0	0	7	0	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	190	10	29	47	0	0	0	0	8	0	88
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	190	10	29	47	0	0	0	0	8	0	88
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	190	10	29	47	0	0	0	0	8	0	88
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.95	0.05	0.39	0.61	0.00	0.00	0.00	0.00	0.08	0.00	0.92
Final Sat.:	0	811	42	310	494	0	0	0	0	69	0	798
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.23	0.23	0.09	0.09	xxxx	xxxx	xxxx	xxxx	0.11	xxxx	0.11
Crit Moves:	xxxx	****	****	****	****	xxxx	xxxx	xxxx	xxxx	****	xxxx	****
Delay/Veh:	0.0	8.4	8.4	7.8	7.8	0.0	0.0	0.0	0.0	7.4	0.0	7.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	8.4	8.4	7.8	7.8	0.0	0.0	0.0	0.0	7.4	0.0	7.4
LOS by Move:	*	A	A	A	A	*	*	*	*	A	*	A
ApproachDel:	8.4			7.8			xxxxxx			7.4		
Delay Adj:	1.00			1.00			xxxxxx			1.00		
ApprAdjDel:	8.4			7.8			xxxxxx			7.4		
LOS by Appr:	A			A			*			A		
AllWayAvgQ:	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

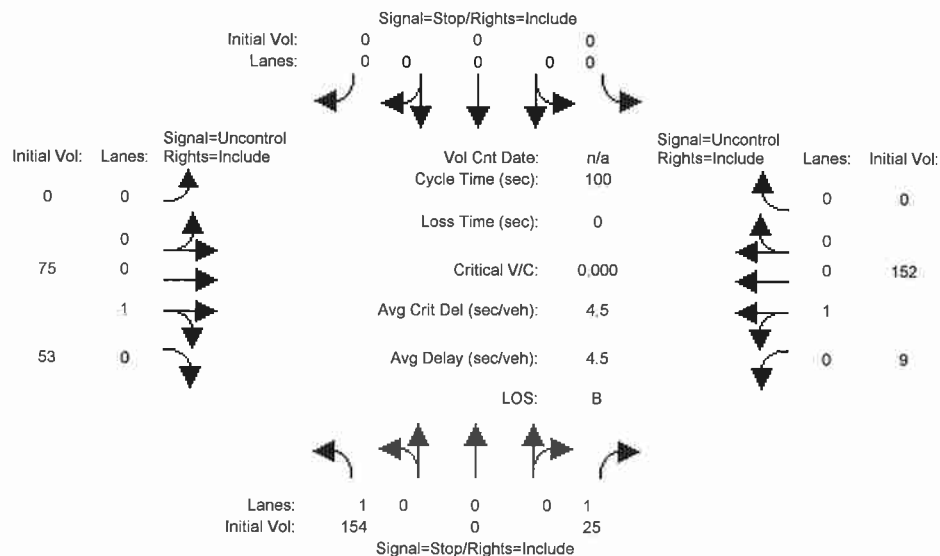
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	8	15	0	0	19	2	0	0	13	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	15	0	0	19	2	0	0	13	0	0	0
Added Vol:	7	1	0	0	2	2	6	0	20	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	15	16	0	0	21	4	6	0	33	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
PHF Volume:	24	26	0	0	34	6	10	0	53	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	24	26	0	0	34	6	10	0	53	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2	xxxxxx	xxxx	xxxxxx
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3	xxxxxx	xxxx	xxxxxx
Capacity Module:												
Cnflct Vol:	40	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	111	111	37	xxxx	xxxx	xxxxxx
Potent Cap.:	1582	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	890	783	1041	xxxx	xxxx	xxxxxx
Move Cap.:	1582	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	880	770	1041	xxxx	xxxx	xxxxxx
Volume/Cap:	0.02	xxxx	xxxx	xxxxxx	xxxx	xxxxxx	0.01	0.00	0.05	xxxx	xxxx	xxxxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	1012	xxxxxx	xxxx	xxxx	xxxxxx
SharedQueue:	0.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.2	xxxxxx	xxxxxx	xxxx	xxxxxx
Shrd ConDel:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	8.8	xxxxxx	xxxxxx	xxxx	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			8.8			xxxxxx		
ApproachLOS:	*			*			A			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM + Project

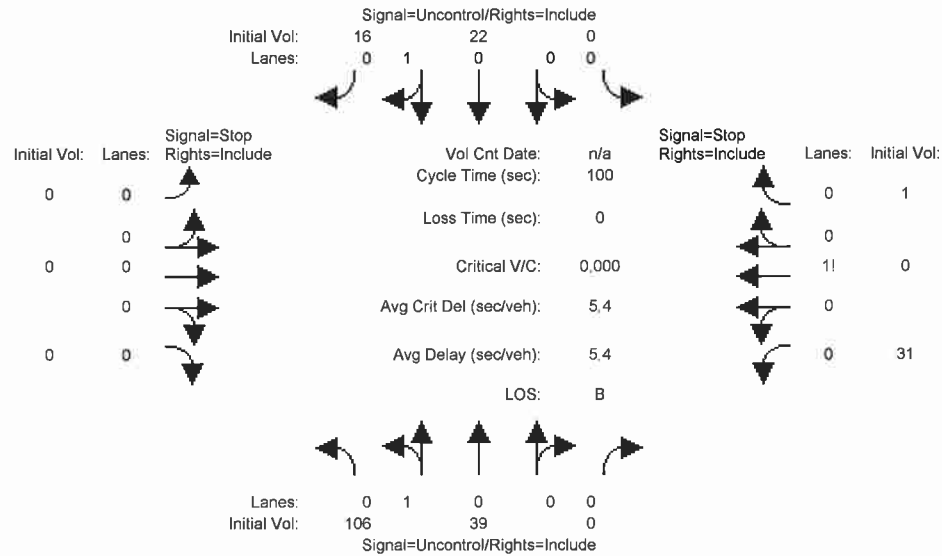
Intersection #16: Canyon View Dr./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	75	0	0	152	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	75	0	0	152	0
Added Vol:	154	0	25	0	0	0	0	0	53	9	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	154	0	25	0	0	0	0	75	53	9	152	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	167	0	27	0	0	0	0	82	58	10	165	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	167	0	27	0	0	0	0	82	58	10	165	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	295	xxxx	110	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	139	xxxx	xxxxx
Potent Cap.:	700	xxxx	949	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1457	xxxx	xxxxx
Move Cap.:	697	xxxx	949	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1457	xxxx	xxxxx
Volume/Cap:	0.24	xxxx	0.03	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.9	xxxx	0.1	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	11.8	xxxx	8.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx
LOS by Move:	B	*	A	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	11.4			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

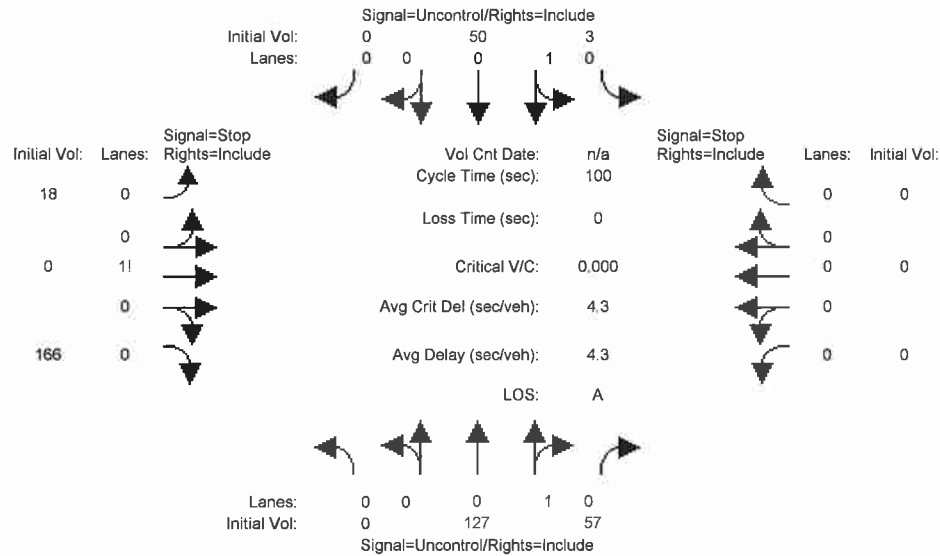
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	106	38	0	0	20	16	0	0	0	12	0	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	38	0	0	20	16	0	0	0	12	0	1
Added Vol:	0	1	0	0	2	0	0	0	0	19	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	106	39	0	0	22	16	0	0	0	31	0	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
PHF Volume:	131	48	0	0	27	20	0	0	0	38	0	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	131	48	0	0	27	20	0	0	0	38	0	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	47	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	347	357	48
Potent Cap.:	1574	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	654	572	1026
Move Cap.:	1574	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	609	521	1026
Volume/Cap:	0.08	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	0.06	0.00	0.00
Level Of Service Module:												
2Way95thQ:	0.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	7.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	617	xxxxxx
SharedQueue:	0.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.2	xxxxxx
Shrd ConDel:	7.5	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	11.2	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			11.2		
ApproachLOS:	*			*			*			B		

Level Of Service Computation Report
 2000 HCM Unsignalized (Future Volume Alternative)
 Existing PM + Project

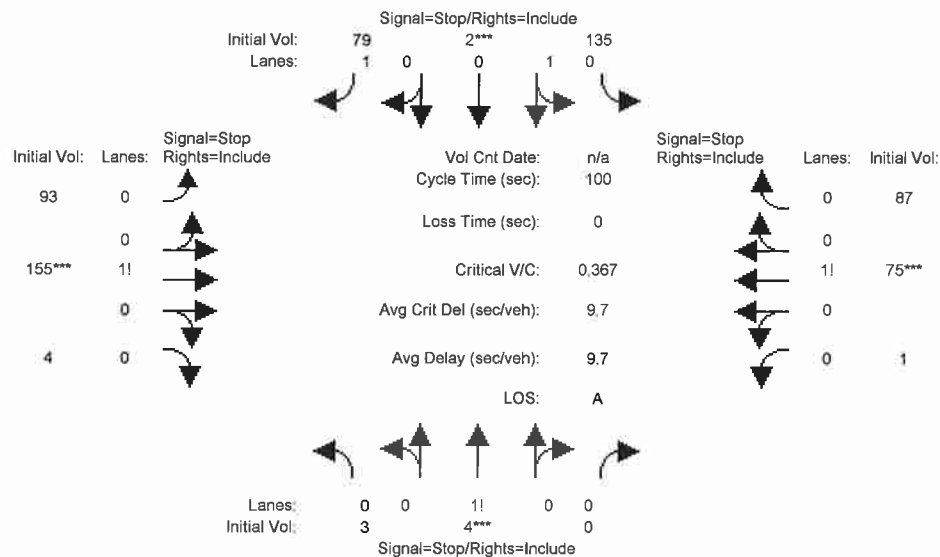
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	126	46	3	29	0	18	0	166	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	126	46	3	29	0	18	0	166	0	0	0
Added Vol:	0	1	11	0	21	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	127	57	3	50	0	18	0	166	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	143	64	3	56	0	20	0	187	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	143	64	3	56	0	20	0	187	0	0	0
Critical Gap Module:												
Critical Gp:xxxxx	xxxx	xxxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:xxxxx	xxxx	xxxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	207	xxxx	xxxxx	238	270	56	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1376	xxxx	xxxxx	755	640	1016	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1376	xxxx	xxxxx	754	639	1016	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.03	0.00	0.18	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:xxxxx	xxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	983	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	0.8	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:xxxxx	xxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	9.6	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	9.6	xxxxxx	xxxxxx	xxxxxx	xxxxxx
ApproachLOS:	*	*	*	*	*	*	*	A	*	*	*	*

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM + Project

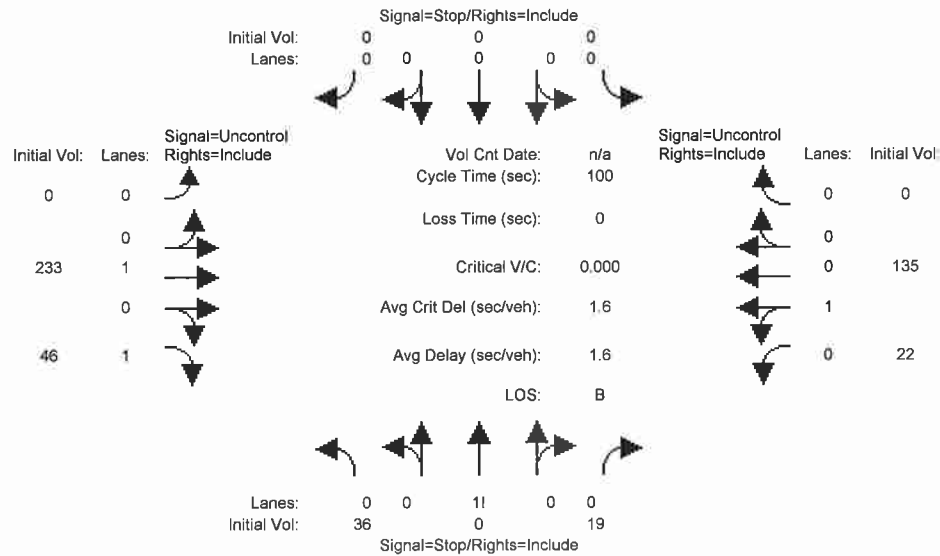
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	3	4	0	135	2	58	81	151	4	1	68	87
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	4	0	135	2	58	81	151	4	1	68	87
Added Vol:	0	0	0	0	0	21	12	4	0	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	4	0	135	2	79	93	155	4	1	75	87
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	3	4	0	144	2	84	99	165	4	1	80	93
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	4	0	144	2	84	99	165	4	1	80	93
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	4	0	144	2	84	99	165	4	1	80	93
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.43	0.57	0.00	0.99	0.01	1.00	0.37	0.61	0.02	0.01	0.46	0.53
Final Sat.:	259	345	0	565	8	708	269	449	12	5	350	406
Capacity Analysis Module:												
Vol/Sat:	0.01	0.01	xxxx	0.25	0.25	0.12	0.37	0.37	0.37	0.23	0.23	0.23
Crit Moves:	****			****			****			****		
Delay/Veh:	8.5	8.5	0.0	10.6	10.6	8.1	10.4	10.4	10.4	8.8	8.8	8.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.5	8.5	0.0	10.6	10.6	8.1	10.4	10.4	10.4	8.8	8.8	8.8
LOS by Move:	A	A	*	B	B	A	B	B	B	A	A	A
ApproachDel:	8.5			9.7			10.4			8.8		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	8.5			9.7			10.4			8.8		
LOS by Appr:	A			A			B			A		
AllWayAvgQ:	0.0	0.0	0.0	0.3	0.3	0.1	0.5	0.5	0.5	0.3	0.3	0.3

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

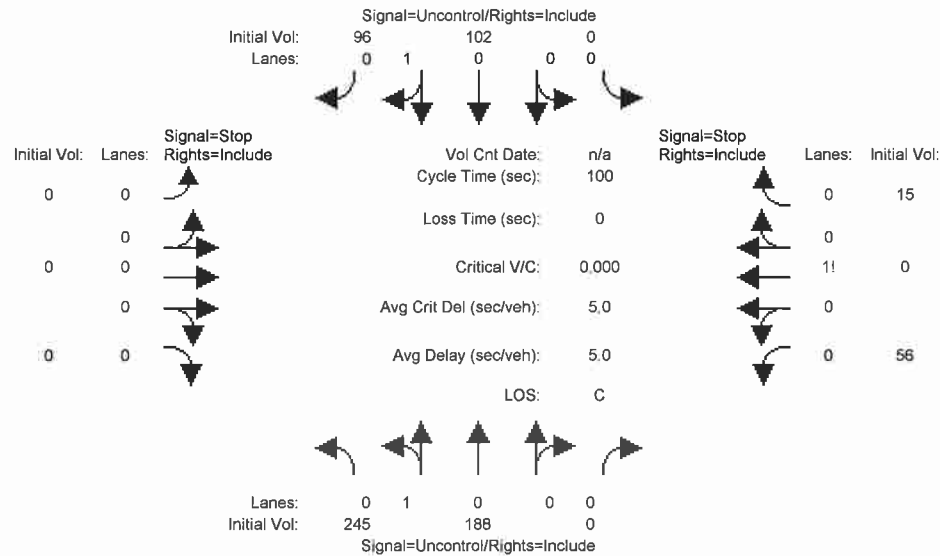
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	31	0	17	0	0	0	0	219	43	18	111	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	0	17	0	0	0	0	219	43	18	111	0
Added Vol:	5	0	2	0	0	0	0	14	3	4	24	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	0	19	0	0	0	0	233	46	22	135	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	39	0	21	0	0	0	0	253	50	24	147	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	39	0	21	0	0	0	0	253	50	24	147	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflict Vol:	448	448	253	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	303	xxxxx	xxxxx
Potent Cap.:	572	509	790	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1269	xxxxx	xxxxx
Move Cap.:	564	499	790	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1269	xxxxx	xxxxx
Volume/Cap:	0.07	0.00	0.03	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.02	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.9	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	626	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
Shared Queue:	xxxxx	0.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx
Shrd ConDel:	xxxxx	11.4	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.9	xxxxx	xxxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:	11.4			xxxxxxx			xxxxxxx			xxxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

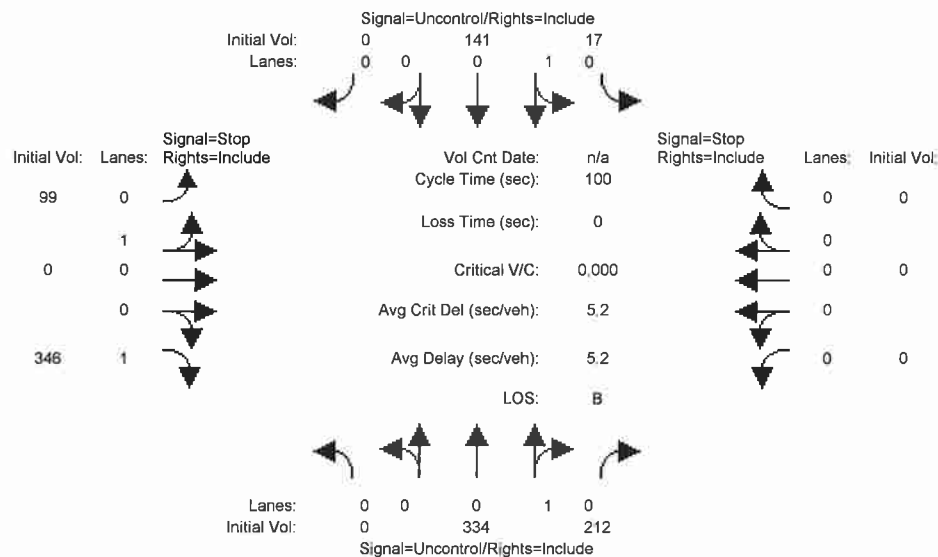
Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	186	185	0	0	97	96	0	0	0	56	0	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	186	185	0	0	97	96	0	0	0	56	0	15
Added Vol:	59	3	0	0	5	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	245	188	0	0	102	96	0	0	0	56	0	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	266	204	0	0	111	104	0	0	0	61	0	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	266	204	0	0	111	104	0	0	0	61	0	16
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	215	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	900	952	204
Potent Cap.:	1367	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	312	261	841
Move Cap.:	1367	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	257	202	841
Volume/Cap:	0.19	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	0.24	0.00	0.02
Level Of Service Module:												
2Way95thQ:	0.7	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	8.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	301	xxxxxx
SharedQueue:	0.7	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	1.0	xxxxxx
Shrd ConDel:	8.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	21.0	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	C	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	21.0	xxxxxx
ApproachLOS:	*	*	*	*	*	*	*	*	*	*	C	*

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	272	212	17	136	0	99	0	244	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	272	212	17	136	0	99	0	244	0	0	0
Added Vol:	0	62	0	0	5	0	0	0	102	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	334	212	17	141	0	99	0	346	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	371	236	19	157	0	110	0	384	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	0	371	236	19	157	0	110	0	384	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	607	xxxx	xxxxx	683	801	157	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	981	xxxx	xxxxx	418	320	894	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	981	xxxx	xxxxx	412	314	894	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	xxxx	xxxx	0.27	0.00	0.43	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxx	xxxx	2.2	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	xxxxx	xxxx	12.0	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	412	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shared Queue:	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	1.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	16.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	C	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx					13.1	xxxxxx		
ApproachLOS:	*			*					B	*		

SimTraffic Performance Report
Existing Conditions PP - PM Peak Hour

9/11/2007

17.8 C

1: External Performance by approach

Approach	WB	All
Delay / Veh (s)	0.3	0.3
Vehicles Exited	101	101
Hourly Exit Rate	404	404

2: External Performance by approach

Approach	EB	All
Delay / Veh (s)	1.8	1.8
Vehicles Exited	171	171
Hourly Exit Rate	684	684

3: External Performance by approach

Approach	SB	All
Delay / Veh (s)	1.4	1.4
Vehicles Exited	4	4
Hourly Exit Rate	16	16

4: External Performance by approach

Approach	SB	All
Delay / Veh (s)	0.2	0.2
Vehicles Exited	16	16
Hourly Exit Rate	64	64

6: External Performance by approach

Approach	NB	All
Delay / Veh (s)	1.0	1.0
Vehicles Exited	139	139
Hourly Exit Rate	556	556

7: Broadway & Schnell School Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	14.5	13.0	13.4	8.1	15.0	9.4	5.0		28.1	37.0	6.5	15.5
Vehicles Exited	82	89	1	1	61	56	1	0	82	2	44	419
Hourly Exit Rate	328	356	4	4	244	224	4	0	328	8	176	1676

8: Broadway & Wilste Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Delay / Veh (s)	16.3	17.3	1.4	1.4	11.3	12.9	10.8
Vehicles Exited	162	7	9	96	6	11	291
Hourly Exit Rate	648	28	36	384	24	44	1164

Total Network Performance

Delay / Veh (s)	23.4
Vehicles Exited	431
Hourly Exit Rate	1724

$$EBL - 16.3 + 14.5 = 30.8 \text{ (82)}$$

$$EBT \quad 16.3 + 13.0 = 29.3 \text{ (89)}$$

$$EBR \quad 16.3 + 13.4 = 29.7 \text{ (1)}$$

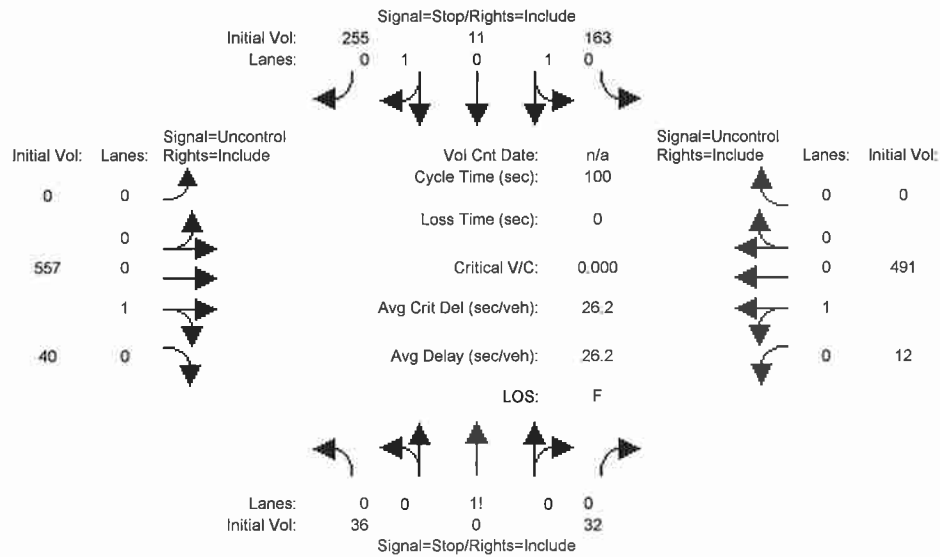
17.8

HCM Unsignalized Intersection Capacity Analysis Existing Conditions - PM Peak Hour - Plus Project 9: Broadway & Blairs Ln 11/18/2008

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	620	30	14	334	15	25	0	34	9	0	31
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
Hourly flow rate (vph)	20	653	32	15	352	16	26	0	36	9	0	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	367			684			1122	1105	668	1117	1113	359
vC1, stage 1 conf vol							708	708		389	389	
vC2, stage 2 conf vol							414	397		728	724	
vCu, unblocked vol	367			684			1122	1105	668	1117	1113	359
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			93	100	92	97	100	95
cM capacity (veh/h)	1191			909			360	378	458	331	368	685
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	20	684	15	367	62	42						
Volume Left	20	0	15	0	26	9						
Volume Right	0	32	0	16	36	33						
cSH	1191	1700	909	1700	410	552						
Volume to Capacity	0.02	0.40	0.02	0.22	0.15	0.08						
Queue Length 95th (ft)	1	0	1	0	13	6						
Control Delay (s)	8.1	0.0	9.0	0.0	15.3	12.1						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.2		0.3		15.3	12.1						
Approach LOS					C	B						
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			47.4%		ICU Level of Service		A					
Analysis Period (min)			15									

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

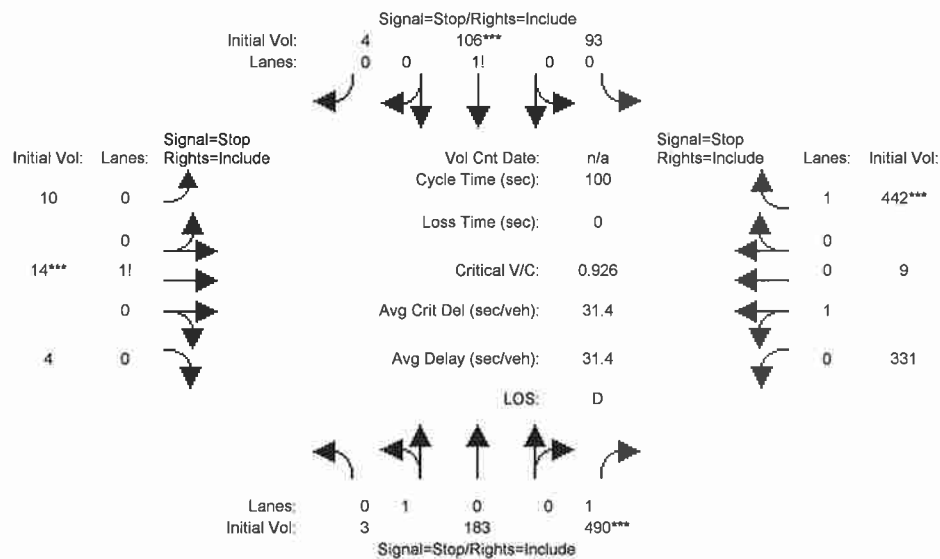
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	36	0	32	158	11	255	0	522	40	12	465	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	36	0	32	158	11	255	0	522	40	12	465	0
Added Vol:	0	0	0	5	0	0	0	35	0	0	26	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	0	32	163	11	255	0	557	40	12	491	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	38	0	34	173	12	271	0	593	43	13	522	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	38	0	34	173	12	271	0	593	43	13	522	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	1303	1162	614	1179	1183	522	xxxx	xxxx	xxxxx	635	xxxx	xxxxx
Potent Cap.:	139	197	496	169	191	558	xxxx	xxxx	xxxxx	958	xxxx	xxxxx
Move Cap.:	67	194	496	156	189	558	xxxx	xxxx	xxxxx	958	xxxx	xxxxx
Volume/Cap:	0.57	0.00	0.07	1.11	0.06	0.49	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	113	xxxxx	158	xxxx	516	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	3.2	xxxxx	10.2	xxxx	3.3	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	80.7	xxxxx	184.0	xxxx	20.1	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx
Shared LOS:	*	F	*	F	*	C	*	*	*	A	*	*
ApproachDel:	80.7			84.9			xxxxxxx			xxxxxxx		
ApproachLOS:	F			F			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM + Project

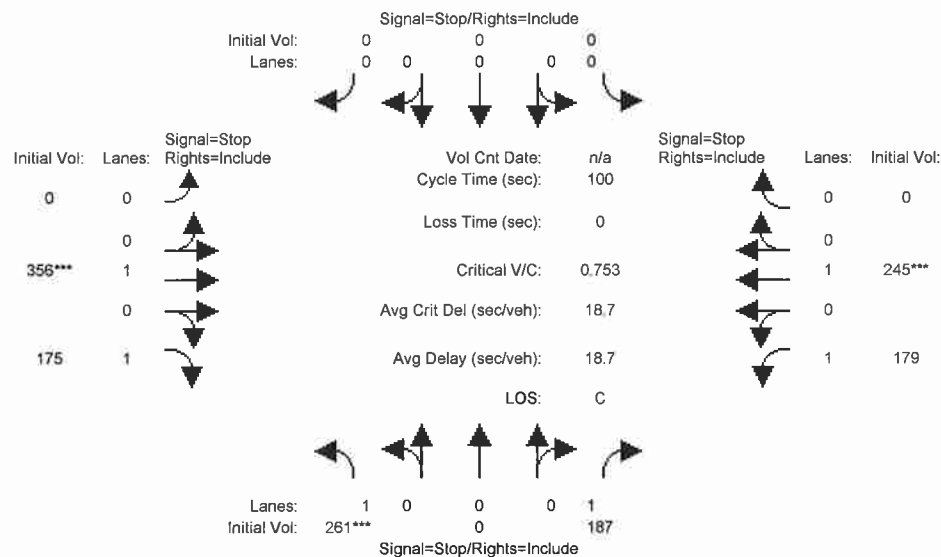
Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	3	183	455	93	106	4	10	14	4	308	9	439
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	183	455	93	106	4	10	14	4	308	9	439
Added Vol:	0	0	35	0	0	0	0	0	0	23	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	183	490	93	106	4	10	14	4	331	9	442
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	3	193	516	98	112	4	11	15	4	348	9	465
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	193	516	98	112	4	11	15	4	348	9	465
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	193	516	98	112	4	11	15	4	348	9	465
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.02	0.98	1.00	0.46	0.52	0.02	0.36	0.50	0.14	0.97	0.03	1.00
Final Sat.:	8	491	557	215	245	9	147	206	59	463	13	565
Capacity Analysis Module:												
Vol/Sat:	0.39	0.39	0.93	0.45	0.45	0.45	0.07	0.07	0.07	0.75	0.75	0.82
Crit Moves:	****			****			****			****		
Delay/Veh:	14.3	14.3	46.4	16.5	16.5	16.5	11.9	11.9	11.9	29.3	29.3	31.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.3	14.3	46.4	16.5	16.5	16.5	11.9	11.9	11.9	29.3	29.3	31.5
LOS by Move:	B	B	E	C	C	C	B	B	B	D	D	D
ApproachDel:	37.6			16.5			11.9			30.6		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	37.6			16.5			11.9			30.6		
LOS by Appr:	E			C			B			D		
AllWayAvgQ:	0.6	0.6	5.8	0.8	0.8	0.8	0.1	0.1	0.1	2.5	2.5	3.5

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM + Project

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	

Volume Module:												
Base Vol:	253	0	184	0	0	0	0	328	161	173	229	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	253	0	184	0	0	0	0	328	161	173	229	0
Added Vol:	8	0	3	0	0	0	0	28	14	6	16	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	261	0	187	0	0	0	0	356	175	179	245	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	290	0	208	0	0	0	0	396	194	199	272	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	290	0	208	0	0	0	0	396	194	199	272	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	290	0	208	0	0	0	0	396	194	199	272	0

Saturation Flow Module:											
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Final Sat.:	468	0	550	0	0	0	0	525	576	477	511

Capacity Analysis Module:												
Vol/Sat:	0.62	xxxx	0.38	xxxx	xxxx	xxxx	xxxx	0.75	0.34	0.42	0.53	xxxx
Crit Moves:	****							****			****	
Delay/Veh:	21.1	0.0	12.6	0.0	0.0	0.0	0.0	26.7	11.7	15.1	16.9	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.1	0.0	12.6	0.0	0.0	0.0	0.0	26.7	11.7	15.1	16.9	0.0
LOS by Move:	C	*	B	*	*	*	*	D	B	C	C	*
ApproachDel:		17.6			xxxxxx			21.8			16.1	
Delay Adj:		1.00			xxxxxx			1.00			1.00	
ApprAdjDel:		17.6			xxxxxx			21.8			16.1	
LOS by Appr:		C			*			C			C	
AllWayAvgQ:	1.4	0.0	0.6	0.0	0.0	0.0	0.0	2.5	0.5	0.7	1.0	0.0

HCM Signalized Intersection Capacity Analysis
13: US 50 & Bedford Rd

Lumsden Ranch EIR
Existing Conditions PP - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97		0.95	1.00	
Satd. Flow (prot)	1770	3368		1770	3387		1681	1663		1770	1764	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	0.75		0.33	1.00	
Satd. Flow (perm)	1770	3368		1770	3387		1198	1276		621	1764	
Volume (vph)	46	1696	184	27	1248	65	323	49	54	130	57	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1843	200	29	1357	71	351	53	59	141	62	34
RTOR Reduction (vph)	0	7	0	0	3	0	0	8	0	0	17	0
Lane Group Flow (vph)	50	2036	0	29	1425	0	193	262	0	141	79	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5		2	1		6			8			4
Permitted Phases							8			4		
Actuated Green, G (s)	5.8	69.3		2.2	65.7		27.1	27.1		27.1	27.1	
Effective Green, g (s)	5.8	69.3		2.2	65.7		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.05	0.63		0.02	0.59		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	93	2110		35	2012		294	313		152	432	
v/s Ratio Prot	0.03	c0.60		0.02	c0.42						0.05	
v/s Ratio Perm							0.16	0.21		c0.23		
v/c Ratio	0.54	0.97		0.83	0.71		0.66	0.84		0.93	0.18	
Uniform Delay, d1	51.1	19.5		54.0	15.7		37.6	39.6		40.8	33.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	12.4		84.5	1.2		5.2	17.3		51.4	0.2	
Delay (s)	57.0	31.9		138.5	16.9		42.8	56.9		92.2	33.2	
Level of Service	E	C		F	B		D	E		F	C	
Approach Delay (s)		32.5			19.3			51.0			68.3	
Approach LOS		C			B			D			E	

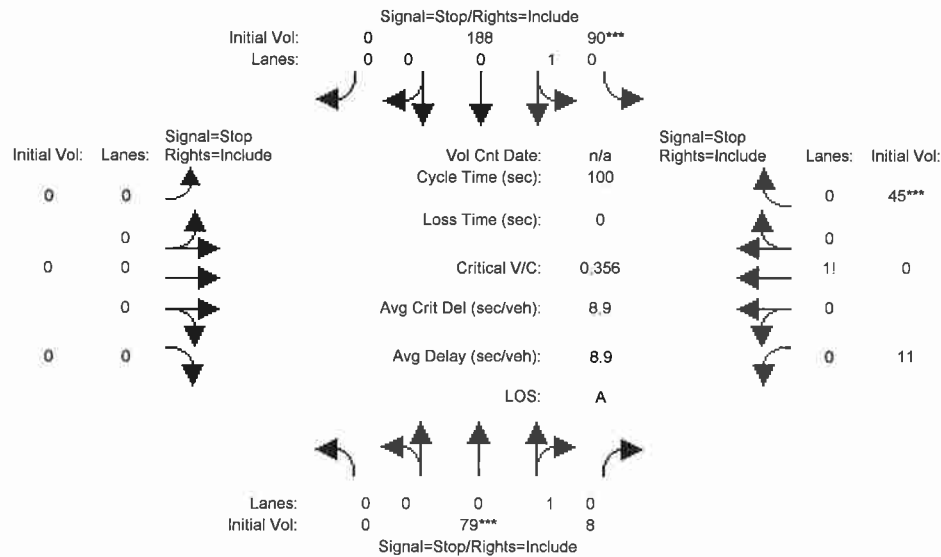
Intersection Summary

HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM + Project

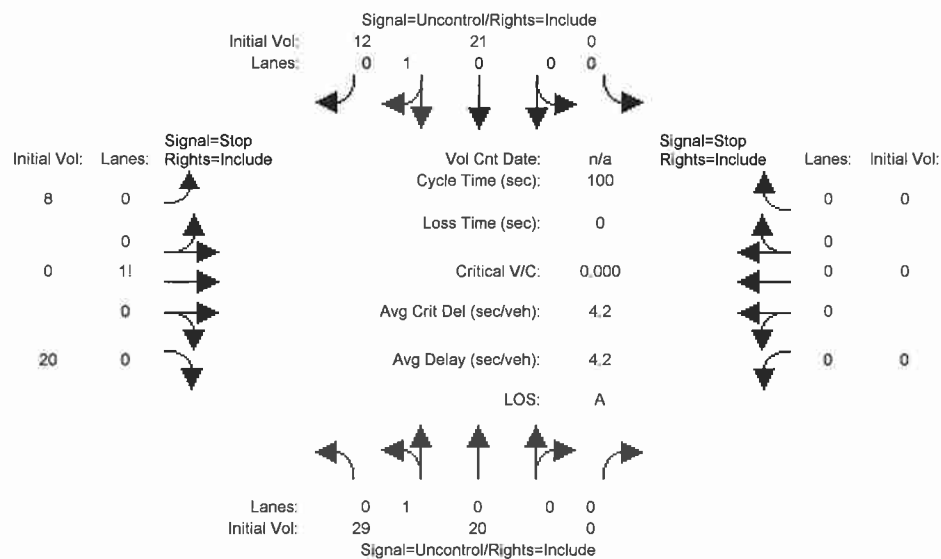
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	79	3	69	188	0	0	0	0	8	0	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	79	3	69	188	0	0	0	0	8	0	33
Added Vol:	0	0	5	21	0	0	0	0	0	3	0	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	79	8	90	188	0	0	0	0	11	0	45
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	86	9	98	204	0	0	0	0	12	0	49
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	86	9	98	204	0	0	0	0	12	0	49
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	86	9	98	204	0	0	0	0	12	0	49
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.91	0.09	0.32	0.68	0.00	0.00	0.00	0.00	0.20	0.00	0.80
Final Sat.:	0	749	76	275	574	0	0	0	0	154	0	629
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.11	0.11	0.36	0.36	xxxx	xxxx	xxxx	xxxx	0.08	xxxx	0.08
Crit Moves:	****			****								****
Delay/Veh:	0.0	7.8	7.8	9.4	9.4	0.0	0.0	0.0	0.0	7.6	0.0	7.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	7.8	7.8	9.4	9.4	0.0	0.0	0.0	0.0	7.6	0.0	7.6
LOS by Move:	*	A	A	A	A	*	*	*	*	A	*	A
ApproachDel:		7.8			9.4		xxxxxx				7.6	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		7.8			9.4		xxxxxx				7.6	
LOS by Appr:		A			A		*				A	
AllWayAvgQ:	0.1	0.1	0.1	0.5	0.5	0.5	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

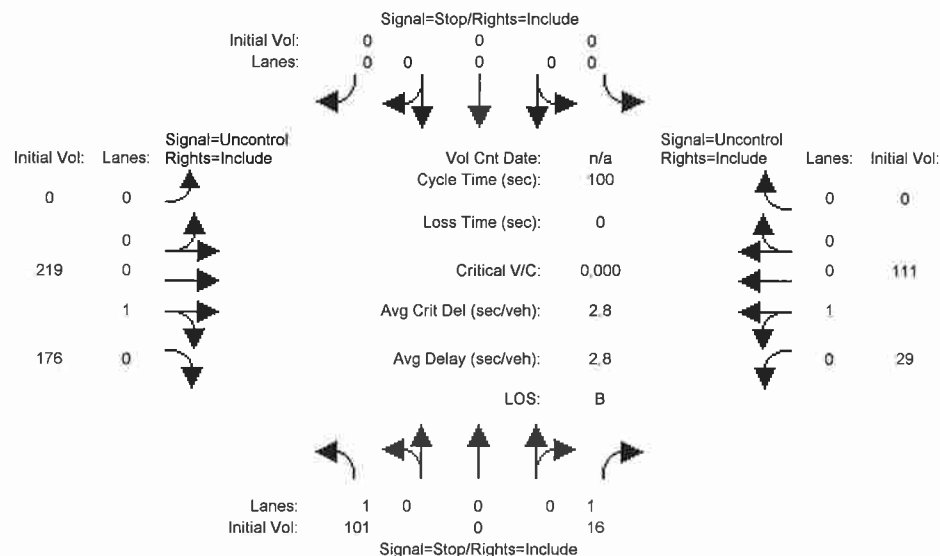
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	6	18	0	0	20	5	4	0	7	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	18	0	0	20	5	4	0	7	0	0	0
Added Vol:	23	2	0	0	1	7	4	0	13	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	29	20	0	0	21	12	8	0	20	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
PHF Volume:	41	28	0	0	30	17	11	0	28	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	41	28	0	0	30	17	11	0	28	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2	xxxxxx	xxxx	xxxxxx
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3	xxxxxx	xxxx	xxxxxx
Capacity Module:												
Cnflct Vol:	46	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	148	148	38	xxxx	xxxx	xxxxxx
Potent Cap.:	1574	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	849	747	1040	xxxx	xxxx	xxxxxx
Move Cap.:	1574	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	832	727	1040	xxxx	xxxx	xxxxxx
Volume/Cap:	0.03	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	0.01	0.00	0.03	xxxx	xxxx	xxxxxx
Level Of Service Module:												
2Way95thQ:	0.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	970	xxxxxx	xxxx	xxxx	xxxxxx
SharedQueue:	0.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	0.1	xxxxxx	xxxxxx	xxxx	xxxxxx
Shrd ConDel:	7.3	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	8.9	xxxxxx	xxxxxx	xxxx	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			8.9			xxxxxx		
ApproachLOS:	*			*			A			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM + Project

Intersection #16: Canyon View Dr./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	219	0	0	111	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	219	0	0	111	0
Added Vol:	101	0	16	0	0	0	0	0	176	29	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	101	0	16	0	0	0	0	219	176	29	111	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	110	0	17	0	0	0	0	238	191	32	121	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	110	0	17	0	0	0	0	238	191	32	121	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	517	xxxx	334	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	429	xxxx	xxxxx
Potent Cap.:	522	xxxx	713	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1141	xxxx	xxxxx
Move Cap.:	511	xxxx	713	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1141	xxxx	xxxxx
Volume/Cap:	0.22	xxxx	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.8	xxxx	0.1	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	14.0	xxxx	10.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx
LOS by Move:	B	*	B	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	13.5			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	B			*			*			*		

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	901	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	357	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	901	357	vph
Peak-hour factor, PHF	0.92	0.62	
Peak 15-min volume, v15	245	144	v
Trucks and buses	6	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1067	593	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 1067$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1067	4500	No
v_{12}	1067	4400	No
$v_{FO} = v_F - v_R$	474	4500	No
v_R	593	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 11.4$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.351$	
Space mean speed in ramp influence area,	$S_R = 50.4$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.4$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	344	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	29	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	344	105	29	vph
Peak-hour factor, PHF	0.92	0.56	0.54	
Peak 15-min volume, v15	93	47	13	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	408	193	55	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 408$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	408	4500	No
v_{12}	408	4400	No
$v_{FO} = v_F - v_R$	215	4500	No
v_R	193	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 6.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D_S = 0.315$	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	239	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	29	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	105	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	239	29	105	vph
Peak-hour factor, PHF	0.92	0.54	0.56	
Peak 15-min volume, v15	65	13	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	283	55	193	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 283 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	338	4500	No
v _{R12}	338	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 6.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	M = 0.299	
	S	
Space mean speed in ramp influence area,	S = 51.1	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 51.1	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/9/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB OFF
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	544	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	292	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	92	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	544	292	92	vph
Peak-hour factor, PHF	0.92	0.74	0.78	
Peak 15-min volume, v15	148	99	29	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	645	406	121	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 645 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	645	4500	No
v_{12}	645	4400	No
$v_{FO} = v_F - v_R$	239	4500	No
v_R	406	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 8.0 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D_S = 0.335$	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	252	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	92	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	292	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	252	92	292	vph
Peak-hour factor, PHF	0.92	0.78	0.74	
Peak 15-min volume, v15	68	29	99	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	299	121	406	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 299 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	420	4500	No
v _{R12}	420	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 6.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	M _S = 0.298	
Space mean speed in ramp influence area,	S _R = 51.1	mph
Space mean speed in outer lanes,	S _O = N/A	mph
Space mean speed for all vehicles,	S = 51.1	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1880	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	429	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1880	429		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	511	136		v
Trucks and buses	6	2		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2227	559	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2227 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2227	4500	No
v_{12}	2227	4400	No
$v_{FO} = v_F - v_R$	1668	4500	No
v_R	559	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 21.3 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.348$	
Space mean speed in ramp influence area,	$S_R = 50.5$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.5$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1235	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	184	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	107	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1235	184	107	vph
Peak-hour factor, PHF	0.92	0.80	0.78	
Peak 15-min volume, v15	336	57	34	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1463	237	141	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1463$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1463	4500	No
v_{12}	1463	4400	No
$v_{FO} = v_F - v_R$	1226	4500	No
v_R	237	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 15.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.319$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.8$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1051	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	107	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	184	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1051	107	184	vph
Peak-hour factor, PHF	0.92	0.78	0.80	
Peak 15-min volume, v15	286	34	57	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1245	141	237	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1245 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1386	4500	No
v _{R12}	1386	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M	= 0.310	
	S		
Space mean speed in ramp influence area,	S _R	= 51.0	mph
Space mean speed in outer lanes,	S ₀	= N/A	mph
Space mean speed for all vehicles,	S	= 51.0	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/9/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1451	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	445	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	229	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1451	445	229	vph
Peak-hour factor, PHF	0.92	0.92	0.91	
Peak 15-min volume, v15	394	121	63	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1719	498	259	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1719 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1719	4500	No
v_{12}	1719	4400	No
$v_{FO} = v_F - v_R$	1221	4500	No
v_R	498	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 17.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.343$	
	S	
Space mean speed in ramp influence area,	$S = 50.5$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	0	
Space mean speed for all vehicles,	$S = 50.5$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1006	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	229	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	445	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1006	229	445	vph
Peak-hour factor, PHF	0.92	0.91	0.92	
Peak 15-min volume, v15	273	63	121	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1192	259	498	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1192 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1451	4500	No
v _{R12}	1451	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.309	
	S	
Space mean speed in ramp influence area,	S = 51.0	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 51.0	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1460	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	214	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	431	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1460	214	431	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	397	58	117	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1730	240	483	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1730$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1730	4500	No
v_{12}	1730	4400	No
$v_{FO} = v_F - v_R$	1490	4500	No
v_R	240	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 17.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.320$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.8$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Broadway WB ON
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1246	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	431	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	214	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1246	431	214	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	339	117	58	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1476	483	240	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
 $v_{12} = v_F (P_{FM}) = 1476 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1959	4500	No
v _{R12}	1959	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 18.7 \text{ pc/mi/ln}$
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.331	
	S	
Space mean speed in ramp influence area,	S _R = 50.7	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	985	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	25	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	222	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	985	25	222	vph
Peak-hour factor, PHF	0.92	0.70	0.79	
Peak 15-min volume, v15	268	9	70	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1167	37	289	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1167$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1167	4500	No
v_{12}	1167	4400	No
$v_{FO} = v_F - v_R$	1130	4500	No
v_R	37	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.2$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.301$	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB ON
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	960	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	222	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	25	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	960	222	25	vph
Peak-hour factor, PHF	0.92	0.79	0.70	
Peak 15-min volume, v15	261	70	9	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1137	289	37	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1137$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1426	4500	No
v_{R12}	1426	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.308$	
	S	
Space mean speed in ramp influence area,	$S = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1182	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	97	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	375	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1182	97	375	vph
Peak-hour factor, PHF	0.92	0.84	0.73	
Peak 15-min volume, v15	321	29	128	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1400	119	529	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1400 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1400	4500	No
v_{12}	1400	4400	No
$v_{FO} = v_F - v_R$	1281	4500	No
v_R	119	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.309$	
	S	
Space mean speed in ramp influence area,	$S = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1085	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	375	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	97	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1085	375	97	vph
Peak-hour factor, PHF	0.92	0.73	0.84	
Peak 15-min volume, v15	295	128	29	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1285	529	119	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1285 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1814	4500	No
v _{R12}	1814	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.5 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M	= 0.318	
	S		
Space mean speed in ramp influence area,	S _R	= 50.9	mph
Space mean speed in outer lanes,	S ₀	= N/A	mph
Space mean speed for all vehicles,	S	= 50.9	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB OFF
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	964	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	133	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	509	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	964	133	509	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	262	36	138	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1142	149	570	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 1142 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1142	4500	No
v_{12}	1142	4400	No
$v_{FO} = v_F - v_R$	993	4500	No
v_R	149	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.311$	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Broadway WB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	831	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	509	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	133	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	831	509	133	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	226	138	36	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	985	570	149	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 985 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1555	4500	No
v_{R12}	1555	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 15.5 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.321$
 S
 Space mean speed in ramp influence area, $S_R = 50.8 \text{ mph}$
 R
 Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$
 O
 Space mean speed for all vehicles, $S = 50.8 \text{ mph}$

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB OFF
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	604	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	32	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	122	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	604	32	122	vph
Peak-hour factor, PHF	0.92	0.65	0.75	
Peak 15-min volume, v15	164	12	41	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	716	51	168	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 716 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	716	4500	No
v_{12}	716	4400	No
$v_{FO} = v_F - v_R$	665	4500	No
v_R	51	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 8.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D = 0.303$	
	S	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB ON
 Jurisdiction:
 Analysis Year: Existing Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	572	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	122	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	32	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	572	122	32	vph
Peak-hour factor, PHF	0.92	0.75	0.65	
Peak 15-min volume, v15	155	41	12	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	678	168	51	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 678$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	846	4500	No
v_{R12}	846	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.0$ - pc/mi/ln
 Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$M_S = 0.301$	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	694	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	71	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	341	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	694	71	341	vph
Peak-hour factor, PHF	0.92	0.77	0.84	
Peak 15-min volume, v15	189	23	101	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	822	95	418	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 822$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	822	4500	No
v_{12}	822	4400	No
$v_{FO} = v_F - v_R$	727	4500	No
v_R	95	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 9.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D = 0.307$	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB ON
Jurisdiction:
Analysis Year: Existing Plus Project
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	623	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	341	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	71	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	623	341	71	vph
Peak-hour factor, PHF	0.92	0.84	0.77	
Peak 15-min volume, v15	169	101	23	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	738	418	95	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 738 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1156	4500	No
v_{R12}	1156	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 12.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.306$	
Space mean speed in ramp influence area,	$S_R = 51.0$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 51.0$	mph

Near Term Conditions

HCM Unsignalized Intersection Capacity Analysis 5: US 50 WB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term No Project - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	69	0	28	122	219	0	0	105	164
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	0	0	93	0	38	165	296	0	0	142	222
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	916	878	253	878	989	296	364			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	916	878	253	878	989	296	364			296		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	61	100	95	86			100		
cM capacity (veh/h)	215	247	786	240	213	743	1195			1265		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	131	461	364									
Volume Left	93	165	0									
Volume Right	38	0	222									
cSH	298	1195	1700									
Volume to Capacity	0.44	0.14	0.21									
Queue Length 95th (ft)	53	12	0									
Control Delay (s)	26.2	4.0	0.0									
Lane LOS	D	A										
Approach Delay (s)	26.2	4.0	0.0									
Approach LOS	D											
Intersection Summary												
Average Delay		5.5										
Intersection Capacity Utilization		49.4%		ICU Level of Service				A				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 6: US 50 EB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term No Project - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	139	2	122	0	0	0	0	202	76	17	157	0
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	211	3	185	0	0	0	0	306	115	26	238	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	653	711	238	839	653	364	238			421		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	653	711	238	839	653	364	238			421		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	44	99	77	100	100	100	100			98		
cM capacity (veh/h)	374	350	801	214	378	681	1329			1138		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	214	185	421	264								
Volume Left	211	0	0	26								
Volume Right	0	185	115	0								
cSH	374	801	1700	1138								
Volume to Capacity	0.57	0.23	0.25	0.02								
Queue Length 95th (ft)	86	22	0	2								
Control Delay (s)	26.8	10.8	0.0	1.0								
Lane LOS	D	B		A								
Approach Delay (s)	19.4		0.0	1.0								
Approach LOS	C											
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			36.9%		ICU Level of Service				A			
Analysis Period (min)			15									

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Near Term No Project	PHF:	0.85
TOD:	AM	Analysis Period:	15 Minutes
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	0	1	--	0	4.2	A	--
	Subtotal	0	1	0	--	4.2	A	--
SB	L	23	26	113	4	5.9	A	--
	T	1	2	200	1	7.5	A	--
	R	58	55	95	8	4.2	A	--
	Subtotal	82	82	100	--	4.9	A	--
EB	L	56	53	95	7	13.0	B	--
	T	35	36	103	5	12.6	B	--
	R	0	1	--	0	10.3	B	--
	Subtotal	91	90	99	--	12.8	B	--
WB	L	1	1	100	0	4.3	A	--
	T	51	53	104	6	7.4	A	--
	R	26	25	92	5	4.5	A	--
	Subtotal	77	79	101	--	6.5	A	--
Total		250	251	100	--	8.2	A	--

HCM Unsignalized Intersection Capacity Analysis
5: US 50 WB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term No Project - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	56	0	15	187	186	0	0	100	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	61	0	16	203	202	0	0	109	105
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	786	770	161	770	823	202	214			202		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	786	770	161	770	823	202	214			202		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	78	100	98	85			100		
cM capacity (veh/h)	269	281	884	281	262	839	1356			1370		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	77	405	214									
Volume Left	61	203	0									
Volume Right	16	0	105									
cSH	327	1356	1700									
Volume to Capacity	0.24	0.15	0.13									
Queue Length 95th (ft)	23	13	0									
Control Delay (s)	19.4	4.8	0.0									
Lane LOS	C	A										
Approach Delay (s)	19.4	4.8	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay		4.9										
Intersection Capacity Utilization		45.3%	ICU Level of Service									
Analysis Period (min)		15	A									

HCM Unsignalized Intersection Capacity Analysis
6: US 50 EB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term No Project - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	99	0	247	0	0	0	0	274	215	19	137	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	110	0	274	0	0	0	0	304	239	21	152	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	618	738	152	893	618	424	152			543		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	618	738	152	893	618	424	152			543		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	100	69	100	100	100	100			98		
cM capacity (veh/h)	395	339	894	179	396	630	1429			1026		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	110	274	543	173								
Volume Left	110	0	0	21								
Volume Right	0	274	239	0								
cSH	395	894	1700	1026								
Volume to Capacity	0.28	0.31	0.32	0.02								
Queue Length 95th (ft)	28	33	0	2								
Control Delay (s)	17.6	10.8	0.0	1.2								
Lane LOS	C	B		A								
Approach Delay (s)	12.7		0.0	1.2								
Approach LOS	B											

Intersection Summary

Average Delay	4.6		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Near Term No Project	PHF:	0.95
TOD:	PM	Analysis Period:	Hourly
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	1	0	0	0	0.0	--	--
	T	2	1	50	0	4.9	A	--
	R	2	2	100	1	4.2	A	--
	Subtotal	5	3	60	--	4.5	A	--
SB	L	215	54	25	4	9.9	A	--
	T	11	3	27	2	11.3	B	--
	R	179	42	23	5	4.9	A	--
	Subtotal	404	98	24	--	7.8	A	--
EB	L	344	89	26	5	19.2	C	--
	T	329	85	26	10	17.6	C	--
	R	6	2	33	1	16.3	C	--
	Subtotal	680	176	26	--	18.4	C	--
WB	L	2	1	50	0	9.6	A	--
	T	212	52	25	9	10.3	B	--
	R	168	43	26	5	6.9	A	--
	Subtotal	382	96	25	--	8.8	A	--
Total		1472	372	25	--	13.0	B	--

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB OFF
Jurisdiction:
Analysis Year: Baseline (2010)
Description:

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 522 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 263 vph
Length of first accel/decel lane 200 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 95 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	522	263	95
Peak-hour factor, PHF	0.92	0.74	0.78
Peak 15-min volume, v15	142	89	30
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCF, ET	2.5	2.5	2.5
Recreational vehicle PCF, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 618 366 125 pcp

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
EQ
 $P =$ 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 618$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	618	4500	No
$F_i F$			
$v = v - v$	252	4500	No
$F_O F R$			
v	366	2100	No
R			
v	0	pc/h (Equation 25-15 or 25-16)	
$3 \text{ or } av34$			
$Is v v$	> 2700 pc/h?	No	
$3 \text{ or } av34$			
$Is v v$	> 1.5 v /2	No	
$3 \text{ or } av34$	12		
If yes, v = 618		(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
618 4400 No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 7.8$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.331$
Space mean speed in ramp influence area, $S = 50.7$ mph
Space mean speed in outer lanes, $S' = N/A$ mph
Space mean speed for all vehicles, $S = 50.7$ mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB ON
Jurisdiction: Baseline (2010)
Analysis Year:
Description:

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 259 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 95 vph
Length of first accel/decel lane 320 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 263 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	259	95	263
Peak-hour factor, PHF	0.92	0.78	0.74
Peak 15-min volume, v15	70	30	89
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, FHV 0.917 0.971 0.971
Driver population factor, FP 1.00 1.00 1.00
Flow rate, vp 307 125 366
pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P =$ 1.000 Using Equation 0
 FM
 $v = v \{P\} = 307$ pc/h
12 F EM

Capacity Checks

	Actual	Maximum	LOS F?
v	432	4500	No
FO	0	pc/h	(Equation 25-4 or 25-5)
Is v 3 or av34	> 2700 pc/h?	No	
Is v 3 or av34	> 1.5 v /2	No	
Is v 3 or av34	12	(Equation 25-8)	
If yes, v = 307			
12A			

Flow Entering Merge Influence Area

Actual 307
Max Desirable 4600
Violation? No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 6.8$ pc/mi/in
R 12 A
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.298$
Space mean speed in ramp influence area, $S = 51.1$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 51.1$ mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB OFF
Jurisdiction:
Analysis Year: Baseline (2010)
Description:

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 1360 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 45.0 mph
Volume on ramp 346 vph
Length of first accel/decel lane 200 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 234 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1360	346	234
Peak-hour factor, PHF	0.92	0.92	0.91
Peak 15-min volume, v15	370	94	64
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fp 1.00 1.00 1.00
Flow rate, vp 1611 387 265 pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $EQ =$
 $P = 1.000$ Using Equation 0
 $FD =$
 $v = v + (v - v) P = 1611$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	1611	4500	No
$FL F$			
$v = v - v$	1224	4500	No
$FO F R$			
v	387	2100	No
R			
v	0		(Equation 25-15 or 25-16)
$3 \text{ or } av34$			
$Is v v > 2700 \text{ pc/h?}$		No	
$3 \text{ or } av34$			
$Is v v > 1.5 v / 2$		No	
$3 \text{ or } av34$	12		
If yes, $v = 1611$			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

Actual 1611
Max Desirable 4400
Violation? No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 16.3$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.333$
Space mean speed in ramp influence area, $S = 50.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 50.7$ mph

Heavy vehicle adjustment, fhv 0.917 0.971 0.971
Driver population factor, fp 1.00 1.00 1.00
Flow rate, vp 1201 265 387
pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$
$$EQ = 1.000 \text{ Using Equation 0}$$
$$FM = 1201 \text{ pc/h}$$
$$v = v_{12} \text{ F } FM$$

Capacity Checks

	Actual	Maximum	LOS F?
v	1466	4500	No
PO	0	pc/h	(Equation 25-4 or 25-5)
Is v	> 2700 pc/h?	No	
Is v	> 1.5 v / 2	No	
Is v	> 1201	(Equation 25-8)	
If yes, v = 1201			

Flow Entering Merge Influence Area
Actual 1201
Max Desirable 4500
Violation? No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v_{12} - 0.00627 L = 14.8$ pc/mi/in
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.309$
Space mean speed in ramp influence area, $S = 51.0$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 51.0$ mph

Phone:
E-mail:
Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Pehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB ON
Jurisdiction: Baseline (2010)
Analysis Year:
Description:

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 1014 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 234 vph
Length of first accel/decel lane 320 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 346 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1014	234	346
Peak-hour factor, PHF	0.92	0.91	0.92
Peak 15-min volume, v15	276	64	94
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kirtelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year: Baseline (2010)
Description:

Freeway Data

Type of analysis: Diverge
Number of lanes in freeway: 2
Free-flow speed on freeway: 55.0 mph
Volume on freeway: 1179 vph

Off Ramp Data

Side of freeway: Right
Number of lanes in ramp: 1
Free-flow speed on ramp: 45.0 mph
Volume on ramp: 97 vph
Length of first accel/decel lane: 220 ft
Length of second accel/decel lane: ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp: 286 vph
Position of adjacent ramp: Downstream
Type of adjacent ramp: On
Distance to adjacent ramp: 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1179	97	286
Peak-hour factor, PHF	0.92	0.84	0.73
Peak 15-min volume, v15	320	29	98
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV: 0.917
Driver population factor, fP: 1.00
Flow rate, vp: 1397
pcph

0.971
1.00
119
404

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $EQ =$
 $P = 1.000$ Using Equation 0
 $FD =$
 $v = v + (v - v) P = 1397$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	1397	4500	No
$FL F$	1278	4500	No
$FO F R$	119	2100	No
$v R$	0	(Equation 25-15 or 25-16)	
v 3 or av34	> 2700 pc/h?	No	
$Is v v$	> 1.5 v /2	No	
$Is v v$	3 or av34	12	
If yes, v = 1397	(Equation 25-18)		

Flow Entering Diverge Influence Area

Actual: 1397
Max Desirable: 4400
Violation? No

Level of Service Determination (if not F)

Density: $D = 4.252 + 0.0086 v - 0.009 L = 14.3$ pc/ml/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.309$
Space mean speed in ramp influence area, $S = 51.0$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 51.0$ mph

Heavy vehicle adjustment, FHV 0.917 0.971 0.971
 Driver population factor, FP 1.00 1.00 1.00
 Flow rate, vp 1282 404 119

pcph

Estimation of V12 Merge Areas

$$L = \frac{EQ}{P} = \frac{1.000}{Using Equation 0}$$

$$FM = v = v \quad (P) = 1282 \quad pc/h$$

$$12 \quad F \quad FM$$

Analyst: Matt Kittelson

Agency/Co.: Fehr & Peers

Date performed: 9/10/2007

Analysis time period: AM Peak Hour

Freeway/Dir of Travel: US 50 WB

Junction: Schnell School WB ON

Jurisdiction: Baseline (2010)

Analysis Year: Baseline (2010)

Description:

Merge Analysis

Fax:

Phone:

E-mail:

Capacity Checks

Actual Maximum LOS F?
 1686 4500 No

v FO 0 pc/h (Equation 25-4 or 25-5)

3 or $av34$ > 2700 $pc/h?$ No

3 or $av34$ > 1.5 v $/2$ No

3 or $av34$ 12 (Equation 25-8)

If yes, v $= 1282$

Flow Entering Merge Influence Area
 Actual 1282 Max Desirable 4500 Violation? No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \quad v + 0.0078 \quad v - 0.00627 \quad L = 16.6$
 R R 12 A $pc/mi/in$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.315$

Space mean speed in ramp influence area, $S = 50.9$ mph

Space mean speed in outer lanes, $S = N/A$ mph

Space mean speed for all vehicles, $S = 50.9$ mph

Freeway Data

Type of analysis Merge

Number of lanes in freeway 2

Free-flow speed on freeway 55.0 mph

Volume on freeway 1082 vph

Length of first accel/decel lane 300 ft

Length of second accel/decel lane 300 ft

On Ramp Data

Side of freeway Right

Number of lanes in ramp 1

Free-flow speed on ramp 45.0 mph

Volume on ramp 286 vph

Length of first accel/decel lane 300 ft

Length of second accel/decel lane 300 ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes

Volume on adjacent Ramp 97 vph

Position of adjacent Ramp Upstream

Type of adjacent Ramp Off

Distance to adjacent Ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components Freeway Ramp Adjacent Ramp

Volume, V (vph) 1082 286 97 vph

Peak-hour factor, PHF 0.92 0.73 0.84

Peak 15-min volume, v_{15} 294 98 29 v

Trucks and buses 6 2 2 %

Recreational vehicles 0 0 0 %

Terrain type: Rolling Rolling Rolling

Grade %

Length mi 2.5 2.5 2.5

Trucks and buses PCE, ET 2.0 2.0 2.0

Recreational vehicle PCE, ER 2.0 2.0 2.0

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year: Baseline (2010)
Description:

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Number of lanes in ramp 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 704 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 71 vph
Length of first accel/decel lane 220 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 284 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	704	71	284
Peak-hour factor, PHF	0.92	0.77	0.84
Peak 15-min volume, v15	191	23	85
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fp 1.00 1.00 1.00
Flow rate, vp 834 95 348 pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $FD =$
 $V = V + (V - V) P = 834$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = V$	834	4500	No
$F_i F$	739	4500	No
$V = V - V$			
$F_i F R$	95	2100	No
$V R$			
$V = V$	0	pc/h	(Equation 25-15 or 25-16)
$3 \text{ or } av34$	> 2700 pc/h?	No	
$3 \text{ or } av34$	$> 1.5 v / 2$	No	
$3 \text{ or } av34$	12		
If yes, $v = 834$			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V 12	834	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 9.4$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.307$
Space mean speed in ramp influence area, $S = 51.0$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 51.0$ mph

HCS+: Ramps and Ramp Junctions Release 5.3

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB ON
Jurisdiction: Baseline (2010)
Analysis Year:
Description:

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 633 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 284 vph
Length of first accel/decel lane 300 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 75 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	633	284	75
Peak-hour factor, PHF	0.92	0.73	0.84
Peak 15-min volume, v15	172	97	22
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 750 401 92 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 750 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
V	1151	4500	No
FO	0	pc/h	(Equation 25-4 or 25-5)
v	v	> 2700 pc/h?	No
3 or av34			
Is v	v	> 1.5 v /2	No
3 or av34			
Is v	v	> 1.5 v /2	No
3 or av34			
If yes, v	v	= 750	(Equation 25-8)
12A			

Flow Entering Merge Influence Area
Actual 750
Max Desirable 4600
Violation? No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 12.4 pc/mi/ln
R
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.306
Space mean speed in ramp influence area, S = 51.0 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 51.0 mph

Near Term Plus Project Conditions

HCM Unsignalized Intersection Capacity Analysis 5: US 50 WB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term Plus Project - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	69	0	28	212	223	0	0	106	164
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	0	0	93	0	38	286	301	0	0	143	222
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1166	1128	254	1128	1239	301	365			301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1166	1128	254	1128	1239	301	365			301		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	37	100	95	76			100		
cM capacity (veh/h)	132	155	785	148	133	738	1194			1260		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	131	588	365									
Volume Left	93	286	0									
Volume Right	38	0	222									
cSH	192	1194	1700									
Volume to Capacity	0.68	0.24	0.21									
Queue Length 95th (ft)	104	23	0									
Control Delay (s)	56.5	5.7	0.0									
Lane LOS	F	A										
Approach Delay (s)	56.5	5.7	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay		9.9										
Intersection Capacity Utilization		54.6%		ICU Level of Service						A		
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis
6: US 50 EB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term Plus Project - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	139	2	153	0	0	0	0	296	76	17	158	0
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	211	3	232	0	0	0	0	448	115	26	239	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	797	855	239	1030	797	506	239			564		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	797	855	239	1030	797	506	239			564		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	29	99	71	100	100	100	100			97		
cM capacity (veh/h)	299	288	800	146	311	566	1327			1008		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	214	232	564	265								
Volume Left	211	0	0	26								
Volume Right	0	232	115	0								
cSH	298	800	1700	1008								
Volume to Capacity	0.72	0.29	0.33	0.03								
Queue Length 95th (ft)	128	30	0	2								
Control Delay (s)	42.4	11.3	0.0	1.1								
Lane LOS	E	B		A								
Approach Delay (s)	26.2		0.0	1.1								
Approach LOS	D											

Intersection Summary

Average Delay	9.4			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Near Term Plus Project **PHF:** 0.85
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	0	1	--	0	4.1	A	--
	Subtotal	0	1	0	--	4.1	A	--
SB	L	33	32	97	3	6.9	A	--
	T	1	1	100	0	6.4	A	--
	R	58	55	95	4	5.3	A	--
	Subtotal	91	88	97	--	5.9	A	--
EB	L	56	52	93	7	14.3	B	--
	T	40	41	103	5	13.2	B	--
	R	0	2	--	1	10.4	B	--
	Subtotal	96	94	98	--	13.7	B	--
WB	L	1	1	100	0	9.9	A	--
	T	67	65	97	6	9.3	A	--
	R	54	48	89	9	5.5	A	--
	Subtotal	121	114	94	--	7.7	A	--
Total		309	297	96	--	9.1	A	--

HCM Unsignalized Intersection Capacity Analysis
 16 Broadway & Canyon View Dr

Lumsden Ranch EIR
 Near Term Plus Project - AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↱	↗
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	76	53	9	163	154	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	80	56	9	172	162	26
Pedestrians	10			10	10	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			146		318	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			146		318	128
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		75	97
cM capacity (veh/h)			1424		659	907
Direction, Lane #	EB 1	WB 1	NB 1	NB 2		
Volume Total	136	181	162	26		
Volume Left	0	9	162	0		
Volume Right	56	0	0	26		
cSH	1700	1424	659	907		
Volume to Capacity	0.08	0.01	0.25	0.03		
Queue Length 95th (ft)	0	1	24	2		
Control Delay (s)	0.0	0.4	12.2	9.1		
Lane LOS		A	B	A		
Approach Delay (s)	0.0	0.4	11.8			
Approach LOS			B			
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization		32.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
5: US 50 WB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term Plus Project - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	56	0	15	246	189	0	0	105	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	61	0	16	267	205	0	0	114	105
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	923	907	167	907	960	205	220			205		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	923	907	167	907	960	205	220			205		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	72	100	98	80			100		
cM capacity (veh/h)	208	221	877	217	206	835	1350			1366		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	77	473	220									
Volume Left	61	267	0									
Volume Right	16	0	105									
cSH	258	1350	1700									
Volume to Capacity	0.30	0.20	0.13									
Queue Length 95th (ft)	30	18	0									
Control Delay (s)	24.8	5.5	0.0									
Lane LOS	C	A										
Approach Delay (s)	24.8	5.5	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay		5.9										
Intersection Capacity Utilization		49.0%	ICU Level of Service	A								
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 6: US 50 EB Ramps & Schnell School Road

Lumsden Ranch EIR
Near Term Plus Project - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	99	0	349	0	0	0	0	336	215	19	142	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	110	0	388	0	0	0	0	373	239	21	158	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	693	812	158	1081	693	493	158			612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	693	812	158	1081	693	493	158			612		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	100	56	100	100	100	100			98		
cM capacity (veh/h)	352	306	888	108	359	576	1422			967		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	110	388	612	179								
Volume Left	110	0	0	21								
Volume Right	0	388	239	0								
cSH	352	888	1700	967								
Volume to Capacity	0.31	0.44	0.36	0.02								
Queue Length 95th (ft)	33	56	0	2								
Control Delay (s)	19.8	12.2	0.0	1.2								
Lane LOS	C	B		A								
Approach Delay (s)	13.9		0.0	1.2								
Approach LOS	B											

Intersection Summary

Average Delay	5.5			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A	
Analysis Period (min)	15			

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	<u>Lumsden Ranch EIR</u>	HCM:	<u>2000</u>
Scenario:	<u>Near Term Plus Project</u>	PHF:	<u>0.95</u>
TOD:	<u>PM</u>	Analysis Period:	<u>15 Minutes</u>
		# of Runs:	<u>10</u>

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	0	0	--	0	0.0	--	--
	T	1	1	100	1	6.9	A	--
	R	1	1	100	0	7.4	A	--
	Subtotal	1	2	200	--	7.1	A	--
SB	L	82	83	101	6	32.2	D	--
	T	3	3	100	1	31.4	D	--
	R	45	43	96	8	6.2	A	--
	Subtotal	129	130	101	--	23.5	C	--
EB	L	86	88	102	10	36.9	E	--
	T	99	94	95	8	35.5	E	--
	R	2	1	50	0	32.9	D	--
	Subtotal	187	183	98	--	36.2	E	--
WB	L	1	1	100	0	24.5	C	--
	T	62	57	92	8	18.2	C	--
	R	58	56	97	7	9.8	A	--
	Subtotal	121	114	94	--	14.1	B	--
Total		438	429	98	--	26.3	D	--

HCM Unsignalized Intersection Capacity Analysis

168: Broadway & Canyon View Dr

Lumsden Ranch EIR
Near Term Plus Project - PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	↗
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	225	175	29	115	101	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	237	184	31	121	106	17
Pedestrians	10			10	10	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			431		531	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			431		531	349
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		78	98
cM capacity (veh/h)			1119		487	683

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	421	152	106	17
Volume Left	0	31	106	0
Volume Right	184	0	0	17
cSH	1700	1119	487	683
Volume to Capacity	0.25	0.03	0.22	0.02
Queue Length 95th (ft)	0	2	21	2
Control Delay (s)	0.0	1.9	14.5	10.4
Lane LOS		A	B	B
Approach Delay (s)	0.0	1.9	13.9	
Approach LOS			B	

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		45.6%	ICU Level of Service A
Analysis Period (min)		15	

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 655 409 125
pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $EQ =$
 $P = 1.000$ Using Equation 0
 $FD =$
 $v = v + (v - v) P = 655$ pc/h
12 R F R FD

Diverge Analysis

Phone:
E-mail:
Fax:

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB OFF
Jurisdiction:
Analysis Year: Baseline (2010) Plus Project
Description:

Freeway Data

Type of analysis
Number of lanes in freeway
Free-flow speed on freeway
Volume on freeway

2 Diverge
55.0
553

mph
vph

Off Ramp Data

Side of freeway
Number of lanes in ramp
Free-flow speed on ramp
Volume on ramp
Length of first accel/decel lane
Length of second accel/decel lane

Right
1
45.0
294
200

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

Yes
95
Downstream
On
2600

vph
ft

Conversion to pc/h Under Base Conditions

Junction Components
Volume, V (vph)
Peak-hour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade
Length
Trucks and buses PCE, ET
Recreational vehicle PCE, ER

Freeway Ramp Adjacent
553 294 95
0.92 0.74 0.78
150 99 30
6 2 2
0 0 0
Rolling Rolling Rolling
0.00 % 0.00 %
0.00 mi 0.00 mi
2.5 2.5 2.5
2.0 2.0 2.0

Capacity Checks

$v = v$ Actual Maximum LOS F?
655 4500 No
 $F_i F$
 $v = v - v$ 246 4500 No
 $F_O F R$
 $v R$ 409 2100 No
 $v v$ 0 pc/h (Equation 25-15 or 25-16)
 $3 \text{ or } av34$
 $Is v v > 2700 \text{ pc/h?}$ No
 $3 \text{ or } av34$
 $Is v v > 1.5 v / 2$ No
 $3 \text{ or } av34$
If yes, $v = 655$ (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
655 4400 No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 8.1$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.335$
Space mean speed in ramp influence area, $S = 50.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 50.6$ mph

HCS+: Ramps and Ramp Junctions Release 5.3

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB ON
Jurisdiction: Baseline (2010) Plus Project
Analysis Year:
Description:

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 259 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 95 vph
Length of first accel/decel lane 320 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 294 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	259	95	294
Peak-hour factor, PHF	0.92	0.78	0.74
Peak 15-min volume, v15	70	30	99
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade			
Length	2.5 mi	2.5 mi	2.5 mi
Trucks and buses PCE, ET	2.0	2.0	2.0
Recreational vehicle PCE, ER			

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vP 307 125 409 pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P =$ 1.000 Using Equation 0
 FM
 $v = v (P) = 307$ pc/h
12 F FM

Capacity Checks

V	Actual	Maximum	LOS F?
432	4500	No	
0	pc/h	(Equation 25-4 or 25-5)	
3 or av34	No		
3 or v	> 2700 pc/h?		
3 or av34	No		
3 or v	> 1.5 v / 2		
3 or av34	12		
3 or v	(Equation 25-8)		
12A			

Flow Entering Merge Influence Area
Actual 307
Max Desirable 4600
Violation? No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 6.8$ pc/ml/in
R 12 A
Level of service for ramp-freeway junction areas of influence A
Speed Estimation

Intermediate speed variable, M = 0.298

Space mean speed in ramp influence area, S = 51.1 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 51.1 mph

Heavy vehicle adjustment, FHV 0.917 0.971 0.971
 Driver population factor, FP 1.00 1.00 1.00
 Flow rate, vp 1732 502 265 pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ = 1.000 \text{ Using Equation 0}$$

$$FD = 1732 \text{ pc/h}$$

$$v = v + (v - v) P = 1732 \text{ pc/h}$$

$$12 \quad R \quad F \quad R \quad FD$$

Diverge Analysis

Phone:
 E-mail:

Fax:

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Baseline (2010) Plus Project
 Description:

Freeway Data

Type of analysis
 Number of lanes in freeway
 Free-flow speed on freeway
 Volume on freeway

Diverge
 2
 55.0 mph
 1462 vph

Off Ramp Data

Side of freeway
 Number of lanes in ramp
 Free-Flow speed on ramp
 Volume on ramp
 Length of first accel/decel lane
 Length of second accel/decel lane

Right
 1
 45.0 mph
 448 vph
 200 ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?
 Volume on adjacent ramp
 Position of adjacent ramp
 Type of adjacent ramp
 Distance to adjacent ramp

Yes
 234 vph
 Downstream
 On
 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components

	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1462	448	234
Peak-hour factor, PHF	0.92	0.92	0.91
Peak 15-min volume, v15	397	122	64
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Capacity Checks

$v = v$
 $F_i \quad F$
 $v = v - v$
 $FO \quad F \quad R$
 $v \quad R$
 $v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

Actual
 1230

Maximum
 4500

LOS F?
 No

Actual
 502

Maximum
 2100

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

$v \quad v$
 $3 \text{ or } av34$
 $Is \quad v \quad v > 2700 \text{ pc/h?}$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 $Is \quad v \quad v > 1.5 \text{ v } / 2$
 12
 $12A$

Actual
 1732

Maximum
 4500

LOS F?
 No

Flow Entering Diverge Influence Area

Actual
 1732

Max Desirable
 4400

Violation?
 No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 17.3 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.343$
 Space mean speed in ramp influence area, $S = 50.5 \text{ mph}$
 Space mean speed in outer lanes, $S = N/A \text{ mph}$
 Space mean speed for all vehicles, $S = 50.5 \text{ mph}$

Heavy vehicle adjustment, $_{FHV}$ 0.917 0.971 0.971
 Driver population factor, $_{FP}$ 1.00 1.00 1.00
 Flow rate, $_{vp}$ 1201 265 502 pcph

Estimation of V12 Merge Areas

$$L = \frac{EQ}{P} = \frac{1.000}{1201} \text{ Using Equation 0}$$

$$v = v_{FM} (P) = 1201 \text{ pc/h}$$

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB ON
 Jurisdiction:
 Analysis Year: Baseline (2010) Plus Project
 Description:

Freeway Data

Type of analysis: Merge
 Number of lanes in freeway: 2
 Free-flow speed on freeway: 55.0 mph
 Volume on freeway: 1014 vph

On Ramp Data

Side of freeway: Right
 Number of lanes in ramp: 1
 Free-flow speed on ramp: 45.0 mph
 Volume on ramp: 234 vph
 Length of first accel/decel lane: 320 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp: 448 vph
 Position of adjacent Ramp: Upstream
 Type of adjacent Ramp: Off
 Distance to adjacent Ramp: 2600 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1014	234	448
Peak-hour factor, PHF	0.92	0.91	0.92
Peak 15-min volume, v_{15}	276	64	122
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Capacity Checks

v_{FO} Actual Maximum LOS F?
 1466 4500 No
 $v_{3 \text{ or } av34}$ 0 pc/h (Equation 25-4 or 25-5)
 Is $v_{3 \text{ or } av34} > 2700$ pc/h? No
 Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$ No
 If yes, $v_{12A} = 1201$ (Equation 25-8)

Flow Entering Merge Influence Area
 Actual Max Desirable Violation?
 1201 4500 No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.309$
 Space mean speed in ramp influence area, $S = 51.0$ mph
 Space mean speed in outer lanes, $S_R = N/A$ mph
 Space mean speed for all vehicles, $S = 51.0$ mph

Heavy vehicle adjustment, fhv	0.917	0.971	0.971
Driver population factor, fp	1.00	1.00	1.00
Flow rate, vp	1400	119	531
			pcph

Phone:
E-mail:

60

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/dir of travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year:
Description: Baseline (2010) plus Project

Freeway Data

Type of analysis	Diverge	mph
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	
Volume on freeway	1192	vph

Off Ramp Data

Side of freeway	Right
Number of lanes in ramp	1
Free-flow speed on ramp	45.0
Volume on ramp	97
Length of first accel/decel lane	220
Length of second accel/decel lane	220
	ft
	ft
	mph

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	376	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components		Freeway	Ramp	Adjacent Ramp	vph
Volume, V (vph)		1182	97	376	
Peak-hour factor, PHF		0.92	0.84	0.73	
Peak 15-min volume, v15		321	29	129	
Trucks and buses		6	2	2	
Recreational vehicles		0	0	0	
Trerrain type:		Rolling	Rolling	Rolling	
Grade		0.00	0.00	0.00	%
Length		0.00	0.00	0.00	mi
Trucks and buses PCE, ET		2.5	2.5	2.5	
Recreational vehicle PCE, ER		2.0	2.0	2.0	

Estimation of V12 Diverge Areas

$$\begin{aligned} L &= \text{(Equation 25-8 or 25-9)} \\ E_Q &= 1.000 \quad \text{Using Equation 0} \\ v_{FD} &= v + (v - v) \frac{P}{r} = 1400 \text{ pc/h} \\ &= 12 \frac{r}{v} \end{aligned}$$

Capacity Checks

$v = v$	Actual	Maximum	LOS F?
Fl F	1400	4500	No
$v = v - v$	1281	4500	No
FO F R			
v	119	2100	No
R			
v	0		(Equation 25-15 or 25-16)
3 or av34	pc/h		
Is v	> 2700 pc/h?	No	
3 or av34			
Is v	> 1.5 v / 2	No	
3 or av34	12		
If yes, v = 1400			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

Flow concerning	Max Desirable	Violation?
diverge influence area	4400	No
Actual	1400	

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 \nu - 0.009 \ln = 14.3$ pc/ml/ln

Level of service for ramp-free-way junction areas of influence B

Speed Estimation

Intermediate speed variable,	D = 0.309
Space mean speed in ramp influence area,	S = 51.0 mph
Space mean speed in outer lanes,	S _R = N/A mph
Space mean speed for all vehicles,	S ₀ = 51.0 mph

HCS+: Ramps and Ramp Junctions Release 5.3

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB ON
Jurisdiction: Baseline (2010) Plus Project
Analysis Year:
Description:

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 1085 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 376 vph
Length of first accel/decel lane 300 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 97 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1085	376	97
Peak-hour factor, PHF	0.92	0.73	0.84
Peak 15-min volume, v15	295	129	29
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade			
Length	2.5 mi	2.5 mi	2.5 mi
Trucks and buses PCE, ET	2.0	2.0	2.0
Recreational vehicle PCE, ER			

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fp 1.00 1.00 1.00
Flow rate, vp 1285 531 119 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1285 pc/h
12 F FM

Capacity Checks

v	FO	Actual	Maximum	LOS F?
1816		4500	No	
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34	> 2700 pc/h?	No		
Is v	v	> 1.5 v / 2	No	
3 or av34	12	(Equation 25-8)		
If yes, v	12A			

Flow Entering Merge Influence Area
Actual 1285
Max Desirable 4600
Violation? No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.5 pc/ml/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.318
Space mean speed in ramp influence area, S = 50.9 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 50.9 mph

HCS+: Ramps and Ramp Junctions Release 5.3

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Schnell School WB OFF
Jurisdiction:
Analysis Year: Baseline (2010) Plus Project
Description:

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 55.0 mph
Volume on freeway 707 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 45.0 mph
Volume on ramp 71 vph
Length of first accel/decel lane 220 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 343 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	707	71	343
Peak-hour factor, PHF	0.92	0.77	0.84
Peak 15-min volume, v15	192	23	102
Trucks and buses	6	2	2
Recreational vehicles	0	0	0
Terrain type:	Rolling	Rolling	Rolling
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	2.5	2.5	2.5
Recreational vehicle PCE, ER	2.0	2.0	2.0

Heavy vehicle adjustment, fHV 0.917 0.971 0.971
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 838 95 421 pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $FD = v + (v - v) P = 838$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	838	4500	No
$F_i F$	743	4500	No
$v = v - v$	95	2100	No
$F_i F R$	0	(Equation 25-15 or 25-16)	
v	0	pc/h	
v 3 or av34	> 2700	pc/h?	No
v 3 or av34	> 1.5 v / 2	No	
v 3 or av34	12	(Equation 25-18)	
If yes, v = 838	12A		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v 12	838	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 9.5$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.307$
Space mean speed in ramp influence area, $S = 51.0$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 51.0$ mph

Heavy vehicle adjustment, FHV 0.917 0.971 0.971
 Driver population factor, FP 1.00 1.00 1.00
 Flow rate, vp 754 484 87
 pcph

Estimation of VI2 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 $P =$ 1.000 Using Equation 0
 $FM = v \cdot v \cdot (P) = 754 \text{ pc/h}$
 $12 \text{ F} \cdot FM$

Capacity Checks

v Actual Maximum LOS F?
 1238 4500 No
 v FO 0 pc/h (Equation 25-4 or 25-5)
 $3 \text{ or } av34$
 $Is \ v \ v > 2700 \text{ pc/h?}$ No
 $3 \text{ or } av34$
 $Is \ v \ v > 1.5 \ v / 2$ No
 $3 \text{ or } av34$
 If yes, $v = 754$ (Equation 25-8)
 12A

Flow Entering Merge Influence Area
 Actual Max Desirable Violation?
 754 4600 No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \ v + 0.0078 \ v - 0.00627 \ L_A = 13.0 \text{ pc/mi/in}$
 12
 level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.307$
 Space mean speed in ramp influence area, $S = 51.0 \text{ mph}$
 Space mean speed in outer lanes, $S = N/A \text{ mph}$
 Space mean speed for all vehicles, $S = 51.0 \text{ mph}$

Phone:
 E-mail:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Baseline (2010) Plus Project
 Description:

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 55.0 mph
 Volume on freeway 636 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 45.0 mph
 Volume on ramp 343 vph
 Length of first accel/decel lane 300 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

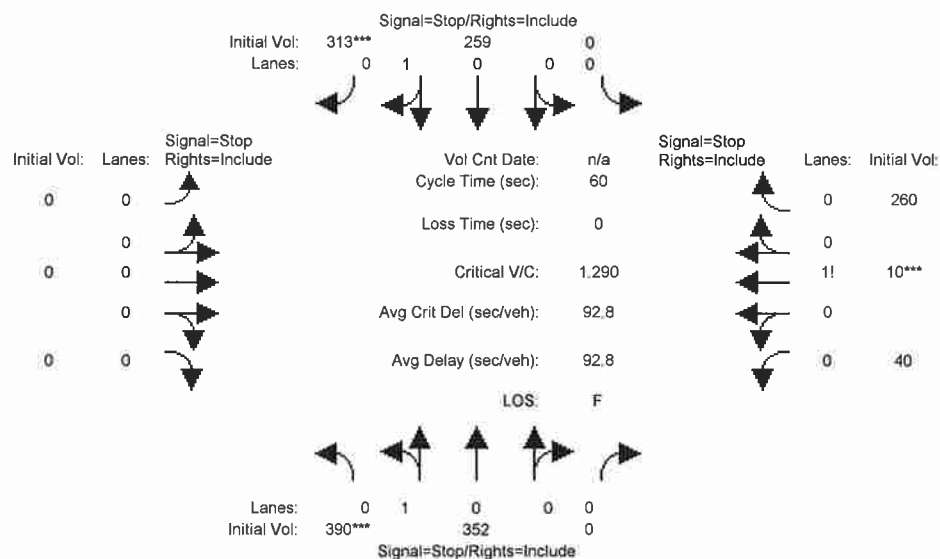
Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 71 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2100 ft

Conversion to pc/h Under Base Conditions

Junction Components
 Volume, V (vph) Freeway Ramp Adjacent Ramp
 636 343 71
 Peak-hour factor, PHF 0.92 0.73 0.84
 Peak 15-min volume, v15 173 117 21
 Trucks and buses 6 2 2
 Recreational vehicles 0 0 0
 Terrain type: Rolling % Rolling % Rolling %
 Grade %
 Length mi
 Trucks and buses PCF, ET 2.5 2.5 2.5
 Recreational vehicle PCF, ER 2.0 2.0 2.0

Cumulative Conditions

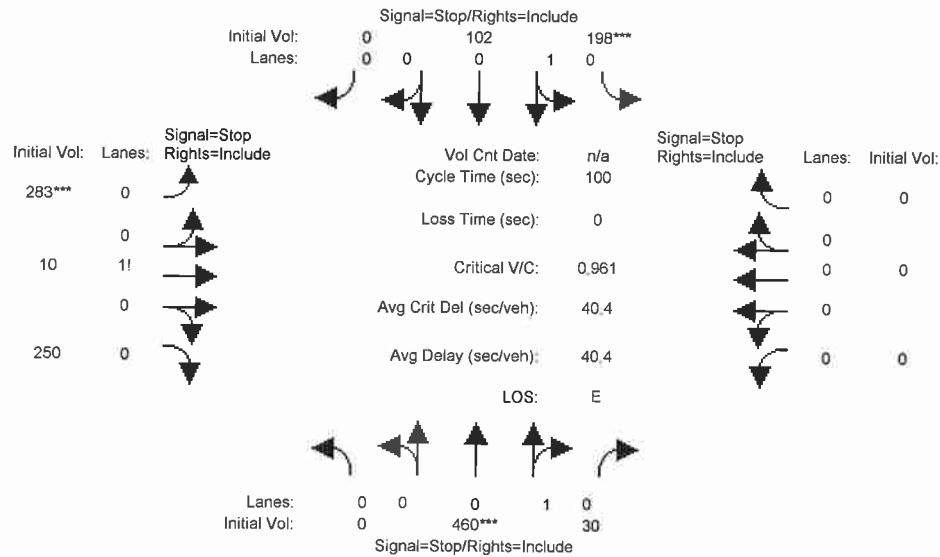
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	390	352	0	0	259	313	0	0	0	40	10	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	390	352	0	0	259	313	0	0	0	40	10	260
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	390	352	0	0	259	313	0	0	0	40	10	260
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	411	371	0	0	273	329	0	0	0	42	11	274
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	411	371	0	0	273	329	0	0	0	42	11	274
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	411	371	0	0	273	329	0	0	0	42	11	274
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.53	0.47	0.00	0.00	0.45	0.55	0.00	0.00	0.00	0.13	0.03	0.84
Final Sat.:	318	287	0	0	292	352	0	0	0	74	18	480
Capacity Analysis Module:												
Vol/Sat:	1.29	1.29	xxxx	xxxx	0.93	0.93	xxxx	xxxx	xxxx	0.57	0.57	0.57
Crit Moves:	****					****					****	
Delay/Veh:	162.0	162	0.0	0.0	44.2	44.2	0.0	0.0	0.0	16.9	16.9	16.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	162.0	162	0.0	0.0	44.2	44.2	0.0	0.0	0.0	16.9	16.9	16.9
LOS by Move:	F	F	*	*	E	E	*	*	*	C	C	C
ApproachDel:	162.0				44.2		xxxxxx			16.9		
Delay Adj:	1.00				1.00		xxxxxx			1.00		
ApprAdjDel:	162.0				44.2		xxxxxx			16.9		
LOS by Appr:	F				E		*			C		
AllWayAvgQ:	25.7	25.7	25.7	6.4	6.4	6.4	0.0	0.0	0.0	1.2	1.2	1.2

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Cumulative AM

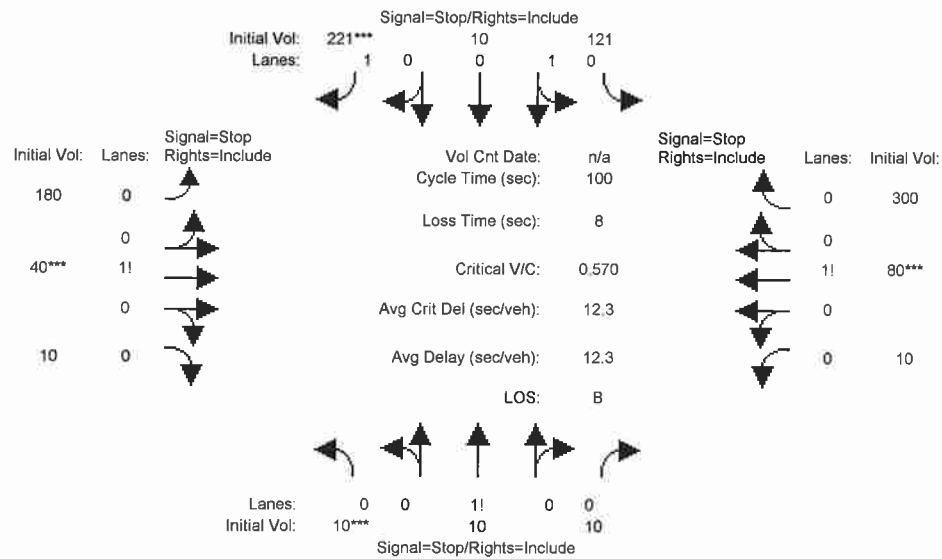
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	460	30	198	102	0	283	10	250	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	460	30	198	102	0	283	10	250	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	460	30	198	102	0	283	10	250	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	484	32	208	107	0	298	11	263	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	484	32	208	107	0	298	11	263	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	484	32	208	107	0	298	11	263	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.94	0.06	0.66	0.34	0.00	0.52	0.02	0.46	0.00	0.00	0.00
Final Sat.:	0	534	35	342	176	0	310	11	274	0	0	0
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.91	0.91	0.61	0.61	xxxx	0.96	0.96	0.96	xxxx	xxxx	xxxx
Crit Moves:	****			****			****					
Delay/Veh:	0.0	41.8	41.8	19.2	19.2	0.0	50.9	50.9	50.9	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	41.8	41.8	19.2	19.2	0.0	50.9	50.9	50.9	0.0	0.0	0.0
LOS by Move:	*	E	E	C	C	*	F	F	F	*	*	*
ApproachDel:		41.8			19.2			50.9		xxxxxx		
Delay Adj:		1.00			1.00			1.00		xxxxxx		
ApprAdjDel:		41.8			19.2			50.9		xxxxxx		
LOS by Appr:		E			C			F		*		
AllWayAvgQ:	5.1	5.1	5.1	1.4	1.4	1.4	6.9	6.9	6.9	0.0	0.0	0.0

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM

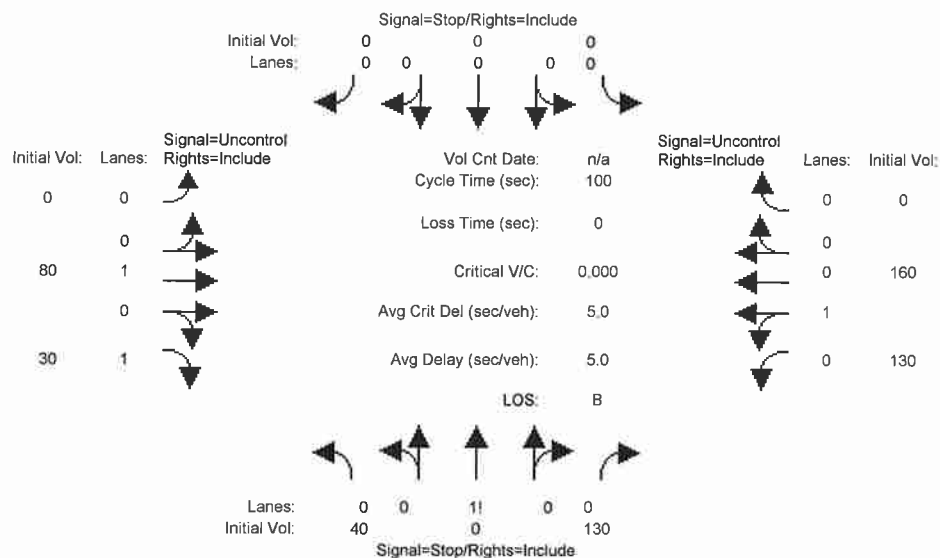
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	10	10	121	10	221	180	40	10	10	80	300
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	10	121	10	221	180	40	10	10	80	300
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	10	10	121	10	221	180	40	10	10	80	300
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	11	11	127	11	233	189	42	11	11	84	316
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	11	11	127	11	233	189	42	11	11	84	316
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	11	11	127	11	233	189	42	11	11	84	316
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.34	0.33	0.33	0.92	0.08	1.00	0.79	0.17	0.04	0.03	0.20	0.77
Final Sat.:	170	170	170	483	40	629	480	107	27	18	148	554
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.06	0.26	0.26	0.37	0.39	0.39	0.39	0.57	0.57	0.57
Crit Moves:	****					****		****			****	
Delay/Veh:	9.4	9.4	9.4	11.5	11.5	11.0	12.0	12.0	12.0	13.7	13.7	13.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.4	9.4	9.4	11.5	11.5	11.0	12.0	12.0	12.0	13.7	13.7	13.7
LOS by Move:	A	A	A	B	B	B	B	B	B	B	B	B
ApproachDel:		9.4			11.2			12.0			13.7	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.4			11.2			12.0			13.7	
LOS by Appr:		A			B			B			B	
AllWayAvgQ:	0.0	0.0	0.0	0.3	0.3	0.5	0.6	0.6	0.6	1.2	1.2	1.2

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

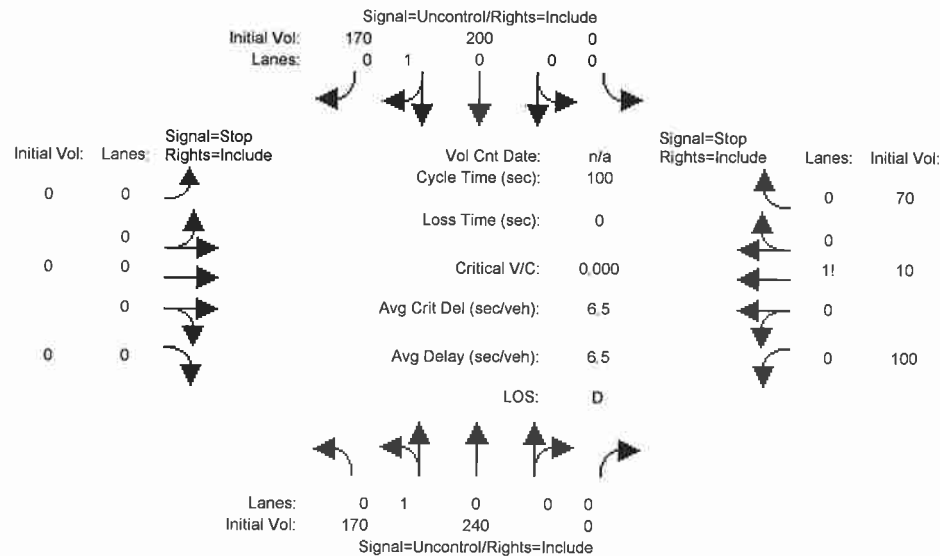
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	130	0	0	0	0	80	30	130	160	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	130	0	0	0	0	80	30	130	160	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	0	130	0	0	0	0	80	30	130	160	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	0	137	0	0	0	0	84	32	137	168	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	42	0	137	0	0	0	0	84	32	137	168	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	526	526	84	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	116	xxxxx	xxxxx
Potent Cap.:	516	460	981	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1486	xxxxx	xxxxx
Move Cap.:	476	414	981	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1486	xxxxx	xxxxx
Volume/Cap:	0.09	0.00	0.14	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.09	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.3	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.7	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxxx	785	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	0.9	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.3	xxxxx	xxxxx
Shrd ConDel:	xxxxx	10.9	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	7.7	xxxxx	xxxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:	10.9			xxxxxxx			xxxxxxx			xxxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

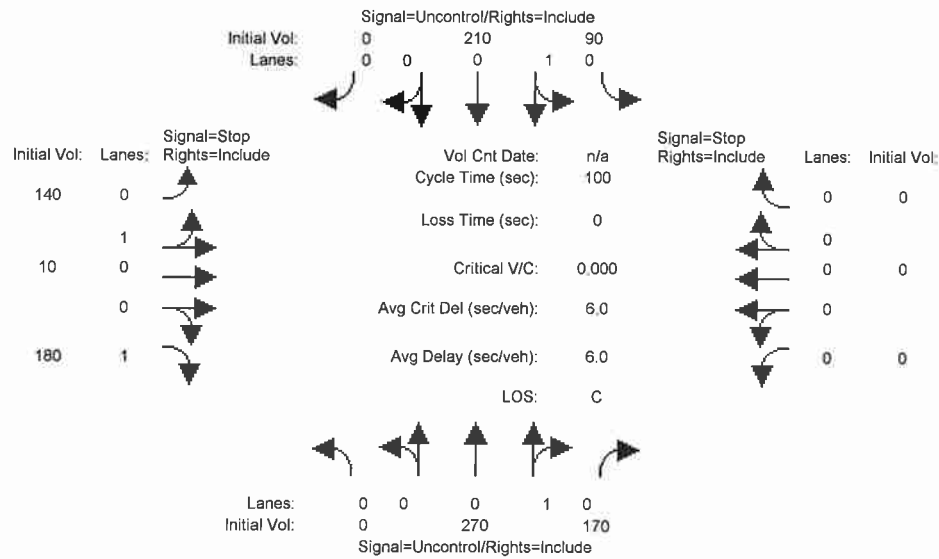
Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	170	240	0	0	200	170	0	0	0	100	10	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	170	240	0	0	200	170	0	0	0	100	10	70
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	170	240	0	0	200	170	0	0	0	100	10	70
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	179	253	0	0	211	179	0	0	0	105	11	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	179	253	0	0	211	179	0	0	0	105	11	74
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflct Vol:	389	xxxx	xxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	911	1000	253
Potent Cap.:	1180	xxxx	xxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	307	245	791
Move Cap.:	1180	xxxx	xxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	267	204	791
Volume/Cap:	0.15	xxxx	xxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	0.39	0.05	0.09
Level Of Service Module:												
2Way95thQ:	0.5	xxxx	xxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	8.6	xxxx	xxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	352	xxxxxx
SharedQueue:	0.5	xxxx	xxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	3.0	xxxxxx
Shrd ConDel:	8.6	xxxx	xxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	26.5	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	D	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			26.5		
ApproachLOS:	*			*			*			D		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	270	170	90	210	0	140	10	180	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	270	170	90	210	0	140	10	180	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	270	170	90	210	0	140	10	180	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	284	179	95	221	0	147	11	189	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	284	179	95	221	0	147	11	189	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	463	xxxx	xxxxx	784	874	221	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1109	xxxx	xxxxx	365	290	824	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1109	xxxx	xxxxx	339	264	824	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.09	xxxx	xxxx	0.43	0.04	0.23	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	xxxx	xxxx	0.9	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	8.6	xxxx	xxxxx	xxxxx	xxxx	10.7	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	333	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	2.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	8.6	xxxx	xxxxx	25.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	D	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			17.3			xxxxxx		
ApproachLOS:	*			*			C			*		

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	<u>Lumsden Ranch EIR</u>	HCM:	<u>2000</u>
Scenario:	<u>Cumulative No Project</u>	PHF:	<u>0.95</u>
TOD:	<u>AM</u>	Analysis Period:	<u>15 Minutes</u>
		# of Runs:	<u>10</u>

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	4.8	A	--
	T	3	3	100	1	4.2	A	--
	R	3	3	100	1	3.5	A	--
	Subtotal	8	9	113	--	4.1	A	--
SB	L	37	32	86	8	7.7	A	--
	T	3	3	67	2	10.7	B	--
	R	63	60	95	7	6.0	A	--
	Subtotal	103	94	91	--	6.7	A	--
EB	L	76	72	95	7	24.0	C	--
	T	37	34	92	6	22.6	C	--
	R	3	3	100	1	19.7	C	--
	Subtotal	116	109	94	--	23.4	C	--
WB	L	3	3	100	1	7.4	A	--
	T	50	51	102	6	10.3	B	--
	R	37	37	100	4	6.0	A	--
	Subtotal	89	91	102	--	8.4	A	--
	Total	316	302	96	--	13.1	B	--

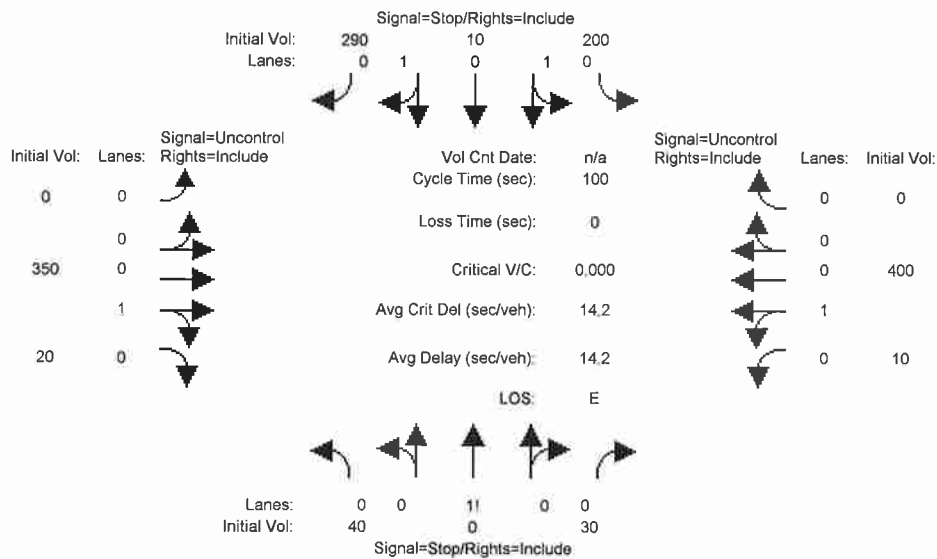
HCM Unsignalized Intersection Capacity Analysis 9: Broadway & Blairs Ln

Lumsden Ranch EIR
Cumulative Conditions - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	400	50	10	420	10	100	10	30	10	10	10
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
Hourly flow rate (vph)	11	421	53	11	442	11	105	11	32	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							1			1		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	453			474			947	942	447	947	963	447
vC1, stage 1 conf vol							468	468		468	468	
vC2, stage 2 conf vol							479	474		479	495	
vCu, unblocked vol	453			474			947	942	447	947	963	447
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			70	97	95	97	97	98
cM capacity (veh/h)	1108			1088			355	368	611	346	362	611
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	474	11	453	147	32						
Volume Left	11	0	11	0	105	11						
Volume Right	0	53	0	11	32	11						
cSH	1108	1700	1088	1700	391	412						
Volume to Capacity	0.01	0.28	0.01	0.27	0.38	0.08						
Queue Length 95th (ft)	1	0	1	0	43	6						
Control Delay (s)	8.3	0.0	8.3	0.0	19.7	14.5						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.2		0.2		19.7	14.5						
Approach LOS					C	B						
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			45.3%		ICU Level of Service		A					
Analysis Period (min)			15									

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

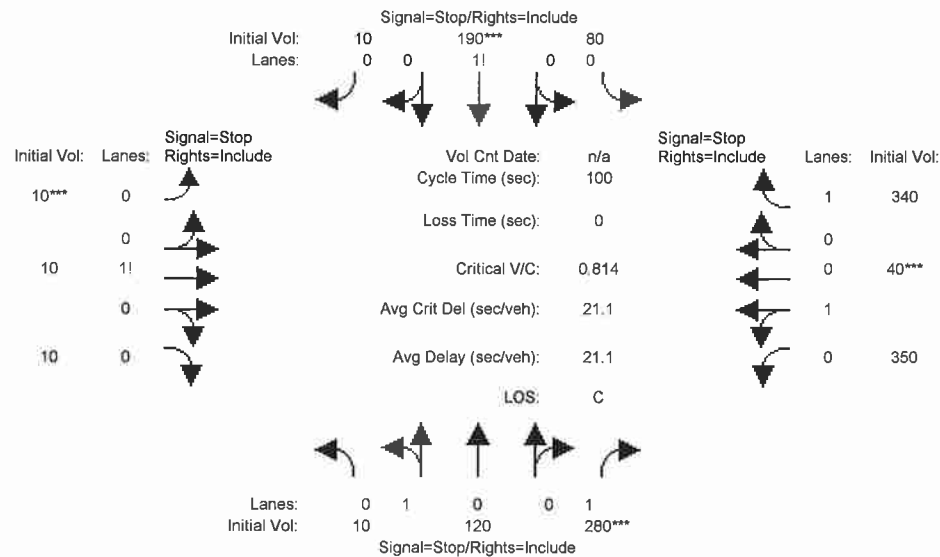
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	30	200	10	290	0	350	20	10	400	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	30	200	10	290	0	350	20	10	400	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	0	30	200	10	290	0	350	20	10	400	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	0	32	211	11	305	0	368	21	11	421	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	42	0	32	211	11	305	0	368	21	11	421	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	979	821	379	837	832	421	xxxxx	xxxxx	xxxxx	389	xxxxx	xxxxx
Potent Cap.:	231	312	672	289	307	637	xxxxx	xxxxx	xxxxx	1180	xxxxx	xxxxx
Move Cap.:	116	309	672	273	304	637	xxxxx	xxxxx	xxxxx	1180	xxxxx	xxxxx
Volume/Cap:	0.36	0.00	0.05	0.77	0.03	0.48	xxxxx	xxxxx	xxxxx	0.01	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	180	xxxxx	274	xxxxx	614	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	1.8	xxxxx	6.4	xxxxx	2.9	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Shrd ConDel:	xxxxx	38.1	xxxxx	56.0	xxxxx	16.9	xxxxx	xxxxx	xxxxx	8.1	xxxxx	xxxxx
Shared LOS:	*	E	*	F	*	C	*	*	*	A	*	*
ApproachDel:	38.1			33.0			xxxxxxx			xxxxxxx		
ApproachLOS:	E			D			*			*		

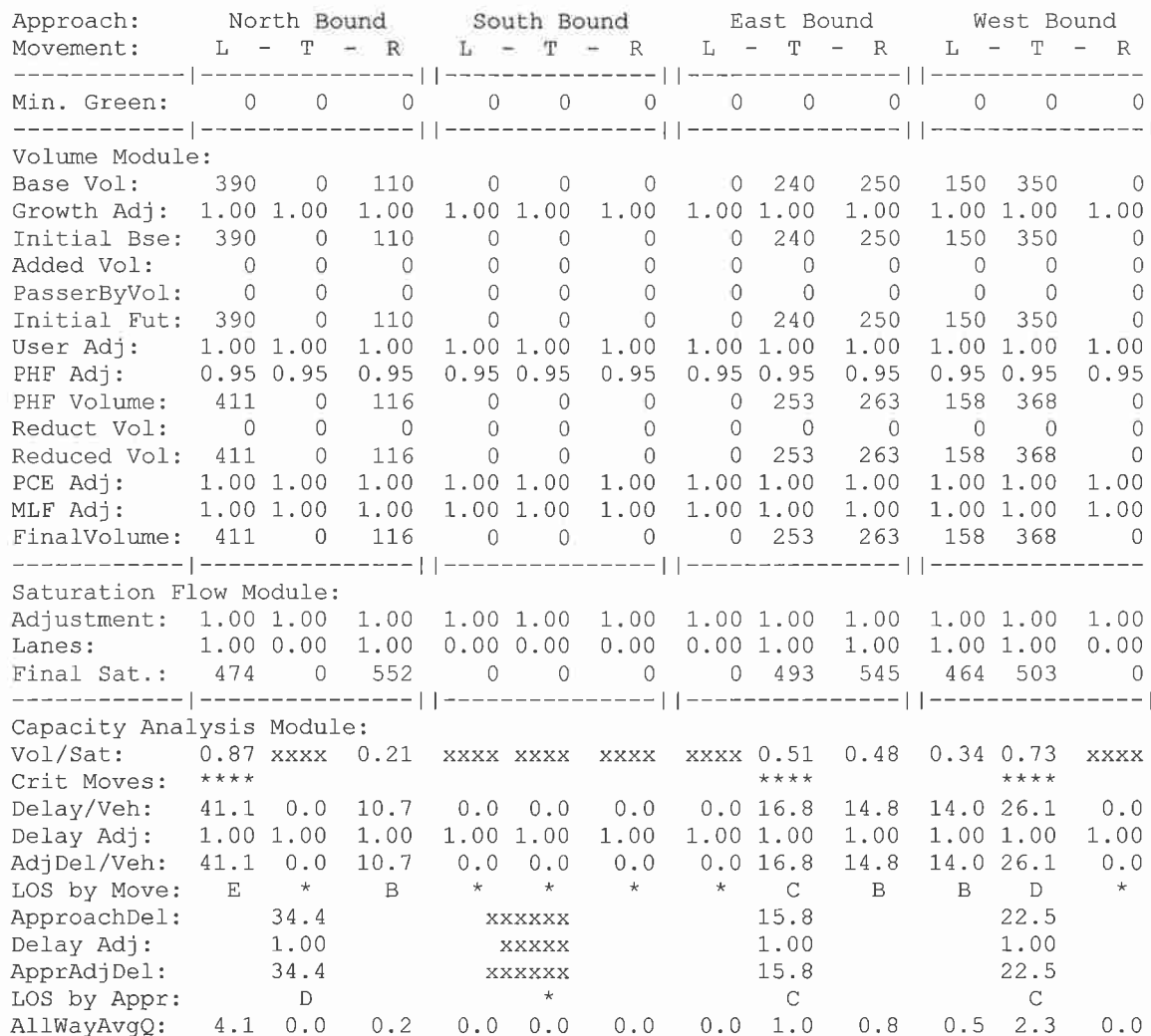
Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM

Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	120	280	80	190	10	10	10	10	350	40	340
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	120	280	80	190	10	10	10	10	350	40	340
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	120	280	80	190	10	10	10	10	350	40	340
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	126	295	84	200	11	11	11	11	368	42	358
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	126	295	84	200	11	11	11	11	368	42	358
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	126	295	84	200	11	11	11	11	368	42	358
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.08	0.92	1.00	0.28	0.68	0.04	0.34	0.33	0.33	0.90	0.10	1.00
Final Sat.:	38	453	548	143	339	18	140	140	140	452	52	599
Capacity Analysis Module:												
Vol/Sat:	0.28	0.28	0.54	0.59	0.59	0.59	0.07	0.07	0.07	0.81	0.81	0.60
Crit Moves:			****			****			****			****
Delay/Veh:	12.5	12.5	16.0	19.3	19.3	19.3	11.3	11.3	11.3	33.3	33.3	16.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.5	12.5	16.0	19.3	19.3	19.3	11.3	11.3	11.3	33.3	33.3	16.8
LOS by Move:	B	B	C	C	C	C	B	B	B	D	D	C
ApproachDel:		14.9			19.3			11.3			25.6	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		14.9			19.3			11.3			25.6	
LOS by Appr:		B			C			B			D	
AllWayAvgQ:	0.4	0.4	1.0	1.3	1.3	1.3	0.1	0.1	0.1	3.3	3.3	1.4

Intersection #12: Cedar Ravine Rd./Main St.



HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Cumulative Conditions - AM Peak Hour

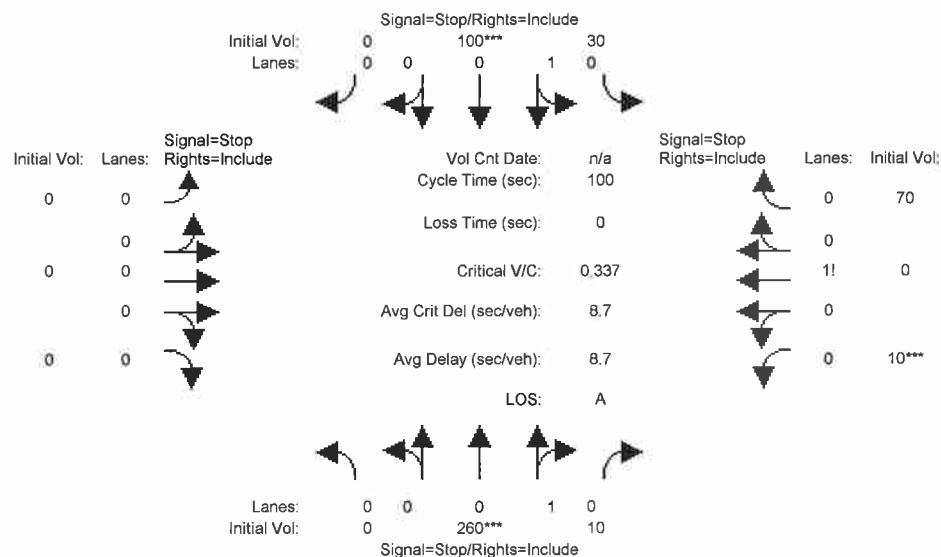
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4806		1770	3343		1681	1719	1583	1770	1693	
Flt Permitted	0.95	1.00		0.95	1.00		0.47	0.53	1.00	0.39	1.00	
Satd. Flow (perm)	1770	4806		1770	3343		829	935	1583	727	1693	
Volume (vph)	70	1430	270	170	1540	300	320	110	70	160	90	140
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)	74	1505	284	179	1621	316	337	116	74	168	95	147
RTOR Reduction (vph)	0	25	0	0	13	0	0	0	51	0	46	0
Lane Group Flow (vph)	74	1764	0	179	1924	0	169	284	23	168	196	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	5.0	49.3		20.7	65.0		38.0	38.0	38.0	38.0	38.0	
Effective Green, g (s)	5.0	49.3		20.7	65.0		38.0	38.0	38.0	38.0	38.0	
Actuated g/C Ratio	0.04	0.41		0.17	0.54		0.32	0.32	0.32	0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	74	1974		305	1811		263	296	501	230	536	
v/s Ratio Prot	0.04	c0.37		0.10	c0.58						0.12	
v/s Ratio Perm							0.20	c0.30	0.01	0.23		
v/c Ratio	1.00	0.89		0.59	1.06		0.64	0.96	0.05	0.73	0.36	
Uniform Delay, d1	57.5	32.9		45.7	27.5		35.2	40.2	28.4	36.4	31.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	104.6	5.7		2.9	39.9		11.5	42.9	0.2	18.4	1.9	
Delay (s)	162.1	38.6		48.6	67.4		46.7	83.2	28.6	54.9	33.6	
Level of Service	F	D		D	E		D	F	C	D	C	
Approach Delay (s)		43.5			65.8			63.8			42.3	
Approach LOS		D			E			E			D	

Intersection Summary

HCM Average Control Delay	55.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM

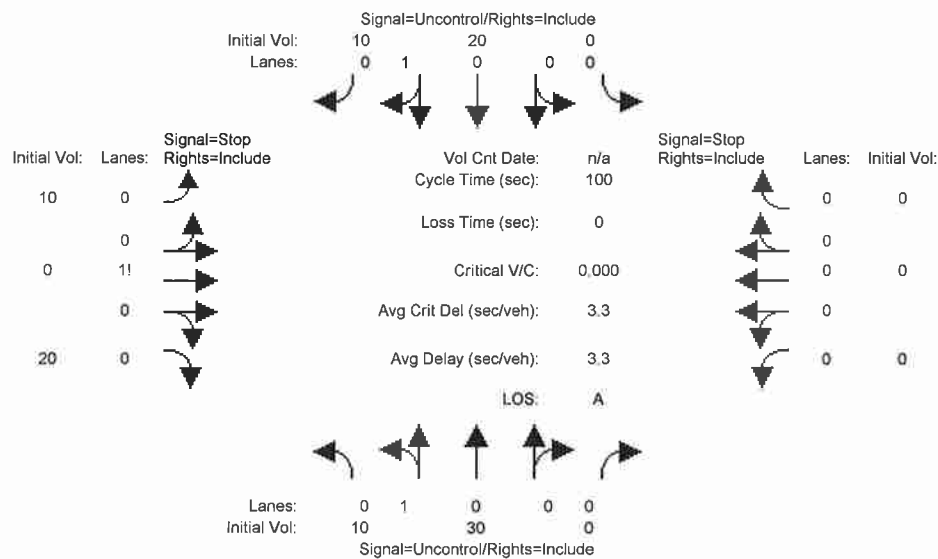
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	260	10	30	100	0	0	0	0	10	0	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	260	10	30	100	0	0	0	0	10	0	70
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	260	10	30	100	0	0	0	0	10	0	70
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	274	11	32	105	0	0	0	0	11	0	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	274	11	32	105	0	0	0	0	11	0	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	274	11	32	105	0	0	0	0	11	0	74
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.96	0.04	0.23	0.77	0.00	0.00	0.00	0.00	0.13	0.00	0.87
Final Sat.:	0	813	31	184	614	0	0	0	0	98	0	685
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.34	0.34	0.17	0.17	xxxx	xxxx	xxxx	xxxx	0.11	xxxx	0.11
Crit Moves:	****			****						****		
Delay/Veh:	0.0	9.3	9.3	8.3	8.3	0.0	0.0	0.0	0.0	7.7	0.0	7.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.3	9.3	8.3	8.3	0.0	0.0	0.0	0.0	7.7	0.0	7.7
LOS by Move:	*	A	A	A	A	*	*	*	*	A	*	A
ApproachDel:		9.3			8.3		xxxxxx				7.7	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		9.3			8.3		xxxxxx				7.7	
LOS by Appr:		A			A		*				A	
AllWayAvgQ:	0.5	0.5	0.5	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

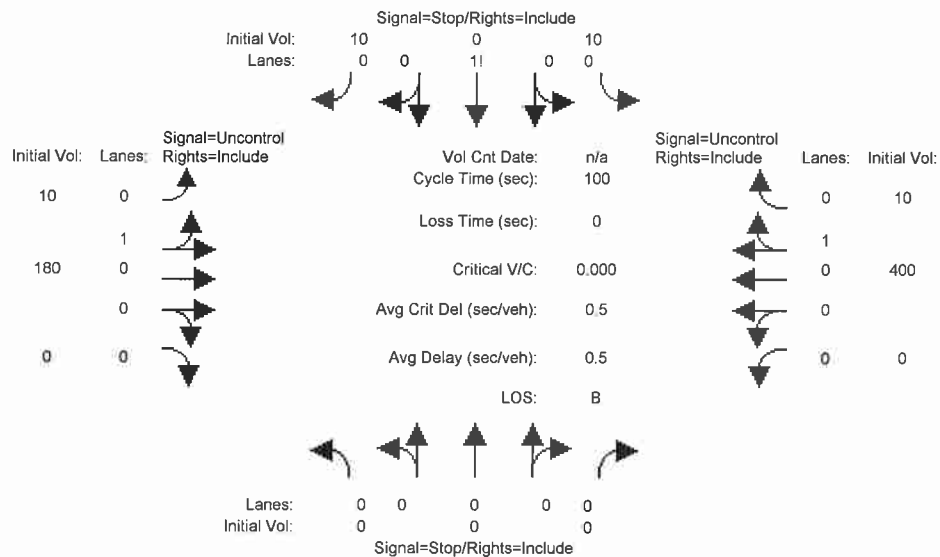
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Volume Module:																				
Base Vol:	10		30		0	0		20		10	10		0		20	0		0		0
Growth Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	10		30		0	0		20		10	10		0		20	0		0		0
Added Vol:	0		0		0	0		0		0	0		0		0	0		0		0
PasserByVol:	0		0		0	0		0		0	0		0		0	0		0		0
Initial Fut:	10		30		0	0		20		10	10		0		20	0		0		0
User Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95
PHF Volume:	11		32		0	0		21		11	11		0		21	0		0		0
Reduct Vol:	0		0		0	0		0		0	0		0		0	0		0		0
Final Volume:	11		32		0	0		21		11	11		0		21	0		0		0
Critical Gap Module:																				
Critical Gp:	4.1	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	6.4	6.5	6.2	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
FollowUpTim:	2.2	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	3.5	4.0	3.3	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Capacity Module:																				
Cnflct Vol:	32	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	79	79	26	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Potent Cap.:	1594	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	929	815	1055	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Move Cap.:	1594	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	924	810	1055	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Volume/Cap:	0.01	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	0.01	0.00	0.02	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Level Of Service Module:																				
2Way95thQ:	0.0	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Control Del:	7.3	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*		*	*	*	*		*	*	*	*	*	*	*		*	*	*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	1007	xxxxxx	xxxxxx	xxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Shared Queue:	0.0	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	0.1	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Shrd ConDel:	7.3	xxxx	xxxxxx		xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	8.7	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx		xxxxxx	xxxx	xxxxxx
Shared LOS:	A	*	*		*	*	*	*		*	A	*	*	*	*	*		*	*	*
ApproachDel:	xxxxxx						xxxxxx				8.7					xxxxxx				
ApproachLOS:	*						*				A					*				

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

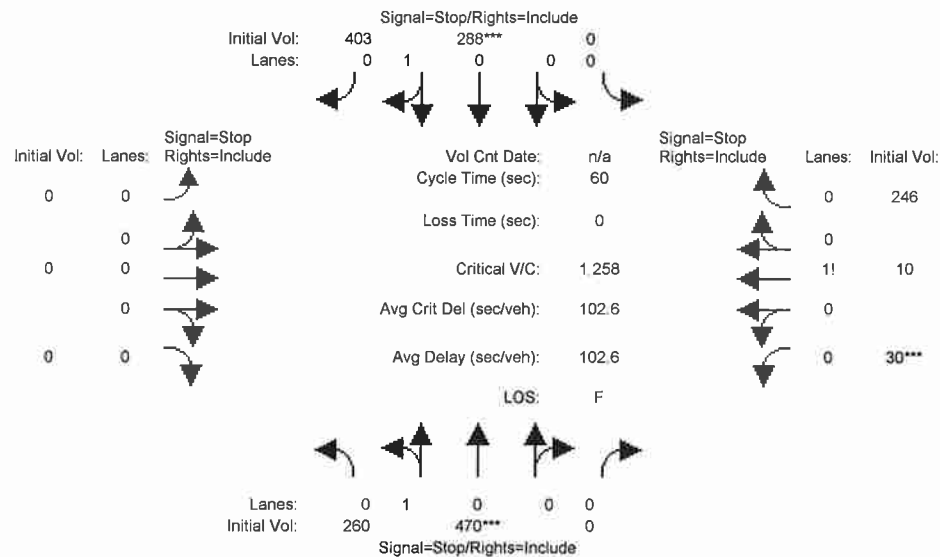
Intersection #17: Barrett Dr./Cedar Ravine Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	10	0	10	10	180	0	0	400	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	10	0	10	10	180	0	0	400	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	10	0	10	10	180	0	0	400	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	11	0	11	11	189	0	0	421	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	11	0	11	11	189	0	0	421	11
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	637	637	426	432	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	445	398	632	1139	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	442	394	632	1139	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	0.00	0.02	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	520	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	12.2	xxxxx	8.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			12.2			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

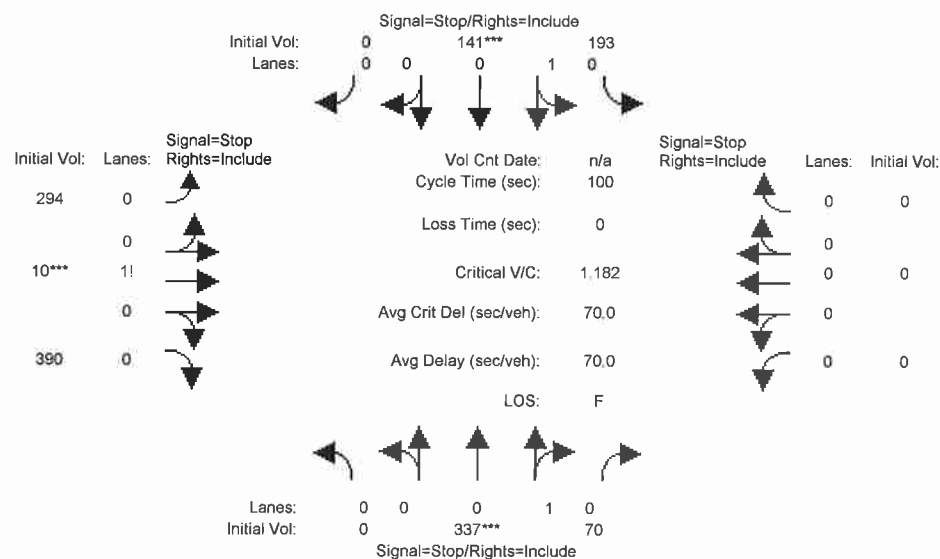
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	260	470	0	0	288	403	0	0	0	30	10	246
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	260	470	0	0	288	403	0	0	0	30	10	246
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	260	470	0	0	288	403	0	0	0	30	10	246
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	274	495	0	0	303	424	0	0	0	32	11	259
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	274	495	0	0	303	424	0	0	0	32	11	259
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	274	495	0	0	303	424	0	0	0	32	11	259
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.64	0.00	0.00	0.42	0.58	0.00	0.00	0.00	0.10	0.03	0.87
Final Sat.:	218	393	0	0	274	384	0	0	0	60	20	494
Capacity Analysis Module:												
Vol/Sat:	1.26	1.26	xxxx	xxxx	1.11	1.11	xxxx	xxxx	xxxx	0.52	0.52	0.52
Crit Moves:	****				****					****		
Delay/Veh:	148.9	149	0.0	0.0	89.6	89.6	0.0	0.0	0.0	16.0	16.0	16.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	148.9	149	0.0	0.0	89.6	89.6	0.0	0.0	0.0	16.0	16.0	16.0
LOS by Move:	F	F	*	*	F	F	*	*	*	C	C	C
ApproachDel:	148.9				89.6		xxxxxx			16.0		
Delay Adj:	1.00				1.00		xxxxxx			1.00		
ApprAdjDel:	148.9				89.6		xxxxxx			16.0		
LOS by Appr:	F				F		*			C		
AllWayAvgQ:	23.8	23.8	23.8	14.8	14.8	14.8	0.0	0.0	0.0	1.1	1.1	1.1

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

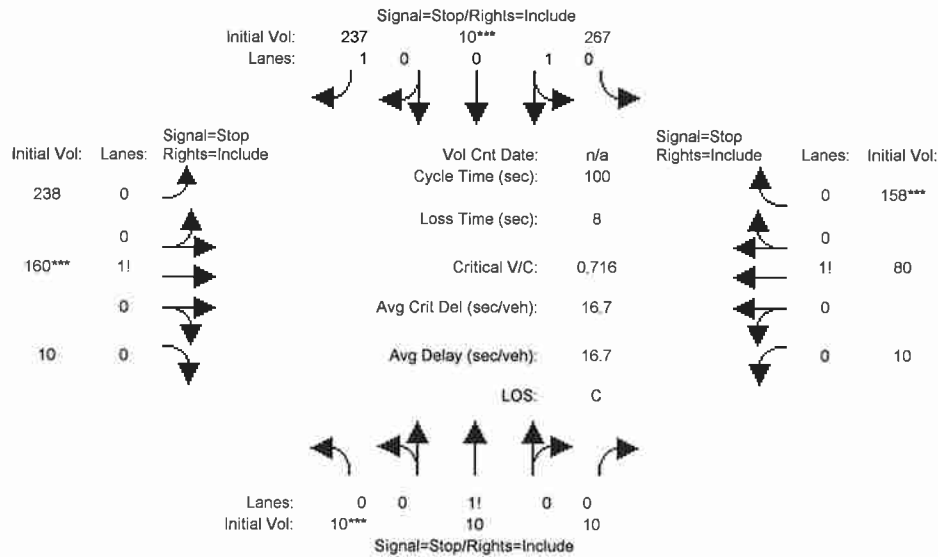
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	337	70	193	141	0	294	10	390	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	337	70	193	141	0	294	10	390	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	337	70	193	141	0	294	10	390	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	355	74	203	148	0	309	11	411	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	355	74	203	148	0	309	11	411	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	355	74	203	148	0	309	11	411	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.83	0.17	0.58	0.42	0.00	0.42	0.01	0.57	0.00	0.00	0.00
Final Sat.:	0	466	97	308	225	0	262	9	347	0	0	0
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.76	0.76	0.66	0.66	xxxx	1.18	1.18	1.18	xxxx	xxxx	xxxx
Crit Moves:	****			****			****					
Delay/Veh:	0.0	26.6	26.6	21.5	21.5	0.0	118.8	119	118.8	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.6	26.6	21.5	21.5	0.0	118.8	119	118.8	0.0	0.0	0.0
LOS by Move:	*	D	D	C	C	*	F	F	F	*	*	*
ApproachDel:	26.6			21.5			118.8			xxxxxx		
Delay Adj:	1.00			1.00			1.00			xxxxxx		
ApprAdjDel:	26.6			21.5			118.8			xxxxxx		
LOS by Appr:	D			C			F			*		
AllWayAvgQ:	2.7	2.7	2.7	1.7	1.7	1.7	18.9	18.9	18.9	0.0	0.0	0.0

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

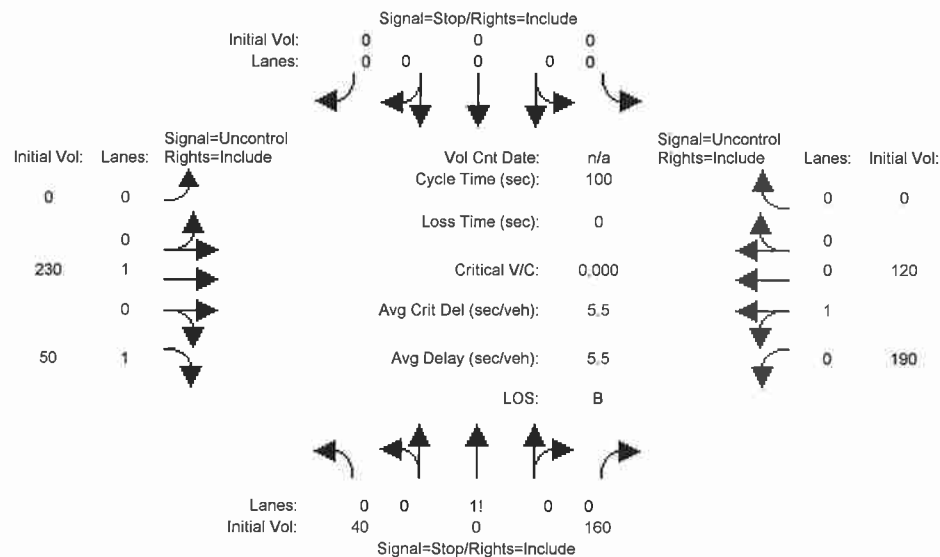
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	10	10	267	10	237	238	160	10	10	80	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	10	267	10	237	238	160	10	10	80	158
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	10	10	267	10	237	238	160	10	10	80	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	11	11	281	11	249	251	168	11	11	84	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	11	11	281	11	249	251	168	11	11	84	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	11	11	281	11	249	251	168	11	11	84	166
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.34	0.33	0.33	0.96	0.04	1.00	0.59	0.39	0.02	0.04	0.32	0.64
Final Sat.:	152	152	152	490	18	611	350	235	15	24	194	383
Capacity Analysis Module:												
Vol/Sat:	0.07	0.07	0.07	0.57	0.57	0.41	0.72	0.72	0.72	0.43	0.43	0.43
Crit Moves:	****			****			****					****
Delay/Veh:	10.1	10.1	10.1	18.0	18.0	12.1	21.5	21.5	21.5	12.7	12.7	12.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.1	10.1	10.1	18.0	18.0	12.1	21.5	21.5	21.5	12.7	12.7	12.7
LOS by Move:	B	B	B	C	C	B	C	C	C	B	B	B
ApproachDel:	10.1			15.3			21.5			12.7		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.1			15.3			21.5			12.7		
LOS by Appr:	B			C			C			B		
AllWayAvgQ:	0.1	0.1	0.1	1.2	1.2	0.6	2.1	2.1	2.1	0.7	0.7	0.7

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

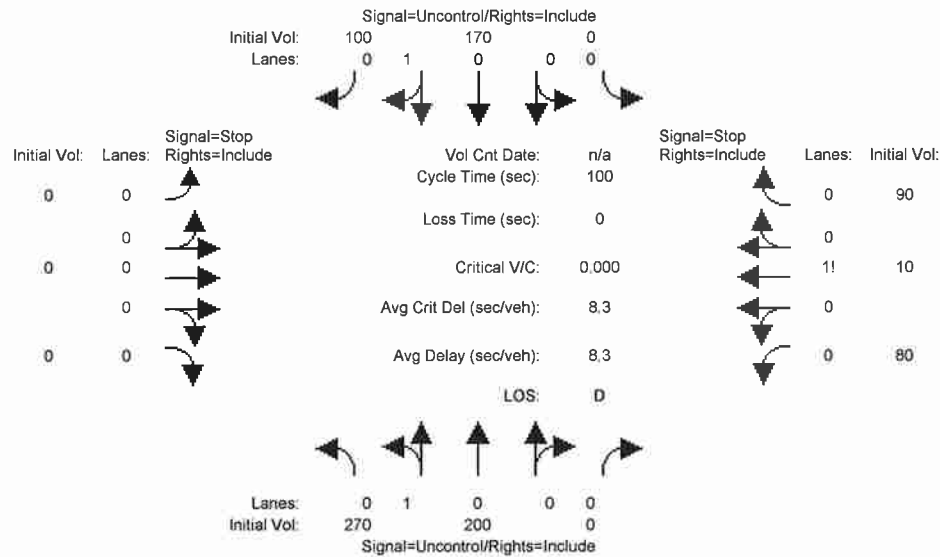
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	160	0	0	0	0	230	50	190	120	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	160	0	0	0	0	230	50	190	120	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	0	160	0	0	0	0	230	50	190	120	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	0	168	0	0	0	0	242	53	200	126	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	42	0	168	0	0	0	0	242	53	200	126	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflict Vol:	768	768	242	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	295	xxxxx	xxxxx
Potent Cap.:	372	334	802	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1278	xxxxx	xxxxx
Move Cap.:	322	275	802	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	1278	xxxxx	xxxxx
Volume/Cap:	0.13	0.00	0.21	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.16	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	8.3	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	618	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	1.5	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx
Shrd ConDel:	xxxxx	13.8	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	8.3	xxxxx	xxxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:		13.8		xxxxxxx			xxxxxxx			xxxxxxx		
ApproachLOS:		B		*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Volume Module:

Base Vol:	270	200	0	0	170	100	0	0	0	80	10	90
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	270	200	0	0	170	100	0	0	0	80	10	90
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	270	200	0	0	170	100	0	0	0	80	10	90
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	284	211	0	0	179	105	0	0	0	84	11	95
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	284	211	0	0	179	105	0	0	0	84	11	95

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3

Capacity Module:

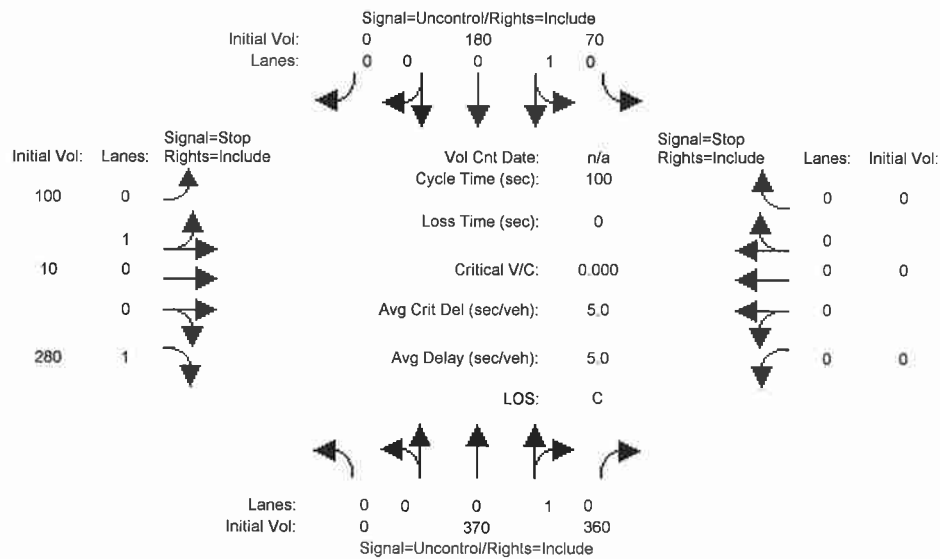
Cnflct Vol:	284	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	1011	1063	211
Potent Cap.:	1290	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	268	225	835
Move Cap.:	1290	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	214	166	835
Volume/Cap:	0.22	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.39	0.06	0.11

Level Of Service Module:

2Way95thQ:	0.8	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	8.6	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	332	xxxxxx
SharedQueue:	0.8	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	3.4	xxxxxx
Shrd ConDel:	8.6	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	29.3	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	D	*
ApproachDel:	xxxxxx				xxxxxx			xxxxxx			29.3	
ApproachLOS:	*				*			*			D	

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	370	360	70	180	0	100	10	280	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	370	360	70	180	0	100	10	280	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	370	360	70	180	0	100	10	280	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	389	379	74	189	0	105	11	295	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	389	379	74	189	0	105	11	295	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	768	xxxx	xxxxx	916	1105	189	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	855	xxxx	xxxxx	305	212	858	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	855	xxxx	xxxxx	284	193	858	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.09	xxxx	xxxx	0.37	0.05	0.34	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	xxxx	xxxx	1.5	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	9.6	xxxx	xxxxx	xxxxx	xxxx	11.4	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	272	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	2.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	9.6	xxxx	xxxxx	27.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	D	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			16.0			xxxxxx		
ApproachLOS:	*			*			C			*		

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Cumulative No Project	PHF:	0.95
TOD:	PM	Analysis Period:	15 Minutes
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	7.6	A	--
	T	3	3	100	1	8.2	A	--
	R	3	3	100	1	5.7	A	--
	Subtotal	8	9	100	--	7.1	A	--
SB	L	66	62	94	9	18.4	C	--
	T	3	4	133	1	17.1	C	--
	R	53	52	98	6	7.7	A	--
	Subtotal	121	117	97	--	13.6	B	--
EB	L	124	105	85	5	125.8	F	--
	T	87	74	85	6	120.6	F	--
	R	3	2	67	1	116.8	F	--
	Subtotal	213	182	85	--	123.6	F	--
WB	L	3	3	100	1	16.5	C	--
	T	58	56	97	8	16.9	C	--
	R	66	63	95	8	14.7	B	--
	Subtotal	126	121	96	--	15.7	C	--
	Total	468	428	91	--	60.8	F	--

Lumsden Ranch EIR
9: Broadway & Blairs Ln

HCM Unsignalized Intersection Capacity Analysis
Cumulative Conditions - AM Peak Hour - Plus Alternative Project

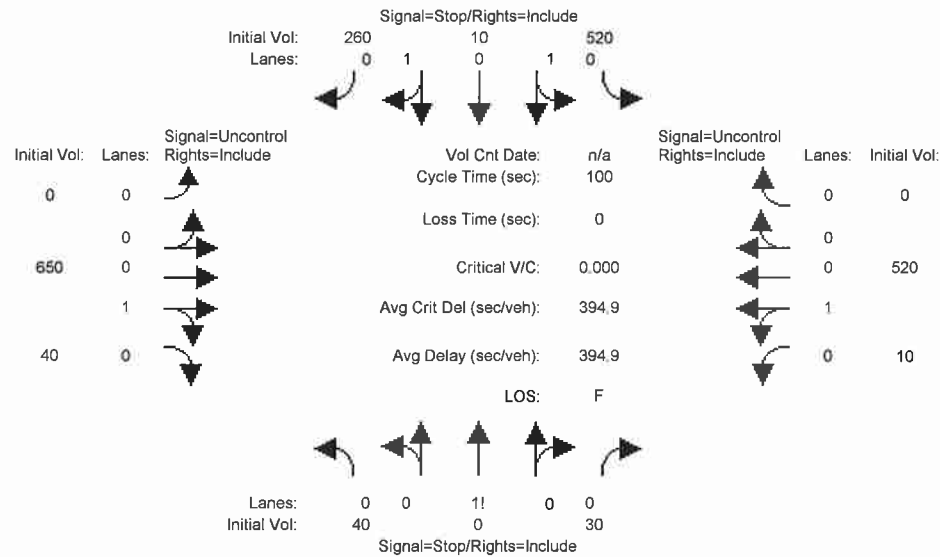
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	413	55	20	453	10	114	10	57	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	435	58	21	477	11	120	11	60	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	487			493			1019	1014	464	1045	1038	482
vC1, stage 1 conf vol							485	485		524	524	
vC2, stage 2 conf vol							535	529		521	514	
vCu, unblocked vol	487			493			1019	1014	464	1045	1038	482
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			70	97	90	97	97	98
cM capacity (veh/h)	1076			1071			403	417	598	371	408	584
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	493	21	487	191	32						
Volume Left	11	0	21	0	120	11						
Volume Right	0	58	0	11	60	11						
cSH	1076	1700	1071	1700	450	437						
Volume to Capacity	0.01	0.29	0.02	0.29	0.42	0.07						
Queue Length 95th (ft)	1	0	2	0	52	6						
Control Delay (s)	8.4	0.0	8.4	0.0	18.7	13.9						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.2		0.3		18.7	13.9						
Approach LOS					C	B						

Intersection Summary

Average Delay	3.5					
Intersection Capacity Utilization	48.7%		ICU Level of Service	A		
Analysis Period (min)	15					

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

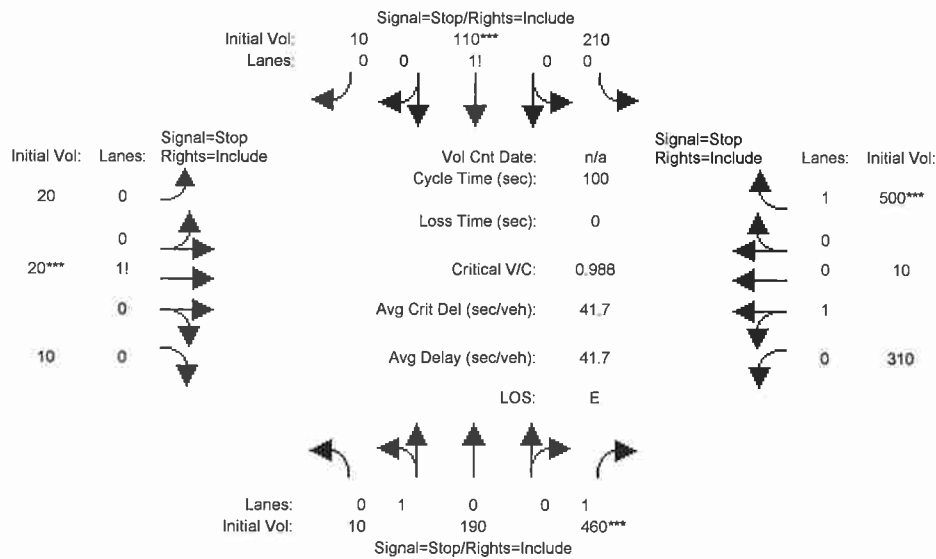
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	30	520	10	260	0	650	40	10	520	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	30	520	10	260	0	650	40	10	520	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	0	30	520	10	260	0	650	40	10	520	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	0	32	547	11	274	0	684	42	11	547	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	42	0	32	547	11	274	0	684	42	11	547	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxxx	xxxxx	4.1	xxxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxxx	xxxxx	2.2	xxxxx	xxxxx
Capacity Module:												
Cnflct Vol:	1416	1274	705	1289	1295	547	xxxxx	xxxxx	xxxxx	726	xxxxx	xxxxx
Potent Cap.:	116	169	440	142	164	540	xxxxx	xxxxx	xxxxx	886	xxxxx	xxxxx
Move Cap.:	54	167	440	130	162	540	xxxxx	xxxxx	xxxxx	886	xxxxx	xxxxx
Volume/Cap:	0.78	0.00	0.07	4.19	0.07	0.51	xxxxx	xxxxx	xxxxx	0.01	xxxxx	xxxxx
Level Of Service Module:												
2Way95thQ:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Control Del:	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	9.1	xxxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxxx	86	xxxxx	131	xxxxx	497	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
SharedQueue:	xxxxx	4.5	xxxxx	57.0	xxxxx	3.5	xxxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx
Shrd ConDel:	xxxxx	144	xxxxx	1534	xxxxx	21.4	xxxxx	xxxxx	xxxxx	9.1	xxxxx	xxxxx
Shared LOS:	*	F	*	F	*	C	*	*	*	A	*	*
ApproachDel:	144.0			1023.8			xxxxxxx			xxxxxxx		
ApproachLOS:	F			F			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

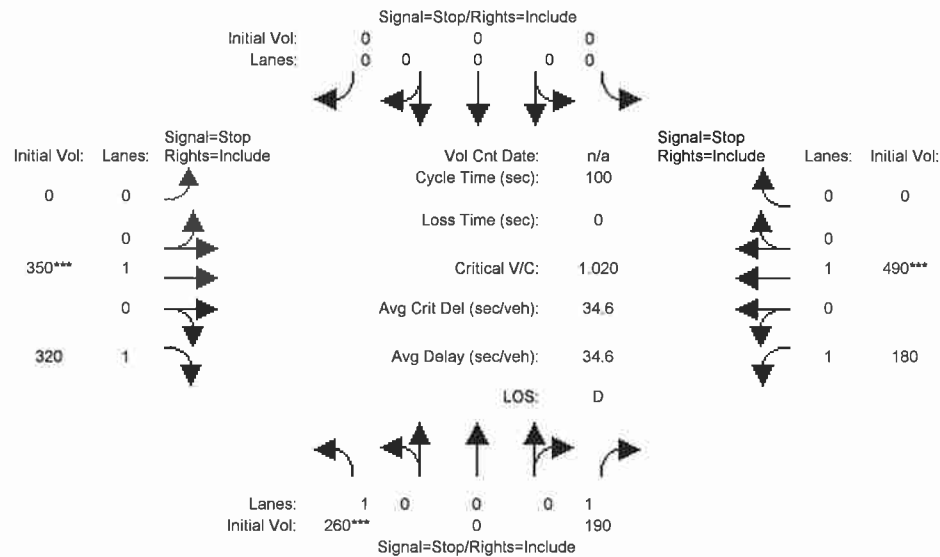
Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	190	460	210	110	10	20	20	10	310	10	500
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	190	460	210	110	10	20	20	10	310	10	500
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	190	460	210	110	10	20	20	10	310	10	500
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	200	484	221	116	11	21	21	11	326	11	526
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	200	484	221	116	11	21	21	11	326	11	526
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	200	484	221	116	11	21	21	11	326	11	526
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	0.64	0.33	0.03	0.40	0.40	0.20	0.97	0.03	1.00
Final Sat.:	24	447	520	292	153	14	151	151	75	438	14	532
Capacity Analysis Module:												
Vol/Sat:	0.45	0.45	0.93	0.76	0.76	0.76	0.14	0.14	0.14	0.74	0.74	0.99
Crit Moves:	****			****			****			****		
Delay/Veh:	16.3	16.3	49.7	30.9	30.9	30.9	13.4	13.4	13.4	30.3	30.3	61.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.3	16.3	49.7	30.9	30.9	30.9	13.4	13.4	13.4	30.3	30.3	61.8
LOS by Move:	C	C	E	D	D	D	B	B	B	D	D	F
ApproachDel:	39.6			30.9			13.4			49.5		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	39.6			30.9			13.4			49.5		
LOS by Appr:	E			D			B			E		
AllWayAvgQ:	0.8	0.8	5.8	2.6	2.6	2.6	0.1	0.1	0.1	2.5	2.5	7.7

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	260	0	190	0	0	0	0	350	320	180	490	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	260	0	190	0	0	0	0	350	320	180	490	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	260	0	190	0	0	0	0	350	320	180	490	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	274	0	200	0	0	0	0	368	337	189	516	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	274	0	200	0	0	0	0	368	337	189	516	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	274	0	200	0	0	0	0	368	337	189	516	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	440	0	511	0	0	0	0	499	551	463	506	0
Capacity Analysis Module:												
Vol/Sat:	0.62	xxxx	0.39	xxxx	xxxx	xxxx	xxxx	0.74	0.61	0.41	1.02	xxxx
Crit Moves:	****							****			****	
Delay/Veh:	22.8	0.0	13.8	0.0	0.0	0.0	0.0	27.2	18.6	15.3	71.6	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.8	0.0	13.8	0.0	0.0	0.0	0.0	27.2	18.6	15.3	71.6	0.0
LOS by Move:	C	*	B	*	*	*	*	D	C	C	F	*
ApproachDel:	19.0			xxxxxx				23.1			56.5	
Delay Adj:	1.00			xxxxxx				1.00			1.00	
ApprAdjDel:	19.0			xxxxxx				23.1			56.5	
LOS by Appr:	C			*				C			F	
AllWayAvgQ:	1.5	0.0	0.6	0.0	0.0	0.0	0.0	2.4	1.4	0.6	8.7	0.0

HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Cumulative Conditions - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4819		1770	3355		1681	1707	1583	1770	1712	
Flt Permitted	0.95	1.00		0.95	1.00		0.59	0.61	1.00	0.38	1.00	
Satd. Flow (perm)	1770	4819		1770	3355		1042	1086	1583	716	1712	
Volume (vph)	150	2170	340	90	1600	240	330	60	90	130	60	70
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)	158	2284	358	95	1684	253	347	63	95	137	63	74
RTOR Reduction (vph)	0	18	0	0	10	0	0	0	72	0	35	0
Lane Group Flow (vph)	158	2624	0	95	1927	0	174	236	23	137	102	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2				6
Permitted Phases							2		2	6		
Actuated Green, G (s)	11.0	69.2		9.8	68.0		29.0	29.0	29.0	29.0	29.0	
Effective Green, g (s)	11.0	69.2		9.8	68.0		29.0	29.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.09	0.58		0.08	0.57		0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	162	2779		145	1901		252	262	383	173	414	
v/s Ratio Prot	0.09	c0.54		0.05	c0.57						0.06	
v/s Ratio Perm							0.17	c0.22	0.01	0.19		
v/c Ratio	0.98	0.94		0.66	1.01		0.69	0.90	0.06	0.79	0.25	
Uniform Delay, d1	54.4	23.6		53.5	26.0		41.4	44.1	35.0	42.7	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	62.8	7.6		10.2	24.1		14.4	35.0	0.3	30.0	1.4	
Delay (s)	117.2	31.2		63.6	50.1		55.9	79.1	35.3	72.7	38.1	
Level of Service	F	C		E	D		E	E	D	E	D	
Approach Delay (s)		36.1			50.7			62.8			55.4	
Approach LOS		D			D			E			E	

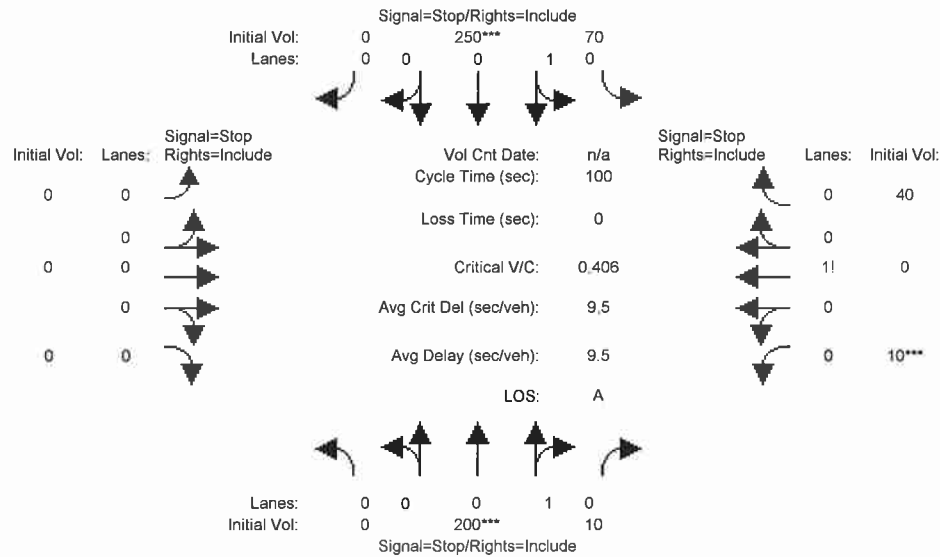
Intersection Summary

HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

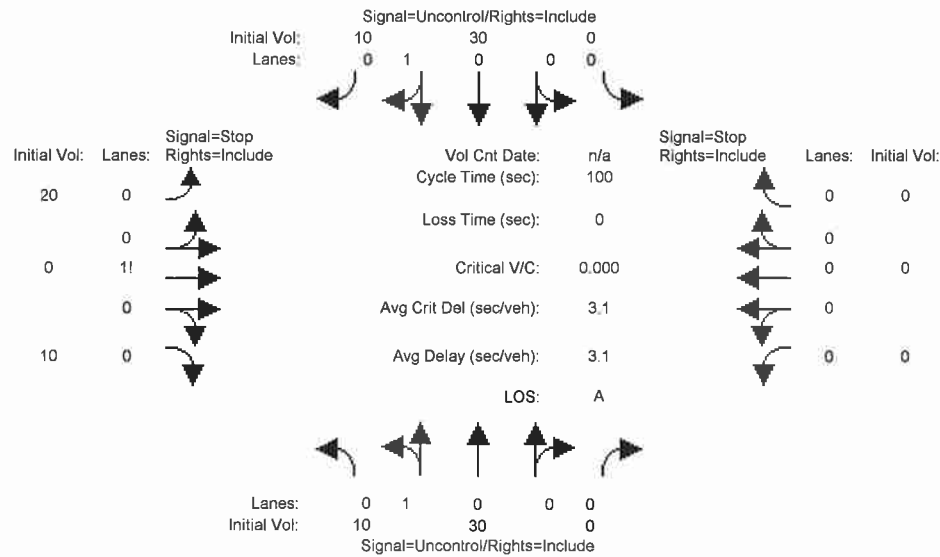
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	200	10	70	250	0	0	0	0	10	0	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	200	10	70	250	0	0	0	0	10	0	40
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	200	10	70	250	0	0	0	0	10	0	40
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	211	11	74	263	0	0	0	0	11	0	42
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	211	11	74	263	0	0	0	0	11	0	42
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	211	11	74	263	0	0	0	0	11	0	42
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.95	0.05	0.22	0.78	0.00	0.00	0.00	0.00	0.20	0.00	0.80
Final Sat.:	0	779	39	182	649	0	0	0	0	143	0	571
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.27	0.27	0.41	0.41	xxxx	xxxx	xxxx	xxxx	0.07	xxxx	0.07
Crit Moves:	****			****						****		
Delay/Veh:	0.0	8.9	8.9	10.1	10.1	0.0	0.0	0.0	0.0	7.9	0.0	7.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	8.9	8.9	10.1	10.1	0.0	0.0	0.0	0.0	7.9	0.0	7.9
LOS by Move:	*	A	A	B	B	*	*	*	*	A	*	A
ApproachDel:		8.9			10.1		xxxxxx				7.9	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		8.9			10.1		xxxxxx				7.9	
LOS by Appr:		A			B		*				A	
AllWayAvgQ:	0.4	0.4	0.4	0.7	0.7	0.7	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

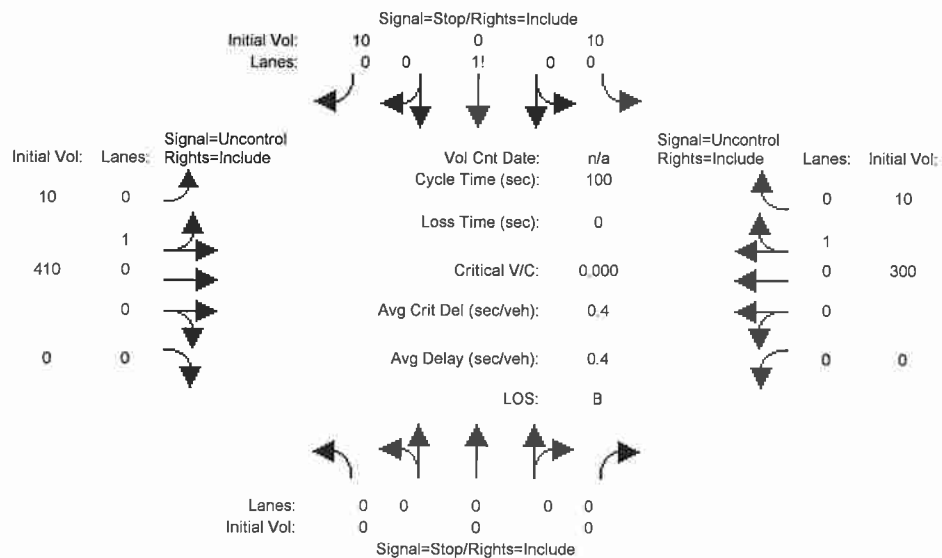
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	10	30	0	0	30	10	20	0	10	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	30	0	0	30	10	20	0	10	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	30	0	0	30	10	20	0	10	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	32	0	0	32	11	21	0	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	11	32	0	0	32	11	21	0	11	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	42	xxxx	xxxxx	xxxx	xxxx	xxxxx	89	89	37	xxxx	xxxx	xxxxx
Potent Cap.:	1580	xxxx	xxxxx	xxxx	xxxx	xxxxx	916	804	1041	xxxx	xxxx	xxxxx
Move Cap.:	1580	xxxx	xxxxx	xxxx	xxxx	xxxxx	911	799	1041	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	0.00	0.01	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	951	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	8.9	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			8.9			xxxxxx		
ApproachLOS:	*			*			A			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #17: Barrett Dr./Cedar Ravine Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	10	0	10	10	410	0	0	300	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	10	0	10	10	410	0	0	300	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	10	0	10	10	410	0	0	300	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	11	0	11	11	432	0	0	316	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	11	0	11	11	432	0	0	316	11
Critical Gap Module:												
Critical Gap:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	774	774	321	326	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	370	332	724	1245	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	367	329	724	1245	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	488	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	12.7	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			12.7			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB Off Ramp
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1600	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1600	500	vph
Peak-hour factor, PHF	0.95	0.95	
Peak 15-min volume, v15	421	132	v
Trucks and buses	6	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1836	542	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P_{FD} = 1836 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1836	4500	No
v_{12}	1836	4400	No
$v_{FO} = v_F - v_R$	1294	4500	No
v_R	542	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.0 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.347$	
Space mean speed in ramp influence area,	$S_R = 50.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.5$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1040	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	543	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	238	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1040	543	238	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	274	143	63	v
Trucks and buses	6	2	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1193	589	251	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P_{FD} = 1193$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1193	4500	No
v_{12}	1193	4400	No
$v_{FO} = v_F - v_R$	604	4500	No
v_R	589	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D = 0.351	
	S	
Space mean speed in ramp influence area,	S = 50.4	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 50.4	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction:
Jurisdiction: Point View EB ON
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	497	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	238	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	543	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	497	238	543	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	131	63	143	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	570	258	589	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 570$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	828	4500	No
v_{R12}	828	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 9.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$M = 0.303$	
Space mean speed in ramp influence area,	$S_R = 51.1$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction: Schnell School EB OFF
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1100	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	330	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1100	330	270	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	289	87	71	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1262	358	293	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1262 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1262	4500	No
v_{12}	1262	4400	No
$v_{FO} = v_F - v_R$	904	4500	No
v_R	358	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.330$	
	S	
Space mean speed in ramp influence area,	$S = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	0	
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Schnell School EB ON
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	770	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	270	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	330	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	770	270	330	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	203	71	87	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	883	293	358	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 883$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v FO	1176	4500	No
v R12	1176	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 12.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.305$	
	S	
Space mean speed in ramp influence area,	$S = 51.0$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	0	
Space mean speed for all vehicles,	$S = 51.0$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB Off Ramp
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2390	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2390	790		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	629	208		v
Trucks and buses	6	2		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2742	857	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2742 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2742	4500	No
v_{12}	2742	4400	No
$v_{FO} = v_F - v_R$	1885	4500	No
v_R	857	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 25.8 \text{ pc/mi/ln}$
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.375$	
Space mean speed in ramp influence area,	$S_R = 50.1$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1650	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	694	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1650	694	273	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	434	183	72	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1893	752	296	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1893 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{F1} = v_F$	1893	4500	No
v_{12}	1893	4400	No
$v_{FO} = v_F - v_R$	1141	4500	No
v_R	752	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.366$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.2$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.2$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 EB
Junction:
Jurisdiction: Point View EB ON
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	956	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	273	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	694	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	956	273	694	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	252	72	183	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1097	296	752	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1097 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1393	4500	No
v _{R12}	1393	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.310	
	S	
Space mean speed in ramp influence area,	S = 51.0	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	O	
Space mean speed for all vehicles,	S = 51.0	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1600	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	390	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	440	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1600	390	440	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	421	103	116	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1836	423	477	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1836 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1836	4500	No
v_{12}	1836	4400	No
$v_{FO} = v_F - v_R$	1413	4500	No
v_R	423	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.336$	
Space mean speed in ramp influence area,	$S_R = 50.6$	mph
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.6$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Schnell School EB ON
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1210	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	440	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	390	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1210	440	390	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	318	116	103	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1388	477	423	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1388 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1865	4500	No
v_{R12}	1865	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.317$
 S
 Space mean speed in ramp influence area, $S_R = 50.9 \text{ mph}$
 S
 Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$
 S
 Space mean speed for all vehicles, $S = 50.9 \text{ mph}$

Phone:
E-mail:

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Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Mosquito WB OFF
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1830	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	460	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1830	280	460	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	482	74	121	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2100	304	499	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2100$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2100	4500	No
v_{12}	2100	4400	No
$v_{FO} = v_F - v_R$	1796	4500	No
v_R	304	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 21.1$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.325$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.8$	mph

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Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Mosquito WB ON
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1550	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	460	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	280	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1550	460	280	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	408	121	74	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1778	499	304	pcph

Estimation of V12 Merge Areas

L =

(Equation 25-2 or 25-3)

EQ

P =

1.000

Using Equation

0

FM

v = v

(P) =

1778

pc/h

12

F

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2277	4500	No
FO			
v	2277	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.1 pc/mi/ln

R

R

12

A

Level of service for ramp-freeway junction areas of influence
C

Speed Estimation

Intermediate speed variable,	M = 0.341	
	S	
Space mean speed in ramp influence area,	S = 50.6	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 50.6	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB OFF
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1257	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	310	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	713	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1257	310	713	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	331	82	188	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1442	336	773	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1442 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1442	4500	No
v_{12}	1442	4400	No
$v_{FO} = v_F - v_R$	1106	4500	No
v_R	336	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.328$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB ON
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	947	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	713	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	310	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	947	713	310	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	249	188	82	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1087	773	336	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1087$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1860	4500	No
v_{R12}	1860	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.6$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.317$	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1660	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	350	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1660	180	350	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	437	47	92	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1905	195	379	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1905$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1905	4500	No
v_{12}	1905	4400	No
$v_{FO} = v_F - v_R$	1710	4500	No
v_R	195	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.316$	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

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Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	180	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1480	350	180	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	389	92	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1698	379	195	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1698 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2077	4500	No
v _{R12}	2077	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.6 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M _S = 0.325	
Space mean speed in ramp influence area,	S _R = 50.8	mph
Space mean speed in outer lanes,	S _O = N/A	mph
Space mean speed for all vehicles,	S = 50.8	mph

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Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Mosquito WB OFF
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1740	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	540	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1740	350	540	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	458	92	142	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1996	379	585	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1996 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1996	4500	No
v_{12}	1996	4400	No
$v_{FO} = v_F - v_R$	1617	4500	No
v_R	379	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 20.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.332$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S_O = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.7$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

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Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Mosquito WB ON
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1390	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	540	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1390	540	350	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	366	142	92	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, f_{HV}	0.917	0.971	0.971	
Driver population factor, f_P	1.00	1.00	1.00	
Flow rate, v_p	1595	585	379	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1595 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2180	4500	No
v_{R12}	2180	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.338$	
Space mean speed in ramp influence area,	$S_R = 50.6$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.6$	mph

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Diverge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB OFF
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1263	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	396	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	673	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1263	396	673	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	332	104	177	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1449	429	730	pcph

Estimation of V12 Diverge Areas

$$\begin{aligned}
 L &= \text{(Equation 25-8 or 25-9)} \\
 EQ & \\
 P &= 1.000 \quad \text{Using Equation 0} \\
 FD & \\
 v_{12} &= v_R + (v_F - v_R) P_{FD} = 1449 \quad \text{pc/h}
 \end{aligned}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1449	4500	No
v_{12}	1449	4400	No
$v_{FO} = v_F - v_R$	1020	4500	No
v_R	429	2100	No

Level of Service Determination (if not F)

$$\begin{aligned}
 \text{Density, } D &= 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.6 \quad \text{pc/mi/ln} \\
 \text{Level of service for ramp-freeway junction areas of influence B}
 \end{aligned}$$

Speed Estimation

Intermediate speed variable,	$D = 0.337$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.6$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.6$	mph

Phone:
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Merge Analysis

Analyst: Matt Kittelson
Agency/Co.: Fehr & Peers
Date performed: 9/10/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: US 50 WB
Junction: Point View WB ON
Jurisdiction:
Analysis Year: Cumulative (2025)
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	867	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	673	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	396	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	867	673	396	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	228	177	104	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	995	730	429	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P) = 995 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1725	4500	No
v _{R12}	1725	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.6 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M	= 0.314	
	S		
Space mean speed in ramp influence area,	S _R	= 50.9	mph
Space mean speed in outer lanes,	S _O	= N/A	mph
Space mean speed for all vehicles,	S	= 50.9	mph

Phone:
E-mail:

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Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1540	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	380	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1540	180	380	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	405	47	100	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1767	195	412	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1767 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1767	4500	No
v_{12}	1767	4400	No
$v_{FO} = v_F - v_R$	1572	4500	No
v_R	195	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 17.5 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.316$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.9$	mph

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Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Cumulative (2025)
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1360	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	380	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	180	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1360	380	180	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	358	100	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1560	412	195	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1560$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1972	4500	No
v_{R12}	1972	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 18.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

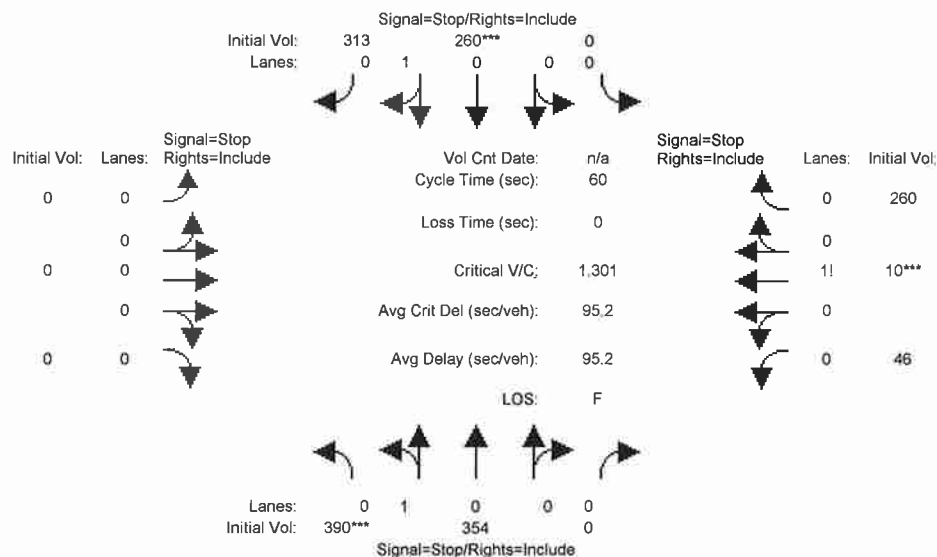
Speed Estimation

Intermediate speed variable,	$M = 0.322$	
	S	
Space mean speed in ramp influence area,	$S = 50.8$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.8$	mph

Cumulative Plus Project Conditions

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM + Project

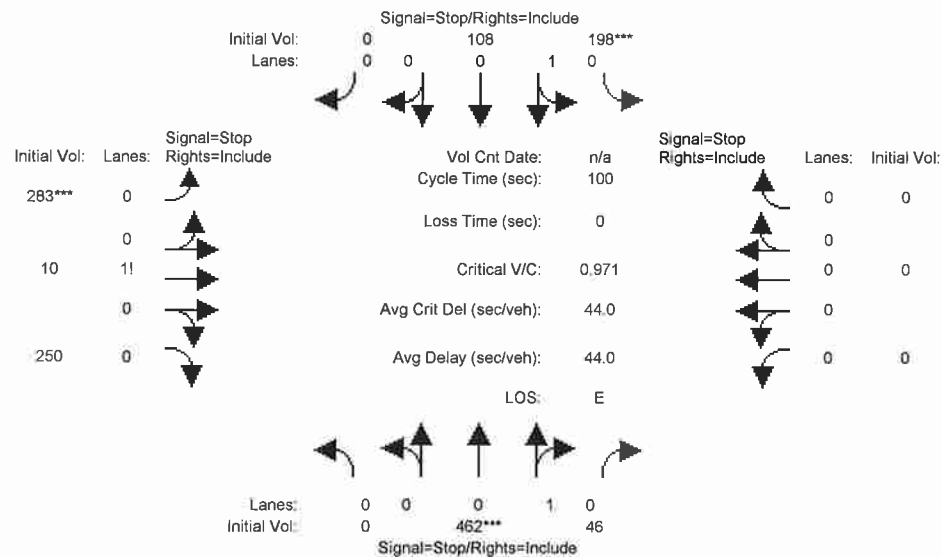
Intersection #1: Point View Dr./US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	390	352	0	0	259	313	0	0	0	40	10	260
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	390	352	0	0	259	313	0	0	0	40	10	260
Added Vol:	0	2	0	0	1	0	0	0	0	6	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	390	354	0	0	260	313	0	0	0	46	10	260
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	411	373	0	0	274	329	0	0	0	48	11	274
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	411	373	0	0	274	329	0	0	0	48	11	274
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	411	373	0	0	274	329	0	0	0	48	11	274
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.52	0.48	0.00	0.00	0.45	0.55	0.00	0.00	0.00	0.15	0.03	0.82
Final Sat.:	316	286	0	0	291	350	0	0	0	83	18	470
Capacity Analysis Module:												
Vol/Sat:	1.30	1.30	xxxx	xxxx	0.94	0.94	xxxx	xxxx	xxxx	0.58	0.58	0.58
Crit Moves:	***				****					****		
Delay/Veh:	166.5	167	0.0	0.0	45.5	45.5	0.0	0.0	0.0	17.4	17.4	17.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	166.5	167	0.0	0.0	45.5	45.5	0.0	0.0	0.0	17.4	17.4	17.4
LOS by Move:	F	F	*	*	E	E	*	*	*	C	C	C
ApproachDel:	166.5				45.5		xxxxxx			17.4		
Delay Adj:	1.00				1.00		xxxxxx			1.00		
ApprAdjDel:	166.5				45.5		xxxxxx			17.4		
LOS by Appr:	F				E		*			C		
AllWayAvgQ:	26.3	26.3	26.3	6.6	6.6	6.6	0.0	0.0	0.0	1.3	1.3	1.3

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM + Project

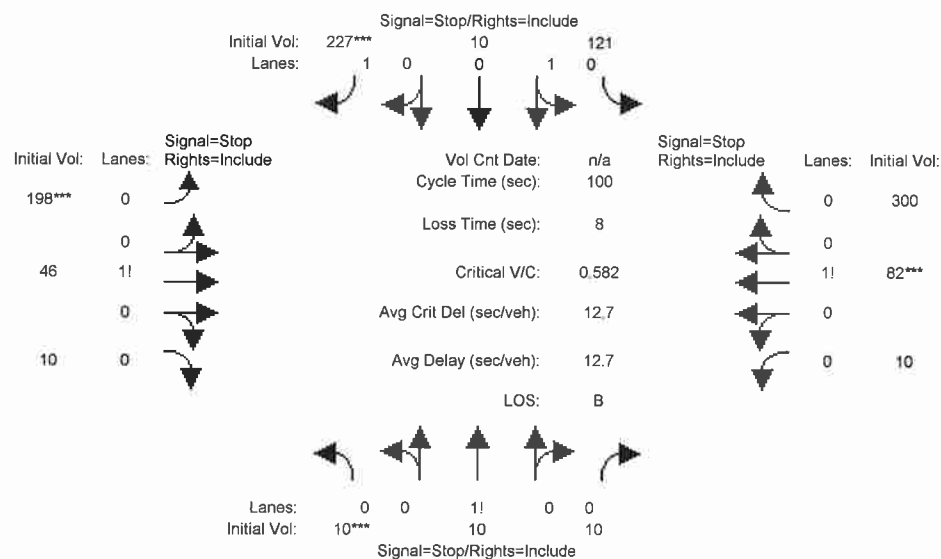
Intersection #2: Point View Dr./US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	460	30	198	102	0	283	10	250	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	460	30	198	102	0	283	10	250	0	0	0
Added Vol:	0	2	16	0	6	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	462	46	198	108	0	283	10	250	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	486	48	208	114	0	298	11	263	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	486	48	208	114	0	298	11	263	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	486	48	208	114	0	298	11	263	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.91	0.09	0.65	0.35	0.00	0.52	0.02	0.46	0.00	0.00	0.00
Final Sat.:	0	517	51	334	182	0	307	11	271	0	0	0
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.94	0.94	0.62	0.62	xxxx	0.97	0.97	0.97	xxxx	xxxx	xxxx
Crit Moves:	****			****			****					
Delay/Veh:	0.0	48.3	48.3	20.0	20.0	0.0	53.6	53.6	53.6	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	48.3	48.3	20.0	20.0	0.0	53.6	53.6	53.6	0.0	0.0	0.0
LOS by Move:	*	E	E	C	C	*	F	F	F	*	*	*
ApproachDel:	48.3			20.0			53.6			xxxxxx		
Delay Adj:	1.00			1.00			1.00			xxxxxx		
ApprAdjDel:	48.3			20.0			53.6			xxxxxx		
LOS by Appr:	E			C			F			*		
AllWayAvgQ:	6.2	6.2	6.2	1.5	1.5	1.5	7.3	7.3	7.3	0.0	0.0	0.0

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Cumulative AM + Project

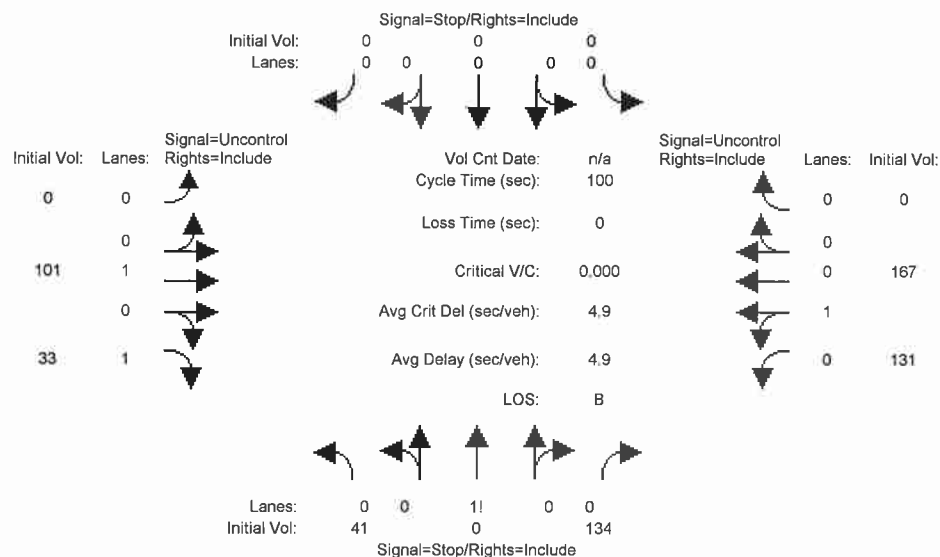
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	10	10	121	10	221	180	40	10	10	80	300
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	10	121	10	221	180	40	10	10	80	300
Added Vol:	0	0	0	0	0	6	18	6	0	0	2	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	10	10	121	10	227	198	46	10	10	82	300
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	11	11	127	11	239	208	48	11	11	86	316
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	11	11	127	11	239	208	48	11	11	86	316
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	11	11	127	11	239	208	48	11	11	86	316
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.34	0.33	0.33	0.92	0.08	1.00	0.78	0.18	0.04	0.03	0.21	0.76
Final Sat.:	166	166	166	477	39	620	476	111	24	18	148	542
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.06	0.27	0.27	0.39	0.44	0.44	0.44	0.58	0.58	0.58
Crit Moves:	****					****	****				****	
Delay/Veh:	9.5	9.5	9.5	11.6	11.6	11.3	12.7	12.7	12.7	14.1	14.1	14.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.5	9.5	9.5	11.6	11.6	11.3	12.7	12.7	12.7	14.1	14.1	14.1
LOS by Move:	A	A	A	B	B	B	B	B	B	B	B	B
ApproachDel:	9.5			11.4			12.7			14.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.5			11.4			12.7			14.1		
LOS by Appr:	A			B			B			B		
AllWayAvgQ:	0.0	0.0	0.0	0.3	0.3	0.5	0.7	0.7	0.7	1.2	1.2	1.2

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

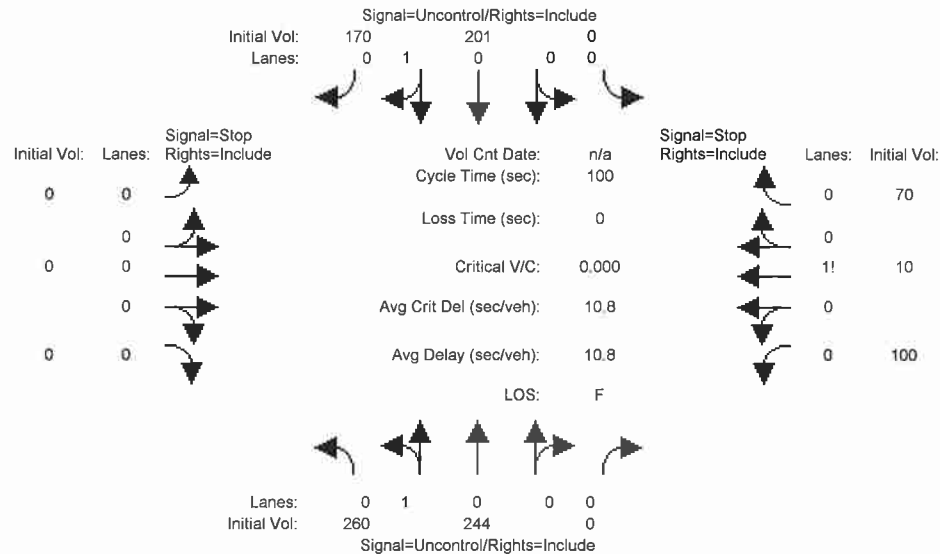
Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	130	0	0	0	0	80	30	130	160	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	130	0	0	0	0	80	30	130	160	0
Added Vol:	1	0	4	0	0	0	0	21	3	1	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	41	0	134	0	0	0	0	101	33	131	167	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	43	0	141	0	0	0	0	106	35	138	176	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	43	0	141	0	0	0	0	106	35	138	176	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx
FollowUpTim:	3.5	4.0	3.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx
Capacity Module:												
Cnflct Vol:	558	558	106	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	141	xxxx	xxxx
Potent Cap.:	494	441	953	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1454	xxxx	xxxx
Move Cap.:	455	396	953	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1454	xxxx	xxxx
Volume/Cap:	0.09	0.00	0.15	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.09	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.3	xxxx	xxxx
Control Del:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.7	xxxx	xxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	759	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:	xxxx	0.9	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.3	xxxx	xxxx
Shrd ConDel:	xxxx	11.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.7	xxxx	xxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:		11.3		xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:		B		*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

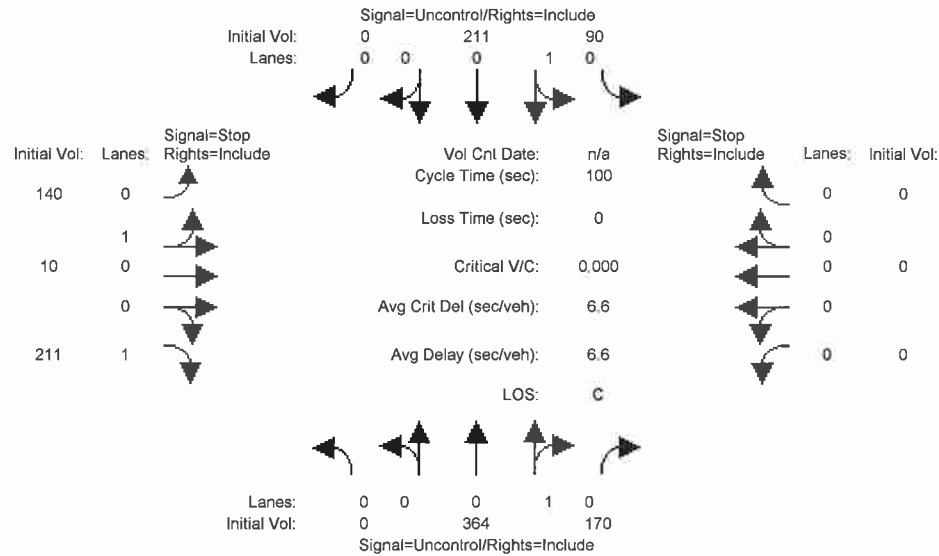
Intersection #5: Schnell School Rd/US 50 WB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	170	240	0	0	200	170	0	0	0	100	10	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	170	240	0	0	200	170	0	0	0	100	10	70
Added Vol:	90	4	0	0	1	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	260	244	0	0	201	170	0	0	0	100	10	70
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	274	257	0	0	212	179	0	0	0	105	11	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	274	257	0	0	212	179	0	0	0	105	11	74
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	391	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	1105	1195	257
Potent Cap.:	1179	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	235	188	787
Move Cap.:	1179	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	185	137	787
Volume/Cap:	0.23	xxxx	xxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	0.57	0.08	0.09
Level Of Service Module:												
2Way95thQ:	0.9	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Control Del:	9.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxx	257	xxxxxx
SharedQueue:	0.9	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	5.2	xxxxxx
Shrd ConDel:	9.0	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	50.3	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	F	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	50.3	xxxxxx
ApproachLOS:	*	*	*	*	*	*	*	*	*	*	F	*

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

Intersection #6: Schnell School Rd/US 50 EB Ramps



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	270	170	90	210	0	140	10	180	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	270	170	90	210	0	140	10	180	0	0	0
Added Vol:	0	94	0	0	1	0	0	0	31	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	364	170	90	211	0	140	10	211	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	383	179	95	222	0	147	11	222	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	0	383	179	95	222	0	147	11	222	0	0	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	562	xxxx	xxxxx	884	974	222	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1019	xxxx	xxxxx	318	254	822	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1019	xxxx	xxxxx	294	229	822	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.09	xxxx	xxxx	0.50	0.05	0.27	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	xxxx	xxxx	1.1	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	8.9	xxxx	xxxxx	xxxxx	xxxx	11.0	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	289	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shared Queue:	xxxxx	xxxx	xxxxx	0.3	xxxx	xxxxx	3.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	8.9	xxxx	xxxxx	31.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	D	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx				19.5		xxxxxx		
ApproachLOS:	*			*				C		*		

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Cumulative Plus Project **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	2	6.0	A	--
	T	3	4	133	2	7.7	A	--
	R	3	3	100	1	4.4	A	--
	Subtotal	8	9	113	--	6.2	A	--
SB	L	45	43	96	11	10.4	B	--
	T	3	3	100	2	9.7	A	--
	R	63	66	105	10	9.2	A	--
	Subtotal	111	112	101	--	9.7	A	--
EB	L	76	72	95	9	28.3	D	--
	T	42	43	102	7	25.3	D	--
	R	3	3	100	1	21.6	C	--
	Subtotal	121	118	98	--	27.1	D	--
WB	L	3	3	100	2	9.7	A	--
	T	64	65	102	8	14.1	B	--
	R	62	60	97	5	9.0	A	--
	Subtotal	129	128	99	--	11.6	B	--
Total		368	367	100	--	15.8	C	--

Lumsden Ranch EIR
9: Broadway & Blairs Ln

HCM Unsignalized Intersection Capacity Analysis
Cumulative Conditions - AM Peak Hour - Plus Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	418	50	10	468	10	100	10	30	10	10	10
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
Hourly flow rate (vph)	11	440	53	11	493	11	105	11	32	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLT			TWLT	
Median storage veh								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	503			493			1017	1012	466	1017	1033	498
vC1, stage 1 conf vol							487	487		519	519	
vC2, stage 2 conf vol							529	524		498	514	
vCu, unblocked vol	503			493			1017	1012	466	1017	1033	498
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			74	97	95	97	97	98
cM capacity (veh/h)	1061			1071			407	420	596	400	415	572

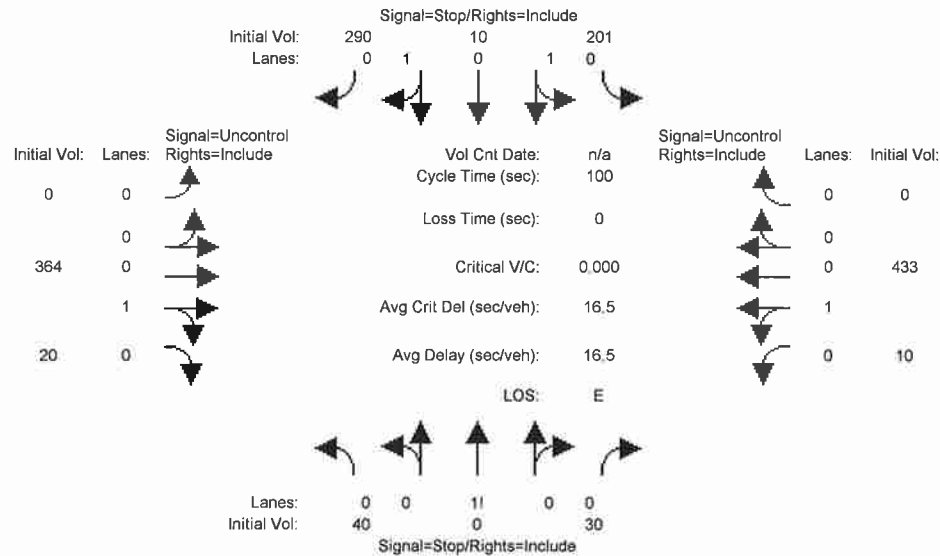
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	493	11	503	147	32
Volume Left	11	0	11	0	105	11
Volume Right	0	53	0	11	32	11
cSH	1061	1700	1071	1700	438	451
Volume to Capacity	0.01	0.29	0.01	0.30	0.34	0.07
Queue Length 95th (ft)	1	0	1	0	37	6
Control Delay (s)	8.4	0.0	8.4	0.0	17.3	13.6
Lane LOS	A		A		C	B
Approach Delay (s)	0.2		0.2		17.3	13.6
Approach LOS					C	B

Intersection Summary

Average Delay	2.6	
Intersection Capacity Utilization	46.5%	ICU Level of Service
Analysis Period (min)	15	A

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

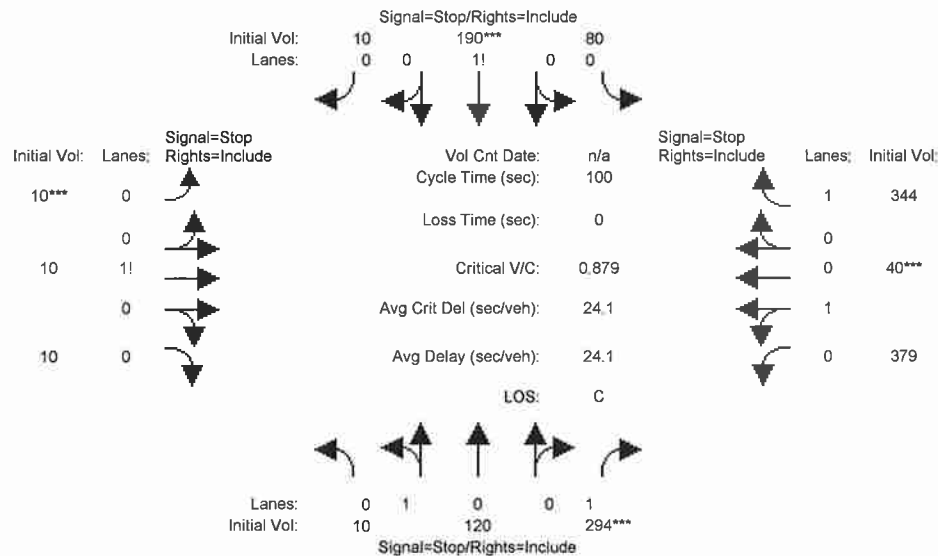
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	30	200	10	290	0	350	20	10	400	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	30	200	10	290	0	350	20	10	400	0
Added Vol:	0	0	0	1	0	0	0	14	0	0	33	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	0	30	201	10	290	0	364	20	10	433	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	0	32	212	11	305	0	383	21	11	456	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	42	0	32	212	11	305	0	383	21	11	456	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1028	871	394	886	881	456	xxxx	xxxx	xxxxx	404	xxxx	xxxxx
Potent Cap.:	214	292	660	267	288	609	xxxx	xxxx	xxxxx	1165	xxxx	xxxxx
Move Cap.:	103	289	660	253	285	609	xxxx	xxxx	xxxxx	1165	xxxx	xxxxx
Volume/Cap:	0.41	0.00	0.05	0.84	0.04	0.50	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.1	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	161	xxxxx	254	xxxx	587	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	2.1	xxxxx	7.3	xxxx	3.2	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	44.8	xxxxx	70.8	xxxx	18.1	xxxxx	xxxx	xxxxx	8.1	xxxx	xxxxx
Shared LOS:	*	E	*	F	*	C	*	*	*	A	*	*
ApproachDel:	44.8			39.8			xxxxxxx			xxxxxxx		
ApproachLOS:	E			E			*			*		

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM + Project

Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module:

Base Vol:	10	120	280	80	190	10	10	10	10	350	40	340
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	120	280	80	190	10	10	10	10	350	40	340
Added Vol:	0	0	14	0	0	0	0	0	0	29	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	120	294	80	190	10	10	10	10	379	40	344
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	126	309	84	200	11	11	11	11	399	42	362
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	126	309	84	200	11	11	11	11	399	42	362
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	126	309	84	200	11	11	11	11	399	42	362

Saturation Flow Module:

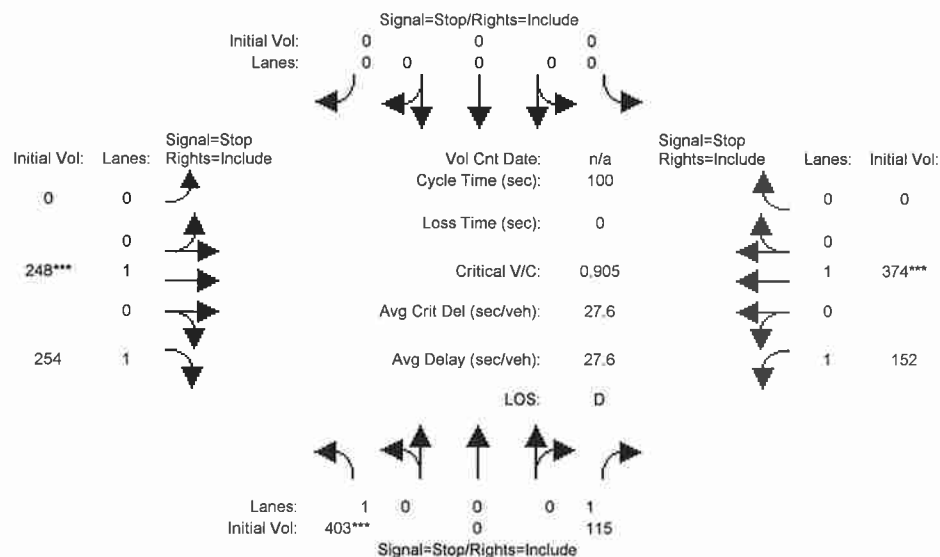
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.08	0.92	1.00	0.28	0.68	0.04	0.34	0.33	0.33	0.90	0.10	1.00
Final Sat.:	37	448	541	141	335	18	139	139	139	454	48	595

Capacity Analysis Module:

Vol/Sat:	0.28	0.28	0.57	0.60	0.60	0.60	0.08	0.08	0.08	0.88	0.88	0.61
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Delay/Veh:	12.7	12.7	17.2	19.8	19.8	19.8	11.4	11.4	11.4	41.8	41.8	17.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.7	12.7	17.2	19.8	19.8	19.8	11.4	11.4	11.4	41.8	41.8	17.4
LOS by Move:	B	B	C	C	C	C	B	B	B	E	E	C
ApproachDel:	15.8			19.8			11.4			30.8		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	15.8			19.8			11.4			30.8		
LOS by Appr:	C			C			B			D		
AllWayAvgQ:	0.4	0.4	1.2	1.3	1.3	1.3	0.1	0.1	0.1	4.5	4.5	1.4

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM + Project

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound				South Bound			East Bound			West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
-----	-----				-----			-----			-----				
Min. Green:	0		0		0	0	0	0	0	0	0	0	0	0	0
-----	-----				-----			-----			-----				
Volume Module:															
Base Vol:	390		0		110	0	0	0	0	240	250	150	350		0
Growth Adj:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	390		0		110	0	0	0	0	240	250	150	350		0
Added Vol:	13		0		5	0	0	0	0	8	4	2	24		0
PasserByVol:	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	403		0		115	0	0	0	0	248	254	152	374		0
User Adj:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	424		0		121	0	0	0	0	261	267	160	394		0
Reduct Vol:	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	424		0		121	0	0	0	0	261	267	160	394		0
PCE Adj:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	424		0		121	0	0	0	0	261	267	160	394		0
-----	-----				-----			-----			-----				
Saturation Flow Module:															
Adjustment:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00		1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Final Sat.:	469		0		544	0	0	0	0	485	535	459	496		0
-----	-----				-----			-----			-----				
Capacity Analysis Module:															
Vol/Sat:	0.90	xxxx		0.22	xxxx	xxxx	xxxx	xxxx	0.54	0.50	0.35	0.79	xxxx		
Crit Moves:	****								****			****			
Delay/Veh:	47.7	0.0		10.9	0.0	0.0	0.0	0.0	17.8	15.4	14.3	31.4	0.0		
Delay Adj:	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.7	0.0		10.9	0.0	0.0	0.0	0.0	17.8	15.4	14.3	31.4	0.0		
LOS by Move:	E	*		B	*	*	*	*	C	C	B	D	*		
ApproachDel:		39.5			xxxxxx				16.6			26.4			
Delay Adj:		1.00			xxxxxx				1.00			1.00			
ApprAdjDel:		39.5			xxxxxx				16.6			26.4			
LOS by Appr:		E			*				C			D			
AllWayAvgQ:	4.9	0.0		0.3	0.0	0.0	0.0	0.0	1.1	0.9	0.5	3.0	0.0		

HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Cumulative Conditions PP - AM Peak Hour

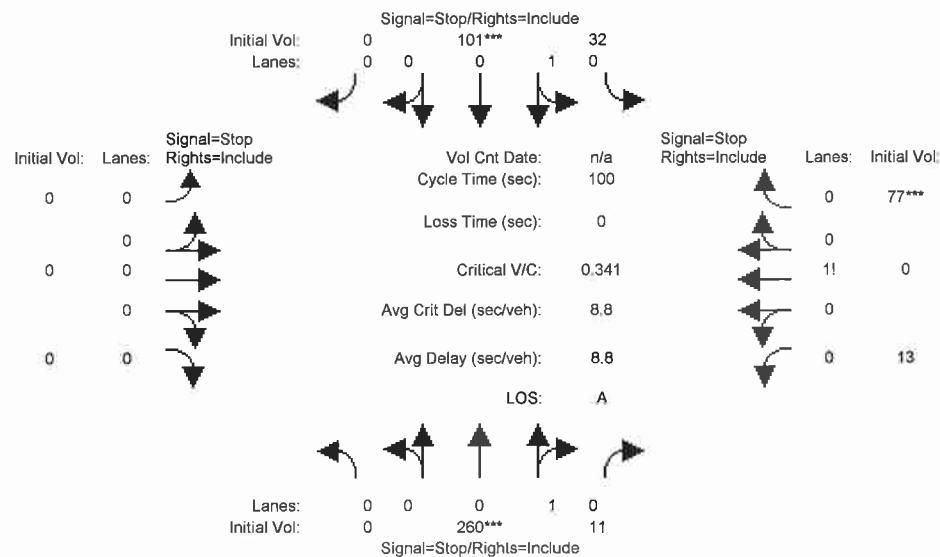
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 	 		 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4807		1770	3344		1681	1719	1583	1770	1694	
Flt Permitted	0.95	1.00		0.95	1.00		0.46	0.52	1.00	0.38	1.00	
Satd. Flow (perm)	1770	4807		1770	3344		815	920	1583	701	1694	
Volume (vph)	70	1459	271	170	1625	309	324	112	70	163	91	140
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)	74	1536	285	179	1711	325	341	118	74	172	96	147
RTOR Reduction (vph)	0	24	0	0	13	0	0	0	51	0	46	0
Lane Group Flow (vph)	74	1797	0	179	2023	0	171	288	23	172	197	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2				6
Permitted Phases							2		2	6		
Actuated Green, G (s)	5.0	50.0		21.0	66.0		37.0	37.0	37.0	37.0	37.0	
Effective Green, g (s)	5.0	50.0		21.0	66.0		37.0	37.0	37.0	37.0	37.0	
Actuated g/C Ratio	0.04	0.42		0.18	0.55		0.31	0.31	0.31	0.31	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	74	2003		310	1839		251	284	488	216	522	
v/s Ratio Prot	0.04	c0.37		0.10	c0.60						0.12	
v/s Ratio Perm							0.21	c0.31	0.01	0.25		
v/c Ratio	1.00	0.90		0.58	1.10		0.68	1.01	0.05	0.80	0.38	
Uniform Delay, d1	57.5	32.6		45.4	27.0		36.3	41.5	29.1	38.0	32.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	104.6	5.7		2.6	54.0		14.0	57.0	0.2	25.5	2.1	
Delay (s)	162.1	38.4		48.0	81.0		50.3	98.5	29.3	63.5	34.6	
Level of Service	F	D		D	F		D	F	C	E	C	
Approach Delay (s)		43.2			78.3			73.5			46.6	
Approach LOS		D			E			E			D	

Intersection Summary

HCM Average Control Delay	62.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Cumulative AM + Project

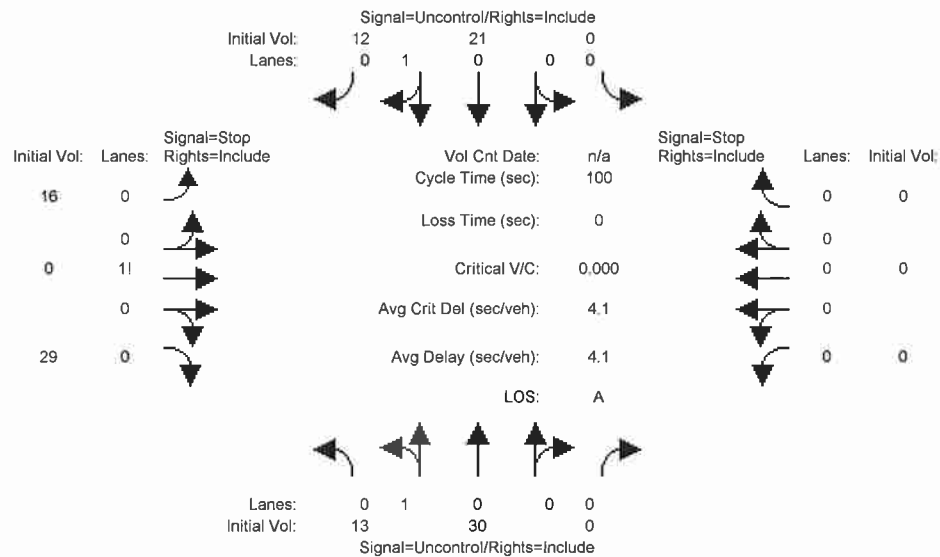
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	260	10	30	100	0	0	0	0	10	0	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	260	10	30	100	0	0	0	0	10	0	70
Added Vol:	0	0	1	2	1	0	0	0	0	3	0	7
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	260	11	32	101	0	0	0	0	13	0	77
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	274	12	34	106	0	0	0	0	14	0	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	274	12	34	106	0	0	0	0	14	0	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	274	12	34	106	0	0	0	0	14	0	81
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.96	0.04	0.24	0.76	0.00	0.00	0.00	0.00	0.14	0.01	0.85
Final Sat.:	0	802	34	190	601	0	0	0	0	112	0	665
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.34	0.34	0.18	0.18	xxxx	xxxx	xxxx	xxxx	0.12	0.00	0.12
Crit Moves:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Delay/Veh:	0.0	9.3	9.3	8.4	8.4	0.0	0.0	0.0	0.0	7.8	7.8	7.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.3	9.3	8.4	8.4	0.0	0.0	0.0	0.0	7.8	7.8	7.8
LOS by Move:	*	A	A	A	A	*	*	*	*	A	A	A
ApproachDel:	9.3			8.4			xxxxxx			7.8		
Delay Adj:	1.00			1.00			xxxxxx			1.00		
ApprAdjDel:	9.3			8.4			xxxxxx			7.8		
LOS by Appr:	A			A			*			A		
AllWayAvgQ:	0.5	0.5	0.5	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

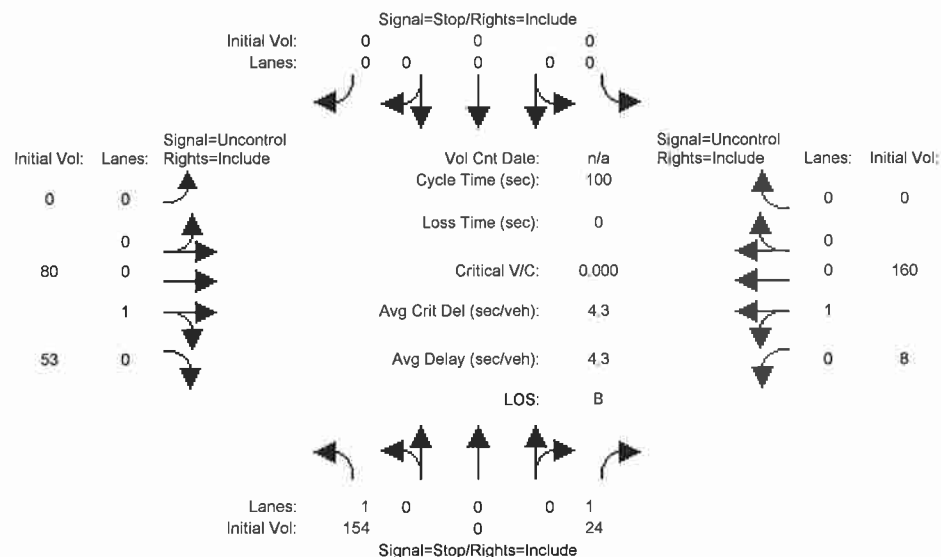
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Volume Module:																				
Base Vol:	10		30		0	0		20		10	10		0		20	0		0		0
Growth Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	10		30		0	0		20		10	10		0		20	0		0		0
Added Vol:	3		0		0	0		1		2	6		0		9	0		0		0
PasserByVol:	0		0		0	0		0		0	0		0		0	0		0		0
Initial Fut:	13		30		0	0		21		12	16		0		29	0		0		0
User Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95
PHF Volume:	14		32		0	0		22		13	17		0		31	0		0		0
Reduct Vol:	0		0		0	0		0		0	0		0		0	0		0		0
FinalVolume:	14		32		0	0		22		13	17		0		31	0		0		0
Critical Gap Module:																				
Critical Gp:	4.1	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	6.4	6.5	6.2	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
FollowUpTim:	2.2	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	3.5	4.0	3.3	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Capacity Module:																				
Cnflict Vol:	35	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	87	87	28	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Potent Cap.:	1590	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	919	807	1052	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Move Cap.:	1590	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	912	800	1052	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Volume/Cap:	0.01	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	0.02	0.00	0.03	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Level Of Service Module:																				
2Way95thQ:	0.0	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Control Del:	7.3	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	998	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
SharedQueue:	0.0	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	0.1	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shrd ConDel:	7.3	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	8.8	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	A	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx										8.8					xxxxxx				
ApproachLOS:	*										A					*				

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

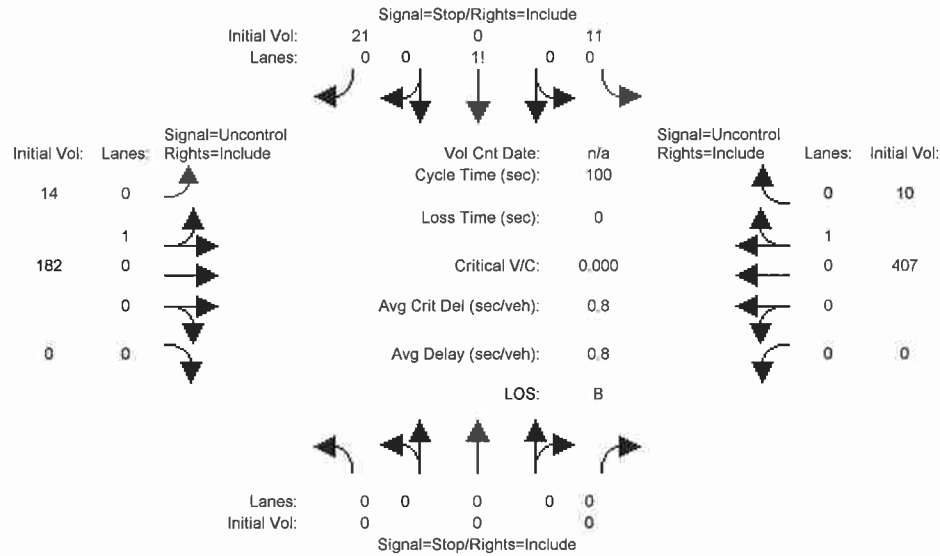
Intersection #16: Canyon View Dr./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	80	0	0	160	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	80	0	0	160	0
Added Vol:	154	0	24	0	0	0	0	0	53	8	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	154	0	24	0	0	0	0	80	53	8	160	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	162	0	25	0	0	0	0	84	56	8	168	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	162	0	25	0	0	0	0	84	56	8	168	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	297	xxxx	112	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	140	xxxx	xxxxx
Potent Cap.:	698	xxxx	946	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1456	xxxx	xxxxx
Move Cap.:	695	xxxx	946	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1456	xxxx	xxxxx
Volume/Cap:	0.23	xxxx	0.03	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.9	xxxx	0.1	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	11.7	xxxx	8.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx
LOS by Move:	B	*	A	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT		LT - LTR - RT		LT - LTR - RT		LT - LTR - RT		LT - LTR - RT		LT - LTR - RT	
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	11.4			xxxxxxx			xxxxxxx			xxxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM + Project

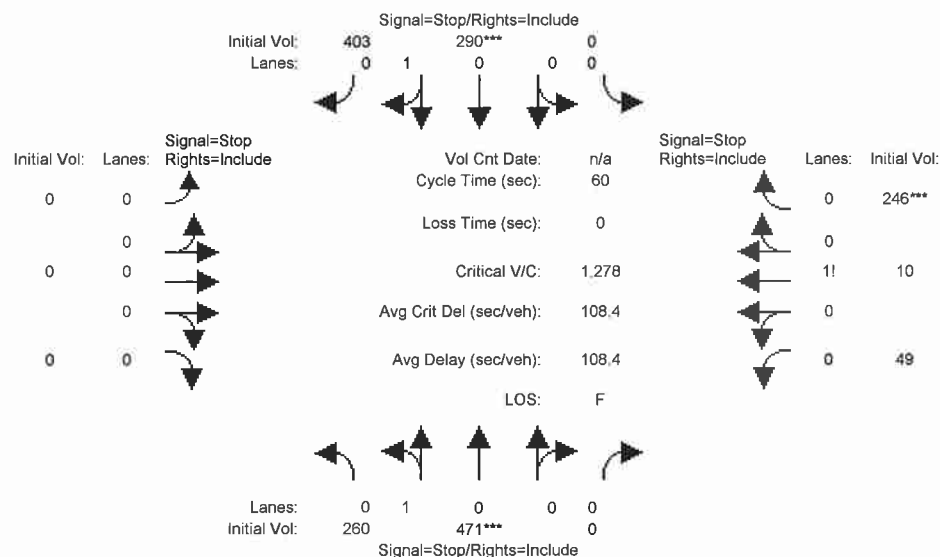
Intersection #17: Barrett Dr./Cedar Ravine Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	10	0	10	10	180	0	0	400	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	10	0	10	10	180	0	0	400	10
Added Vol:	0	0	0	1	0	11	4	2	0	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	11	0	21	14	182	0	0	407	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	12	0	22	15	192	0	0	428	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	12	0	22	15	192	0	0	428	11
Critical Gap Module:												
Critical Gp:xxxxx	xxxx	xxxx	xxxx	6.4	6.5	6.2	4.1	xxxx	xxxx	xxxx	xxxx	xxxx
FollowUpTim:xxxxx	xxxx	xxxx	xxxx	3.5	4.0	3.3	2.2	xxxx	xxxx	xxxx	xxxx	xxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxx	655	655	434	439	xxxx	xxxx	xxxx	xxxx	xxxx
Potent Cap.:	xxxx	xxxx	xxxx	434	388	626	1132	xxxx	xxxx	xxxx	xxxx	xxxx
Move Cap.:	xxxx	xxxx	xxxx	430	383	626	1132	xxxx	xxxx	xxxx	xxxx	xxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	0.00	0.04	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.0	xxxx	xxxx	xxxx	xxxx	xxxx
Control Del:xxxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	8.2	xxxx	xxxx	xxxx	xxxx	xxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxx	xxxx	541	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:xxxxx	xxxx	xxxx	xxxx	xxxx	0.2	xxxx	0.0	xxxx	xxxx	xxxx	xxxx	xxxx
Shrd ConDel:xxxxx	xxxx	xxxx	xxxx	xxxx	12.1	xxxx	8.2	xxxx	xxxx	xxxx	xxxx	xxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx				12.1		xxxxxx			xxxxxx		
ApproachLOS:	*				B		*			*		

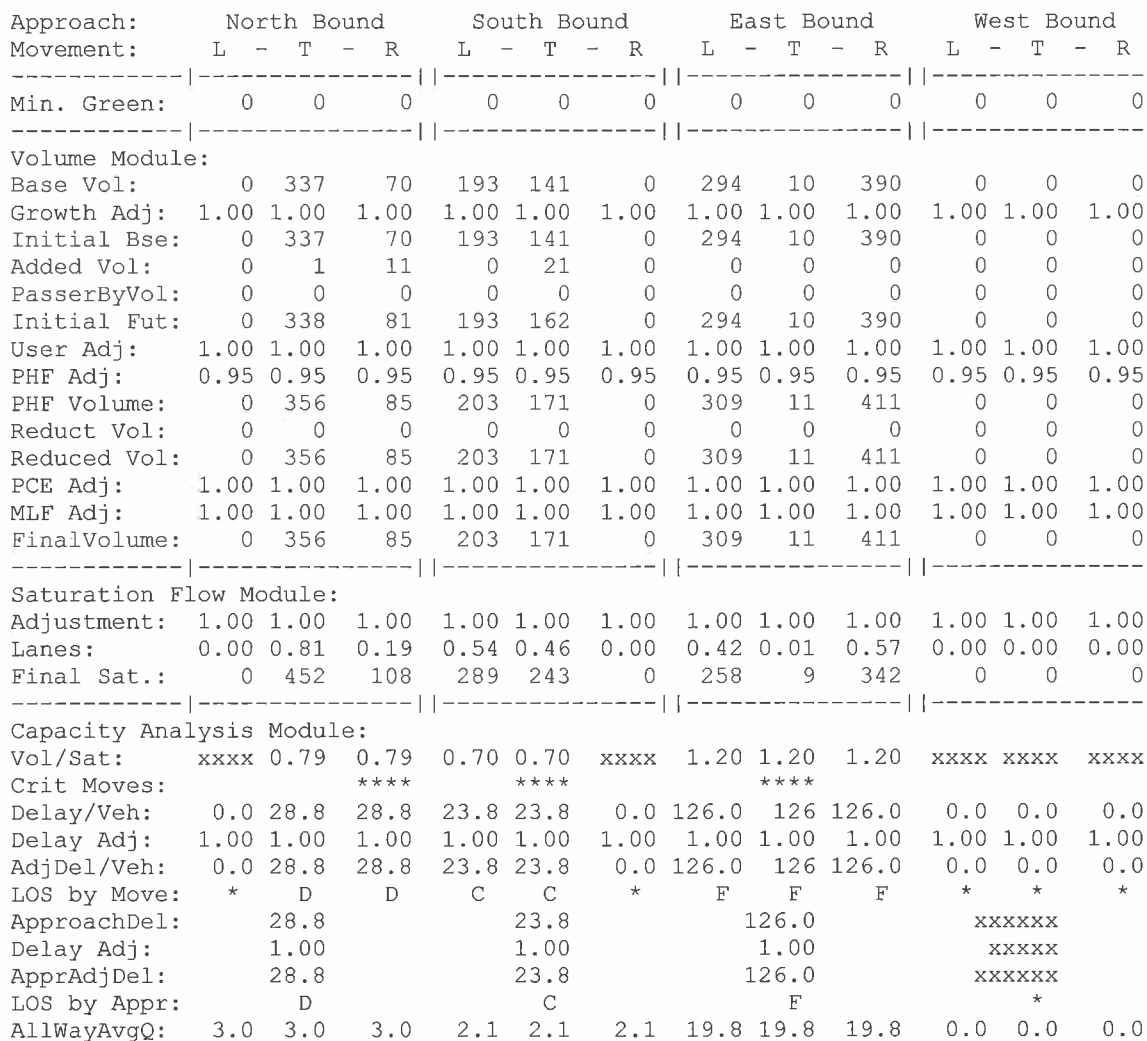
Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM + Project

Intersection #1: Point View Dr./US 50 WB Ramps



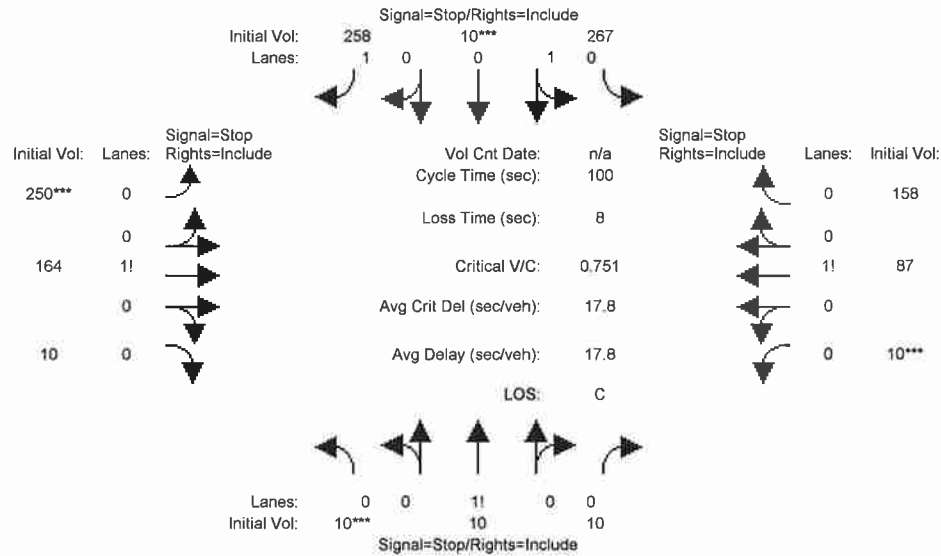
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	260	470	0	0	288	403	0	0	0	30	10	246
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	260	470	0	0	288	403	0	0	0	30	10	246
Added Vol:	0	1	0	0	2	0	0	0	0	19	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	260	471	0	0	290	403	0	0	0	49	10	246
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	274	496	0	0	305	424	0	0	0	52	11	259
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	274	496	0	0	305	424	0	0	0	52	11	259
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	274	496	0	0	305	424	0	0	0	52	11	259
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.64	0.00	0.00	0.42	0.58	0.00	0.00	0.00	0.16	0.03	0.81
Final Sat.:	214	388	0	0	271	377	0	0	0	92	19	460
Capacity Analysis Module:												
Vol/Sat:	1.28	1.28	xxxx	xxxx	1.13	1.13	xxxx	xxxx	xxxx	0.56	0.56	0.56
Crit Moves:	****				****							****
Delay/Veh:	157.1	157	0.0	0.0	97.1	97.1	0.0	0.0	0.0	17.1	17.1	17.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	157.1	157	0.0	0.0	97.1	97.1	0.0	0.0	0.0	17.1	17.1	17.1
LOS by Move:	F	F	*	*	F	F	*	*	*	C	C	C
ApproachDel:	157.1				97.1		xxxxxx			17.1		
Delay Adj:	1.00				1.00		xxxxxx			1.00		
ApprAdjDel:	157.1				97.1		xxxxxx			17.1		
LOS by Appr:	F				F		*			C		
AllWayAvgQ:	24.8	24.8	24.8	15.9	15.9	15.9	0.0	0.0	0.0	1.2	1.2	1.2

Intersection #2: Point View Dr./US 50 EB Ramps



Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM + Project

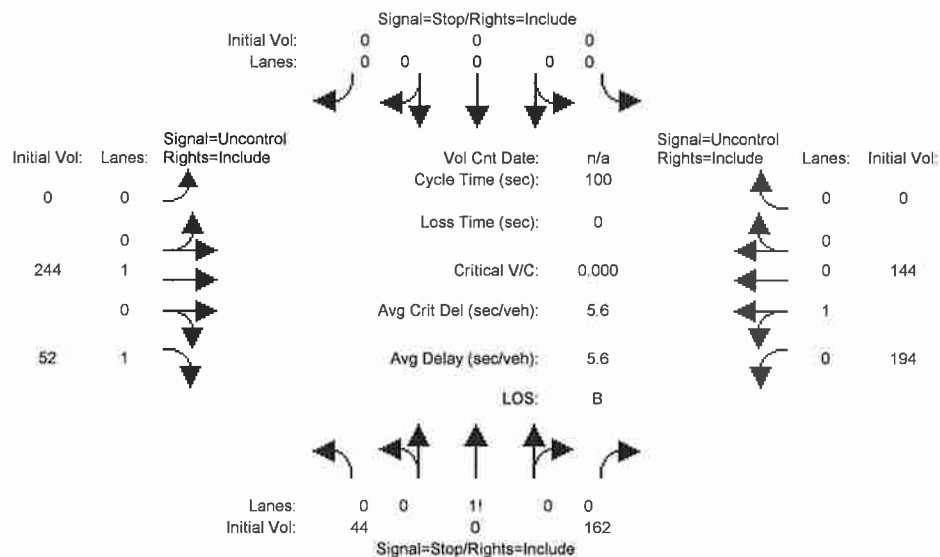
Intersection #3: Point View Dr./Broadway/Monterey Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	10	10	267	10	237	238	160	10	10	80	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	10	267	10	237	238	160	10	10	80	158
Added Vol:	0	0	0	0	0	21	12	4	0	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	10	10	267	10	258	250	164	10	10	87	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	11	11	281	11	272	263	173	11	11	92	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	11	11	281	11	272	263	173	11	11	92	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	11	11	11	281	11	272	263	173	11	11	92	166
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.34	0.33	0.33	0.96	0.04	1.00	0.59	0.39	0.02	0.04	0.34	0.62
Final Sat.:	149	149	149	486	18	603	350	230	14	23	202	367
Capacity Analysis Module:												
Vol/Sat:	0.07	0.07	0.07	0.58	0.58	0.45	0.75	0.75	0.75	0.45	0.45	0.45
Crit Moves:	****			****			****			****		
Delay/Veh:	10.3	10.3	10.3	18.4	18.4	12.9	23.8	23.8	23.8	13.2	13.2	13.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.3	10.3	10.3	18.4	18.4	12.9	23.8	23.8	23.8	13.2	13.2	13.2
LOS by Move:	B	B	B	C	C	B	C	C	C	B	B	B
ApproachDel:	10.3			15.7			23.8			13.2		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.3			15.7			23.8			13.2		
LOS by Appr:	B			C			C			B		
AllWayAvgQ:	0.1	0.1	0.1	1.2	1.2	0.7	2.4	2.4	2.4	0.7	0.7	0.7

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM + Project

Intersection #4: Airport Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	40	0	160	0	0	0	0	230	50	190	120	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	160	0	0	0	0	230	50	190	120	0
Added Vol:	4	0	2	0	0	0	0	14	2	4	24	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	44	0	162	0	0	0	0	244	52	194	144	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	46	0	171	0	0	0	0	257	55	204	152	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	46	0	171	0	0	0	0	257	55	204	152	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx
FollowUpTim:	3.5	4.0	3.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx
Capacity Module:												
Cnflct Vol:	817	817	257	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	312	xxxx	xxxx
Potent Cap.:	349	313	787	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1260	xxxx	xxxx
Move Cap.:	300	256	787	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1260	xxxx	xxxx
Volume/Cap:	0.15	0.00	0.22	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.16	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.6	xxxx	xxxx
Control Del:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	8.4	xxxx	xxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	584	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
SharedQueue:	xxxx	1.7	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.6	xxxx	xxxx
Shrd ConDel:	xxxx	14.8	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	8.4	xxxx	xxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:		14.8		xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:		B		*			*			*		

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Cumulative Plus Project **PHF:** 0.95
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	87	73	84	13	4.2	A	--
	T	53	46	87	4	2.4	A	--
	Subtotal	140	119	85	--	3.5	A	--
SB	T	46	45	96	8	4.2	A	--
	R	26	24	92	4	4.0	A	--
	Subtotal	72	69	96	--	4.1	A	--
WB	L	21	24	114	4	27.5	D	--
	T	3	2	67	2	18.5	C	--
	R	24	23	96	7	22.8	C	--
	Subtotal	47	49	104	--	24.9	C	--
Total		260	237	91	--	8.1	A	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	114	98	86	9	1.6	A	--
	R	95	77	81	3	1.0	A	--
	Subtotal	208	176	85	--	1.3	A	--
SB	L	18	16	89	5	21.5	C	--
	T	49	52	106	5	18.9	C	--
	Subtotal	67	68	101	--	19.6	C	--
EB	L	26	20	77	5	54.1	F	--
	T	3	3	100	2	92.1	F	--
	R	101	88	87	10	105.7	F	--
	Subtotal	129	112	87	--	95.9	F	--
Total		405	355	88	--	34.5	D	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	<u>Lumsden Ranch EIR</u>	HCM:	<u>2000</u>
Scenario:	<u>Cumulative Plus Project</u>	PHF:	<u>0.95</u>
TOD:	<u>PM</u>	Analysis Period:	<u>15 Minutes</u>
		# of Runs:	<u>10</u>

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	8.3	A	--
	T	3	2	67	2	10.7	B	--
	R	3	3	67	1	7.6	A	--
	Subtotal	8	8	100	--	8.8	A	--
SB	L	94	90	96	4	25.2	D	--
	T	3	3	100	2	26.3	D	--
	R	53	47	89	8	8.1	A	--
	Subtotal	149	140	94	--	19.5	C	--
EB	L	124	92	74	4	188.4	F	--
	T	103	85	83	11	186.1	F	--
	R	3	3	67	1	180.5	F	--
	Subtotal	230	179	78	--	187.2	F	--
WB	L	3	3	67	1	30.6	D	--
	T	67	64	96	8	31.7	D	--
	R	82	82	100	8	30.9	D	--
	Subtotal	152	149	97	--	31.2	D	--
Total		539	476	88	--	86.2	F	--

Lumsden Ranch EIR
9: Broadway & Blairs Ln

HCM Unsignalized Intersection Capacity Analysis
Cumulative Conditions - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	750	80	20	380	20	60	10	40	10	10	30
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
Hourly flow rate (vph)	21	789	84	21	400	21	63	11	42	11	11	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	421			874			1353	1337	832	1332	1368	411
vC1, stage 1 conf vol							874	874		453	453	
vC2, stage 2 conf vol							479	463		879	916	
vCu, unblocked vol	421			874			1353	1337	832	1332	1368	411
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			78	97	89	96	96	95
cM capacity (veh/h)	1138			772			291	317	369	249	295	641

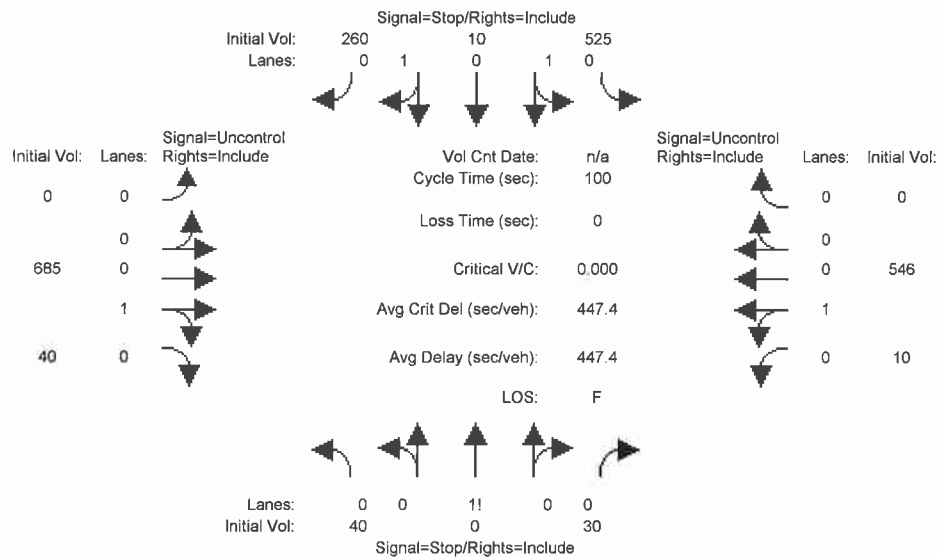
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	21	874	21	421	116	53
Volume Left	21	0	21	0	63	11
Volume Right	0	84	0	21	42	32
cSH	1138	1700	772	1700	318	414
Volume to Capacity	0.02	0.51	0.03	0.25	0.36	0.13
Queue Length 95th (ft)	1	0	2	0	40	11
Control Delay (s)	8.2	0.0	9.8	0.0	22.7	15.0
Lane LOS	A		A		C	B
Approach Delay (s)	0.2		0.5		22.7	15.0
Approach LOS					C	B

Intersection Summary

Average Delay	2.5					
Intersection Capacity Utilization	64.0%			ICU Level of Service	B	
Analysis Period (min)	15					

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM + Project

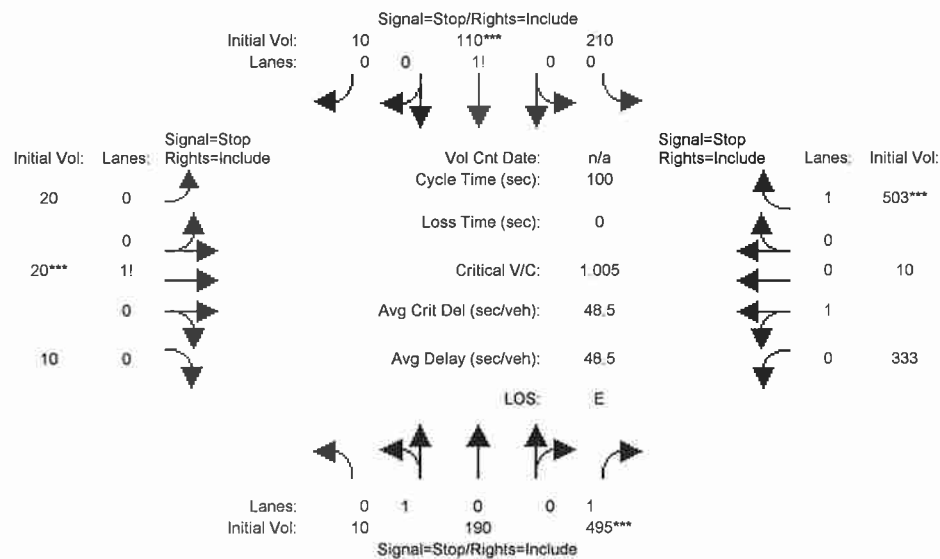
Intersection #10: US 50 EB Ramps/Broadway



Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Volume Module:																				
Base Vol:	40		0		30	520		10		260	0	650		40		10	520		0	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00		1.00		1.00
Initial Bse:	40		0		30	520		10		260	0	650		40		10	520		0	
Added Vol:	0		0		0	5		0		0	0	35		0		0	26		0	
PasserByVol:	0		0		0	0		0		0	0	0		0		0	0		0	
Initial Fut:	40		0		30	525		10		260	0	685		40		10	546		0	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95	0.95		0.95		0.95	0.95		0.95		0.95	0.95	0.95		0.95	0.95		0.95		0.95
PHF Volume:	42		0		32	553		11		274	0	721		42		11	575		0	
Reduct Vol:	0		0		0	0		0		0	0	0		0		0	0		0	
FinalVolume:	42		0		32	553		11		274	0	721		42		11	575		0	
Critical Gap Module:																				
Critical Gp:	7.1	6.5		6.2		7.1	6.5		6.2		xxxxx	xxxxx	xxxxx		4.1	xxxxx	xxxxx		xxxxx	
FollowUpTim:	3.5	4.0		3.3		3.5	4.0		3.3		xxxxx	xxxxx	xxxxx		2.2	xxxxx	xxxxx		xxxxx	
Capacity Module:																				
Cnflct Vol:	1480	1338		742		1354	1359		575		xxxxx	xxxxx	xxxxx		763	xxxxx	xxxxx		xxxxx	
Potent Cap.:	105	154		419		128	150		522		xxxxx	xxxxx	xxxxx		859	xxxxx	xxxxx		xxxxx	
Move Cap.:	47	153		419		117	148		522		xxxxx	xxxxx	xxxxx		859	xxxxx	xxxxx		xxxxx	
Volume/Cap:	0.90	0.00		0.08		4.71	0.07		0.52		xxxxx	xxxxx	xxxxx		0.01	xxxxx	xxxxx		xxxxx	
Level Of Service Module:																				
2Way95thQ:	xxxxx	xxxxx		xxxxx		xxxxx	xxxxx		xxxxx		xxxxx	xxxxx	xxxxx		0.0	xxxxx	xxxxx		xxxxx	
Control Del:	xxxxx	xxxxx		xxxxx		xxxxx	xxxxx		xxxxx		xxxxx	xxxxx	xxxxx		9.2	xxxxx	xxxxx		xxxxx	
LOS by Move:	*	*		*		*	*		*		*	*	*		A	*	*		*	
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxxx	75		xxxxx		118	xxxxx		477		xxxxx	xxxxx	xxxxx		xxxxx	xxxxx	xxxxx		xxxxx	
SharedQueue:	xxxxx	5.2		xxxxx		59.2	xxxxx		3.8		xxxxx	xxxxx	xxxxx		0.0	xxxxx	xxxxx		xxxxx	
Shrd ConDel:	xxxxx	193		xxxxx		1774	xxxxx		23.1		xxxxx	xxxxx	xxxxx		9.2	xxxxx	xxxxx		xxxxx	
Shared LOS:	*	F		*		F	*		C		*	*	*		A	*	*		*	
ApproachDel:		193.0					1187.0				xxxxxxx				xxxxxxx					
ApproachLOS:		F					F				*				*				*	

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM + Project

Intersection #11: Mosquito Rd./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module:

Base Vol:	10	190	460	210	110	10	20	20	10	310	10	500
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	190	460	210	110	10	20	20	10	310	10	500
Added Vol:	0	0	35	0	0	0	0	0	0	23	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	190	495	210	110	10	20	20	10	333	10	503
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	200	521	221	116	11	21	21	11	351	11	529
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	200	521	221	116	11	21	21	11	351	11	529
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	11	200	521	221	116	11	21	21	11	351	11	529

Saturation Flow Module:

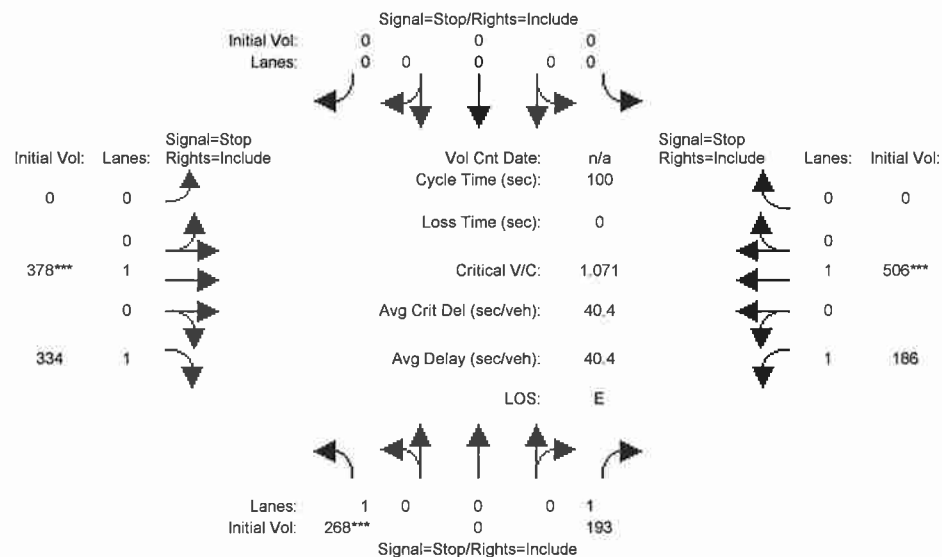
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	0.64	0.33	0.03	0.40	0.40	0.20	0.97	0.03	1.00
Final Sat.:	23	446	519	291	152	14	150	150	75	436	13	527

Capacity Analysis Module:

Vol/Sat:	0.45	0.45	1.00	0.76	0.76	0.76	0.14	0.14	0.14	0.80	0.80	1.01
Crit Moves:			****			****			****			****
Delay/Veh:	16.4	16.4	66.7	31.6	31.6	31.6	13.5	13.5	13.5	36.3	36.3	66.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.4	16.4	66.7	31.6	31.6	31.6	13.5	13.5	13.5	36.3	36.3	66.3
LOS by Move:	C	C	F	D	D	D	B	B	B	E	E	F
ApproachDel:	52.3			31.6			13.5			54.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	52.3			31.6			13.5			54.1		
LOS by Appr:	F			D			B			F		
AllWayAvgQ:	0.8	0.8	8.2	2.6	2.6	2.6	0.1	0.1	0.1	3.2	3.2	8.3

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM + Project

Intersection #12: Cedar Ravine Rd./Main St.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module:												
Base Vol:	260	0	190	0	0	0	0	350	320	180	490	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	260	0	190	0	0	0	0	350	320	180	490	0
Added Vol:	8	0	3	0	0	0	0	28	14	6	16	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	268	0	193	0	0	0	0	378	334	186	506	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	282	0	203	0	0	0	0	398	352	196	533	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	282	0	203	0	0	0	0	398	352	196	533	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	282	0	203	0	0	0	0	398	352	196	533	0

Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	435	0	505	0	0	0	0	495	546	456	497	0

Capacity Analysis Module:												
Vol/Sat:	0.65	xxxx	0.40	xxxx	xxxx	xxxx	xxxx	0.80	0.64	0.43	1.07	xxxx
Crit Moves:	****							****			****	
Delay/Veh:	24.3	0.0	14.2	0.0	0.0	0.0	0.0	33.0	20.1	15.9	87.1	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.3	0.0	14.2	0.0	0.0	0.0	0.0	33.0	20.1	15.9	87.1	0.0
LOS by Move:	C	*	B	*	*	*	*	D	C	C	F	*
ApproachDel:	20.0			xxxxxx				26.9			67.9	
Delay Adj:	1.00			xxxxxx				1.00			1.00	
ApprAdjDel:	20.0			xxxxxx				26.9			67.9	
LOS by Appr:	C			*				D			F	
AllWayAvgQ:	1.6	0.0	0.6	0.0	0.0	0.0	0.0	3.2	1.6	0.7	10.7	0.0

HCM Signalized Intersection Capacity Analysis 13: US 50 & Bedford Rd

Lumsden Ranch EIR
Cumulative Conditions PP - PM Peak Hour

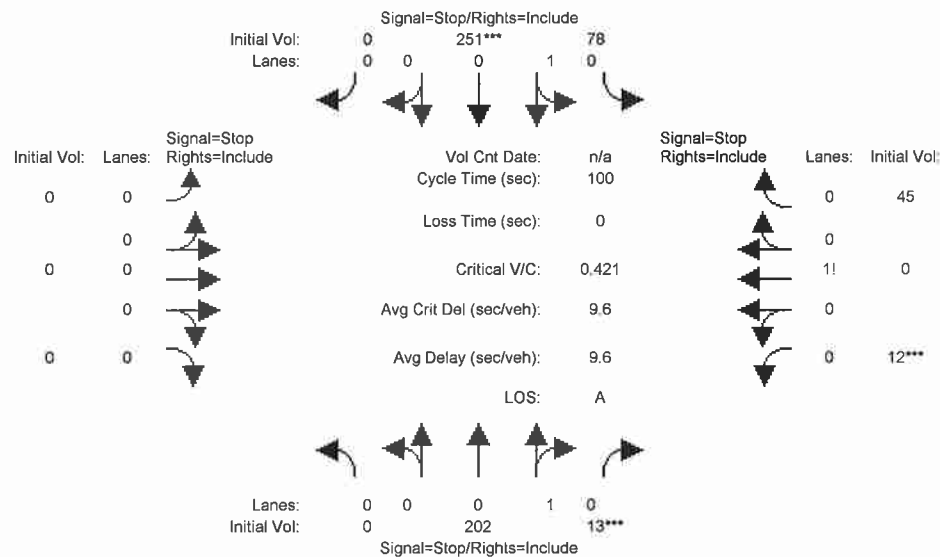
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4820		1770	3356		1681	1707	1583	1770	1714	
Flt Permitted	0.95	1.00		0.95	1.00		0.58	0.60	1.00	0.37	1.00	
Satd. Flow (perm)	1770	4820		1770	3356		1026	1070	1583	684	1714	
Volume (vph)	150	2267	345	90	1656	246	333	61	90	140	62	70
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)	158	2386	363	95	1743	259	351	64	95	147	65	74
RTOR Reduction (vph)	0	17	0	0	10	0	0	0	73	0	35	0
Lane Group Flow (vph)	158	2732	0	95	1992	0	176	239	22	147	105	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2				6
Permitted Phases							2		2	6		
Actuated Green, G (s)	11.0	72.0		8.0	69.0		28.0	28.0	28.0	28.0	28.0	
Effective Green, g (s)	11.0	72.0		8.0	69.0		28.0	28.0	28.0	28.0	28.0	
Actuated g/C Ratio	0.09	0.60		0.07	0.57		0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	162	2892		118	1930		239	250	369	160	400	
v/s Ratio Prot	0.09	c0.57		0.05	c0.59						0.06	
v/s Ratio Perm							0.17	c0.22	0.01	0.21		
v/c Ratio	0.98	0.94		0.81	1.03		0.74	0.96	0.06	0.92	0.26	
Uniform Delay, d1	54.4	22.2		55.2	25.5		42.6	45.4	35.8	44.9	37.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	62.8	7.4		31.5	29.3		18.2	46.6	0.3	52.3	1.6	
Delay (s)	117.2	29.6		86.7	54.8		60.8	92.0	36.1	97.2	39.1	
Level of Service	F	C		F	D		E	F	D	F	D	
Approach Delay (s)		34.3			56.2			70.8			69.0	
Approach LOS		C			E			E			E	

Intersection Summary

HCM Average Control Delay	47.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Cumulative PM + Project

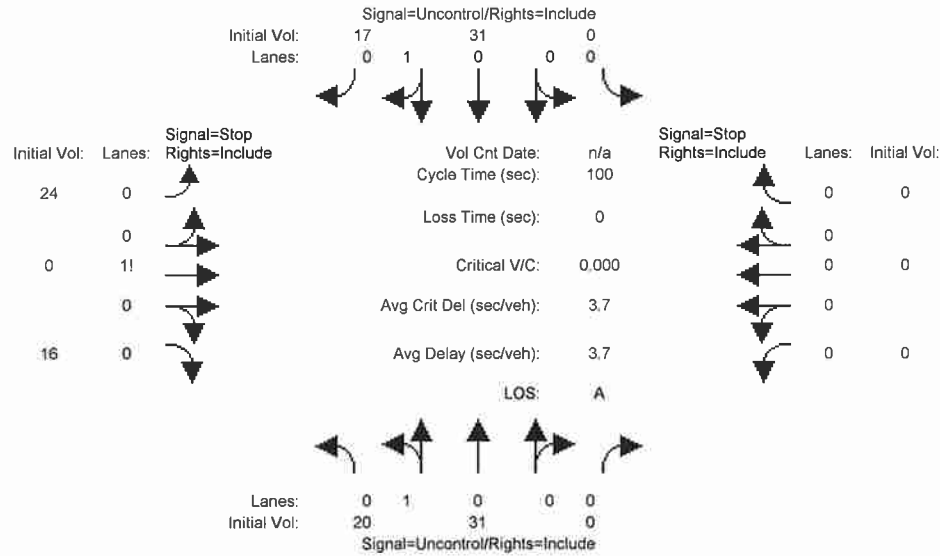
Intersection #14: Cedar Ravine Rd./Country Club Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	200	10	70	250	0	0	0	0	10	0	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	200	10	70	250	0	0	0	0	10	0	40
Added Vol:	0	2	3	8	1	0	0	0	0	2	0	5
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	202	13	78	251	0	0	0	0	12	0	45
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	213	14	82	264	0	0	0	0	13	0	47
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	213	14	82	264	0	0	0	0	13	0	47
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	213	14	82	264	0	0	0	0	13	0	47
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.94	0.06	0.24	0.76	0.00	0.00	0.00	0.00	0.21	0.00	0.79
Final Sat.:	0	763	49	195	628	0	0	0	0	149	0	558
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.28	0.28	0.42	0.42	xxxx	xxxx	xxxx	xxxx	0.08	xxxx	0.08
Crit Moves:			****		****							
Delay/Veh:	0.0	9.0	9.0	10.3	10.3	0.0	0.0	0.0	0.0	8.0	0.0	8.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.0	9.0	10.3	10.3	0.0	0.0	0.0	0.0	8.0	0.0	8.0
LOS by Move:	*	A	A	B	B	*	*	*	*	A	*	A
ApproachDel:		9.0			10.3		xxxxxx				8.0	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		9.0			10.3		xxxxxx				8.0	
LOS by Appr:		A			B		*				A	
AllWayAvgQ:	0.4	0.4	0.4	0.7	0.7	0.7	0.0	0.0	0.0	0.1	0.1	0.1

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM + Project

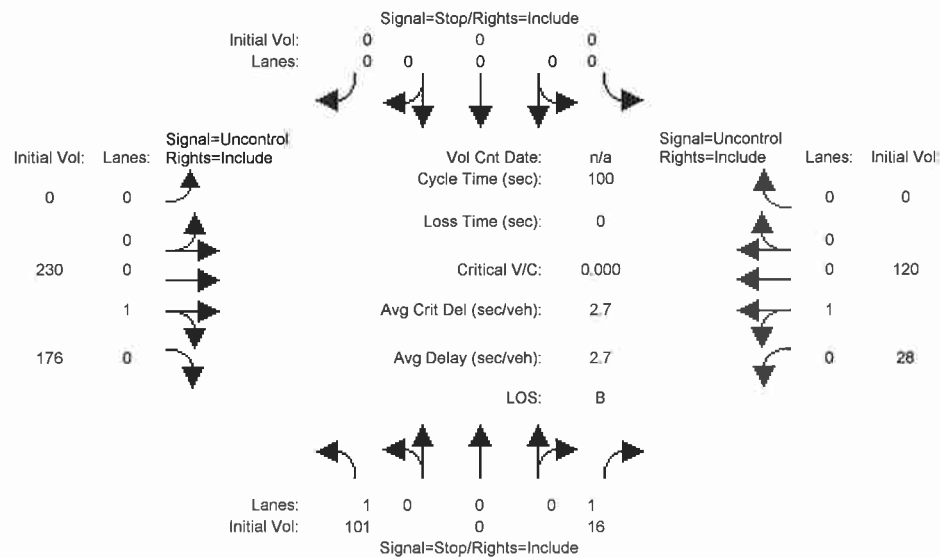
Intersection #15: Country Club Dr./Barrett Dr.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	10	30	0	0	30	10	20	0	10	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	30	0	0	30	10	20	0	10	0	0	0
Added Vol:	10	1	0	0	1	7	4	0	6	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	20	31	0	0	31	17	24	0	16	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	21	33	0	0	33	18	25	0	17	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	21	33	0	0	33	18	25	0	17	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	51	xxxx	xxxxx	xxxx	xxxx	xxxxx	116	116	42	xxxx	xxxx	xxxxx
Potent Cap.:	1569	xxxx	xxxxx	xxxx	xxxx	xxxxx	885	778	1035	xxxx	xxxx	xxxxx
Move Cap.:	1569	xxxx	xxxxx	xxxx	xxxx	xxxxx	875	767	1035	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	0.00	0.02	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	933	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	7.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxxx	9.0	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx				9.0		xxxxxx		
ApproachLOS:	*			*				A		*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM + Project

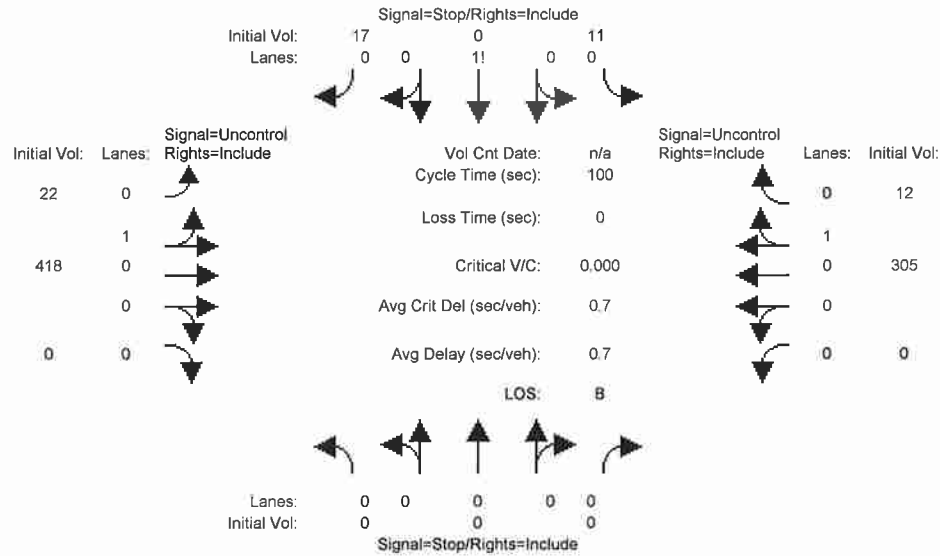
Intersection #16: Canyon View Dr./Broadway



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	230	0	0	120	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	230	0	0	120	0
Added Vol:	101	0	16	0	0	0	0	0	176	28	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	101	0	16	0	0	0	0	230	176	28	120	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	106	0	17	0	0	0	0	242	185	29	126	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	106	0	17	0	0	0	0	242	185	29	126	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	520	xxxx	335	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	427	xxxx	xxxxx
Potent Cap.:	520	xxxx	712	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1143	xxxx	xxxxx
Move Cap.:	509	xxxx	712	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1143	xxxx	xxxxx
Volume/Cap:	0.21	xxxx	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.8	xxxx	0.1	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	13.9	xxxx	10.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx
LOS by Move:	B	*	B	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT		LT - LTR - RT				LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	13.4			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	B			*			*			*		

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM + Project

Intersection #17: Barrett Dr./Cedar Ravine Rd.



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	10	0	10	10	410	0	0	300	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	10	0	10	10	410	0	0	300	10
Added Vol:	0	0	0	1	0	7	12	8	0	0	5	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	11	0	17	22	418	0	0	305	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	12	0	18	23	440	0	0	321	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	12	0	18	23	440	0	0	321	13
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflct Vol:	xxxx	xxxx	xxxxx	814	814	327	334	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	350	315	719	1237	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	345	309	719	1237	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	0.00	0.02	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	504	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	12.6	xxxxx	8.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx				12.6		xxxxxx			xxxxxx		
ApproachLOS:	*				B		*			*		

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB Off Ramp
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1692	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	501	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1692	501	vph
Peak-hour factor, PHF	0.95	0.95	
Peak 15-min volume, v15	445	132	v
Trucks and buses	6	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1941	543	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 1941 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1941	4500	No
v_{12}	1941	4400	No
$v_{FO} = v_F - v_R$	1398	4500	No
v_R	543	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.9 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.347$	
Space mean speed in ramp influence area,	$S_R = 50.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.5$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1100	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	543	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	254	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1100	543	254	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	289	143	67	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1262	589	275	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1262 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1262	4500	No
v_{12}	1262	4400	No
$v_{FO} = v_F - v_R$	673	4500	No
v_R	589	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.3 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.351$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.4$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.4$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Point View EB ON
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	557	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	254	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	543	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	557	254	543	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	147	67	143	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	639	275	589	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 639$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	914	4500	No
v_{R12}	914	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.6$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.304$	
	S	
Space mean speed in ramp influence area,	$S = 51.1$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 51.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	361	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1191	361	270	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	313	95	71	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1367	391	293	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1367 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1367	4500	No
v_{12}	1367	4400	No
$v_{FO} = v_F - v_R$	976	4500	No
v_R	391	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.333$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	0	
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Schnell School EB ON
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	830	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	270	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	361	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	830	270	361	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	218	71	95	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	952	293	391	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 952 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1245	4500	No
v_{R12}	1245	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 13.0 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.306$
 S
 Space mean speed in ramp influence area, $S_R = 51.0 \text{ mph}$
 S
 Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$
 S
 Space mean speed for all vehicles, $S = 51.0 \text{ mph}$

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Broadway EB Off Ramp
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2497	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	795	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2497	795		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	657	209		v
Trucks and buses	6	2		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.917	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2865	862	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2865 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2865	4500	No
v_{12}	2865	4400	No
$v_{FO} = v_F - v_R$	2003	4500	No
v_R	862	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 26.8 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.376$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.1$	mph
	R	
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 50.1$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Point View EB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1650	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	694	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	284	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1650	694	284	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	434	183	75	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1893	752	308	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1893 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1893	4500	No
v_{12}	1893	4400	No
$v_{FO} = v_F - v_R$	1141	4500	No
v_R	752	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.366$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.2$	mph
	S	
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.2$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Point View EB ON
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	956	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	284	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	694	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	956	284	694	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	252	75	183	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1097	308	752	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1097$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1405	4500	No
v_{R12}	1405	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 14.4$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.310$
 S
 Space mean speed in ramp influence area, $S = 51.0$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 51.0$ mph

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E-mail:

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Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 EB
 Junction: Schnell School EB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1702	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	492	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	440	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1702	492	440	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	448	129	116	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1953	533	477	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1953 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1953	4500	No
v_{12}	1953	4400	No
$v_{FO} = v_F - v_R$	1420	4500	No
v_R	533	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 19.2 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.346$	
	S	
Space mean speed in ramp influence area,	$S = 50.5$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 50.5$	mph

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Merge Analysis

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 Date performed: 9/10/2007
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 Freeway/Dir of Travel: US 50 EB
 Junction:
 Jurisdiction: Schnell School EB ON
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1210	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	440	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	492	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1210	440	492	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	318	116	129	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1388	477	533	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1388 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1865	4500	No
v_{R12}	1865	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.317$
 S
 Space mean speed in ramp influence area, $S_R = 50.9 \text{ mph}$
 S
 Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$
 S
 Space mean speed for all vehicles, $S = 50.9 \text{ mph}$

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Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1924	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	460	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1924	280	460	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	506	74	121	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2208	304	499	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2208 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2208	4500	No
v_{12}	2208	4400	No
$v_{FO} = v_F - v_R$	1904	4500	No
v_R	304	2100	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 22.0 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.325$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 50.8$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

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 Date performed: 9/10/2007
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 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1644	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	460	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	280	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1644	460	280	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	433	121	74	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1886	499	304	pcph

Estimation of V12 Merge Areas

$$\begin{aligned}
 L &= \text{(Equation 25-2 or 25-3)} \\
 EQ & \\
 P &= 1.000 \quad \text{Using Equation } 0 \\
 FM & \\
 v_{12} &= v_F (P_{FM}) = 1886 \quad \text{pc/h}
 \end{aligned}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2385	4500	No
v _{R12}	2385	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 22.0 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.345	
	S	
Space mean speed in ramp influence area,	S _R = 50.5	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 50.5	mph

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Diverge Analysis

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 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1267	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	713	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1267	316	713	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	333	83	188	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1454	343	773	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1454 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1454	4500	No
v_{12}	1454	4400	No
$v_{FO} = v_F - v_R$	1111	4500	No
v_R	343	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.329$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.7$	mph

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Merge Analysis

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 Date performed: 9/10/2007
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 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	951	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	713	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	316	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	951	713	316	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	250	188	83	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1091	773	343	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1091 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1864	4500	No
v _{R12}	1864	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.317	
	S	
Space mean speed in ramp influence area,	S = 50.9	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 50.9	mph

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Diverge Analysis

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 Date performed: 9/10/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1664	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	440	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1664	180	440	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	438	47	116	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1909	195	477	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1909 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1909	4500	No
v_{12}	1909	4400	No
$v_{FO} = v_F - v_R$	1714	4500	No
v_R	195	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.7 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.316$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.9$	mph
	S	
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
	S	
Space mean speed for all vehicles,	$S = 50.9$	mph

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Merge Analysis

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 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1484	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	440	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	180	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1484	440	180	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	391	116	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1703	477	195	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1703 \quad pc/h$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2180	4500	No
v _{R12}	2180	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.4 \quad pc/mi/ln$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.329	
	S	
Space mean speed in ramp influence area,	S _R = 50.7	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone:
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Fax:

Diverge Analysis

Analyst: Matt Kittelson
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 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1802	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	540	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1802	350	540	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	474	92	142	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2068	379	585	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2068 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2068	4500	No
v_{12}	2068	4400	No
$v_{FO} = v_F - v_R$	1689	4500	No
v_R	379	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 20.8 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.332$	
	S	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S_O = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 50.7$	mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Mosquito WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1452	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	540	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	875	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1452	540	350	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	382	142	92	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1666	585	379	pcph

Estimation of V12 Merge Areas

$$\begin{aligned}
 L &= \text{(Equation 25-2 or 25-3)} \\
 EQ & \\
 P &= 1.000 \quad \text{Using Equation 0} \\
 FM & \\
 v_{12} &= v_F (P_{FM}) = 1666 \text{ pc/h}
 \end{aligned}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2251	4500	No
v _{R12}	2251	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.340	
	S	
Space mean speed in ramp influence area,	S = 50.6	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 50.6	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1175	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	230	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	673	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1175	305	673	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	309	80	177	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1348	331	730	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1348 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1348	4500	No
v_{12}	1348	4400	No
$v_{FO} = v_F - v_R$	1017	4500	No
v_R	331	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.8 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.328$	
	S	
Space mean speed in ramp influence area,	$S = 50.7$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	O	
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Point View WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	870	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	673	vph
Length of first accel/decel lane	320	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	305	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	870	673	305	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	229	177	80	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	998	730	331	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 998$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1728	4500	No
v_{R12}	1728	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.6$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.314$	
	S	
Space mean speed in ramp influence area,	$S = 50.9$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB OFF
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1543	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	220	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	439	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1543	180	439	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	406	47	116	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1770	195	476	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 1770 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1770	4500	No
v_{12}	1770	4400	No
$v_{FO} = v_F - v_R$	1575	4500	No
v_R	195	2100	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 17.5 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D = 0.316$	
	S	
Space mean speed in ramp influence area,	$S = 50.9$	mph
	R	
Space mean speed in outer lanes,	$S = \text{N/A}$	mph
	0	
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Matt Kittelson
 Agency/Co.: Fehr & Peers
 Date performed: 9/10/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: US 50 WB
 Junction: Schnell School WB ON
 Jurisdiction:
 Analysis Year: Cum (2025) Plus Project
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1363	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	439	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	180	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1363	439	180	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	359	116	47	v
Trucks and buses	6	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.917	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1564	476	195	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1564$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2040	4500	No
v_{R12}	2040	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.324$	
	S	
Space mean speed in ramp influence area,	$S = 50.8$	mph
	R	
Space mean speed in outer lanes,	$S = N/A$	mph
	O	
Space mean speed for all vehicles,	$S = 50.8$	mph

Existing Plus Project Mitigation

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #5 Schnell School Rd/US 50 WB Ramps

Cycle (sec): 100 Critical Vol./Cap.(X): 0.784
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.2
 Optimal Cycle: 0 Level Of Service: C

Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Stop Sign Stop Sign Stop Sign Stop Sign
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 0 1 0 0 0 0 0 0 0 0 0 0

Volume Module:

Base Vol: 121 217 0 0 105 164 0 0 0 69 0 28
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 121 217 0 0 105 164 0 0 0 69 0 28
 Added Vol: 90 4 0 0 1 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 211 221 0 0 106 164 0 0 0 69 0 28
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74
 PHF Volume: 285 299 0 0 143 222 0 0 0 93 0 38
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 285 299 0 0 143 222 0 0 0 93 0 38
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 285 299 0 0 143 222 0 0 0 93 0 38

Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Lanes: 0.49 0.51 0.00 0.00 0.39 0.61 0.00 0.00 0.00 0.71 0.00 0.29
 Final Sat.: 364 381 0 0 299 463 0 0 0 402 0 163

Capacity Analysis Module:

Vol/Sat: 0.78 0.78 xxxx 0.48 0.48 xxxx xxxx 0.23 xxxx 0.23
 Crit Moves: ****
 Delay/Veh: 22.3 22.3 0.0 0.0 11.5 11.5 0.0 0.0 0.0 10.4 0.0 10.4
 Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 22.3 22.3 0.0 0.0 11.5 11.5 0.0 0.0 0.0 10.4 0.0 10.4
 LOS by Move: C C * * B B * * * B * B
 ApproachDel: 22.3 11.5 xxxxxx 10.4
 Delay Adj: 1.00 1.00 xxxxxx 1.00
 ApprAdjDel: 22.3 11.5 xxxxxx 10.4
 LOS by Appr: C B * B
 AllWayAvgQ: 3.0 3.0 3.0 0.8 0.8 0.8 0.0 0.0 0.0 0.2 0.2 0.2

Note: Queue reported is the number of cars per lane.

2

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #6 Schnell School Rd/US 50 EB Ramps

Cycle (sec): 100 Critical Vol./Cap.(X): 0.839

Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.2

Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	0	0	1	0	0	0	0

Volume Module:

Base Vol:	0	200	73	17	157	0	138	2	121	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	200	73	17	157	0	138	2	121	0	0	0
Added Vol:	0	94	0	0	1	0	0	0	31	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	294	73	17	158	0	138	2	152	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PHF Volume:	0	445	111	26	239	0	209	3	230	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	445	111	26	239	0	209	3	230	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	445	111	26	239	0	209	3	230	0	0	0

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.80	0.20	0.10	0.90	0.00	0.99	0.01	1.00	0.00	0.00	0.00
Final Sat.:	0	531	132	57	531	0	490	7	594	0	0	0

Capacity Analysis Module:

Vol/Sat:	xxxx	0.84	0.84	0.45	0.45	xxxx	0.43	0.43	0.39	xxxx	xxxx	xxxx
Crit Moves:	****			****		****				****		
Delay/Veh:	0.0	29.1	29.1	13.4	13.4	0.0	14.5	14.5	11.9	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	29.1	29.1	13.4	13.4	0.0	14.5	14.5	11.9	0.0	0.0	0.0
LOS by Move:	*	D	D	B	B	*	B	B	B	*	*	*
ApproachDel:	29.1			13.4			13.1			xxxxxx		
Delay Adj:	1.00			1.00			1.00			xxxxxx		
ApprAdjDel:	29.1			13.4			13.1			xxxxxx		
LOS by Appr:	D			B			B			*		
AllWayAvgQ:	3.8	3.8	3.8	0.7	0.7	0.7	0.7	0.7	0.6	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

3

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 US 50 EB Ramps/Broadway

Cycle (sec): 100 Critical Vol./Cap.(X): 0.790
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.6
Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Stop Sign	Stop Sign
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 1! 0 1	0 1 0 1 0	0 0 0 1 0	0 0 1 0 0

Volume Module:

Base Vol:	0	0	24	137	0	210	0	314	22	0	396	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	24	137	0	210	0	314	22	0	396	0
Added Vol:	0	0	0	1	0	0	0	14	0	0	33	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	24	138	0	210	0	328	22	0	429	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	0	27	155	0	236	0	369	25	0	482	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	27	155	0	236	0	369	25	0	482	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	27	155	0	236	0	369	25	0	482	0

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	2.00	0.79	0.21	1.00	0.00	0.94	0.06	0.00	1.00	0.00
Final Sat.:	0	-488	1420	380	99	561	0	557	37	0	610	0

Capacity Analysis Module:

Vol/Sat:	xxxx	0.00	0.02	0.41	0.00	0.42	xxxx	0.66	0.66	xxxx	0.79	xxxx
Crit Moves:			****			****			****		****	
Delay/Veh:	0.0	9.1	9.4	14.5	14.5	12.9	0.0	19.0	19.0	0.0	26.1	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.1	9.4	14.5	14.5	12.9	0.0	19.0	19.0	0.0	26.1	0.0
LOS by Move:	*	A	A	B	B	B	*	C	C	*	D	*
ApproachDel:		9.5			13.6			19.0			26.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.5			13.6			19.0			26.1	
LOS by Appr:		A			B			C			D	
AllWayAvgQ:	0.0	0.0	0.0	0.6	0.6	0.6	1.7	1.7	1.7	2.9	2.9	2.9

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis
10: Broadway & US 50 EB Off Ramp

Existing Plus Project - PM Peak Hour
9/20/2007

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↖			↖			↖		↖	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		0.95	0.95	
Frt		0.99			1.00			0.94		1.00	0.86	
Flt Protected		1.00			1.00			0.97		0.95	1.00	
Satd. Flow (prot)		1847			1860			1709		1681	1515	
Flt Permitted		1.00			0.99			0.42		0.95	1.00	
Satd. Flow (perm)		1847			1839			736		1681	1515	
Volume (vph)	0	328	22	12	429	0	34	0	24	138	9	210
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)	0	345	23	13	452	0	36	0	25	145	9	221
RTOR Reduction (vph)	0	3	0	0	0	0	0	21	0	0	171	0
Lane Group Flow (vph)	0	365	0	0	465	0	0	40	0	145	59	0
Turn Type			Perm				Perm			Split		
Protected Phases		4			8			2		6	6	
Permitted Phases				8			2					
Actuated Green, G (s)		18.8			18.8			7.6		11.3	11.3	
Effective Green, g (s)		18.8			18.8			7.6		11.3	11.3	
Actuated g/C Ratio		0.38			0.38			0.15		0.23	0.23	
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)		699			696			113		382	344	
v/s Ratio Prot		0.20								c0.09	0.04	
v/s Ratio Perm					c0.25			c0.05				
v/c Ratio		0.52			0.67			0.35		0.38	0.17	
Uniform Delay, d1		12.0			12.9			18.8		16.2	15.4	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.7			2.4			1.9		0.6	0.2	
Delay (s)		12.7			15.3			20.7		16.9	15.7	
Level of Service		B			B			C		B	B	
Approach Delay (s)		12.7			15.3			20.7			16.1	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay		15.0										
HCM Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		49.7										
Intersection Capacity Utilization		56.1%										
Analysis Period (min)		15										
c Critical Lane Group												

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

 Intersection #11 Mosquito Rd./Broadway

Cycle (sec): 70 Critical Vol./Cap.(X): 0.557
 Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 18.2
 Optimal Cycle: 50 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

Volume Module:

Base Vol:	4	69	271	62	188	3	3	3	4	288	28	324
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	69	271	62	188	3	3	3	4	288	28	324
Added Vol:	0	0	14	0	0	0	0	0	0	29	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	69	285	62	188	3	3	3	4	317	28	328
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	4	78	320	70	211	3	3	3	4	356	31	369
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	78	320	70	211	3	3	3	4	356	31	369
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	78	320	70	211	3	3	3	4	356	31	369

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.99	0.99	0.99	0.93	0.93	0.93	0.96	0.96	0.85
Lanes:	0.05	0.95	1.00	0.25	0.74	0.01	0.30	0.30	0.40	0.92	0.08	1.00
Final Sat.:	104	1791	1615	459	1392	22	531	531	708	1669	147	1615

Capacity Analysis Module:

Vol/Sat:	0.04	0.04	0.20	0.15	0.15	0.15	0.01	0.01	0.01	0.21	0.21	0.23
Crit Moves:	****			****			****			****		
Green/Cycle:	0.08	0.08	0.49	0.27	0.27	0.27	0.01	0.01	0.01	0.41	0.41	0.41
Volume/Cap:	0.56	0.56	0.41	0.56	0.56	0.56	0.56	0.52	0.52	0.52	0.52	0.56
Delay/Veh:	35.8	35.8	11.8	23.2	23.2	23.2	64.7	55.5	55.5	16.2	16.2	16.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.8	35.8	11.8	23.2	23.2	23.2	64.7	55.5	55.5	16.2	16.2	16.9
LOS by Move:	D	D	B	C	C	C	E	E	E	B	B	B
HCM2kAvgQ:	3	3	5	6	6	6	1	1	1	7	7	7

 Note: Queue reported is the number of cars per lane.

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #5 Schnell School Rd/US 50 WB Ramps

Cycle (sec): 100 Critical Vol./Cap.(X): 0.586

Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.6

Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	0	0	0	0	0	0	1	0

Volume Module:

Base Vol:	186	185	0	0	97	96	0	0	0	56	0	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	186	185	0	0	97	96	0	0	0	56	0	15
Added Vol:	59	3	0	0	5	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	245	188	0	0	102	96	0	0	0	56	0	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	266	204	0	0	111	104	0	0	0	61	0	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	266	204	0	0	111	104	0	0	0	61	0	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	266	204	0	0	111	104	0	0	0	61	0	16

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.57	0.43	0.00	0.00	0.52	0.48	0.00	0.00	0.00	0.79	0.00	0.21
Final Sat.:	455	349	0	0	419	395	0	0	0	484	0	130

Capacity Analysis Module:

Vol/Sat:	0.59	0.59	xxxx	xxxx	0.26	0.26	xxxx	xxxx	xxxx	0.13	xxxx	0.13
Crit Moves:	****			****			****			****		
Delay/Veh:	13.4	13.4	0.0	0.0	8.8	8.8	0.0	0.0	0.0	9.0	0.0	9.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.4	13.4	0.0	0.0	8.8	8.8	0.0	0.0	0.0	9.0	0.0	9.0
LOS by Move:	B	B	*	*	A	A	*	*	*	A	*	A
ApproachDel:	13.4				8.8		xxxxxx			9.0		
Delay Adj:	1.00				1.00		xxxxxx			1.00		
ApprAdjDel:	13.4				8.8		xxxxxx			9.0		
LOS by Appr:	B				A		*			A		
AllWayAvgQ:	1.3	1.3	1.3	0.3	0.3	0.3	0.0	0.0	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

 Intersection #6 Schnell School Rd/US 50 EB Ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.891
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.3
 Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Lanes:	0	0	0	1	0	0	0	1	0	0	1	0	0

Volume Module:

Base Vol:	0	272	212	17	136	0	99	0	244	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	272	212	17	136	0	99	0	244	0	0	0
Added Vol:	0	62	0	0	5	0	0	0	102	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	334	212	17	141	0	99	0	346	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	371	236	19	157	0	110	0	384	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	371	236	19	157	0	110	0	384	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	371	236	19	157	0	110	0	384	0	0	0

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.61	0.39	0.11	0.89	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	416	264	61	503	0	505	0	606	0	0	0

Capacity Analysis Module:

Vol/Sat:	xxxx	0.89	0.89	0.31	0.31	xxxx	0.22	xxxx	0.63	xxxx	xxxx	xxxx
Crit Moves:			****		****				****			
Delay/Veh:	0.0	34.9	34.9	11.6	11.6	0.0	11.5	0.0	17.1	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	34.9	34.9	11.6	11.6	0.0	11.5	0.0	17.1	0.0	0.0	0.0
LOS by Move:	*	D	D	B	B	*	B	*	C	*	*	*
ApproachDel:		34.9			11.6			15.8		xxxxxx		
Delay Adj:		1.00			1.00			1.00		xxxxxx		
ApprAdjDel:		34.9			11.6			15.8		xxxxxx		
LOS by Appr:		D			B			C		*		
AllWayAvgQ:	5.0	5.0	5.0	0.4	0.4	0.4	0.3	0.3	1.5	0.0	0.0	0.0

 Note: Queue reported is the number of cars per lane.

Lumsden Ranch EIR

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 US 50 EB Ramps/Broadway

Cycle (sec): 100 Critical Vol./Cap. (X): 1.179
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 69.9
 Optimal Cycle: 0 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	0	1	0	0	0	0	1	0	0

Volume Module:

Base Vol:	36	0	32	158	11	255	0	522	40	12	465	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	36	0	32	158	11	255	0	522	40	12	465	0
Added Vol:	0	0	0	5	0	0	0	35	0	0	26	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	0	32	163	11	255	0	557	40	12	491	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	38	0	34	173	12	271	0	593	43	13	522	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	38	0	34	173	12	271	0	593	43	13	522	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	38	0	34	173	12	271	0	593	43	13	522	0

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.76	0.24	1.00	0.00	0.93	0.07	0.02	0.98	0.00
Final Sat.:	408	-408	840	336	106	510	0	503	36	13	522	0

Capacity Analysis Module:

Vol/Sat:	0.09	0.00	0.04	0.52	0.11	0.53	xxxx	1.18	1.18	1.00	1.00	xxxx
Crit Moves:	****					****		****			****	
Delay/Veh:	12.2	12.2	11.9	19.1	19.1	17.4	0.0	122	121.7	64.7	64.7	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.2	12.2	11.9	19.1	19.1	17.4	0.0	122	121.7	64.7	64.7	0.0
LOS by Move:	B	B	B	C	C	C	*	F	F	F	F	*
ApproachDel:	11.9			18.2				121.7			64.7	
Delay Adj:	1.00			1.00				1.00			1.00	
ApprAdjDel:	11.9			18.2				121.7			64.7	
LOS by Appr:	B			C				F			F	
AllWayAvgQ:	0.1	0.1	0.1	1.0	1.1	1.1	16.8	16.8	16.8	8.2	8.2	8.2

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis
10: Broadway & US 50 EB Off Ramp

Existing Plus Project - PM Peak Hour

9/20/2007

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑		↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		0.95	0.95	
Frt		0.99			1.00			0.94		1.00	0.86	
Flt Protected		1.00			1.00			0.97		0.95	1.00	
Satd. Flow (prot)		1846			1860			1699		1681	1516	
Flt Permitted		1.00			0.98			0.40		0.95	1.00	
Satd. Flow (perm)		1846			1832			692		1681	1516	
Volume (vph)	0	557	40	12	491	0	36	0	32	163	11	255
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)	0	586	42	13	517	0	38	0	34	172	12	268
RTOR Reduction (vph)	0	3	0	0	0	0	0	29	0	0	210	0
Lane Group Flow (vph)	0	625	0	0	530	0	0	43	0	172	70	0
Turn Type			Perm				Perm			Split		
Protected Phases		4			8			2		6	6	
Permitted Phases				8			2					
Actuated Green, G (s)		25.1			25.1			7.7		12.5	12.5	
Effective Green, g (s)		25.1			25.1			7.7		12.5	12.5	
Actuated g/C Ratio		0.44			0.44			0.13		0.22	0.22	
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)		809			802			93		367	331	
v/s Ratio Prot		c0.34								c0.10	0.05	
v/s Ratio Perm					0.29			c0.06				
v/c Ratio		0.77			0.66			0.46		0.47	0.21	
Uniform Delay, d1		13.7			12.7			22.9		19.5	18.4	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		4.6			2.1			3.5		0.9	0.3	
Delay (s)		18.3			14.8			26.4		20.5	18.7	
Level of Service		B			B			C		C	B	
Approach Delay (s)		18.3			14.8			26.4			19.4	
Approach LOS		B			B			C			B	

Intersection Summary

HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

5

Lumsden Ranch EIR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Mosquito Rd./Broadway

Cycle (sec): 70 Critical Vol./Cap.(X): 0.702
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 19.6
Optimal Cycle: 62 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

Volume Module:

Base Vol:	3	183	455	93	106	4	10	14	4	308	9	439
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	183	455	93	106	4	10	14	4	308	9	439
Added Vol:	0	0	35	0	0	0	0	0	0	23	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	183	490	93	106	4	10	14	4	331	9	442
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	3	193	516	98	112	4	11	15	4	348	9	465
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	193	516	98	112	4	11	15	4	348	9	465
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	193	516	98	112	4	11	15	4	348	9	465

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.98	0.98	0.98	0.96	0.96	0.96	0.95	0.95	0.85
Lanes:	0.02	0.98	1.00	0.46	0.52	0.02	0.36	0.50	0.14	0.97	0.03	1.00
Final Sat.:	31	1867	1615	849	967	37	654	915	261	1765	48	1615

Capacity Analysis Module:

Vol/Sat:	0.10	0.10	0.32	0.12	0.12	0.12	0.02	0.02	0.02	0.20	0.20	0.29
Crit Moves:	****			****			****			****		
Green/Cycle:	0.16	0.17	0.57	0.16	0.18	0.18	0.02	0.03	0.03	0.40	0.41	0.41
Volume/Cap:	0.65	0.59	0.56	0.70	0.65	0.65	0.70	0.49	0.49	0.49	0.48	0.70
Delay/Veh:	32.4	29.6	10.1	34.8	31.1	31.1	75.7	39.5	39.5	16.2	15.7	20.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.4	29.6	10.1	34.8	31.1	31.1	75.7	39.5	39.5	16.2	15.7	20.5
LOS by Move:	C	C	B	C	C	C	E	D	D	B	B	C
HCM2kAvgQ:	5	5	7	6	6	6	2	1	1	6	6	10

Note: Queue reported is the number of cars per lane.

Near Term Plus Project Mitigation

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Near Term Plus Project - Mitigation **PHF:** 0.77
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	69	66	96	13	9.8	A	--
	T	72	68	94	3	10.0	A	--
	Subtotal	141	134	95	--	9.9	A	--
SB	T	34	32	94	4	7.9	A	--
	R	53	50	94	5	5.5	A	--
	Subtotal	88	82	93	--	6.4	A	--
WB	L	22	22	100	3	6.2	A	--
	R	9	10	111	3	4.3	A	--
	Subtotal	31	31	100	--	5.6	A	--
Total		260	247	95	--	8.2	A	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	96	93	97	14	6.8	A	--
	R	25	27	108	5	4.7	A	--
	Subtotal	121	120	99	--	6.3	A	--
SB	L	6	5	83	2	6.9	A	--
	T	51	49	94	4	7.8	A	--
	Subtotal	57	54	95	--	7.7	A	--
EB	L	45	42	93	5	9.7	A	--
	R	50	49	98	7	9.9	A	--
	Subtotal	95	92	97	--	9.8	A	--
Total		272	265	97	--	7.8	A	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Near Term Plus Project - Mitigation **PHF:** 0.77
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	0	1	--	1	7.2	A	--
	Subtotal	0	1	0	--	7.2	A	--
SB	L	36	35	97	7	7.3	A	--
	T	1	2	200	1	8.2	A	--
	R	64	62	97	4	6.2	A	--
	Subtotal	101	98	97	--	6.6	A	--
EB	L	61	59	97	8	23.5	C	--
	T	44	42	95	6	21.0	C	--
	R	0	1	--	0	18.0	C	--
	Subtotal	106	102	96	--	22.4	C	--
WB	L	1	1	100	0	12.9	B	--
	T	74	74	100	8	13.2	B	--
	R	59	61	103	9	8.1	A	--
	Subtotal	133	136	102	--	10.9	B	--
Total		341	337	99	--	13.1	B	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Near Term Plus Project Mitigation **PHF:** 0.93
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	66	65	98	5	7.6	A	--
	T	51	51	100	8	8.3	A	--
	Subtotal	117	116	99	--	7.9	A	--
SB	T	28	30	107	5	6.6	A	--
	R	26	28	108	5	4.4	A	--
	Subtotal	54	58	107	--	5.5	A	--
WB	L	15	14	93	4	5.1	A	--
	R	4	4	100	2	3.3	A	--
	Subtotal	19	19	95	--	4.6	A	--
Total		190	192	101	--	6.9	A	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	90	91	101	11	6.6	A	--
	R	58	56	97	7	4.7	A	--
	Subtotal	148	147	99	--	5.9	A	--
SB	L	5	6	120	3	14.3	B	--
	T	38	38	100	8	18.3	C	--
	Subtotal	43	43	100	--	17.8	C	--
EB	L	27	25	93	6	11.9	B	--
	R	94	93	99	9	31.8	D	--
	Subtotal	120	118	98	--	27.5	D	--
Total		312	309	99	--	15.9	C	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Near Term Plus Project Mitigation	PHF:	0.93
TOD:	PM	Analysis Period:	15 Minutes
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	0	0	--	0	0.0	--	--
	T	1	1	100	0	8.7	A	--
	R	1	2	200	1	6.6	A	--
	Subtotal	1	3	300	--	7.5	A	--
SB	L	84	81	96	6	19.2	C	--
	T	3	3	100	1	19.9	C	--
	R	46	46	100	9	6.7	A	--
	Subtotal	132	130	98	--	14.8	B	--
EB	L	88	86	98	8	56.5	F	--
	T	101	96	95	6	53.8	F	--
	R	2	2	100	1	50.7	F	--
	Subtotal	191	183	96	--	55.0	F	--
WB	L	1	1	100	0	24.7	C	--
	T	64	67	105	6	27.3	D	--
	R	60	60	100	8	13.3	B	--
	Subtotal	124	128	103	--	20.8	C	--
	Total	448	444	99	--	33.1	D	--

Cumulative Plus Project Mitigation

ROUNABOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)							1
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	744	0	1212	0.65	13	B	125
South	573	446	969	0.62	15	B	125
East							
West	316	744	807	0.41	13	B	50
All	1633				14	B	

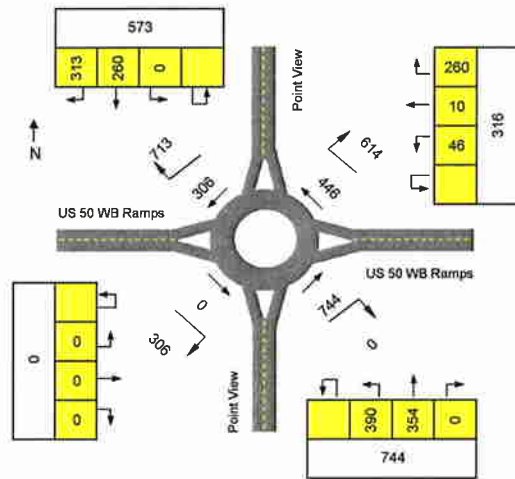
Source: Roundabouts: An Informational Guide (FHWA, 2000), Equations A-8 & A-10

Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



ROUNABOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

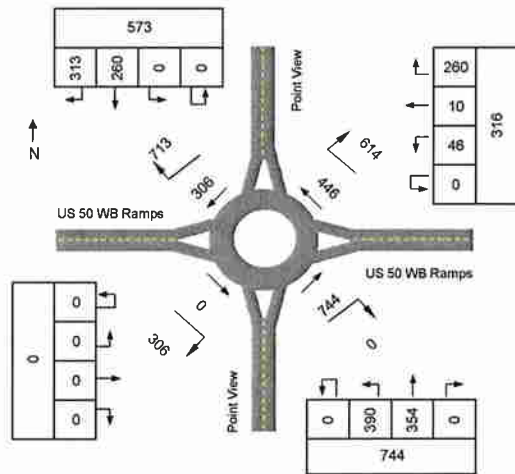
Type of Design							Single-Lane Roundabout
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	744	0	1272	0.62	12	B	100
South	573	446	878	0.69	18	C	150
East							
West	316	744	685	0.49	15	C	75
All	1633				15	B	

Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



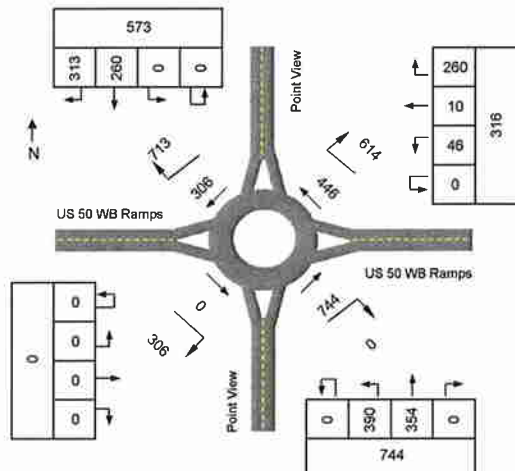
ROUNABOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design							Single-Lane Roundabout
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	744	0	1130	0.69	15	C	150
South	573	446	723	0.83	30	D	225
East							
West	316	744	537	0.62	22	C	100
All	1633				22	C	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Does not account for flared entry lanes or pedestrian effects.

** Assumes a queued vehicle length of 25 feet



ROUNABOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)							1
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	508	293	1052	0.51	12	B	75
South	307	0	1212	0.27	9	A	25
East	543	198	1104	0.52	12	B	75
West							
All	1358				11	B	

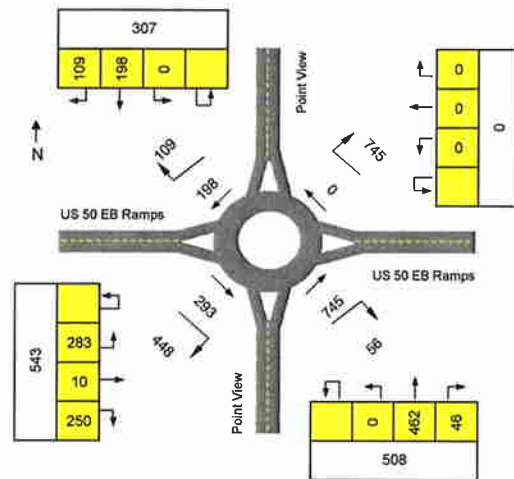
Source: Roundabouts: An Informational Guide (FHWA, 2000), Equations A-8 & A-10

Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



ROUNABOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

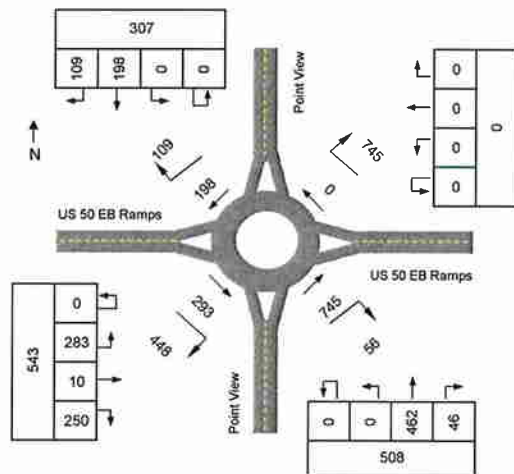
Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	508	293	997	0.54	13	B	75
South	307	0	1272	0.25	9	A	25
East	543	198	1079	0.53	12	B	75
West							
All	1358				12	B	

Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



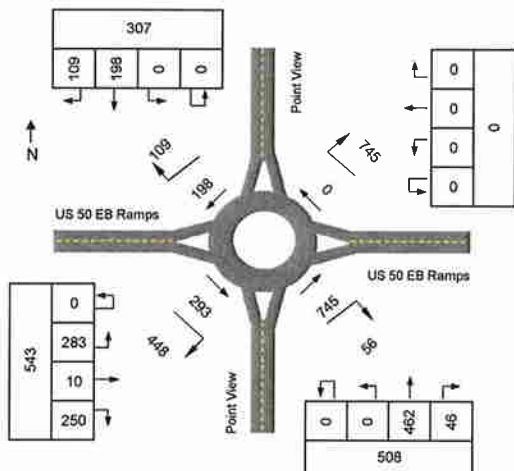
ROUNABOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	AM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	508	293	843	0.63	16	C	125
South	307	0	1130	0.29	9	A	25
East	543	198	927	0.62	15	B	100
West							
All	1358				14	B	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Does not account for flared entry lanes or pedestrian effects.

** Assumes a queued vehicle length of 25 feet



SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR *No widening* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 1 **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	96	85	89	8	21.8	C	--
	R	45	44	98	5	2.5	A	--
	Subtotal	141	129	91	--	15.1	B	--
SB	L	24	21	88	6	36.7	D	--
	T	56	55	98	4	36.3	D	--
	Subtotal	79	77	97	--	36.4	D	--
EB	L	37	41	111	7	49.8	D	--
	T	3	3	100	1	54.8	D	--
	R	56	55	98	6	12.8	B	--
	Subtotal	95	98	103	--	29.3	C	--
Total		315	304	97	--	25.1	C	--

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	32.7	C	--
	T	3	2	67	1	88.8	F	--
	R	3	2	67	1	12.1	B	--
	Subtotal	8	7	88	--	38.9	D	--
SB	L	45	45	100	5	14.1	B	--
	T	3	3	100	2	10.2	B	--
	R	63	64	102	5	4.4	A	--
	Subtotal	111	113	102	--	8.5	A	--
EB	L	76	69	91	6	83.8	F	--
	T	47	46	98	7	57.6	E	--
	R	3	3	100	2	50.9	D	--
	Subtotal	126	119	94	--	72.7	E	--
WB	L	3	2	67	1	32.6	C	--
	T	70	72	103	6	33.8	C	--
	R	62	59	95	8	38.4	D	--
	Subtotal	134	134	100	--	35.8	D	--
Total		379	371	98	--	39.4	D	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 1 **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 8: Broadway & Wilste Rd

Type: Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	R	11	9	82	3	79.9	F	--
	Subtotal	11	9	82	--	79.9	F	--
EB	T	116	112	97	10	22.1	C	--
	R	11	14	127	3	5.3	A	--
	Subtotal	126	126	100	--	20.2	C	--
WB	T	136	140	103	6	1.0	A	--
	Subtotal	136	140	103	--	1.0	A	--
	Total	272	275	101	--	12.3	B	--

Intersection: 5: US 50 WB Ramps & Schnell School Rd

Type: Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	68	62	91	9	23.2	C	--
	T	64	59	92	6	22.9	C	--
	Subtotal	133	121	91	--	23.1	C	--
SB	T	53	52	98	7	28.4	C	--
	R	45	44	98	6	18.8	B	--
	Subtotal	98	96	98	--	24.0	C	--
WB	L	26	28	108	4	34.6	C	--
	T	3	2	67	1	34.3	C	--
	R	18	17	94	4	8.6	A	--
	Subtotal	47	47	100	--	25.1	C	--
	Total	278	263	95	--	23.8	C	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR *Minor Widening* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 2 **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	68	68	100	7	30.8	C	--
	T	64	62	97	4	26.5	C	--
	Subtotal	133	130	98	--	28.7	C	--
SB	T	53	52	98	7	17.1	B	--
	R	45	47	102	6	11.2	B	--
	Subtotal	98	99	101	--	14.3	B	--
WB	L	26	27	104	5	34.3	C	--
	T	3	2	67	1	40.9	D	--
	R	18	18	100	5	9.1	A	--
	Subtotal	47	48	102	--	25.0	C	--
Total		278	277	100	--	22.9	C	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	96	90	94	7	18.5	B	--
	R	45	42	93	5	3.3	A	--
	Subtotal	141	132	94	--	13.7	B	--
SB	L	24	22	92	5	22.8	C	--
	T	56	54	96	3	23.5	C	--
	Subtotal	79	76	96	--	23.3	C	--
EB	L	37	40	108	5	36.6	D	--
	T	3	3	100	2	35.7	D	--
	R	56	58	104	4	11.5	B	--
	Subtotal	95	101	106	--	22.3	C	--
Total		315	310	98	--	18.9	B	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 2 **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	2	33.9	C	--
	T	3	2	67	1	46.0	D	--
	R	3	2	67	1	14.0	B	--
	Subtotal	8	8	100	--	31.5	C	--
SB	L	45	44	98	5	13.6	B	--
	T	3	3	100	2	8.7	A	--
	R	63	67	105	5	3.6	A	--
	Subtotal	111	113	102	--	7.6	A	--
EB	L	76	69	91	6	57.1	E	--
	T	47	44	94	7	44.1	D	--
	R	3	3	100	3	40.0	D	--
	Subtotal	126	116	92	--	51.7	D	--
WB	L	3	3	67	2	40.4	D	--
	T	70	75	107	5	34.5	C	--
	R	62	62	100	8	12.7	B	--
	Subtotal	134	140	104	--	24.9	C	--
Total		379	377	99	--	28.1	C	--

Intersection: 8: Broadway & Wilste Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	R	11	10	91	3	29.2	D	--
	Subtotal	11	10	91	--	29.2	D	--
EB	T	116	110	95	10	9.5	A	--
	R	11	13	118	5	2.8	A	--
	Subtotal	126	123	98	--	8.8	A	--
WB	T	136	145	107	6	1.0	A	--
	Subtotal	136	145	107	--	1.0	A	--
	Total	272	278	102	--	5.4	A	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR *Full Mitigation* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation **PHF:** 0.95
TOD: AM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	68	67	99	6	14.0	B	--
	T	64	64	100	9	3.2	A	--
	Subtotal	133	131	98	--	8.8	A	--
SB	T	53	53	100	7	35.6	D	--
	R	45	43	96	8	29.7	C	--
	Subtotal	98	96	98	--	33.0	C	--
WB	L	26	23	88	5	28.4	C	--
	T	3	3	100	2	26.7	C	--
	R	18	19	106	4	16.3	B	--
	Subtotal	47	45	96	--	23.2	C	--
Total		278	272	98	--	19.7	B	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	96	93	97	6	7.6	A	--
	R	45	42	93	5	1.8	A	--
	Subtotal	141	135	96	--	5.8	A	--
SB	L	24	23	96	6	33.7	C	--
	T	56	51	91	9	9.1	A	--
	Subtotal	79	75	95	--	16.8	B	--
EB	L	37	38	103	5	24.0	C	--
	T	3	3	100	1	26.8	C	--
	R	56	52	93	9	9.9	A	--
	Subtotal	95	93	98	--	16.1	B	--
Total		315	303	96	--	11.7	B	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Cumulative Plus Project - Signal Mitigation	PHF:	0.95
TOD:	AM	Analysis Period:	15 Minutes
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	5	5	100	2	31.0	C	--
	T	3	2	67	1	32.7	C	--
	R	3	3	100	2	10.3	B	--
	Subtotal	11	10	91	--	24.9	C	--
SB	L	45	43	96	7	18.1	B	--
	T	3	3	67	1	21.9	C	--
	R	63	60	95	10	3.2	A	--
	Subtotal	111	105	95	--	9.7	A	--
EB	L	74	71	96	7	42.9	D	--
	T	39	35	90	4	19.8	B	--
	R	5	5	100	2	13.7	B	--
	Subtotal	118	111	94	--	34.2	C	--
WB	L	5	6	120	2	17.7	B	--
	T	59	52	88	6	18.8	B	--
	R	62	59	95	6	15.2	B	--
	Subtotal	126	117	93	--	16.9	B	--
	Total	366	344	94	--	20.5	C	--



Movement Summary

Lumsden Ranch EIR

Broadway Schnell School Rd - AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Broadway (E)										
11L	L	237	2.1	0.287	8.7	LOS A	45	0.59	0.76	21.4
16R	R	246	2.0	0.287	4.2	LOS A	45	0.59	0.53	23.1
Approach		483	2.1	0.287	6.4	LOS A	45	0.59	0.64	22.2
Schnell School Rd (N)										
7L	L	191	2.1	0.345	10.3	LOS B	71	0.55	0.69	21.9
4R	R	126	2.4	0.344	1.9	LOS A	71	0.55	0.29	23.2
Approach		318	2.2	0.344	7.0	LOS A	71	0.55	0.53	22.4
US 50 EB Off										
15L	L	158	1.9	0.208	15.7	LOS B	38	0.66	0.80	28.3
12T	T	96	2.1	0.253	9.0	LOS A	50	0.67	0.71	33.2
12R	R	126	2.4	0.253	10.5	LOS B	50	0.67	0.75	32.3
Approach		381	2.1	0.253	12.3	LOS B	50	0.67	0.76	30.6
Broadway (W)										
13L	L	208	1.9	0.261	7.1	LOS A	40	0.53	0.69	21.8
18T	T	107	1.9	0.261	4.2	LOS A	40	0.53	0.47	24.6
18R	R	157	1.9	0.261	3.7	LOS A	40	0.53	0.49	22.8
Approach		472	1.9	0.261	5.3	LOS A	40	0.53	0.57	22.7
All Vehicles		1654	2.1	0.345	7.5	LOS A	71	0.58	0.63	23.9

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Movement Summary

Lumsden Ranch EIR

Wilste Broadway - AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Wilste (S)										
3L	L	21	4.5	0.062	9.8	LOS A	10	0.55	0.69	21.0
8R	R	21	4.5	0.062	6.1	LOS A	10	0.55	0.58	22.2
Approach		44	4.5	0.062	7.9	LOS A	10	0.55	0.63	21.5
Broadway (E)										
1L	L	21	4.5	0.355	6.7	LOS A	84	0.15	0.56	21.9
6T	T	468	1.9	0.356	1.8	LOS A	84	0.15	0.23	23.8
Approach		490	2.0	0.356	2.0	LOS A	84	0.15	0.24	23.7
Broadway (W)										
2T	T	441	2.0	0.337	1.8	LOS A	70	0.13	0.23	23.8
2R	R	21	4.5	0.338	3.0	LOS A	70	0.13	0.35	23.3
Approach		463	2.2	0.337	1.8	LOS A	70	0.13	0.23	23.8
All Vehicles		997	2.2	0.356	2.2	LOS A	84	0.16	0.26	23.6

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: AM - Wilste & Broadway

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Movement Summary

Lumsden Ranch EIR

Schnell School Rd US 50 WB Ramps - AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Schnell School Rd (S)										
3L	L	274	1.8	0.335	9.3	LOS A	0	0.00	0.69	23.4
8T	T	257	1.9	0.336	1.6	LOS A	0	0.00	0.22	24.2
Approach		530	1.9	0.335	5.6	LOS A		0.00	0.46	23.8
US 50 WB Off-Ramp										
1L	L	105	1.9	0.284	11.4	LOS B	49	0.66	0.81	20.4
6T	T	11	9.1	0.282	8.3	LOS A	49	0.66	0.74	23.4
6R	R	74	1.4	0.284	7.7	LOS A	49	0.66	0.66	21.6
Approach		189	2.1	0.284	9.8	LOS A	49	0.66	0.75	21.0
Schnell School Rd (N)										
4T	T	212	1.9	0.527	6.9	LOS A	126	0.73	0.77	21.9
4R	R	179	2.2	0.526	9.8	LOS A	126	0.73	0.84	22.8
Approach		390	2.1	0.527	8.2	LOS A	126	0.73	0.80	22.3
All Vehicles		1109	2.0	0.527	7.2	LOS A	126	0.37	0.63	22.8

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: AM - Schnell School & WB Ramps

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HCM Signalized Intersection Capacity Analysis 10: Broadway & US 50 EB Off Ramp

Cumulative Plus Project - AM Peak Hour
9/19/2007

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↖			↖		↖	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		0.95	0.95	
Frt		0.99			1.00			0.94		1.00	0.86	
Flt Protected		1.00			1.00			0.97		0.95	1.00	
Satd. Flow (prot)		1850			1861			1706		1681	1513	
Flt Permitted		1.00			0.99			0.25		0.95	1.00	
Satd. Flow (perm)		1850			1842			434		1681	1513	
Volume (vph)	0	364	20	10	433	0	40	0	30	201	10	290
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)	0	383	21	11	456	0	42	0	32	212	11	305
RTOR Reduction (vph)	0	3	0	0	0	0	0	24	0	0	240	0
Lane Group Flow (vph)	0	401	0	0	467	0	0	50	0	212	76	0
Turn Type				Perm			Perm			Split		
Protected Phases		4			8			2		6	6	
Permitted Phases				8			2					
Actuated Green, G (s)		20.5			20.5			16.0		13.1	13.1	
Effective Green, g (s)		20.5			20.5			16.0		13.1	13.1	
Actuated g/C Ratio		0.33			0.33			0.26		0.21	0.21	
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)		616			613			113		357	322	
v/s Ratio Prot		0.22								c0.13	0.05	
v/s Ratio Perm					c0.25			c0.12				
v/c Ratio		0.65			0.76			0.45		0.59	0.24	
Uniform Delay, d1		17.5			18.4			19.1		21.9	20.1	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		2.5			5.6			2.8		2.6	0.4	
Delay (s)		20.0			23.9			21.9		24.5	20.5	
Level of Service		B			C			C		C	C	
Approach Delay (s)		20.0			23.9			21.9			22.1	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay		22.1				HCM Level of Service		C				
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		61.6				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		59.6%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 6 Report

HCM Signalized Intersection Capacity Analysis
10: Broadway & US 50 EB Off Ramp

Cumulative Plus Project - AM Peak Hour
9/19/2007

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0				4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	0.95	0.95	
Frt		0.99			1.00				0.86	1.00	0.85	
Flt Protected		1.00			1.00				1.00	0.95	1.00	
Satd. Flow (prot)		1850			1863				1611	1681	1504	
Flt Permitted		1.00			1.00				1.00	0.95	1.00	
Satd. Flow (perm)		1850			1863				1611	1681	1504	
Volume (vph)	0	364	20	0	433	0	0	0	70	201	0	290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	396	22	0	471	0	0	0	76	218	0	315
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	71	0	228	0
Lane Group Flow (vph)	0	416	0	0	471	0	0	0	5	218	87	0
Turn Type									custom	Split		
Protected Phases		4			8					6	6	
Permitted Phases									2			
Actuated Green, G (s)		16.3			16.3				2.6	11.8	11.8	
Effective Green, g (s)		16.3			16.3				2.6	11.8	11.8	
Actuated g/C Ratio		0.38			0.38				0.06	0.28	0.28	
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)		706			711				98	465	416	
v/s Ratio Prot		0.22			c0.25					c0.13	0.06	
v/s Ratio Perm									c0.00			
v/c Ratio		0.59			0.66				0.05	0.47	0.21	
Uniform Delay, d1		10.5			10.9				18.9	12.8	11.9	
Progression Factor		1.00			1.00				1.00	1.00	1.00	
Incremental Delay, d2		1.3			2.3				0.2	0.7	0.3	
Delay (s)		11.8			13.3				19.1	13.6	12.1	
Level of Service		B			B				B	B	B	
Approach Delay (s)		11.8			13.3			19.1			12.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay		13.0				HCM Level of Service			B			
HCM Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		42.7				Sum of lost time (s)			12.0			
Intersection Capacity Utilization		49.2%				ICU Level of Service			A			
Analysis Period (min)		15										
c Critical Lane Group												

Level-Of-Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Mosquito Rd./Broadway

Cycle (sec): 80 Critical Vol./Cap.(X): 0.613
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 22.7
Optimal Cycle: 56 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

Volume Module:

Base Vol:	10	120	280	80	190	10	10	10	10	350	40	340
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	120	280	80	190	10	10	10	10	350	40	340
Added Vol:	0	0	14	0	0	0	0	0	0	29	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	120	294	80	190	10	10	10	10	379	40	344
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	126	309	84	200	11	11	11	11	399	42	362
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	126	309	84	200	11	11	11	11	399	42	362
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	126	309	84	200	11	11	11	11	399	42	362

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.98	0.98	0.98	0.94	0.94	0.94	0.96	0.96	0.85
Lanes:	0.08	0.92	1.00	0.28	0.68	0.04	0.34	0.33	0.33	0.90	0.10	1.00
Final Sat.:	146	1747	1615	533	1265	67	595	595	595	1645	174	1615

Capacity Analysis Module:

Vol/Sat:	0.07	0.07	0.19	0.16	0.16	0.16	0.02	0.02	0.02	0.24	0.24	0.22
Crit Moves:	****			****			****			****		
Green/Cycle:	0.12	0.12	0.51	0.26	0.26	0.26	0.03	0.03	0.03	0.40	0.40	0.40
Volume/Cap:	0.61	0.61	0.37	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57
Uniform Del:	33.6	33.6	11.7	26.2	26.2	26.2	38.4	38.4	38.4	19.3	19.3	18.8
IncrcmntDel:	5.0	5.0	0.3	2.4	2.4	2.4	20.0	20.0	20.0	1.6	1.6	1.2
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	38.5	38.5	12.0	28.5	28.5	28.5	58.4	58.4	58.4	20.9	20.9	20.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	38.5	38.5	12.0	28.5	28.5	28.5	58.4	58.4	58.4	20.9	20.9	20.0
LOS by Move:	D	D	B	C	C	C	E	E	E	C	C	C
HCM2kAvgQ:	4	4	5	7	7	7	2	2	2	9	9	8

Note: Queue reported is the number of cars per lane.

Intersection 12

Cumulative + Projected

AM

ROUNDBABOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)	2						
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	AM	N-S	Cedar Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	518	248	1026	0.53	7	A	75
South							
East	502	152	1098	0.48	6	A	75
West	526	403	912	0.61	10	A	100
All	1546				8	A	

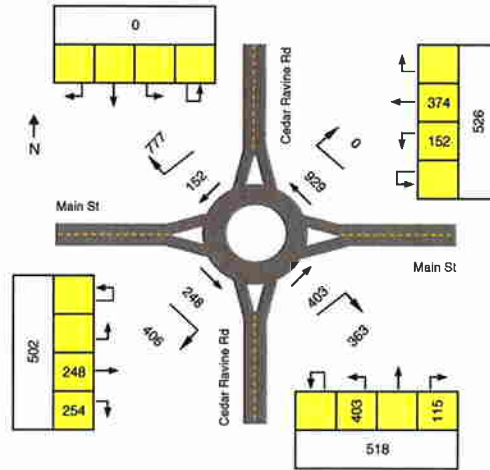
Source: Roundabouts: An Informational Guide (FHWA, 2000)

Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



ROUNDBABOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

Type of Design	Single-Lane Roundabout						
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	AM	N-S	Cedar Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	518	248	1035	0.53	12	B	75
South							
East	502	152	1121	0.47	11	B	75
West	526	403	910	0.61	15	B	100
All	1546				13	B	

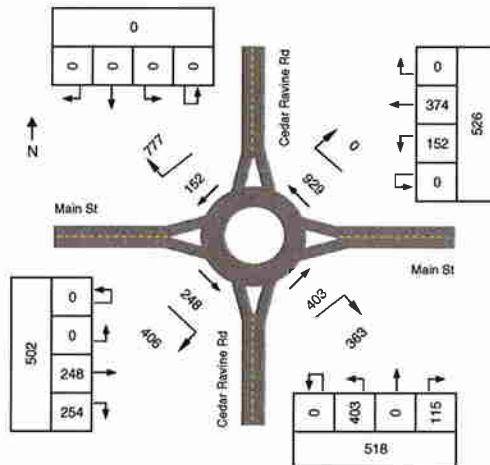
Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000

Includes a "+5" factor to account for start-up delay under higher v/c ratios, so the delay for lower v/c ratios may be over-estimated.

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



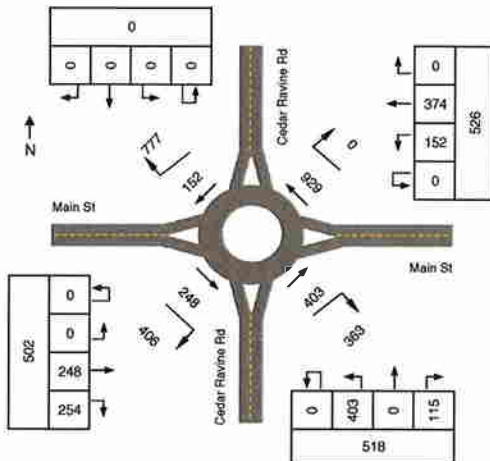
ROUNDBABOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design	Single-Lane Roundabout						
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	AM	N-S	Cedar Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	518	248	882	0.62	15	C	100
South							
East	502	152	971	0.54	13	B	75
West	526	403	755	0.73	22	C	175
All	1546				17	C	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Includes a "+5" factor to account for start-up delay under higher v/c ratios, so the delay for lower v/c ratios may be over-estimated.

Does not account for flared entry lanes or pedestrian effects.



HCM Signalized Intersection Capacity Analysis 13: US 50 & Bedford Rd

Lumsden Ranch EIR - Mitigation
Cumulative Conditions PP - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4807		1770	3406	1583	1681	1719	1583	1770	1694	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.47	0.53	1.00	0.39	1.00	
Satd. Flow (perm)	1770	4807		1770	3406	1583	831	938	1583	721	1694	
Volume (vph)	70	1459	271	170	1625	309	324	112	70	163	91	140
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)	74	1536	285	179	1711	325	341	118	74	172	96	147
RTOR Reduction (vph)	0	23	0	0	0	123	0	0	50	0	45	0
Lane Group Flow (vph)	74	1798	0	179	1711	202	171	288	24	172	198	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		
Actuated Green, G (s)	5.0	50.5		17.2	62.7	62.7	37.1	37.1	37.1	37.1	37.1	
Effective Green, g (s)	5.0	50.5		17.2	62.7	62.7	37.1	37.1	37.1	37.1	37.1	
Actuated g/C Ratio	0.04	0.43		0.15	0.54	0.54	0.32	0.32	0.32	0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	76	2078		261	1828	850	264	298	503	229	538	
v/s Ratio Prot	0.04	c0.37		0.10	c0.50						0.12	
v/s Ratio Perm						0.13	0.21	c0.31	0.01	0.24		
v/c Ratio	0.97	0.87		0.69	0.94	0.24	0.65	0.97	0.05	0.75	0.37	
Uniform Delay, d1	55.8	30.1		47.2	25.2	14.4	34.2	39.2	27.6	35.7	30.8	
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	93.6	4.0		7.3	9.6	0.1	11.7	44.3	0.2	20.1	1.9	
Delay (s)	149.5	34.1		54.5	34.8	14.5	45.9	83.5	27.8	55.8	32.7	
Level of Service	F	C		D	C	B	D	F	C	E	C	
Approach Delay (s)		38.6			33.4			63.7			42.3	
Approach LOS		D			C			E			D	

Intersection Summary

HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	116.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

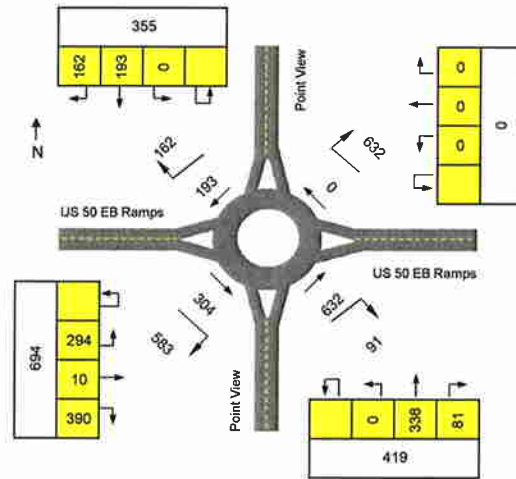
ROUNABOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)							1
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	419	304	1046	0.42	11	B	50
South	355	0	1212	0.31	9	A	25
East	694	193	1107	0.66	14	B	125
West							
All	1468				12	B	

Source: Roundabouts: An Informational Guide (FHWA, 2000), Equations A-8 & A-10
Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).
Does not account for flared entry lanes or pedestrian effects.

*LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



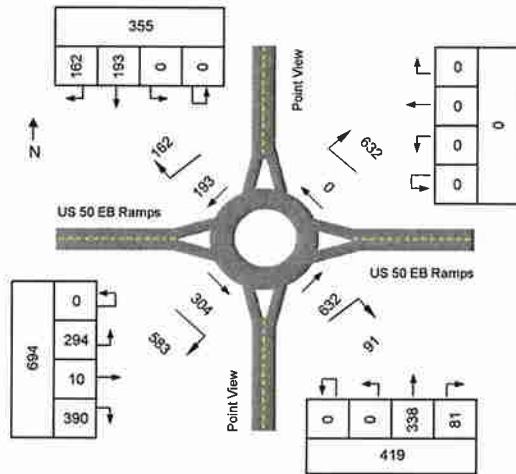
ROUNABOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	419	304	988	0.45	12	B	50
South	355	0	1272	0.29	9	A	25
East	694	193	1083	0.67	15	B	150
West							
All	1468				13	B	

Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000
Does not account for flared entry lanes or pedestrian effects.

*LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



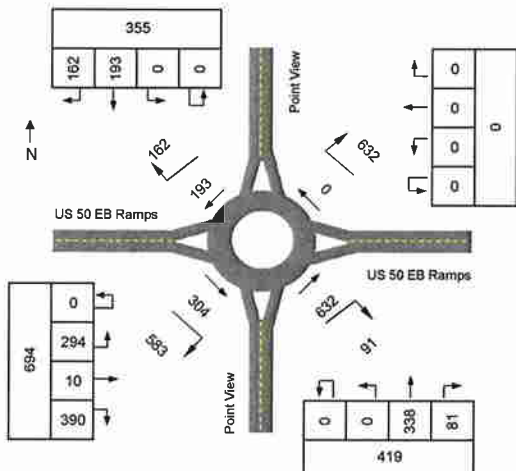
ROUNABOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	US 50 EB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	419	304	834	0.53	14	B	75
South	355	0	1130	0.33	10	A	25
East	694	193	932	0.78	21	C	200
West							
All	1468				16	C	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Does not account for flared entry lanes or pedestrian effects.

** Assumes a queued vehicle length of 25 feet



ROUNABOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)							1
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	731	0	1212	0.63	13	B	125
South	693	319	1038	0.70	16	C	150
East							
West	305	731	814	0.39	12	B	50
All	1729				14	B	

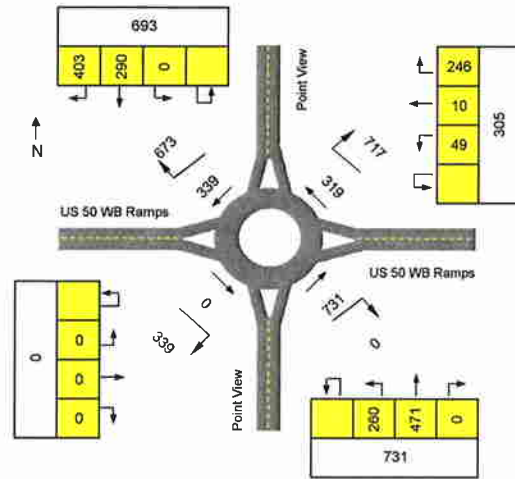
Source: Roundabouts: An Informational Guide (FHWA, 2000), Equations A-8 & A-10

Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



ROUNABOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

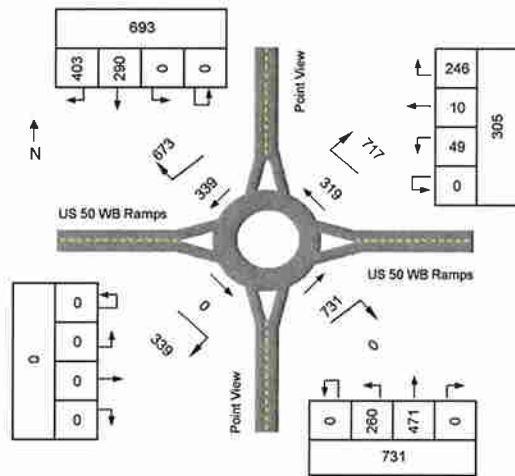
Type of Design							Single-Lane Roundabout
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	731	0	1272	0.60	12	B	100
South	693	319	975	0.75	19	C	175
East							
West	305	731	692	0.46	15	B	50
All	1729				15	C	

Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



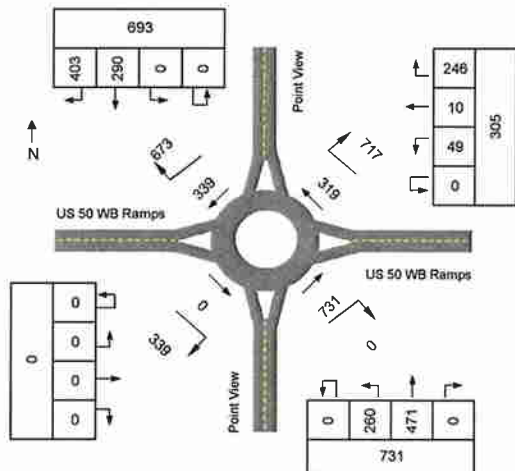
ROUNABOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design							Single-Lane Roundabout
Period (hr)	0.25	Date	2025	E-W	US 50 WB Ramps		
PHF	0.95	Time	PM	N-S	Point View		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	731	0	1130	0.68	15	B	150
South	693	319	821	0.89	33	D	300
East							
West	305	731	544	0.59	21	C	100
All	1729				23	C	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Does not account for flared entry lanes or pedestrian effects.

** Assumes a queued vehicle length of 25 feet



SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR *No widening* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 1 **PHF:** 0.95
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	87	74	85	6	14.9	B	--
	T	53	44	83	6	15.1	B	--
	Subtotal	140	119	84	--	15.0	B	--
SB	T	46	37	80	9	197.4	F	--
	R	26	18	69	4	182.6	F	--
	Subtotal	72	55	76	--	192.5	F	--
WB	L	21	22	105	6	58.4	E	--
	T	3	2	67	1	59.2	E	--
	R	24	22	92	6	8.6	A	--
	Subtotal	47	46	98	--	34.7	C	--
Total		260	219	84	--	63.5	E	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	114	96	84	7	12.4	B	--
	R	95	85	89	7	2.1	A	--
	Subtotal	208	181	87	--	7.5	A	--
SB	L	18	17	94	5	90.3	F	--
	T	49	39	80	5	99.3	F	--
	Subtotal	67	56	84	--	96.6	F	--
EB	L	26	23	88	4	70.8	E	--
	T	3	2	67	1	74.0	E	--
	R	101	90	89	12	93.5	F	--
	Subtotal	129	115	88	--	88.7	F	--
Total		405	351	87	--	48.2	D	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 1 **PHF:** 0.95
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	36.7	D	--
	T	3	3	100	1	44.4	D	--
	R	3	2	67	1	12.6	B	--
	Subtotal	8	8	100	--	32.3	C	--
SB	L	94	77	82	8	26.4	C	--
	T	3	3	100	2	39.8	D	--
	R	53	49	92	9	2.3	A	--
	Subtotal	149	129	87	--	17.5	B	--
EB	L	124	100	81	8	129.1	F	--
	T	119	93	77	6	112.5	F	--
	R	3	2	67	1	108.9	F	--
	Subtotal	246	195	79	--	121.0	F	--
WB	L	3	2	67	1	82.1	F	--
	T	75	70	93	7	93.8	F	--
	R	82	79	96	4	17.9	B	--
	Subtotal	160	151	94	--	54.1	D	--
Total		563	483	86	--	70.9	E	--

Intersection: 8: Broadway & Wilste Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	R	18	3	17	2	590.8	F	--
	Subtotal	18	3	17	--	590.8	F	--
EB	T	227	193	85	8	56.7	F	--
	R	18	16	89	3	47.0	E	--
	Subtotal	246	210	85	--	55.9	F	--
WB	T	131	123	94	13	1.1	A	--
	Subtotal	131	123	94	--	1.1	A	--
	Total	394	336	85	--	41.3	E	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project: Lumsden Ranch EIR *Minor Widening* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation 2 **PHF:** 0.95
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	87	72	83	8	44.2	D	--
	T	53	44	83	8	41.3	D	--
	Subtotal	140	116	83	--	43.1	D	--
SB	T	46	44	96	7	42.9	D	--
	R	26	23	88	5	43.4	D	--
	Subtotal	72	67	93	--	43.1	D	--
WB	L	21	24	114	5	43.3	D	--
	T	3	2	67	1	60.0	E	--
	R	24	20	83	5	8.6	A	--
	Subtotal	47	46	98	--	28.9	C	--
Total		260	229	88	--	40.2	D	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	114	95	83	9	23.0	C	--
	R	95	84	88	6	3.5	A	--
	Subtotal	208	179	86	--	13.8	B	--
SB	L	18	17	94	4	69.3	E	--
	T	49	47	96	5	65.5	E	--
	Subtotal	67	64	96	--	66.5	E	--
EB	L	26	25	96	4	48.4	D	--
	T	3	2	67	1	43.3	D	--
	R	101	94	93	9	46.7	D	--
	Subtotal	129	120	93	--	47.0	D	--
Total		405	363	90	--	34.2	C	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	Lumsden Ranch EIR	HCM:	2000
Scenario:	Cumulative Plus Project - Signal Mitigation 2	PHF:	0.95
TOD:	PM	Analysis Period:	15 Minutes
		# of Runs:	10

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	3	3	100	1	56.2	E	--
	T	3	4	133	3	87.7	F	--
	R	3	3	67	1	30.1	C	--
	Subtotal	8	9	113	--	61.6	E	--
SB	L	94	88	94	10	18.5	B	--
	T	3	2	67	1	21.8	C	--
	R	53	50	94	8	2.0	A	--
	Subtotal	149	141	95	--	12.6	B	--
EB	L	124	99	80	5	152.0	F	--
	T	119	92	77	7	137.5	F	--
	R	3	3	100	1	137.0	F	--
	Subtotal	246	193	78	--	144.9	F	--
WB	L	3	2	67	1	131.0	F	--
	T	75	65	87	4	140.2	F	--
	R	82	75	91	11	44.9	D	--
	Subtotal	160	143	89	--	89.8	F	--
	Total	563	486	86	--	88.8	F	--

Intersection: 8: Broadway & Wilste Rd **Type:** Un-Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	R	18	1	6	2	665.6	F	--
	Subtotal	18	1	6	--	665.6	F	--
EB	T	227	192	85	7	69.8	F	--
	R	18	14	78	2	56.9	F	--
	Subtotal	246	206	84	--	68.9	F	--
WB	T	131	118	90	9	1.0	A	--
	Subtotal	131	118	90	--	1.0	A	--
	Total	394	326	83	--	46.4	E	--

SIMTRAFFIC LEVEL OF SERVICE REPORT

Including Upstream Delays

Project: Lumsden Ranch *Full Mitigation* **HCM:** 2000
Scenario: Cumulative Plus Project - Signal Mitigation **PHF:** 0.95
TOD: PM **Analysis Period:** 15 Minutes **# of Runs:** 10

Intersection: 5: US 50 WB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	87	83	95	8	20.6	C	--
	T	53	47	89	8	7.8	A	--
	Subtotal	140	131	94	--	16.0	B	--
SB	T	46	41	89	6	49.5	D	--
	R	26	22	85	5	33.2	C	--
	Subtotal	72	63	88	--	43.7	D	--
WB	L	21	22	105	5	43.0	D	--
	T	3	3	100	2	39.0	D	--
	R	24	20	83	4	24.8	C	--
	Subtotal	47	45	96	--	34.6	C	--
Total		260	239	92	--	26.8	C	--

Intersection: 6: US 50 EB Ramps & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	T	114	104	91	6	7.2	A	--
	R	95	86	91	9	1.9	A	--
	Subtotal	208	190	91	--	4.8	A	--
SB	L	18	16	89	4	105.8	F	--
	T	49	46	94	9	63.0	E	--
	Subtotal	67	62	93	--	73.9	E	--
EB	L	26	28	108	3	37.2	D	--
	T	3	3	67	2	38.1	D	--
	R	101	93	92	8	58.5	E	--
	Subtotal	129	123	95	--	53.3	D	--
Total		405	374	92	--	32.1	C	--

SIMTRAFFIC LEVEL OF SERVICE REPORT Including Upstream Delays

Project:	<u>Lumsden Ranch</u>	HCM:	<u>2000</u>
Scenario:	<u>Cumulative Plus Project - Signal Mitigation</u>	PHF:	<u>0.95</u>
TOD:	<u>PM</u>	Analysis Period:	<u>15 Minutes</u>
		# of Runs:	<u>10</u>

Intersection: 7: Broadway & Schnell School Rd **Type:** Signalized

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	8	6	75	2	85.3	F	--
	T	8	7	88	2	114.0	F	--
	R	5	5	100	2	56.7	E	--
	Subtotal	21	18	86	--	87.7	F	--
SB	L	94	86	91	6	29.7	C	--
	T	13	11	77	3	25.9	C	--
	R	42	41	98	7	2.0	A	--
	Subtotal	149	138	93	--	21.2	C	--
EB	L	118	105	89	12	68.0	E	--
	T	98	94	96	8	65.0	E	--
	R	8	8	100	4	62.5	E	--
	Subtotal	224	207	92	--	66.4	E	--
WB	L	11	9	82	3	39.9	D	--
	T	57	52	91	6	39.2	D	--
	R	82	79	95	7	23.4	C	--
	Subtotal	149	139	93	--	30.3	C	--
	Total	544	501	92	--	44.8	D	--



Movement Summary

Lumsden Ranch EIR

Broadway Schnell School Rd - PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Broadway (E)										
11L	L	248	2.0	0.392	9.9	LOS A	72	0.72	0.87	21.0
16R	R	328	2.1	0.392	5.9	LOS A	72	0.72	0.73	22.9
Approach		577	2.1	0.392	7.7	LOS A	72	0.72	0.79	22.1
Schnell School Rd (N)										
7L	L	186	2.1	0.271	9.7	LOS A	54	0.53	0.67	21.9
4R	R	56	1.8	0.272	1.9	LOS A	54	0.53	0.28	23.3
Approach		243	2.1	0.271	7.9	LOS A	54	0.53	0.58	22.1
US 50 EB Off										
15L	L	116	1.7	0.208	17.0	LOS B	35	0.66	0.84	27.6
12T	T	263	1.9	0.454	9.1	LOS A	102	0.73	0.74	32.8
12R	R	155	1.9	0.455	10.7	LOS B	102	0.73	0.78	32.0
Approach		533	1.9	0.454	11.3	LOS B	102	0.71	0.78	31.2
Broadway (W)										
13L	L	273	1.8	0.552	9.4	LOS A	121	0.72	0.91	21.2
18T	T	227	2.2	0.552	6.4	LOS A	121	0.72	0.80	24.1
18R	R	414	1.9	0.551	5.9	LOS A	121	0.72	0.83	22.3
Approach		913	2.0	0.552	7.1	LOS A	121	0.72	0.85	22.4
All Vehicles		2266	2.0	0.552	8.3	LOS A	121	0.70	0.79	23.8

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Movement Summary

Lumsden Ranch EIR

Wilste Broadway - PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Wilste (S)										
3L	L	32	3.1	0.162	14.7	LOS B	29	0.78	0.88	19.4
8R	R	42	2.4	0.162	10.9	LOS B	29	0.78	0.82	20.4
Approach		74	2.7	0.162	12.6	LOS B	29	0.78	0.85	19.9
Broadway (E)										
1L	L	42	2.4	0.359	6.8	LOS A	88	0.20	0.55	21.8
6T	T	427	2.1	0.358	1.9	LOS A	88	0.20	0.24	23.6
Approach		470	2.1	0.358	2.3	LOS A	88	0.20	0.27	23.4
Broadway (W)										
2T	T	845	2.0	0.655	2.2	LOS A	221	0.33	0.28	23.3
2R	R	32	3.1	0.653	3.4	LOS A	221	0.33	0.37	22.9
Approach		877	2.1	0.654	2.2	LOS A	221	0.33	0.28	23.3
All Vehicles		1421	2.1	0.655	2.8	LOS A	221	0.31	0.31	23.1

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: PM - Wilste & Broadway

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Movement Summary

Lumsden Ranch EIR

Schnell School Rd US 50 WB Ramps - PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Schnell School Rd (S)										
3L	L	346	2.0	0.354	9.3	LOS A	0	0.00	0.69	23.4
8T	T	214	1.9	0.354	1.6	LOS A	0	0.00	0.22	24.2
Approach		559	2.0	0.354	6.4	LOS A		0.00	0.51	23.7
US 50 WB Off-Ramp										
1L	L	84	2.4	0.294	11.7	LOS B	51	0.67	0.83	20.3
6T	T	11	9.1	0.297	8.6	LOS A	51	0.67	0.76	23.3
6R	R	95	2.1	0.294	8.0	LOS A	51	0.67	0.68	21.4
Approach		191	2.6	0.294	9.7	LOS A	51	0.67	0.75	21.0
Schnell School Rd (N)										
4T	T	184	2.2	0.408	6.0	LOS A	78	0.69	0.69	22.2
4R	R	105	1.9	0.409	8.9	LOS A	78	0.69	0.77	23.1
Approach		290	2.1	0.409	7.0	LOS A	78	0.69	0.72	22.6
All Vehicles		1040	2.1	0.409	7.2	LOS A	78	0.31	0.61	22.9

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

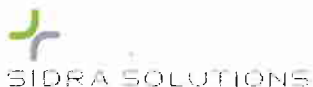
* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: PM - Schnell School & WB Ramps

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HCM Signalized Intersection Capacity Analysis 10: Broadway & US 50 EB Off Ramp

Cumulative Plus Project - PM Peak Hour
9/19/2007

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↱			↕		↱	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		0.95	0.95	
Frt		0.99			1.00			0.94		1.00	0.90	
Flt Protected		1.00			1.00			0.97		0.95	0.98	
Satd. Flow (prot)		1849			1861			1706		1681	1574	
Flt Permitted		1.00			0.70			0.20		0.95	0.98	
Satd. Flow (perm)		1849			1310			357		1681	1574	
Volume (vph)	0	685	40	10	546	0	40	0	30	525	10	260
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)	0	721	42	11	575	0	42	0	32	553	11	274
RTOR Reduction (vph)	0	2	0	0	0	0	0	26	0	0	70	0
Lane Group Flow (vph)	0	761	0	0	586	0	0	48	0	407	361	0
Turn Type				Perm			Perm			Split		
Protected Phases		4			8			2		6	6	
Permitted Phases				8			2					
Actuated Green, G (s)		38.0			38.0			15.4		23.1	23.1	
Effective Green, g (s)		38.0			38.0			15.4		23.1	23.1	
Actuated g/C Ratio		0.43			0.43			0.17		0.26	0.26	
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)		794			562			62		439	411	
v/s Ratio Prot		0.41								c0.24	0.23	
v/s Ratio Perm					c0.45			c0.13				
v/c Ratio		0.96			1.04			0.77		0.93	0.88	
Uniform Delay, d1		24.5			25.2			34.8		31.9	31.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		22.0			49.5			42.5		25.6	18.6	
Delay (s)		46.5			74.8			77.3		57.4	50.0	
Level of Service		D			E			E		E	D	
Approach Delay (s)		46.5			74.8			77.3			53.6	
Approach LOS		D			E			E			D	
Intersection Summary												
HCM Average Control Delay		57.5				HCM Level of Service		E				
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		88.5				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		75.3%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
10: Broadway & US 50 EB Off Ramp

Cumulative Plus Project - PM Peak Hour
9/19/2007

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0				4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	0.95	0.95	
Flt		0.99			1.00				0.86	1.00	0.90	
Flt Protected		1.00			1.00				1.00	0.95	0.98	
Satd. Flow (prot)		1849			1863				1611	1681	1571	
Flt Permitted		1.00			1.00				1.00	0.95	0.98	
Satd. Flow (perm)		1849			1863				1611	1681	1571	
Volume (vph)	0	685	40	0	546	0	0	0	70	525	0	260
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	745	43	0	593	0	0	0	76	571	0	283
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	71	0	69	0
Lane Group Flow (vph)	0	786	0	0	593	0	0	0	5	414	371	0
Turn Type									custom	Split		
Protected Phases		4			8					6	6	
Permitted Phases									2			
Actuated Green, G (s)		36.5			36.5				4.8	21.9	21.9	
Effective Green, g (s)		36.5			36.5				4.8	21.9	21.9	
Actuated g/C Ratio		0.49			0.49				0.06	0.29	0.29	
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)		897			904				103	490	458	
v/s Ratio Prot		c0.43			0.32					c0.25	0.24	
v/s Ratio Perm									c0.00			
v/c Ratio		0.88			0.66				0.05	0.84	0.81	
Uniform Delay, d1		17.3			14.6				33.1	25.1	24.7	
Progression Factor		1.00			1.00				1.00	1.00	1.00	
Incremental Delay, d2		9.6			1.7				0.2	12.6	10.4	
Delay (s)		26.9			16.3				33.2	37.7	35.2	
Level of Service		C			B				C	D	D	
Approach Delay (s)		26.9			16.3			33.2			36.4	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM Average Control Delay		27.9				HCM Level of Service			C			
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		75.2				Sum of lost time (s)			12.0			
Intersection Capacity Utilization		75.3%				ICU Level of Service			D			
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 6 Report

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Mosquito Rd./Broadway

Cycle (sec): 80 Critical Vol./Cap. (X): 0.837
 Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 29.3
 Optimal Cycle: 86 Level Of Service: C

Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Protected Protected Protected Protected
 Rights: Ovl Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 0 1 0 0 1 0 0 1 0 0 0 0 1 0 0 1

Volume Module:

Base Vol: 10 190 460 210 110 10 20 20 10 310 10 500
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 10 190 460 210 110 10 20 20 10 310 10 500
 Added Vol: 0 0 35 0 0 0 0 0 0 23 0 3
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 10 190 495 210 110 10 20 20 10 333 10 503
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 11 200 521 221 116 11 21 21 11 351 11 529
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 11 200 521 221 116 11 21 21 11 351 11 529
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Final Volume: 11 200 521 221 116 11 21 21 11 351 11 529

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 1.00 1.00 0.85 0.97 0.97 0.97 0.95 0.95 0.95 0.95 0.95 0.85
 Lanes: 0.05 0.95 1.00 0.64 0.33 0.03 0.40 0.40 0.20 0.97 0.03 1.00
 Final Sat.: 95 1801 1615 1167 611 56 725 725 362 1760 53 1615

Capacity Analysis Module:

Vol/Sat: 0.11 0.11 0.32 0.19 0.19 0.19 0.03 0.03 0.03 0.20 0.20 0.33
 Crit Moves: **** **** **** ****
 Green/Cycle: 0.14 0.15 0.52 0.23 0.24 0.24 0.03 0.05 0.05 0.37 0.39 0.39
 Volume/Cap: 0.80 0.75 0.62 0.84 0.80 0.80 0.84 0.54 0.54 0.54 0.51 0.84
 Uniform Del: 33.4 32.7 13.6 29.5 28.8 28.8 38.4 36.8 36.8 19.7 18.5 22.0
 IncremntDel: 16.3 11.0 1.4 13.9 10.5 10.5 59.9 5.7 5.7 0.8 0.6 9.6
 InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
 Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Delay/Veh: 49.8 43.7 15.1 43.4 39.3 39.3 98.3 42.5 42.5 20.5 19.1 31.6
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 49.8 43.7 15.1 43.4 39.3 39.3 98.3 42.5 42.5 20.5 19.1 31.6
 LOS by Move: D D B D D D F D D C B C
 HCM2kAvgQ: 7 7 10 11 10 10 3 2 2 7 7 15

Note: Queue reported is the number of cars per lane.

PM

ROUNDBOUT OPERATIONS ANALYSIS (FHWA)

Type of Design (1 - Urban & Rural Single Lane or 2 - Urban Compact)							2
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	PM	N-S	Cear Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	461	378	930	0.52	8	A	75
South							
East	712	186	1072	0.70	11	B	150
West	692	268	1012	0.72	12	B	175
All	1865				11	B	

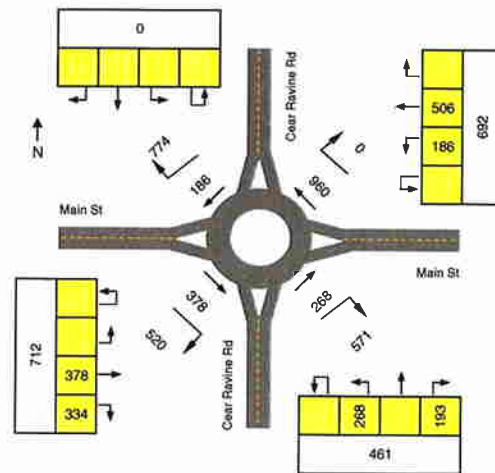
Source: Roundabouts: An Informational Guide (FHWA, 2000)

Capacity calculation is valid for inscribed diameters of 25 to 55 m (80 to 180 ft).

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



ROUNDBOUT OPERATIONS ANALYSIS (HCM 2000 - AVERAGE VALUES)

Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	PM	N-S	Cear Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS*	Queue** (ft)
North	461	378	929	0.52	13	B	75
South							
East	712	186	1090	0.69	15	C	150
West	692	268	1018	0.72	17	C	150
All	1865				15	C	

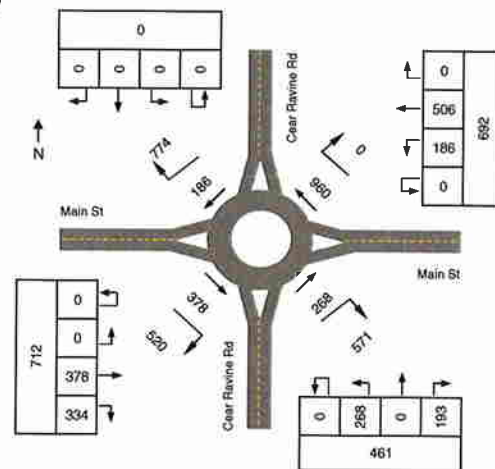
Capacity based on average of upper and lower values provided in Highway Capacity Manual 2000

Includes a "+5" factor to account for start-up delay under higher v/c ratios, so the delay for lower v/c ratios may be over-estimated.

Does not account for flared entry lanes or pedestrian effects.

* LOS criteria for unsignalized intersections from the Highway Capacity Manual 2000

** Assumes a queued vehicle length of 25 feet



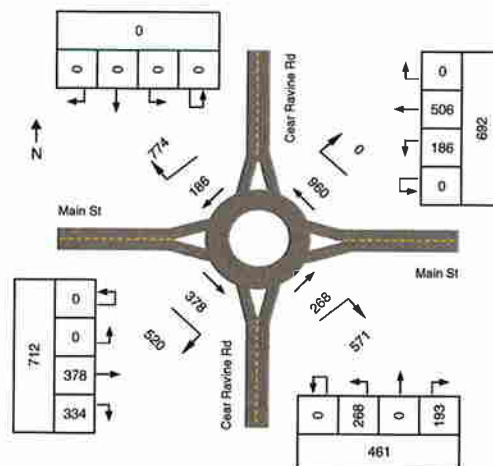
ROUNDBOUT OPERATIONS ANALYSIS (NCHRP 572)

Type of Design		Single-Lane Roundabout					
Period (hr)	0.25	Date	2025	E-W	Main St		
PHF	0.95	Time	PM	N-S	Cear Ravine Rd		
Approach	Total Volume (vph)	Circ. Flow (vph)	Capacity (vph)	v/c	Control Delay (sec)	LOS	Queue** (ft)
North	461	378	774	0.63	17	C	100
South							
East	712	186	938	0.80	22	C	225
West	692	268	864	0.84	27	D	250
All	1865				23	C	

Source: NCHRP 572: Roundabouts in the United States (TRB, 2007)

Includes a "+5" factor to account for start-up delay under higher v/c ratios, so the delay for lower v/c ratios may be over-estimated.

Does not account for flared entry lanes or pedestrian effects.



HCM Signalized Intersection Capacity Analysis

13: US 50 & Bedford Rd

Lumsden Ranch EIR
Cumulative Conditions PP - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4820		1770	3406	1583	1681	1707	1583	1770	1747	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.71	0.74	1.00	0.37	1.00	1.00
Satd. Flow (perm)	1770	4820		1770	3406	1583	1254	1303	1583	691	1747	1504
Volume (vph)	150	2267	345	90	1656	246	333	61	90	140	62	70
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)	158	2386	363	95	1743	259	351	64	95	147	65	74
RTOR Reduction (vph)	0	17	0	0	0	94	0	0	73	0	3	52
Lane Group Flow (vph)	158	2732	0	95	1743	165	176	239	22	147	68	16
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	11.0	71.9		7.0	67.9	67.9	28.0	28.0	28.0	28.0	28.0	28.0
Effective Green, g (s)	11.0	71.9		7.0	67.9	67.9	28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.09	0.60		0.06	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	164	2915		104	1945	904	295	307	373	163	411	354
v/s Ratio Prot	0.09	c0.57		0.05	c0.51						0.04	
v/s Ratio Perm						0.10	0.14	0.18	0.01	c0.21		0.01
v/c Ratio	0.96	0.94		0.91	0.90	0.18	0.60	0.78	0.06	0.90	0.17	0.05
Uniform Delay, d1	53.7	21.4		55.6	22.4	12.2	40.4	42.5	35.2	44.1	36.2	35.1
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	59.0	6.6		61.0	5.8	0.1	8.6	17.5	0.3	48.4	0.9	0.2
Delay (s)	112.8	28.1		116.6	28.3	12.3	49.0	60.1	35.6	92.5	37.0	35.4
Level of Service	F	C		F	C	B	D	E	D	F	D	D
Approach Delay (s)		32.7			30.3			51.7			65.2	
Approach LOS		C			C			D			E	

Intersection Summary

HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

**APPENDIX I:
AIR QUALITY MODELING**

APPENDIX AIR AIR QUALITY

- URBEMIS Assumptions and Calculations
- URBEMIS Report
- URBEMIS Report with Natural Gas Fireplaces
- CO Emissions Calculations
- Greenhouse Gas Emissions Calculations

Lumsden Ranch

URBEMIS Assumptions and Calculations

Project Data					
366	sf units	Source: project description			
1	clubhouse	Source: project description			
367	units	Calculation			
3,504	ADT	Source: traffic report			
9.55	average trip rate per day	Calculation			
42	acres for residential units and club house	Source: project description	Phase I	Phase II	Phase III
16	acres for roadway	Source: project description			
75	acres for open space with walking paths	Source: project description			
133	total acreage	Calculation			
58	acres disturbed	Calculation	19.33	19.33	19.33
100	percent wood burning fireplaces	Source: project manager			
2010	project year	Source: project description			
75	July mean temp	Source: weather.com			
45	Dec mean temp	Source: weather.com			
1	street sweeper for mass grading	Source: PM			
1	street sweeper for fine grading	Source: PM			

Months/Phase	Task	
0	demolition	Assumption
3	mass site grading	Assumption
3	fine site grading (overlap 1 month with prior activity)	Assumption
3	trenching (overlap 1 month with prior activity)	Assumption
3	paving (overlap 1 month with prior activity)	Assumption
10	building construction (overlap 1 month with prior activity)	Assumption
3	coating (overlap 1 month with prior activity)	Assumption
19	total	Source: project description

Demolition		
5	residences and outbuildings	Source: project description
3,000	square feet per residence and outbuildings	Assumption
15,000	total square feet	Calcuation
122.5	square root of total square feet	Calcuation
12	feet in height	Assumption
180,000	cubic feet	Calcuation
1	residence and outbuildings per day	Assumption

3,000	square feet per residence and outbuildings	Assumption
54.8	square root of square feet	Calculation
12	feet in height	Assumption
36,000	cubic feet	Calculation

Aggregate Material Imported During Fine Grading		Phase I	Phase II	Phase III	
16	acres for roadway	Source: project description			
43,560	sf to acre	Assumption			
696,960	square feet of roadway	Calculation			
6	inches thick	Assumption			
12	inches to feet	Assumption			
0.5	feet thick	Calculation			
348,480	cubic feet	Calculation			
27	cubic feet to cubic yard	Assumption			
12,907	cubic yard	Calculation	4302.22	4302.22	4302.22 cy of aggregate for road base

ROG & NOX Calculations				
Comparison to Countywide				
1,160	tons per year ROG & NOx	477	pounds per day ROG & Nox	
		87.0525	tons per year ROG & Nox	
		8%		
18	tons per day ROG & NOX	0.2385	tons per day ROG & NOX	
		1.3%		
Reduction with EPA-certified burners				
411	lbs/day ROG			
0.6	reduction			
164	lbs/day ROG			

Urbemis 2007 Version 9.2.2

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Lois Clarke\My Documents\Lois\Miller Env't Inc\Lumsden\Analysis\Lumsden Mountain Counties.urb9

Project Name: Lumsden Mountain County

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2008 TOTALS (lbs/day unmitigated)	24.44	142.47	188.25	0.07	420.34	8.70	429.05	87.83	7.99	95.82	17,234.72
2008 TOTALS (lbs/day mitigated)	24.44	142.47	188.25	0.07	95.58	8.70	104.28	20.01	7.99	28.00	17,234.72
2009 TOTALS (lbs/day unmitigated)	298.08	167.55	297.60	0.14	420.66	10.03	430.69	87.95	9.20	97.14	25,721.74
2009 TOTALS (lbs/day mitigated)	270.79	167.55	297.60	0.14	95.89	10.03	105.93	20.12	9.20	29.32	25,721.74
2010 TOTALS (lbs/day unmitigated)	289.26	62.20	228.62	0.13	0.64	3.35	3.99	0.23	3.05	3.28	17,293.29
2010 TOTALS (lbs/day mitigated)	261.97	62.20	228.62	0.13	0.64	3.35	3.99	0.23	3.05	3.28	17,293.29

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	26.61	4.76	18.99	0.00	0.06	0.05	5,896.70

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	37.27	44.47	428.32	0.25	42.72	8.35	24,898.80

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	63.88	49.23	447.31	0.25	42.78	8.40	30,795.50

Urbemis 2007 Version 9.2.2

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Lois Clarke\My Documents\Lois\Miller Env't Inc\Lumsden\Analysis\Lumsden Mountain Counties.urb9

Project Name: Lumsden Mountain County

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2008 TOTALS (lbs/day unmitigated)	24.44	142.47	188.25	0.07	420.34	8.70	429.05	87.83	7.99	95.82	17,234.72
2008 TOTALS (lbs/day mitigated)	24.44	142.47	188.25	0.07	95.58	8.70	104.28	20.01	7.99	28.00	17,234.72
2009 TOTALS (lbs/day unmitigated)	298.08	167.55	297.60	0.14	420.66	10.03	430.69	87.95	9.20	97.14	25,721.74
2009 TOTALS (lbs/day mitigated)	270.79	167.55	297.60	0.14	95.89	10.03	105.93	20.12	9.20	29.32	25,721.74
2010 TOTALS (lbs/day unmitigated)	289.26	62.20	228.62	0.13	0.64	3.35	3.99	0.23	3.05	3.28	17,293.29
2010 TOTALS (lbs/day mitigated)	261.97	62.20	228.62	0.13	0.64	3.35	3.99	0.23	3.05	3.28	17,293.29

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	125.17	18.46	643.45	2.04	103.66	99.78	25,222.76

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	40.07	66.94	466.15	0.22	42.72	8.35	21,751.52

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	165.24	85.40	1,109.60	2.26	146.38	108.13	46,974.28

Urbemis 2007 Version 9.2.2

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Lois Clarke\My Documents\Lois\Miller Env't Inc\Lumsden\Analysis\Lumsden Mountain Counties with nat gas fp.urb9

Project Name: Lumsden Mountain County

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2008 TOTALS (lbs/day unmitigated)	24.17	143.86	173.85	0.06	420.34	8.70	429.05	87.83	7.99	95.82	16,693.42
2008 TOTALS (lbs/day mitigated)	24.17	143.86	173.85	0.06	95.58	8.70	104.28	20.01	7.99	28.00	16,693.42
2009 TOTALS (lbs/day unmitigated)	297.60	170.01	271.50	0.12	420.66	10.03	430.69	87.95	9.20	97.14	24,666.90
2009 TOTALS (lbs/day mitigated)	270.31	170.01	271.50	0.12	95.89	10.03	105.93	20.12	9.20	29.32	24,666.90
2010 TOTALS (lbs/day unmitigated)	288.83	64.34	204.47	0.12	0.64	3.35	3.99	0.23	3.05	3.28	16,238.00
2010 TOTALS (lbs/day mitigated)	261.54	64.34	204.47	0.12	0.64	3.35	3.99	0.23	3.05	3.28	16,238.00

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	23.71	7.64	3.26	0.02	0.26	0.25	9,756.41

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	48.59	71.83	545.36	0.22	42.74	8.36	21,904.42

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	72.30	79.47	548.62	0.24	43.00	8.61	31,660.83

Urbemis 2007 Version 9.2.2

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Lois Clarke\My Documents\Lois\Miller Env't Inc\Lumsden\Analysis\Lumsden Mountain Counties with nat gas fp.urb9

Project Name: Lumsden Mountain County

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5</u>	<u>PM2.5</u>	<u>CO2</u>
2008 TOTALS (lbs/day unmitigated)	24.17	143.86	173.85	0.06	420.34	8.70	429.05	87.83	7.99	95.82	16,693.42
2008 TOTALS (lbs/day mitigated)	24.17	143.86	173.85	0.06	95.58	8.70	104.28	20.01	7.99	28.00	16,693.42
2009 TOTALS (lbs/day unmitigated)	297.60	170.01	271.50	0.12	420.66	10.03	430.69	87.95	9.20	97.14	24,666.90
2009 TOTALS (lbs/day mitigated)	270.31	170.01	271.50	0.12	95.89	10.03	105.93	20.12	9.20	29.32	24,666.90
2010 TOTALS (lbs/day unmitigated)	288.83	64.34	204.47	0.12	0.64	3.35	3.99	0.23	3.05	3.28	16,238.00
2010 TOTALS (lbs/day mitigated)	261.54	64.34	204.47	0.12	0.64	3.35	3.99	0.23	3.05	3.28	16,238.00

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	26.61	4.76	18.99	0.00	0.06	0.05	5,896.70

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	39.78	51.81	425.39	0.22	42.74	8.36	23,010.98

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	66.39	56.57	444.38	0.22	42.80	8.41	28,907.68

Lumsden Ranch

CO Emissions Calculations

El Dorado County AQMD CEQA Guide

First Edition February 2002

CO	1-hour	8-hour		
Background	3	0	ppm	Source: AQMD
2007	1.53	0.51	ppm	Source: AQMD
2010	1.32	0.35	ppm	Source: AQMD
2008	1.46	0.46	ppm	Calculated
2009	1.39	0.40	ppm	Calculated

ADT		3,504		Source: Traffic Report
Conversion to peak hour traffic trips		0.1		Source: AQMD
Peak hour traffic trips		350.4		Calculated

CO	1-hour	8-hour	0.7	Conversion from 1- to 8-hour
Project				
300	1.1		ppm	Source: AQMD
500	1.7		ppm	Source: AQMD
350.4	1.3	0.9	ppm	Calculated

Significance	2008		2009		2010	Operation	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour	
1. Background Concentration	1.46	0.46	1.39	0.40	1.3	0.4	Calculated
2. Project-Related Pollutant Concentration	1.3	0.9	1.3	0.9	1.3	0.9	Calculated
3. Anticipated Total Concentration	2.71	1.33	2.64	1.28	2.6	1.2	Calculated
4. Ambient Air Quality Standard	20	9	20	9	20	9	Source: AQMD
5. Significance Determination: Significant if >0	-17.29	-7.67	-17.36	-7.72	-17.43	-7.77	Calculated
Significant? (Yes/No)	N	N	N	N	N	N	

Lumsden Ranch

Greenhouse Gas Emissions Calculations

Total Emissions from Indirect Electricity Use

Formula and Emission Factor from The California Climate Action Registry Report Protocol 2006

pages: 32 and 96

Pg. 32 (CCARRP) gives Equation

Total CO₂(CH₄,N₂O) emissions (metric tons) Equals Electricity use (kWh) times Electricity emission Factor (lbs CO₂(CH₄,N₂O)/kWh) divided by 2,204.62 (lbs/metric ton)

Pg. 85 (CCARRP) gives CO₂ output emission rate (lbs/mWh)

804.54 (lbs/mWh)

Pg. 86 (CCARRP) gives Methane and Nitrous Oxide electricity emission factors (lbs/mWh)

Methane - 0.0067 (lbs/mWh)

Nitrous Oxide - 0.0037 (lbs/mWh)

Annual

Use (kWh)

6,864 EIA average residential in CA 2005

367 units

Electric Use (kWh)	Electric Use mWh	GHG	Pollutant Emission Rate (lb/mWh)	Lbs. of Emissions	Metric Tons of Emissions	CO ₂ e factors	CO ₂ Equivalents (CO ₂ e) Metric tons/year
2,519,088	2,519	CO	804.54	2026707.06	919.2999517	1	919.30
2,519,088	2,519	CH ₄	0.0067	16.8778896	0.007655691	296	2.27
2,519,088	2,519	N ₂ O	0.0037	9.3206256	0.00422777	23	0.10
						Total	921.66

1	pound	0.00045359	metric tons	conversion			
25,017	CO ₂ pounds from URBEMIS	11.35	metric tons	CO ₂ from construction			
37,883	CO ₂ pounds from URBEMIS	17.18	metric tons	CO ₂ from operations			
		921.66	metric tons	CO ₂ from indirect electricity use			
		938.85	metric tons	CO ₂ from operations including indirect electricity use			
		950.19	metric tons	CO ₂ total			
		25000	metric tons	reporting limit			
		3.80%		project compared to reporting limit			
		174000000	metric tons	state goal			
		0.00055%		project compared to state goal			

APPENDIX J: NOISE MODELING

Appendix Noise Table NA-1 Existing and Projected PM Peak-Hour Traffic Noise Levels Along Roadways in the Project Vicinity (Lumsden Ranch)

P.M. Peak Hour Noise Levels Leq /a,b,c/

Roadway Segment	Existing						Year 2025								
			Sig. Criteria	Change Exist+P	Change Exist + A				Change 2025 NP	Change 2025+Proj		Change 2025+Proj	Change 2025 + A		Change 2025 + A
	Existing (No Proj)	Existing + Project		from Existing	Existing + Alternative	from Existing	2025 (No Proj)	Criteria dBA	from Existing NP	2025 + Project	from 2025 NP	from Existing NP	2025 + Alternative	from 2025 NP	from Existing NP
1 Airport Road south of Broadway	56.7	57.2	5.0	0.52	57.2	0.52	62.8	3.0	6.06	62.9	0.12	6.18	62.9	0.12	6.18
2 Broadway east of Airport Road	62.0	62.5	3.0	0.49	62.5	0.49	64.8	3.0	2.83	65.1	0.26	3.09	65.1	0.26	3.09
3 Broadway west of Airport Road	62.4	62.9	3.0	0.47	62.9	0.47	66.9	1.5	4.51	67.2	0.32	4.83	67.2	0.32	4.83
4 Wiltse Road South of Broadway	57.2	57.2	5.0	0.00	57.2	0.00	57.8	5.0	0.56	57.8	0.00	0.56	57.8	0.00	0.56
5 Broadway east of Wiltse Road	66.3	66.7	1.5	0.41	66.8	0.46	67.1	1.5	0.80	67.4	0.35	1.15	67.5	0.39	1.19
6 Broadway west of Wiltse Road	66.2	66.6	1.5	0.43	66.6	0.47	67.0	1.5	0.85	67.4	0.35	1.21	67.4	0.39	1.25
7 Blairs Lane north of Broadway	55.0	55.0	5.0	0.00	55.0	0.00	56.3	5.0	1.31	56.3	0.00	1.31	56.3	0.00	1.31
8 Blairs Lane south of Broadway	56.5	56.5	5.0	0.00	58.9	2.40	59.8	5.0	3.30	59.8	0.00	3.30	61.0	1.24	4.54
9 Broadway east of Blairs Lane	66.1	66.5	1.5	0.39	66.5	0.48	67.0	1.5	0.96	67.3	0.31	1.27	67.4	0.39	1.35
10 Broadway west of Blairs Lane	66.2	66.6	1.5	0.38	66.6	0.38	67.4	1.5	1.17	67.7	0.29	1.46	67.7	0.28	1.45
11 Country Club Drive north of Barrett Drive	53.1	54.2	5.0	1.13	54.2	1.13	55.9	5.0	2.82	56.5	0.59	3.41	56.5	0.59	3.41
12 Country Club Drive south of Barrett Drive	53.4	55.9	5.0	2.47	55.9	2.47	55.4	5.0	1.96	56.3	0.88	2.84	56.3	0.88	2.84
13 Barrett Drive west of Country Club Drive	49.8	54.7	5.0	4.96	54.7	4.96	53.3	5.0	3.57	55.2	1.88	5.44	55.2	1.88	5.44
14 Canyon View Drive south of Broadway	NA	61.4	3.0	NA	59.9	NA	NA	NA	NA	61.4	NA	NA	59.9	NA	NA
15 Broadway east of Canyon View Drive	NA	62.1	3.0	NA	62.1	NA	NA	NA	NA	62.3	NA	NA	62.3	NA	NA
16 Broadway west of Canyon View Drive	NA	64.2	3.0	NA	63.4	NA	NA	NA	NA	64.3	NA	NA	63.6	NA	NA
17 Barrett Drive north of Cedar Ravine Road	NA	NA	NA	NA	NA	NA	52.4	5.0	NA	54.3	1.90	NA	54.3	1.90	NA
18 Cedar Ravine Road east of Barrett Drive	NA	NA	NA	NA	NA	NA	65.0	3.0	NA	65.1	0.09	NA	65.1	0.09	NA
19 Cedar Ravine Road west of Barrett Drive	NA	NA	NA	NA	NA	NA	65.0	3.0	NA	65.2	0.19	NA	65.2	0.19	NA

Significance Criteria

Less than 60 dBA = 5.0 dBA or more

60 - 65 dBA = 3.0 dBA or more

Greater than 65 dBA = 1.5 dBA or more

Reference: Federal Interagency Committee on Noise (FICON), Federal Agency Review of Selected Airport Noise Analysis Issues, 1992).

/a/ Noise levels were calculated using the FHWA Traffic Noise Prediction Model for weekday p.m. peak-hour conditions.

Noise levels were calculated for 15 meters (49 feet) from the roadway centerline.

/b/ The analysis assumes the average vehicle speed to be 35 mph on all roads.

Vehicle mix is assumed to consist of 97 percent automobiles and light trucks, 2 percent medium trucks, and 1 percent heavy trucks.

/c/ Bold numbers represent significant increases in noise levels.

Last Update January 17, 2009

ROAD SEGMENT #4: Airport Road south of Broadway		TOTAL # VEHICLES	VEHICLE TYPE %								VEHICLE SPEED								calveno factors			Calculated dBA (15 meters from roadway center)
			Auto		Medium Truck		Heavy Truck		Auto		k/h		MT		k/h		Auto		MT	HT		
			% Auto		% MT		% HT		Auto		MT		k/h		HT		Auto		MT	HT		
			%	Auto	%	MT	%	HT		k/h		MT		k/h		Auto		MT		HT		
Existing		109	97	106	2	2	1	1	35	56	35	56	35	56	54.6	47.4	51.1	56.7				
Existing + Project		123	97	119	2	2	1	1	35	56	35	56	35	56	55.1	47.9	51.6	57.2				
Existing + Alternate Configuration		123	97	119	2	2	1	1	35	56	35	56	35	56	55.1	47.9	51.6	57.2				
2025 No Project		440	97	427	2	9	1	4	35	56	35	56	35	56	60.6	53.5	57.2	62.8				
2025 + Project		452	97	438	2	9	1	5	35	56	35	56	35	56	60.7	53.6	57.3	62.9				
2025 + Alternative Configuration		452	97	438	2	9	1	5	35	56	35	56	35	56	60.7	53.6	57.3	62.9				

ROAD SEGMENT #4: Broadway east of Airport Road		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
			Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
			%	Auto	%	MT	%	HT		k/h		k/h		k/h				
Existing	365	97	354	2	7	1	4	35	56	35	56	35	56	59.8	52.7	56.4	62.0	
Existing + Project	409	97	397	2	8	1	4	35	56	35	56	35	56	60.3	53.2	56.9	62.5	
Existing + Alternate Configuration	409	97	397	2	8	1	4	35	56	35	56	35	56	60.3	53.2	56.9	62.5	
2025 No Project	700	97	679	2	14	1	7	35	56	35	56	35	56	62.6	55.5	59.2	64.8	
2025 + Project	744	97	722	2	15	1	7	35	56	35	56	35	56	62.9	55.8	59.5	65.1	
2025 + Alternative Configuration	744	97	722	2	15	1	7	35	56	35	56	35	56	62.9	55.8	59.5	65.1	

ROAD SEGMENT #4: Broadway west of Airport Road		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
			Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
			%	Auto	%	MT	%	HT	k/h	MT	k/h	HT	k/h					
Existing		404	97	392	2	8	1	4	35	56	35	56	35	56	60.2	53.1	56.8	62.4
Existing + Project		450	97	437	2	9	1	5	35	56	35	56	35	56	60.7	53.6	57.3	62.9
Existing + Alternate Configuration		450	97	437	2	9	1	5	35	56	35	56	35	56	60.7	53.6	57.3	62.9
2025 No Project		1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
2025 + Project		1,228	97	1,191	2	25	1	12	35	56	35	56	35	56	65.1	57.9	61.6	67.2
2025 + Alternative Configuration		1,228	97	1,191	2	25	1	12	35	56	35	56	35	56	65.1	57.9	61.6	67.2

ROAD SEGMENT #8: Wiltse Road South of Broadway		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
			Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
			%	Auto	%	MT	%	HT	k/h	k/h	k/h	k/h	k/h					
Existing	123	97	119	2	2	1	1	35	56	35	56	35	56	55.1	47.9	51.6	57.2	
Existing + Project	123	97	119	2	2	1	1	35	56	35	56	35	56	55.1	47.9	51.6	57.2	
Existing + Alternate Configuration	123	97	119	2	2	1	1	35	56	35	56	35	56	55.1	47.9	51.6	57.2	
2025 No Project	140	97	136	2	3	1	1	35	56	35	56	35	56	55.6	48.5	52.2	57.8	
2025 + Project	140	97	136	2	3	1	1	35	56	35	56	35	56	55.6	48.5	52.2	57.8	
2025 + Alternative Configuration	140	97	136	2	3	1	1	35	56	35	56	35	56	55.6	48.5	52.2	57.8	

ROAD SEGMENT #8: Broadway east of Wiltse Road		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)		
			Auto		Medium Truck		Heavy Truck		Auto		k/h		MT		k/h		Auto		MT	HT
			%	Auto	%	MT	%	HT												
Existing		990	97	960	2	20	1	10	35	56	35	56	35	56	64.1	57.0	60.7	66.3		
Existing + Project		1,089	97	1,056	2	22	1	11	35	56	35	56	35	56	64.5	57.4	61.1	66.7		
Existing + Alternate Configuration		1,101	97	1,068	2	22	1	11	35	56	35	56	35	56	64.6	57.5	61.2	66.8		
2025 No Project		1,190	97	1,154	2	24	1	12	35	56	35	56	35	56	64.9	57.8	61.5	67.1		
2025 + Project		1,289	97	1,250	2	26	1	13	35	56	35	56	35	56	65.3	58.1	61.8	67.4		
2025 + Alternative Configuration		1,301	97	1,262	2	26	1	13	35	56	35	56	35	56	65.3	58.2	61.9	67.5		

ROAD SEGMENT #8: Broadway west of Wiltse Road		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)						
			Auto		Medium Truck		Heavy Truck		Auto k/h		MT k/h		HT k/h		Auto				MI			HT		
Existing	961	97	932	2	19	1	10	35	56	35	56	35	56	64.0	56.9	60.6	66.2							
Existing + Project	1,060	97	1,028	2	21	1	11	35	56	35	56	35	56	64.4	57.3	61.0	66.6							
Existing + Alternate Configuration	1,072	97	1,040	2	21	1	11	35	56	35	56	35	56	64.5	57.3	61.0	66.6							
2025 No Project	1,170	97	1,135	2	23	1	12	35	56	35	56	35	56	64.9	57.7	61.4	67.0							
2025 + Project	1,269	97	1,231	2	25	1	13	35	56	35	56	35	56	65.2	58.1	61.8	67.4							
2025 + Alternative Configuration	1,281	97	1,243	2	26	1	13	35	56	35	56	35	56	65.3	58.1	61.8	67.4							

ROAD SEGMENT #9: Blairs Lane north of Broadway		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
			Auto		Medium Truck		Heavy Truck		Auto		MT		k/h		HT			
			% Auto		% MT		% HT		Auto		MT		k/h		HT			
			%	Auto	%	MT	%	HT		k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	74	97	72	2	1	1	1	35	56	35	56	35	56	52.9	45.7	49.4	55.0	
Existing + Project	74	97	72	2	1	1	1	35	56	35	56	35	56	52.9	45.7	49.4	55.0	
Existing + Alternate Configuration	74	97	72	2	1	1	1	35	56	35	56	35	56	52.9	45.7	49.4	55.0	
2025 No Project	100	97	97	2	2	1	1	35	56	35	56	35	56	54.2	47.0	50.7	56.3	
2025 + Project	100	97	97	2	2	1	1	35	56	35	56	35	56	54.2	47.0	50.7	56.3	
2025 + Alternative Configuration	100	97	97	2	2	1	1	35	56	35	56	35	56	54.2	47.0	50.7	56.3	

ROAD SEGMENT #9: Blairs Lane south of Broadway		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)		
			Auto		Medium Truck		Heavy Truck		Auto		MT		k/h		HT		Auto		MT	HT
			%	Auto	%	MT	%	HT	%	Auto	%	MT	%	k/h	%	HT				
Existing	103	97	100	2	2	1	1	35	56	35	56	35	56	54.3	47.2	50.9	56.5			
Existing + Project	103	97	100	2	2	1	1	35	56	35	56	35	56	54.3	47.2	50.9	56.5			
Existing + Alternate Configuration	179	97	174	2	4	1	2	35	56	35	56	35	56	56.7	49.6	53.3	58.9			
2025 No Project	220	97	213	2	4	1	2	35	56	35	56	35	56	57.6	50.5	54.2	59.8			
2025 + Project	220	97	213	2	4	1	2	35	56	35	56	35	56	57.6	50.5	54.2	59.8			
2025 + Alternative Configuration	293	97	284	2	6	1	3	35	56	35	56	35	56	58.8	51.7	55.4	61.0			

Noise Appendix
Table NA-2

ROAD SEGMENT #9: Broadway east of Blairs Lane	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	938	97	910	2	19	1	9	35	56	35	56	35	56	63.9	56.8	60.5	66.1
Existing + Project	1,026	97	995	2	21	1	10	35	56	35	56	35	56	64.3	57.2	60.9	66.5
Existing + Alternate Configuration	1,047	97	1,016	2	21	1	10	35	56	35	56	35	56	64.4	57.2	60.9	66.5
2025 No Project	1,170	97	1,135	2	23	1	12	35	56	35	56	35	56	64.9	57.7	61.4	67.0
2025 + Project	1,258	97	1,220	2	25	1	13	35	56	35	56	35	56	65.2	58.0	61.7	67.3
2025 + Alternative Configuration	1,279	97	1,241	2	26	1	13	35	56	35	56	35	56	65.2	58.1	61.8	67.4

ROAD SEGMENT #9: Broadway west of Blairs Lane	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	971	97	942	2	19	1	10	35	56	35	56	35	56	64.0	56.9	60.6	66.2
Existing + Project	1,059	97	1,027	2	21	1	11	35	56	35	56	35	56	64.4	57.3	61.0	66.6
Existing + Alternate Configuration	1,060	97	1,028	2	21	1	11	35	56	35	56	35	56	64.4	57.3	61.0	66.6
2025 No Project	1,270	97	1,232	2	25	1	13	35	56	35	56	35	56	65.2	58.1	61.8	67.4
2025 + Project	1,358	97	1,317	2	27	1	14	35	56	35	56	35	56	65.5	58.4	62.1	67.7
2025 + Alternative Configuration	1,356	97	1,315	2	27	1	14	35	56	35	56	35	56	65.5	58.4	62.1	67.7

ROAD SEGMENT #15: Country Club Drive north of Barrett Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	47	97	46	2	1	1	0	35	56	35	56	35	56	50.9	43.8	47.5	53.1
Existing + Project	61	97	59	2	1	1	1	35	56	35	56	35	56	52.0	44.9	48.6	54.2
Existing + Alternate Configuration	61	97	59	2	1	1	1	35	56	35	56	35	56	52.0	44.9	48.6	54.2
2025 No Project	90	97	87	2	2	1	1	35	56	35	56	35	56	53.7	46.6	50.3	55.9
2025 + Project	103	97	100	2	2	1	1	35	56	35	56	35	56	54.3	47.2	50.9	56.5
2025 + Alternative Configuration	103	97	100	2	2	1	1	35	56	35	56	35	56	54.3	47.2	50.9	56.5

ROAD SEGMENT #15: Country Club Drive south of Barrett Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	51	97	49	2	1	1	1	35	56	35	56	35	56	51.3	44.1	47.8	53.4
Existing + Project	90	97	87	2	2	1	1	35	56	35	56	35	56	53.7	46.6	50.3	55.9
Existing + Alternate Configuration	90	97	87	2	2	1	1	35	56	35	56	35	56	53.7	46.6	50.3	55.9
2025 No Project	80	97	78	2	2	1	1	35	56	35	56	35	56	53.2	46.1	49.8	55.4
2025 + Project	98	97	95	2	2	1	1	35	56	35	56	35	56	54.1	47.0	50.7	56.3
2025 + Alternative Configuration	98	97	95	2	2	1	1	35	56	35	56	35	56	54.1	47.0	50.7	56.3

ROAD SEGMENT #15: Barrett Drive west of Country Club Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	22	97	21	2	0	1	0	35	56	35	56	35	56	47.6	40.5	44.2	49.8
Existing + Project	69	97	67	2	1	1	1	35	56	35	56	35	56	52.6	45.4	49.1	54.7
Existing + Alternate Configuration	69	97	67	2	1	1	1	35	56	35	56	35	56	52.6	45.4	49.1	54.7
2025 No Project	50	97	49	2	1	1	1	35	56	35	56	35	56	51.2	44.0	47.7	53.3
2025 + Project	77	97	75	2	2	1	1	35	56	35	56	35	56	53.0	45.9	49.6	55.2
2025 + Alternative Configuration	77	97	75	2	2	1	1	35	56	35	56	35	56	53.0	45.9	49.6	55.2

ROAD SEGMENT #16: Canyon View Drive south of Broadway	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
Existing + Project	322	97	312	2	6	1	3	35	56	35	56	35	56	59.3	52.1	55.8	61.4
Existing + Alternate Configuration	228	97	221	2	5	1	2	35	56	35	56	35	56	57.8	50.6	54.3	59.9
2025 No Project	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
2025 + Project	321	97	311	2	6	1	3	35	56	35	56	35	56	59.2	52.1	55.8	61.4
2025 + Alternative Configuration	227	97	220	2	5	1	2	35	56	35	56	35	56	57.7	50.6	54.3	59.9

ROAD SEGMENT #16: Broadway east of Canyon View Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
Existing + Project	375	97	364	2	8	1	4	35	56	35	56	35	56	59.9	52.8	56.5	62.1
Existing + Alternate Configuration	375	97	364	2	8	1	4	35	56	35	56	35	56	59.9	52.8	56.5	62.1
2025 No Project	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
2025 + Project	394	97	382	2	8	1	4	35	56	35	56	35	56	60.1	53.0	56.7	62.3
2025 + Alternative Configuration	394	97	382	2	8	1	4	35	56	35	56	35	56	60.1	53.0	56.7	62.3

ROAD SEGMENT #16: Broadway west of Canyon View Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto		Medium Truck		Heavy Truck		Auto		MT	HT	k/h	k/h	Auto	MT	HT	
		%	Auto	%	MT	%	HT	Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT	
Existing	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
Existing + Project	607	97	589	2	12	1	6	35	56	35	56	35	56	62.0	54.9	58.6	64.2
Existing + Alternate Configuration	513	97	498	2	10	1	5	35	56	35	56	35	56	61.3	54.1	57.8	63.4
2025 No Project	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
2025 + Project	627	97	608	2	13	1	6	35	56	35	56	35	56	62.1	55.0	58.7	64.3
2025 + Alternative Configuration	533	97	517	2	11	1	5	35	56	35	56	35	56	61.4	54.3	58.0	63.6

ROAD SEGMENT #17: Barrett Drive north of Cedar Ravine Road		TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)		
			Auto		Medium Truck		Heavy Truck		Auto		k/h		MT		HT		Auto		MT	HT
			%	Auto	%	MT	%	HT		k/h		k/h		k/h						
Existing	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!			
Existing + Project	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!			
Existing + Alternate Configuration	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!			
2025 No Project	40	97	39	2	1	1	0	35	56	35	56	35	56	50.2	43.1	46.8	52.4			
2025 + Project	62	97	60	2	1	1	1	35	56	35	56	35	56	52.1	45.0	48.7	54.3			
2025 + Alternative Configuration	62	97	60	2	1	1	1	35	56	35	56	35	56	52.1	45.0	48.7	54.3			

ROAD SEGMENT #17: Cedar Ravine Road east of Barrett Drive	TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						calveno factors			Calculated dBA (15 meters from roadway center)
		Auto	Medium Truck		Heavy Truck		Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT		
		%	Auto	%	MT	%	HT										
Existing	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
Existing + Project	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
Existing + Alternate Configuration	0	97	0	2	0	1	0	35	56	35	56	35	56	#NUM!	#NUM!	#NUM!	#NUM!
2025 No Project	730	97	708	2	15	1	7	35	56	35	56	35	56	62.8	55.7	59.4	65.0
2025 + Project	746	97	724	2	15	1	7	35	56	35	56	35	56	62.9	55.8	59.5	65.1
2025 + Alternative Configuration	746	97	724	2	15	1	7	35	56	35	56	35	56	62.9	55.8	59.5	65.1

															Calculated dBA		
															(15 meters from roadway center)		
ROAD SEGMENT #17: Cedar Ravine Road west of Barrett Drive																	
TOTAL																	
# VEHICLES																	
															calveno factors		

**APPENDIX K:
FIRE SAFE PLAN**

Lumsden Ranch
Wildfire Fire Safe Plan

Prepared for:

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May 20, 2007

Lumsden Ranch Fire Safe Plan

Plan Approved by:



Mark Johnson, Battalion Chief
Fire Marshal
El Dorado County Fire Protection District

6-27-07
Date

Prepared by:



William F. Draper
RPF 898

6-27-07
Date



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I. PURPOSE AND SCOPE

Communities are increasingly concerned about wildfire safety. Drought years coupled with flammable vegetation and annual periods of severe fire weather insure the potential for periodic wildfires.

The purpose of this plan is to assess the wildfire hazards and risks of the Lumsden Ranch development, to identify measures to reduce these hazards and risks and to protect the native vegetation. There are moderate to heavy fuel hazards and gentle to steep topography associated with this proposed development both on and adjacent to the project.

The possibility of large fires occurring when the Lumsden Ranch project is complete will be reduced. However, small wildfires in the open space areas and on the larger lots may occur due to the increase in public uses.

Incorporation of the fire hazard reduction measures into the design and maintenance of the development will reduce the size and intensity of wildfires and help prevent catastrophic fire losses. State and County regulations provide the basic guidelines and requirements for fire safe mitigation measures and defensible space around dwellings. This plan builds on these basic rules and provides additional fire hazard reduction measures customized to the topography and vegetation of the development with special emphasis on the interface of homes and wildland fuels.

The scope of the Lumsden Ranch Wildfire Fire Safe Plan recognizes the extraordinary natural features of the area and designs wildfire safety measures which are meant to compliment and become part of the community design. The Plan contains measures for providing and maintaining defensible space along roads, in open space and around future homes. Plan implementation measures must be maintained in order to assure adequate wildfire protection.

Homeowners who live in and adjacent to the wildfire environment must take primary responsibility along with the fire services for ensuring their homes have sufficient low ignitability and surrounding fuel reduction treatment. The fire services should become a community partner providing homeowners with technical assistance as well as fire response. For this to succeed, it must be shared and implemented equally by homeowners and the fire services.

II. FIRE PLAN LIMITATIONS

The Wildfire Fire Safe Plan for the Lumsden Ranch does not guarantee that wildfire will not threaten, damage or destroy natural resources, homes or endanger residents. However, the full implementation of the mitigation measures will reduce the exposure of homes to potential loss from wildfire and provide defensible space for firefighters and residents as well as protect the native vegetation. Specific items are listed for homeowner's attention to aid in home wildfire safety.

III. THE LUMSDEN RANCH WILDFIRE FIRE SAFE PLAN

1. PROJECT DESCRIPTION

Lumsden Ranch is located within the incorporated community of Placerville in generally a bowl with east, west and north facing gentle to steep slopes and lies south of Highway 50, west of Country Club Drive, south of Barrett Drive and to the west of Cedar Ravine. Wiltse Road leads into the project area from the north with Lumsden Park nestled at the base of this new development. Eskaton is to the northwest with Blair Lane as the road access that could provide a potential third way into and out of Lumsden Ranch. This project will divide 134 acres into 366 lots ranging in size from 4,000 square feet to 25,000 square feet. Housing will occupy approximately 42.6 acres with the remaining 91.4 acres being used for roads, clubhouse facilities and open space with a hiking trail network. This is a good location for a maintained hiking trail. The new road, Canyon View, being the main connector road needs to have 40 feet of travel surface. Canyon View will connect with Broadway and Barrett Drive. All the other proposed roads within the development, Nugget Lane, Alhambra Drive, Hidden Treasure Drive, Mace Drive, Shirley Lane, Vandalia, Lane, and Skinner Lane will directly or indirectly connect with Canyon View. These feeder roads will have 30 feet of travel surface with street parking allowed on only one side of the street. All roadways shall conform to City of Placerville standards. If Hidden Treasure Drive is connected to Blair Lane, a third unrestricted road will serve this new development. Without this third access, an emergency exit will be required to provide for safe evacuation of residents. The most logical route would be from Mace Drive by the Detention Basin A down to Wiltse Road. The key topographic features are the gentle to steep slopes for the house sites and the varied forested open space sloping to the east, west and north. Since Wiltse is such a narrow road there are limitations to its use.

All fire protection is provided by the El Dorado County Fire Protection District and California Department of Forestry and Fire Protection (CDF) would assist with wildland fire protection. A fire hydrant system will serve the new area. Water is to be supplied by El Dorado Irrigation District. Current fire flow is expected to be 1,500 gallons per minute at 20 pounds of pressure for 2 hours. Due to the unique location and access all residences shall have residential fire sprinklers. If the third access route, Hidden Treasure Drive to Blair Lane is developed as an unrestricted roadway, the provision for residential fire sprinklers can be waived.

2. PROJECT VEGETATION (FUELS)

For wildfire planning purposes the vegetation is classified as follows:

- (a) ground fuels- ceanothus (Sweet Birch), dogwood, buckeye, toyon, manzanita, scotch broom, blackberries, poison oak, and grass (brush)
- (b) overstory- young growth mixed conifer stand of black oak, live oak, incense cedar, sugar pine, Douglas-fir, ponderosa pine, Gray pine, blue oak, and big leaf maple

Heavy fuel loading must be removed from the majority of the property. Buffers are needed to provide a separation of the tree canopy from the brush which will better insure that a crown fire from down the slope doesn't threaten this development and surrounding homes. To minimize a ground fire getting into the crown of the trees in the open space the use of trails, roads and fuel breaks needs to be improved and maintained. The ladder fuels are mainly tree limbs, seedling, saplings, and brush. The majority of the open space must have the ladder fuels removed. Sprouting will become an issue in the future and create a fire hazard if

not eliminated when they occur. A special maintenance program must be funded and strictly followed to better insure a safer environment.

With the need to remove commercial tree species that have a potential value, a timberland conversion should be sought from the California Department of Forestry and Fire Protection. The timberland conversion would allow for the commercial removal of all trees needing to be removed for roads, house sites and the cleanup of the open space areas.

3. PROBLEM STATEMENTS

A. The grass/brush fuels will ignite and have a rapid rate of spread.

Fire in the grass/brush fuels on the slopes throughout this development is the most serious wildfire problem for this project.

B. Risk of fire starts will increase with development.

The greatest risk from fire ignition will be along roads, in the open space areas and on large lots as human use on these areas increase.

C. Provisions must be made to maintain all fuel treatments.

The wildfire protection values of fuel reduction are rapidly lost if not maintained. Annual maintenance by June 1 of each year is necessary.

D. Typical home design and siting often does not recognize adequate wildfire mitigation measures.

A review of many wildfires has conclusively shown that most home losses occur when: (1) there is inadequate clearing of flammable vegetation around a house, (2) roofs are not fire resistant, (3) homes are sited in hazardous locations, (4) firebrand ignition points and heat traps are not adequately protected and (5) there is a lack of water for suppression.

4. GOALS

- A. Modify the continuity of high hazard vegetation fuels.
- B. Reduce the size and intensity of wildfires.
- C. Ensure defensible space is provided around all structures.
- D. Design fuel treatments to minimize tree removal
- E. Ensure fuel treatment measures are maintained.
- F. Identify fire safe structural features.
- G. Help homeowners protect their homes from wildfire.

5. WILDFIRE MITIGATION MEASURES

Wildfire mitigation measures are designed to accomplish the Goals by providing and maintaining defensible space and treating high hazard fuel areas. Fire hazard severity is reduced through these mitigation measures. The Wildfire Fire Safe Plan places emphasis on defensible space around structures.

Lumsden Ranch

Only one road will be a main through road with a 40 foot wide travel surface. All the other interior roads will be 30 feet wide. A fuel treatment zone of 10 feet shall be maintained on both sides of the roads along all open space areas. No parking will be required on one side of the roadway due to the reduced width. The roads and cul-de-sac's shall conform to Placerville Department of Transportation specifications.

The road access from Broadway is very good. The road access from Barrett Drive has severe traffic limitations. Barrett Drive, Country Club Drive and Cedar Ravine are all narrow roads with unrestricted parking. This impedes emergency response. Travel distance from the north end of Hidden Treasure Drive to Alhambra Drive to Nugget Lane to Canyon View and out to Barrett Drive is approximately .65 miles. From the same starting point but going out Mace Drive to Shirley Lane to Vandalia Lane to Mace Drive to Canyon View and finally out to Broadway is .51 miles. These routes require a lot of turns which can be confusing in a stressful time. In the case of a major evacuation, one good access point can not be used by residents trying to leave and emergency equipment trying to get to the emergency.

A third route out could be a through road going out Hidden Treasure Drive and down Blair Lane to Broadway. This access would greatly shorten travel time in the case of emergency evacuations.

Emergency equipment will be coming to the area from several different directions depending on the emergency agencies responding. The residents need to take their closest exit out if safe. This is not always possible. With the restricted roads it becomes critical for another emergency exit for the residents. The developer can pursue a third access route which would have unrestricted use. If this additional route is developed, the need for each residence to have fire sprinklers becomes optional at the developer or builders choice.

Lumsden Ranch is not to be a gated development.

Fuels are a dense stand of conifers with brush understory. Tree limbs, grass, brush, and brush sprouts are the major ladder fuels. A 50 foot fuelbreak shall be maintained along all the sides of the development against the open space on slopes less than 30%. Where slopes in the open space are greater than 30%, the fuel break must be 100 feet wide. This must be maintained annually. This can be accomplished through initial cleaning out of the open space and the maintenance of the open space. A special assessment district with the ability to collect a regular fee for open space and the emergency gate maintenance must be formed by the developer. This can be a Community Services District or a Zone of Benefit but must be a legal entity. Also, there are unmodified wildfire fuels on the north and east side of this development which is not controlled by this project.

After the establishment of the roads and lots a thorough tree assessment needs to be completed to determine the health of the open space trees and assess the extent of initial fuel treatment for the fuelbreaks.

More restrictive standards maybe applied by approving Placerville authorities.

Mitigation Measures:

- **All homes shall have Class A listed roofing and siding of fire resistant material.**
 - a. **Responsibility- developer/homeowner**

- Decks that are cantilevered over the natural slope shall be enclosed.
 - a. Responsibility- homeowner (See Appendix A for guidelines)
 - All residences shall have a NFPA 13 D Fire Sprinkler system designed and installed by a licensed engineer. El Dorado County Fire Protection District shall review and approve the sprinkler system design prior to installation.
 - a. Responsibility- builder
- OR**
- The developer shall provide for a third route of access to and from the development. This access shall be unrestricted.
 - a. Responsibility- developer
 - Fencing adjacent to open space shall be constructed of non-flammable material.
 - a. Responsibility-developer/homeowner

6. OTHER FIRE SAFE REQUIREMENTS

- A. A Notice of Restriction shall be filed with the final subdivision map which stipulates that a Wildfire Fire Safe Plan has been prepared and wildfire mitigation measures must be implemented.
- B. A copy of the Wildfire Fire Safe Plan shall be given to each new landowner within the development.
- C. An emergency evacuation plan needs to be provided to each resident showing all the road accesses.
- D. Road improvements and fire hydrants shall be completed prior to the filing of the final map or completion of a "Bonding and Completion Plan".
- E. "No Parking" signs shall be posted along one side of the 30 foot roadways including the cul-de-sac's.
- F. The project shall meet all the Public Resource Codes 4290 as amended (the 1991 SRA Fire Safe Regulations- Article 2 Access, Article 3 Signing, Article 4 Water, Article 5 Fuels), County and Fire Department ordinances.
- G. A legal entity (Zone of Benefit, CSD etc.) shall be created with authority for maintaining and enforcing all fuel treatment mitigation. Covenants, Conditions and Restrictions must be developed to ensure the enforcement of the structural and vegetation Fire Safe regulations.

- H. Every 5 years the Fire Department shall review open space areas with the legal entity to determine if additional fuel hazard reduction work is necessary.
- I. The water hydrant system shall meet the California Fire Code specifications to water volume, pressure and spacing. Hydrant locations shall be determined by El Dorado County Fire Protection District.
- J. The homeowner/property owner is responsible for any future fire safe or building code changes adopted by the State or local authority.
- K. All property gates must be at least 2 feet wider than the driveway they gate. Gates must be set into the property minimum of 30 feet from the edge of the roadway.
- L. Fuel treatment along Lumsden Ranch roads as they pass through open space shall have all fuels within 10 feet of the shoulder of the roadway treated annually by June 1.
- M. Clearance requirements may be required by the City of Placerville at the time of construction.
- N. The open space fuelbreaks shall be 50 feet wide on slopes up to 30% and 100 feet wide on slopes over 30%. This distance is measured from the rear property line of all developed lots or from the edge of the roadway (See Appendix B).
- O. Open space shall be treated annually by June 1 to prevent the brush and grasses from becoming a fire hazard. Grass can be mowed to a 2" stubble.
- P. Hiking trails within the open space shall have a 5 foot wide fuel treatment zone on both sides of the trail which is maintained annually by June 1. Trailhead shall be posted "No Smoking".
- Q. Prior to housing construction an assessment of the needed fuel treatment shall be performed. The assessment shall be reported in writing to El Dorado County Fire Protection District.
- R. Fuel treatment of the fuelbreaks shall be completed prior housing occupancy. It shall be maintained annually by June 1.
- S. Lockable pedestrian gates shall be installed in backyard fencing having direct access to the open space. Spacing of the gates shall be determined by El Dorado County Fire Protection District.
- T. Clearance requirements shall pertain to the Clubhouse and all of its associated facilities.

E. Appendix

APPENDIX A

LUMSDEN RANCH ENCLOSED DECK GUIDELINES

The purpose of enclosing decks that are cantilevered out over the natural slope is to help prevent heat traps and fire brands from a wildfire igniting the deck or fuels under the deck.

1. Does not apply to decks that are constructed using fire resistant materials such as concrete, steel, stucco etc.
2. Applies to decks one story or less above natural slopes.
3. Combustible material must not be stored under the deck.
4. Deck shall not be constructed from composite materials.

APPENDIX B

LUMSDEN RANCH FUEL TREATMENT SPECIFICATIONS

For

MIXED CONIFER VEGETATION

Within The Designated Fuel Treatment Areas

1. Leave all live trees **EXCEPT** Gray pines.
2. Remove all dead trees.
3. Remove all brush.
4. Prune all live trees of dead branches and green branches 8 feet from the ground as measured on the uphill side of the tree, except no more than 1/3 of the live crown is removed. All slash created by pruning must be disposed of by chipping, burning or hauling off site.
5. Annually by June 1, reduce the grass or weeds to a 2 inch stubble by mowing, chemical treatment, disking or a combination of treatments.
6. Mature, multi stem Live Oak trees: remove all dead limbs and stems, cut off green stems at 8 feet above the ground as measured on the uphill side that arch over and are growing towards the ground.
7. Gray pines farther out from structures than the designated fuel treatment zone must be isolated from any brush by at least 10 feet.

Line	Linecode	Pay Period	Pay Period
1	1	1/1/78	1/1/78
2	2	1/1/78	1/1/78
3	3	1/1/78	1/1/78
4	4	1/1/78	1/1/78
5	5	1/1/78	1/1/78
6	6	1/1/78	1/1/78
7	7	1/1/78	1/1/78
8	8	1/1/78	1/1/78
9	9	1/1/78	1/1/78
10	10	1/1/78	1/1/78
11	11	1/1/78	1/1/78
12	12	1/1/78	1/1/78
13	13	1/1/78	1/1/78
14	14	1/1/78	1/1/78
15	15	1/1/78	1/1/78
16	16	1/1/78	1/1/78
17	17	1/1/78	1/1/78
18	18	1/1/78	1/1/78
19	19	1/1/78	1/1/78
20	20	1/1/78	1/1/78
21	21	1/1/78	1/1/78
22	22	1/1/78	1/1/78
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24	24	1/1/78	1/1/78
25	25	1/1/78	1/1/78
26	26	1/1/78	1/1/78
27	27	1/1/78	1/1/78
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42	42	1/1/78	1/1/78
43	43	1/1/78	1/1/78
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45	45	1/1/78	1/1/78
46	46	1/1/78	1/1/78
47	47	1/1/78	1/1/78
48	48	1/1/78	1/1/78
49	49	1/1/78	1/1/78
50	50	1/1/78	1/1/78
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52	52	1/1/78	1/1/78
53	53	1/1/78	1/1/78
54	54	1/1/78	1/1/78
55	55	1/1/78	1/1/78
56	56	1/1/78	1/1/78
57	57	1/1/78	1/1/78
58	58	1/1/78	1/1/78
59	59	1/1/78	1/1/78
60	60	1/1/78	1/1/78
61	61	1/1/78	1/1/78
62	62	1/1/78	1/1/78
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68	68	1/1/78	1/1/78
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78	78	1/1/78	1/1/78
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80	80	1/1/78	1/1/78
81	81	1/1/78	1/1/78
82	82	1/1/78	1/1/78
83	83	1/1/78	1/1/78
84	84	1/1/78	1/1/78
85	85	1/1/78	1/1/78
86	86	1/1/78	1/1/78
87	87		

