HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

1/3/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	726	416	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	789	452	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	452				847	226
vC1, stage 1 conf vol					452	
vC2, stage 2 conf vol					395	
vCu, unblocked vol	452				847	226
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1105				506	777

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	263	526	301	151	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1105	1700	1700	1700	1700
Volume to Capacity	0.00	0.31	0.18	0.09	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		


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-------------------------------------------------------------------------------
                          Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
*******************************************************************************
Cycle (sec):          223                 Critical Vol./Cap.(X):         0.962
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        223                 Level Of Service:                   E
*******************************************************************************
Street Name:            Hazel Avenue                 Gold Country Boulevard
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:           Include          Include          AddLane          Include
Min. Green:    15   88   88    73   73   73    15   47   47    15   47   47
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        2  0  3  0  1    1  0  4  0  1    2  0  1  0  1    1  0  0  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:     209 2905   49    15 1763  189   291   15  420    40   18   14
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:  209 2905   49    15 1763  189   291   15  420    40   18   14
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:     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 Volume:   209 2905   49    15 1763  189   291   15  420    40   18   14
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  209 2905   49    15 1763  189   291   15  420    40   18   14
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:     1.10 1.00 1.00  1.00 1.00 1.00  1.10 1.00 1.00  1.00 1.00 1.00
FinalVolume:  230 2905   49    15 1763  189   320   15  420    40   18   14
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 3.00 1.00  1.00 4.00 1.00  2.00 1.00 1.00  1.00 0.56 0.44
Final Sat.:  3000 4500 1500  1500 6000 1500  3000 1500 1500  1500  844  656
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.65 0.03  0.01 0.29 0.13  0.11 0.01 0.28  0.03 0.02 0.02
Crit Volume:       968          15                          420   40
Crit Moves:       ****         ****                        ****  ****
*******************************************************************************
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                          Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
*******************************************************************************
Cycle (sec):          107                 Critical Vol./Cap.(X):         0.961
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                 Level Of Service:                   E
*******************************************************************************
Street Name:            Hazel Avenue                   Folsom Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Split Phase      Split Phase      Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   26    0     8   26   26     8   47   47     8   20   20
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        1  0  0  1  0    1  1  0  1  1    2  0  1  1  0    1  0  1  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      21  206    3   400    3  277  880  442    1    2  236  594
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:   21  206    3   400    3  277  880  442    1    2  236  594
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:     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 Volume:    21  206    3   400    3  277  880  442    1    2  236  594
Reduct Vol:     0    0    0     0    0    0    0    0    0    0    0    0
Reduced Vol:   21  206    3   400    3  277  880  442    1    2  236  594
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  1.10 1.00 1.10  1.10 1.00 1.00  1.00 1.00 1.00
FinalVolume:   21  206    3   440    3  305  968  442    1    2  236  594
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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 0.99 0.01  2.00 0.02 1.98  2.00 1.99 0.01  1.00 1.00 1.00
Final Sat.:  1500 1478   22  3000   29 2971  3000 2993    7  1500 1500 1500
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.14 0.14  0.15 0.10 0.10  0.32 0.15 0.15  0.00 0.16 0.40
Crit Volume:       209          154          484                          594
Crit Moves:       ****         ****         ****                         ****
*******************************************************************************
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HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

1/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1645	87	0	1680	873	762
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3440	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3440	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1788	95	0	1826	949	828
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1798	84	0	1826	949	828
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	64.0	64.0		108.5	36.5	108.5
Effective Green, g (s)	64.0	64.0		108.5	36.5	108.5
Actuated g/C Ratio	0.59	0.59		1.00	0.34	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2029	850		3539	1191	1583
v/s Ratio Prot	c0.52			0.52	c0.27	
v/s Ratio Perm		0.06				0.52
v/c Ratio	0.89	0.10		0.52	0.80	0.52
Uniform Delay, d1	19.1	9.7		0.0	32.6	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	0.1		0.1	3.8	1.2
Delay (s)	24.2	9.7		0.1	36.4	1.2
Level of Service	C	A		A	D	A
Approach Delay (s)	23.5			0.1	20.0	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	539	76	214	535	192	2628	0	0	1996	98
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	1.00	0.95	0.95	1.00	0.91			0.91	1.00
Frt			0.86	1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)			1611	1770	1650	1504	1770	5085			5085	1583
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)			1611	1770	1650	1504	1770	5085			5085	1583
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	0	586	83	233	582	209	2857	0	0	2170	107
RTOR Reduction (vph)	0	0	235	0	2	2	0	0	0	0	0	24
Lane Group Flow (vph)	0	0	351	83	423	388	209	2857	0	0	2170	83
Turn Type			custom	Prot		Perm	Prot					Perm
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						6
Actuated Green, G (s)			20.7	13.3	38.0	38.0	16.0	123.1			103.1	103.1
Effective Green, g (s)			20.7	13.3	38.0	38.0	16.0	123.1			103.1	103.1
Actuated g/C Ratio			0.12	0.08	0.22	0.22	0.09	0.73			0.61	0.61
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)			197	139	371	338	167	3702			3100	965
v/s Ratio Prot				0.05	0.26		c0.12	c0.56			0.43	
v/s Ratio Perm			c0.22			c0.26						0.05
v/c Ratio			1.78	0.60	1.14	1.15	1.25	0.77			0.70	0.09
Uniform Delay, d1			74.2	75.3	65.6	65.6	76.6	14.3			22.5	13.6
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2			371.1	6.7	91.0	95.9	152.9	1.0			0.7	0.0
Delay (s)			445.3	82.0	156.6	161.4	229.4	15.3			23.2	13.6
Level of Service			F	F	F	F	F	B			C	B
Approach Delay (s)		445.3			151.8			29.9			22.7	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	79.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	169.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Existing Conditions

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	9	4	1	1	6	2	209	10	28	495	58
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	4	1	1	7	2	227	11	30	538	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	755	873	301	576	899	119	601			238		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	873	301	576	899	119	601			238		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	99	97	99	100	100	99	100			98		
cM capacity (veh/h)	289	280	696	380	270	910	972			1326		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	17	2	7	116	124	299	332
Volume Left	3	1	0	2	0	30	0
Volume Right	4	0	7	0	11	0	63
cSH	331	316	910	972	1700	1326	1700
Volume to Capacity	0.05	0.01	0.01	0.00	0.07	0.02	0.20
Queue Length 95th (ft)	4	1	1	0	0	2	0
Control Delay (s)	16.5	16.5	9.0	0.2	0.0	1.0	0.0
Lane LOS	C	C	A	A		A	
Approach Delay (s)	16.5	10.9		0.1		0.5	
Approach LOS	C	B					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		


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                       Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
********************************************************************************
Cycle (sec):        155               Critical Vol./Cap.(X):        0.552
Loss Time (sec):      0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       90               Level Of Service:                 A
********************************************************************************
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:          Include          Include          Include          Include
Min. Green:    8   37    37    8   37     0    8   37    37    8   37     0
Y+R:         4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:       1  0  1  0  1   1  0  1  1  0   1  0  2  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      19   52   168   49  100    42   40  380    77  421 1151   110
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:   19   52   168   49  100    42   40  380    77  421 1151   110
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:     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 Volume:    19   52   168   49  100    42   40  380    77  421 1151   110
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   19   52   168   49  100    42   40  380    77  421 1151   110
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:   19   52   168   49  100    42   40  380    77  421 1151   110
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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 1.00  1.00 1.00 1.41  0.59 1.00 2.00  1.00 1.00 2.74  0.26
Final Sat.:  1500 1500  1500 1500 2113   887 1500 3000  1500 1500 4107   393
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.03  0.11 0.03 0.05  0.05 0.03 0.13  0.05 0.28 0.28  0.28
Crit Volume:             168   49                   190         421
Crit Moves:             ****  ****                 ****        ****
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                       Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
********************************************************************************
Cycle (sec):        145               Critical Vol./Cap.(X):        0.938
Loss Time (sec):      0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:      180               Level Of Service:                 E
********************************************************************************
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:          Include          Include          Include          Include
Min. Green:    8   32    32    8   32    32    8   32    32    8   32    32
Y+R:         4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:       2  0  3  0  1   2  0  3  0  1   2  0  2  0  1   2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     877 1218    62  207  715   652  227  192    69   78  444   140
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:  877 1218    62  207  715   652  227  192    69   78  444   140
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:     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 Volume:   877 1218    62  207  715   652  227  192    69   78  444   140
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  877 1218    62  207  715   652  227  192    69   78  444   140
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:     1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00
FinalVolume:  965 1218    62  228  715   652  250  192    69   86  444   140
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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:       2.00 3.00  1.00 2.00 3.00  1.00 2.00 2.00  1.00 2.00 3.00  1.00
Final Sat.:  3000 4500  1500 3000 4500  1500 3000 3000  1500 3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 0.27  0.04 0.08 0.16  0.43 0.08 0.06  0.05 0.03 0.10  0.09
Crit Volume:  482                        652  125                    148
Crit Moves:  ****                       ****  ****                  ****
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                       Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap.(X):        0.646
Loss Time (sec):      0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       64               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:          Include          Include          Include            Ovl
Min. Green:   10   22     0    0   22    10   10   22     0   10   22     0
Y+R:         5.5  5.3   0.0  0.0  5.6   4.0  5.5  5.7   0.0  5.5  5.5   0.0
Lanes:       2  0  2  1  0   2  0  3  0  1   2  0  2  1  0   2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      25  615    27  752 1160   703  207  127    38   75  139   386
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:   25  615    27  752 1160   703  207  127    38   75  139   386
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:     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 Volume:    25  615    27  752 1160   703  207  127    38   75  139   386
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   25  615    27  752 1160   703  207  127    38   75  139   386
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:     1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.10
FinalVolume:   28  615    27  827 1160   703  228  127    38   83  139   425
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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:       2.00 2.87  0.13 2.00 3.00  1.00 2.00 2.31  0.69 2.00 1.00  2.00
Final Sat.:  3000 4311   189 3000 4500  1500 3000 3464  1036 3000 1500  3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.14  0.14 0.28 0.26  0.47 0.08 0.04  0.04 0.03 0.09  0.14
Crit Volume:   14                        703  114                    139
Crit Moves:  ****                       ****  ****                  ****
********************************************************************************
```

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5: US 50 Eastbound Ramps & Sunrise Boulevard

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1043	545	0	1089	2303	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.94	0.88		0.86	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	4990	2787		6408	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	4990	2787		6408	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1134	592	0	1184	2503	0
RTOR Reduction (vph)	0	12	0	0	0	0
Lane Group Flow (vph)	1134	580	0	1184	2503	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		81.9	81.9	
Effective Green, g (s)	26.1	26.1		81.9	81.9	
Actuated g/C Ratio	0.22	0.22		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1123	627		4524	3590	
v/s Ratio Prot	c0.23			0.18	c0.49	
v/s Ratio Perm		0.21				
v/c Ratio	1.01	0.92		0.26	0.70	
Uniform Delay, d1	44.9	44.0		6.1	9.9	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.3	19.5		0.0	0.6	
Delay (s)	74.2	63.5		6.2	10.5	
Level of Service	E	E		A	B	
Approach Delay (s)	70.5			6.2	10.5	
Approach LOS	E			A	B	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

6: US 50 Westbound Ramps & Sunrise Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	448	309	1735	0	0	2535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	5085			5085
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	5085			5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	487	336	1886	0	0	2755
RTOR Reduction (vph)	0	100	0	0	0	0
Lane Group Flow (vph)	487	236	1886	0	0	2755
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	17.1	17.1	146.0			146.0
Effective Green, g (s)	17.1	17.1	146.0			146.0
Actuated g/C Ratio	0.10	0.10	0.85			0.85
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	343	279	4339			4339
v/s Ratio Prot	c0.14		0.37			c0.54
v/s Ratio Perm		0.08				
v/c Ratio	1.42	0.85	0.43			0.63
Uniform Delay, d1	77.0	75.7	2.9			4.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	205.3	20.4	0.1			0.3
Delay (s)	282.3	96.1	3.0			4.3
Level of Service	F	F	A			A
Approach Delay (s)	206.3		3.0			4.3
Approach LOS	F		A			A

Intersection Summary			
HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	171.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

7: US 50 WB Off-Ramp & Zinfandel Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	777	151	790	0	0	749
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	845	164	859	0	0	814
RTOR Reduction (vph)	0	103	0	0	0	0
Lane Group Flow (vph)	845	61	859	0	0	814
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	19.4	19.4	21.9			21.9
Effective Green, g (s)	19.4	19.4	21.9			21.9
Actuated g/C Ratio	0.37	0.37	0.42			0.42
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1264	583	2113			1471
v/s Ratio Prot	c0.25	0.04	0.17			c0.23
v/s Ratio Perm						
v/c Ratio	0.67	0.10	0.41			0.55
Uniform Delay, d1	14.0	10.9	10.8			11.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.4	0.1	0.1			0.5
Delay (s)	15.3	11.0	11.0			12.1
Level of Service	B	B	B			B
Approach Delay (s)	14.6		11.0			12.1
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	11.4
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

8: US 50 EB Off-Ramp & Zinfandel Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	348	971	1281	0	0	159	0	1193	6	0	1345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.95	0.85			0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3028	1441			2787		6403			3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3028	1441			2787		6403			3539	
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)	378	1055	1392	0	0	173	0	1297	7	0	1462	0
RTOR Reduction (vph)	0	15	15	0	0	165	0	1	0	0	0	0
Lane Group Flow (vph)	340	1690	765	0	0	8	0	1303	0	0	1462	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	48.4	48.4	48.4			5.5		47.9			57.3	
Effective Green, g (s)	48.4	48.4	48.4			5.5		47.9			57.3	
Actuated g/C Ratio	0.41	0.41	0.41			0.05		0.41			0.49	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	665	1252	596			131		2619			1732	
v/s Ratio Prot	0.21	c0.56				0.00		0.20			c0.41	
v/s Ratio Perm			0.53									
v/c Ratio	0.51	1.35	1.28			0.06		0.50			0.84	
Uniform Delay, d1	25.6	34.4	34.4			53.3		25.7			26.0	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	0.7	162.9	140.3			0.2		0.1			4.0	
Delay (s)	26.2	197.3	174.6			53.5		25.8			30.0	
Level of Service	C	F	F			D		C			C	
Approach Delay (s)		170.4			53.5			25.8			30.0	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	98.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	117.1	Sum of lost time (s)	11.4
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Existing Conditions

Weekday PM Peak Hour

1: Crawford Drive & Kilgore Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	1	6	1	0	12	1	488	0	0	271	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	1	7	1	0	13	1	530	0	0	295	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	577	829	149	687	832	265	299			530		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	577	829	149	687	832	265	299			530		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	81	100	99	100	100	98	100			100		
cM capacity (veh/h)	392	304	870	330	303	733	1259			1033		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	83	1	13	266	265	147	152
Volume Left	75	1	0	1	0	0	0
Volume Right	7	0	13	0	0	0	4
cSH	408	330	733	1259	1700	1033	1700
Volume to Capacity	0.20	0.00	0.02	0.00	0.16	0.00	0.09
Queue Length 95th (ft)	19	0	1	0	0	0	0
Control Delay (s)	16.0	16.0	10.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	A	A			
Approach Delay (s)	16.0	10.5		0.0		0.0	
Approach LOS	C	B					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		


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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):         155                Critical Vol./Cap.(X):         0.830
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       134                Level Of Service:                  D
*******************************************************************************
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:          Include           Include           Include           Include
Min. Green:     8   37    37     8   37     0     8   37    37     8   37     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      78  160   397   131   72    58   134 1028    24   203  618   123
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:   78  160   397   131   72    58   134 1028    24   203  618   123
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:     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 Volume:    78  160   397   131   72    58   134 1028    24   203  618   123
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   78  160   397   131   72    58   134 1028    24   203  618   123
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:   78  160   397   131   72    58   134 1028    24   203  618   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  1.00  1.00 1.11  0.89  1.00 2.00  1.00  1.00 2.50  0.50
Final Sat.:  1500 1500  1500  1500 1662  1338  1500 3000  1500  1500 3753   747
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.11  0.26  0.09 0.04  0.04  0.09 0.34  0.02  0.14 0.16  0.16
Crit Volume:             397   131                   514         203
Crit Moves:             ****  ****                  ****        ****
*******************************************************************************
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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
*******************************************************************************
Cycle (sec):         145                Critical Vol./Cap.(X):         1.022
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                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:        Protected         Protected         Protected         Protected
Rights:          Include           Include           Include           Include
Min. Green:     8   32    32     8   32    32     8   32    32     8   32    32
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     504 1118    29   246 1241   110   473  650   726   211  386   229
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:  504 1118    29   246 1241   110   473  650   726   211  386   229
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:     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 Volume:   504 1118    29   246 1241   110   473  650   726   211  386   229
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  504 1118    29   246 1241   110   473  650   726   211  386   229
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:     1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00
FinalVolume:  554 1118    29   271 1241   110   520  650   726   232  386   229
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  2.00 3.00  1.00  2.00 2.00  1.00  2.00 3.00  1.00
Final Sat.:  3000 4500  1500  3000 4500  1500  3000 3000  1500  3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.25  0.02  0.09 0.28  0.07  0.17 0.22  0.48  0.08 0.09  0.15
Crit Volume:  277                   414                    726   116
Crit Moves:  ****                  ****                   ****  ****
*******************************************************************************
```

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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
*******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.785
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       106                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:          Include           Include           Include              Ovl
Min. Green:    10   22     0     0   22    10    10   22     0    10   22     0
Y+R:          5.5  5.3   0.0   0.0  5.6   4.0   5.5  5.7   0.0   5.5  5.5   0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      52 1229    36   553  597   235   551  146    30    51  148   741
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:   52 1229    36   553  597   235   551  146    30    51  148   741
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:     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 Volume:    52 1229    36   553  597   235   551  146    30    51  148   741
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   52 1229    36   553  597   235   551  146    30    51  148   741
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:     1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.10
FinalVolume:   57 1229    36   608  597   235   606  146    30    56  148   815
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 2.91  0.09  2.00 3.00  1.00  2.00 2.49  0.51  2.00 1.00  2.00
Final Sat.:  3000 4372   128  3000 4500  1500  3000 3733   767  3000 1500  3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.28  0.28  0.20 0.13  0.16  0.20 0.04  0.04  0.02 0.10  0.27
Crit Volume:             422   304              303                    148
Crit Moves:             ****  ****             ****                   ****
*******************************************************************************
```

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1270	299	0	2104	1314	0
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	*0.57	0.88		*0.70	*1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3026	2787		5216	7353	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3026	2787		5216	7353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1380	325	0	2287	1428	0
RTOR Reduction (vph)	0	16	0	0	0	0
Lane Group Flow (vph)	1380	309	0	2287	1428	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	67.6	67.6		68.0	68.0	
Effective Green, g (s)	67.6	67.6		68.0	68.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1424	1312		2470	3482	
v/s Ratio Prot	c0.46			c0.44	0.19	
v/s Ratio Perm		0.11				
v/c Ratio	0.97	0.24		0.93	0.41	
Uniform Delay, d1	37.0	22.6		35.4	24.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.8	0.1		6.6	0.1	
Delay (s)	53.8	22.7		42.1	24.8	
Level of Service	D	C		D	C	
Approach Delay (s)	47.9			42.1	24.8	
Approach LOS	D			D	C	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	143.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	385	457	2962	0	0	1289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	*0.70			*0.50
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	3912			2794
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	3912			2794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	418	497	3220	0	0	1401
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	418	492	3220	0	0	1401
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	21.0	21.0	101.0			101.0
Effective Green, g (s)	21.0	21.0	101.0			101.0
Actuated g/C Ratio	0.16	0.16	0.78			0.78
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	555	450	3039			2171
v/s Ratio Prot	0.12		c0.82			0.50
v/s Ratio Perm		c0.18				
v/c Ratio	0.75	1.09	1.06			0.65
Uniform Delay, d1	52.0	54.5	14.5			6.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.7	70.1	34.9			0.7
Delay (s)	57.8	124.6	49.4			7.2
Level of Service	E	F	D			A
Approach Delay (s)	94.0		49.4			7.2
Approach LOS	F		D			A

Intersection Summary			
HCM Average Control Delay	46.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	285	239	1689	0	0	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	310	260	1836	0	0	840
RTOR Reduction (vph)	0	12	0	0	0	0
Lane Group Flow (vph)	310	248	1836	0	0	840
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	18.4	18.4	46.3			46.3
Effective Green, g (s)	18.4	18.4	46.3			46.3
Actuated g/C Ratio	0.24	0.24	0.61			0.61
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	830	383	3094			2153
v/s Ratio Prot	0.09	c0.16	c0.36			0.24
v/s Ratio Perm						
v/c Ratio	0.37	0.65	0.59			0.39
Uniform Delay, d1	24.0	25.9	9.1			7.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	3.7	0.3			0.1
Delay (s)	24.3	29.7	9.4			7.8
Level of Service	C	C	A			A
Approach Delay (s)	26.8		9.4			7.8
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	11.4
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	670	201	464	0	0	957	0	2506	3	0	921	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.97	0.85			0.85		1.00			0.98	
Flt Protected	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3023	1441			2787		6407			3465	
Flt Permitted	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3023	1441			2787		6407			3465	
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)	728	218	504	0	0	1040	0	2724	3	0	1001	163
RTOR Reduction (vph)	0	19	57	0	0	70	0	0	0	0	10	0
Lane Group Flow (vph)	371	722	281	0	0	970	0	2727	0	0	1154	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	39.6	39.6	39.6			16.2		45.6			65.7	
Effective Green, g (s)	39.6	39.6	39.6			16.2		45.6			65.7	
Actuated g/C Ratio	0.34	0.34	0.34			0.14		0.39			0.56	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	546	1026	489			387		2504			1951	
v/s Ratio Prot	0.23	c0.24				c0.35		c0.43			0.33	
v/s Ratio Perm			0.20									
v/c Ratio	0.68	0.70	0.58			2.51		1.09			0.59	
Uniform Delay, d1	33.1	33.5	31.6			50.2		35.6			16.7	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.4	2.2	1.6			685.8		47.5			0.5	
Delay (s)	36.5	35.7	33.3			736.1		83.0			17.2	
Level of Service	D	D	C			F		F			B	
Approach Delay (s)		35.3			736.1			83.0			17.2	
Approach LOS		D			F			F			B	

Intersection Summary			
HCM Average Control Delay	166.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	15.3
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

Existing plus Project Conditions

Weekday AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

5/5/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	536	691	264	36	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	583	751	287	39	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	1038				1236	519
vC1, stage 1 conf vol					895	
vC2, stage 2 conf vol					341	
vCu, unblocked vol	1038				1236	519
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				88	99
cM capacity (veh/h)	665				332	502

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	219	388	501	537	42
Volume Left	25	0	0	0	39
Volume Right	0	0	0	287	3
cSH	665	1700	1700	1700	341
Volume to Capacity	0.04	0.23	0.29	0.32	0.12
Queue Length 95th (ft)	3	0	0	0	11
Control Delay (s)	1.6	0.0	0.0	0.0	17.1
Lane LOS	A				C
Approach Delay (s)	0.6		0.0		17.1
Approach LOS					C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		


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                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
********************************************************************************
Cycle (sec):         223                 Critical Vol./Cap.(X):         0.498
Loss Time (sec):       0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       223                 Level Of Service:                  A
********************************************************************************
Street Name:               Hazel Avenue               Gold Country Boulevard
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:            Include          Include          AddLane          Include
Min. Green:     15   88    88   73   73    73   15   47    47   15   47    47
Y+R:           4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:          2  0  3  0  1   1  0  4  0  1   2  0  1  0  1   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      502  967    14   12 2752   449  178    2   392   21   14     7
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:   502  967    14   12 2752   449  178    2   392   21   14     7
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:      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 Volume:    502  967    14   12 2752   449  178    2   392   21   14     7
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   502  967    14   12 2752   449  178    2   392   21   14     7
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:      1.10 1.00  1.00 1.00 1.00  1.00 1.10 1.00  1.00 1.00 1.00  1.00
FinalVolume:   552  967    14   12 2752   449  196    2   392   21   14     7
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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:        2.00 3.00  1.00 1.00 4.00  1.00 2.00 1.00  1.00 1.00 0.67  0.33
Final Sat.:   3000 4500  1500 1500 6000  1500 3000 1500  1500 1500 1000   500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.21  0.01 0.01 0.46  0.30 0.07 0.00  0.26 0.01 0.01  0.01
Crit Volume:       322          12                           392   21
Crit Moves:        ****       ****                          ****  ****
**********************************************************************
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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
********************************************************************************
Cycle (sec):         107                 Critical Vol./Cap.(X):         0.721
Loss Time (sec):       0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       107                 Level Of Service:                  C
********************************************************************************
Street Name:               Hazel Avenue                    Folsom Boulevard
Approach:         North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:      8   26     0    8   26    26    8   47    47    8   20    20
Y+R:           4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:          1  0  0  1  0   1  1  0  1  1   2  0  1  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        1   26     0  276  271   602  206  127    22    1  655   487
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:     1   26     0  276  271   602  206  127    22    1  655   487
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:      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 Volume:      1   26     0  276  271   602  206  127    22    1  655   487
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:     1   26     0  276  271   602  206  127    22    1  655   487
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 1.10 1.00  1.10 1.10 1.00  1.00 1.00 1.00  1.00
FinalVolume:     1   26     0  304  271   662  227  127    22    1  655   487
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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 1.00  0.00 1.06 0.94  2.00 2.00 1.70  0.30 1.00 1.00  1.00
Final Sat.:   1500 1500     0 1585 1415  3000 3000 2557   443 1500 1500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.02  0.00 0.19 0.19  0.22 0.08 0.05  0.05 0.00 0.44  0.32
Crit Volume:         26              287    113                     655
Crit Moves:        ****             ****   ****                    ****
********************************************************************************
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HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

5/5/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	977	158	0	718	991	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3436	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3436	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1062	172	0	780	1077	833
RTOR Reduction (vph)	2	66	0	0	0	0
Lane Group Flow (vph)	1077	89	0	780	1077	833
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	16.4	16.4		46.9	22.5	46.9
Effective Green, g (s)	16.4	16.4		46.9	22.5	46.9
Actuated g/C Ratio	0.35	0.35		1.00	0.48	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1202	504		3539	1698	1583
v/s Ratio Prot	c0.31			0.22	c0.30	
v/s Ratio Perm		0.06				0.53
v/c Ratio	0.90	0.18		0.22	0.63	0.53
Uniform Delay, d1	14.4	10.6		0.0	9.1	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.9	0.2		0.0	0.8	1.3
Delay (s)	23.4	10.7		0.0	9.9	1.3
Level of Service	C	B		A	A	A
Approach Delay (s)	21.8			0.0	6.1	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	312	97	220	495	398	912	0	0	3193	133
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	1.00	0.95	0.95	1.00	0.91			0.91	1.00
Frt			0.86	1.00	0.94	0.85	1.00	1.00			1.00	0.85
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)			1611	1770	1660	1504	1770	5085			5085	1583
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)			1611	1770	1660	1504	1770	5085			5085	1583
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	0	339	105	239	538	433	991	0	0	3471	145
RTOR Reduction (vph)	0	0	286	0	15	80	0	0	0	0	0	18
Lane Group Flow (vph)	0	0	53	105	391	291	433	991	0	0	3471	127
Turn Type			custom	Prot		Perm	Prot					Perm
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						6
Actuated Green, G (s)			27.6	16.1	47.7	47.7	28.1	120.4			88.3	88.3
Effective Green, g (s)			27.6	16.1	47.7	47.7	28.1	120.4			88.3	88.3
Actuated g/C Ratio			0.16	0.09	0.27	0.27	0.16	0.68			0.50	0.50
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)			252	162	450	407	282	3477			2550	794
v/s Ratio Prot				0.06	c0.24		c0.24	0.19			c0.68	
v/s Ratio Perm			0.03			0.19						0.08
v/c Ratio			0.21	0.65	0.87	0.71	1.54	0.29			1.36	0.16
Uniform Delay, d1			64.8	77.3	61.2	58.0	74.0	10.9			43.9	23.8
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2			0.4	8.6	16.2	5.9	258.0	0.0			165.1	0.1
Delay (s)			65.2	85.9	77.5	63.9	332.0	11.0			209.0	23.9
Level of Service			E	F	E	E	F	B			F	C
Approach Delay (s)		65.2			72.8			108.6			201.6	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	154.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	176.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	115.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

Existing plus Project Conditions

Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

5/5/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	726	416	47	206	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	789	452	51	224	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	503				881	252
vC1, stage 1 conf vol					478	
vC2, stage 2 conf vol					403	
vCu, unblocked vol	503				881	252
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				54	93
cM capacity (veh/h)	1057				491	748

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	267	526	301	202	273
Volume Left	4	0	0	0	224
Volume Right	0	0	0	51	49
cSH	1057	1700	1700	1700	524
Volume to Capacity	0.00	0.31	0.18	0.12	0.52
Queue Length 95th (ft)	0	0	0	0	75
Control Delay (s)	0.2	0.0	0.0	0.0	19.1
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		19.1
Approach LOS					C

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		


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Existing plus Project CondiThu May 5, 2011 11:27:14                 Page 2-1
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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
********************************************************************************
Cycle (sec):          223                Critical Vol./Cap.(X):         0.988
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        223                Level Of Service:                  E
********************************************************************************
Street Name:              Hazel Avenue              Gold Country Boulevard
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:           Include          Include          AddLane          Include
Min. Green:    15   88    88    73   73    73    15   47    47    15   47    47
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:         2  0  3  0  1    1  0  4  0  1    2  0  1  0  1    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     247 2905    49    15 1763   198   458   15   459    40   18    14
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:  247 2905    49    15 1763   198   458   15   459    40   18    14
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:     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 Volume:   247 2905    49    15 1763   198   458   15   459    40   18    14
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  247 2905    49    15 1763   198   458   15   459    40   18    14
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:     1.10 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.00  1.00 1.00  1.00
FinalVolume:  272 2905    49    15 1763   198   504   15   459    40   18    14
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  1.00 4.00  1.00  2.00 1.00  1.00  1.00 0.56  0.44
Final Sat.:  3000 4500  1500  1500 6000  1500  3000 1500  1500  1500  844   656
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.65  0.03  0.01 0.29  0.13  0.17 0.01  0.31  0.03 0.02  0.02
Crit Volume:       968          15                          459    40
Crit Moves:       ****        ****                         ****  ****
********************************************************************************
```



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Existing plus Project CondiThu May 5, 2011 11:27:14                 Page 3-1
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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
********************************************************************************
Cycle (sec):          107                Critical Vol./Cap.(X):         0.970
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                Level Of Service:                  E
********************************************************************************
Street Name:              Hazel Avenue                  Folsom Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   26     0     8   26    26     8   47    47     8   20    20
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:         1  0  0  1  0    1  1  0  1  1    2  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  208     3   408   11   285   882  442     1     2  236   596
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:   21  208     3   408   11   285   882  442     1     2  236   596
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:     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 Volume:    21  208     3   408   11   285   882  442     1     2  236   596
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  208     3   408   11   285   882  442     1     2  236   596
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  1.10 1.00  1.10  1.10 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21  208     3   449   11   314   970  442     1     2  236   596
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 0.99  0.01  2.00 0.07  1.93  2.00 1.99  0.01  1.00 1.00  1.00
Final Sat.:  1500 1479    21  3000  102  2898  3000 2993     7  1500 1500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.14  0.14  0.15 0.11  0.11  0.32 0.15  0.15  0.00 0.16  0.40
Crit Volume:       211                162   485                            596
Crit Moves:       ****               ****  ****                           ****
********************************************************************************
```


HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

5/9/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1668	87	0	1686	896	802
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3440	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3440	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1813	95	0	1833	974	872
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1823	84	0	1833	974	872
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	65.7	65.7		110.2	36.5	110.2
Effective Green, g (s)	65.7	65.7		110.2	36.5	110.2
Actuated g/C Ratio	0.60	0.60		1.00	0.33	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2051	859		3539	1172	1583
v/s Ratio Prot	c0.53			0.52	c0.28	
v/s Ratio Perm		0.06				0.55
v/c Ratio	0.89	0.10		0.52	0.83	0.55
Uniform Delay, d1	19.1	9.5		0.0	34.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	0.0		0.1	5.2	1.4
Delay (s)	24.2	9.6		0.1	39.2	1.4
Level of Service	C	A		A	D	A
Approach Delay (s)	23.6			0.1	21.3	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	539	76	214	544	192	2657	232	0	2059	98
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	1.00	0.95	0.95	1.00	0.91			0.91	1.00
Frt			0.86	1.00	0.93	0.85	1.00	0.99			1.00	0.85
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)			1611	1770	1649	1504	1770	5024			5085	1583
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)			1611	1770	1649	1504	1770	5024			5085	1583
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	0	586	83	233	591	209	2888	252	0	2238	107
RTOR Reduction (vph)	0	0	234	0	2	2	0	4	0	0	0	23
Lane Group Flow (vph)	0	0	352	83	426	394	209	3136	0	0	2238	84
Turn Type			custom	Prot		Perm	Prot					Perm
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						6
Actuated Green, G (s)			20.7	13.3	38.0	38.0	16.0	124.0			104.0	104.0
Effective Green, g (s)			20.7	13.3	38.0	38.0	16.0	124.0			104.0	104.0
Actuated g/C Ratio			0.12	0.08	0.22	0.22	0.09	0.73			0.61	0.61
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)			196	138	369	336	167	3665			3111	968
v/s Ratio Prot				0.05	0.26		c0.12	c0.62			0.44	
v/s Ratio Perm			c0.22			c0.26						0.05
v/c Ratio			1.79	0.60	1.16	1.17	1.25	0.86			0.72	0.09
Uniform Delay, d1			74.6	75.8	66.0	66.0	77.0	16.6			22.9	13.5
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2			376.7	7.2	96.4	105.2	152.9	2.1			0.8	0.0
Delay (s)			451.4	83.0	162.4	171.2	229.9	18.7			23.7	13.6
Level of Service			F	F	F	F	F	B			C	B
Approach Delay (s)		451.4			159.0			31.9			23.2	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	79.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	170.0	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			

Kilgore-Crawford Site

Existing plus Project Conditions

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	9	4	1	1	45	2	209	13	312	495	58
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	4	1	1	49	2	227	14	339	538	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1415	1493	301	1195	1518	121	601			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1415	1493	301	1195	1518	121	601			241		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	96	89	99	99	99	95	100			74		
cM capacity (veh/h)	73	91	696	104	88	908	972			1322		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	17	2	49	116	128	608	332
Volume Left	3	1	0	2	0	339	0
Volume Right	4	0	49	0	14	0	63
cSH	110	95	908	972	1700	1322	1700
Volume to Capacity	0.16	0.02	0.05	0.00	0.08	0.26	0.20
Queue Length 95th (ft)	14	2	4	0	0	26	0
Control Delay (s)	44.0	43.8	9.2	0.2	0.0	6.0	0.0
Lane LOS	E	E	A	A		A	
Approach Delay (s)	44.0	10.7		0.1		3.9	
Approach LOS	E	B					

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	44.2%	ICU Level of Service	A	
Analysis Period (min)	15			


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Ex+P AM                    Thu May 12, 2011 09:17:40                  Page 3-1
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):          155                Critical Vol./Cap.(X):         0.673
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         90                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:           Include          Include          Include          Include
Min. Green:     8   37   37     8   37    0     8   37   37     8   37    0
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     43   52  182    49  111   42    40  380  252   527 1151  110
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:  43   52  182    49  111   42    40  380  252   527 1151  110
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:     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 Volume:   43   52  182    49  111   42    40  380  252   527 1151  110
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  43   52  182    49  111   42    40  380  252   527 1151  110
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:  43   52  182    49  111   42    40  380  252   527 1151  110
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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 1.00 1.00  1.00 1.45 0.55  1.00 2.00 1.00  1.00 2.74 0.26
Final Sat.:  1500 1500 1500  1500 2176  824  1500 3000 1500  1500 4107  393
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.03 0.12  0.03 0.05 0.05  0.03 0.13 0.17  0.35 0.28 0.28
Crit Volume:            182    49                       252   527
Crit Moves:             ****  ****                     ****  ****
*******************************************************************************
```



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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
*******************************************************************************
Cycle (sec):          145                Critical Vol./Cap.(X):         0.991
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                Level Of Service:                  E
*******************************************************************************
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:           Include          Include          Include          Include
Min. Green:     8   32   32     8   32   32     8   32   32     8   32   32
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    900 1218   62   207  715  709   235  194   72    78  461  140
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: 900 1218   62   207  715  709   235  194   72    78  461  140
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:     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 Volume:  900 1218   62   207  715  709   235  194   72    78  461  140
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol: 900 1218   62   207  715  709   235  194   72    78  461  140
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:     1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00
FinalVolume: 990 1218   62   228  715  709   259  194   72    86  461  140
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 3.00 1.00  2.00 3.00 1.00  2.00 2.00 1.00  2.00 3.00 1.00
Final Sat.:  3000 4500 1500  3000 4500 1500  3000 3000 1500  3000 4500 1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.27 0.04  0.08 0.16 0.47  0.09 0.06 0.05  0.03 0.10 0.09
Crit Volume: 495                         709  129                  154
Crit Moves:  ****                        ****  ****                 ****
*******************************************************************************
```



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-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.646
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         64                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:           Include          Include          Include          Ovl
Min. Green:    10   22    0     0   22   10    10   22    0    10   22    0
Y+R:          5.5  5.3  0.0   0.0  5.6  4.0   5.5  5.7  0.0   5.5  5.5  0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     25  615   27   910 1160  703   207  127   38    75  139  407
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:  25  615   27   910 1160  703   207  127   38    75  139  407
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:     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 Volume:   25  615   27   910 1160  703   207  127   38    75  139  407
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  25  615   27   910 1160  703   207  127   38    75  139  407
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:     1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.10
FinalVolume:  28  615   27  1001 1160  703   228  127   38    83  139  448
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 2.87 0.13  2.00 3.00 1.00  2.00 2.31 0.69  2.00 1.00 2.00
Final Sat.:  3000 4311  189  3000 4500 1500  3000 3464 1036  3000 1500 3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.14 0.14  0.33 0.26 0.47  0.08 0.04 0.04  0.03 0.09 0.15
Crit Volume:   14                        703  114                  139
Crit Moves:  ****                        ****  ****                 ****
*******************************************************************************
```

5: US 50 Eastbound Ramps & Sunrise Boulevard

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1043	545	0	1092	2369	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.94	0.88		0.86	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	4990	2787		6408	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	4990	2787		6408	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1134	592	0	1187	2575	0
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	1134	582	0	1187	2575	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		83.3	83.3	
Effective Green, g (s)	26.1	26.1		83.3	83.3	
Actuated g/C Ratio	0.22	0.22		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1109	620		4547	3608	
v/s Ratio Prot	c0.23			0.19	c0.51	
v/s Ratio Perm		0.21				
v/c Ratio	1.02	0.94		0.26	0.71	
Uniform Delay, d1	45.6	44.9		6.1	10.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.9	21.9		0.0	0.7	
Delay (s)	78.5	66.8		6.1	10.7	
Level of Service	E	E		A	B	
Approach Delay (s)	74.5			6.1	10.7	
Approach LOS	E			A	B	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

6: US 50 Westbound Ramps & Sunrise Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	491	309	1738	0	0	2558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	5085			5085
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	5085			5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	534	336	1889	0	0	2780
RTOR Reduction (vph)	0	99	0	0	0	0
Lane Group Flow (vph)	534	237	1889	0	0	2780
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	17.0	17.0	147.6			147.6
Effective Green, g (s)	17.0	17.0	147.6			147.6
Actuated g/C Ratio	0.10	0.10	0.86			0.86
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	338	275	4348			4348
v/s Ratio Prot	c0.16		0.37			c0.55
v/s Ratio Perm		0.08				
v/c Ratio	1.58	0.86	0.43			0.64
Uniform Delay, d1	77.8	76.6	2.9			4.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	274.7	23.0	0.1			0.3
Delay (s)	352.5	99.7	3.0			4.3
Level of Service	F	F	A			A
Approach Delay (s)	254.9		3.0			4.3
Approach LOS	F		A			A

Intersection Summary			
HCM Average Control Delay	43.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	172.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

7: US 50 WB Off-Ramp & Zinfandel Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	777	151	794	0	0	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	845	164	863	0	0	842
RTOR Reduction (vph)	0	103	0	0	0	0
Lane Group Flow (vph)	845	61	863	0	0	842
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	19.6	19.6	22.5			22.5
Effective Green, g (s)	19.6	19.6	22.5			22.5
Actuated g/C Ratio	0.37	0.37	0.42			0.42
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1258	580	2139			1488
v/s Ratio Prot	c0.25	0.04	0.17			c0.24
v/s Ratio Perm						
v/c Ratio	0.67	0.11	0.40			0.57
Uniform Delay, d1	14.2	11.2	10.8			11.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.4	0.1	0.1			0.5
Delay (s)	15.7	11.3	10.9			12.3
Level of Service	B	B	B			B
Approach Delay (s)	15.0		10.9			12.3
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	11.4
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

8: US 50 EB Off-Ramp & Zinfandel Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	348	971	1413	0	0	159	0	1214	6	0	1370	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.94	0.85			0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3010	1441			2787		6403			3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3010	1441			2787		6403			3539	
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)	378	1055	1536	0	0	173	0	1320	7	0	1489	0
RTOR Reduction (vph)	0	14	14	0	0	165	0	1	0	0	0	0
Lane Group Flow (vph)	340	1801	800	0	0	8	0	1326	0	0	1489	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	48.4	48.4	48.4			5.5		49.1			58.5	
Effective Green, g (s)	48.4	48.4	48.4			5.5		49.1			58.5	
Actuated g/C Ratio	0.41	0.41	0.41			0.05		0.42			0.49	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	659	1231	590			130		2658			1750	
v/s Ratio Prot	0.21	c0.60				0.00		0.21			c0.42	
v/s Ratio Perm			0.56									
v/c Ratio	0.52	1.46	1.36			0.06		0.50			0.85	
Uniform Delay, d1	26.2	35.0	35.0			53.9		25.5			26.1	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	0.7	213.0	171.4			0.2		0.1			4.2	
Delay (s)	26.9	248.0	206.3			54.1		25.7			30.3	
Level of Service	C	F	F			D		C			C	
Approach Delay (s)		211.2			54.1			25.7			30.3	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	120.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	11.4
Intersection Capacity Utilization	105.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Existing plus Project Conditions

Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	1	6	4	0	260	1	488	1	50	271	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	1	7	4	0	283	1	530	1	54	295	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	955	939	149	796	941	266	299			532		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	955	939	149	796	941	266	299			532		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	40	100	99	98	100	61	100			95		
cM capacity (veh/h)	125	248	870	264	248	732	1259			1032		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	83	4	283	266	266	202	152
Volume Left	75	4	0	1	0	54	0
Volume Right	7	0	283	0	1	0	4
cSH	135	264	732	1259	1700	1032	1700
Volume to Capacity	0.61	0.02	0.39	0.00	0.16	0.05	0.09
Queue Length 95th (ft)	79	1	46	0	0	4	0
Control Delay (s)	66.4	18.9	13.0	0.0	0.0	2.7	0.0
Lane LOS	F	C	B	A		A	
Approach Delay (s)	66.4	13.1		0.0		1.5	
Approach LOS	F	B					

Intersection Summary				
Average Delay		7.8		
Intersection Capacity Utilization	43.9%	ICU Level of Service		A
Analysis Period (min)		15		


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-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):          155                 Critical Vol./Cap.(X):          0.905
Loss Time (sec):        0                 Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                 Level Of Service:                    E
*******************************************************************************
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:           Include          Include          Include          Include
Min. Green:     8   37   37     8   37    0     8   37   37     8   37    0
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     231  160   490   131   73   58   134 1028   55   222  618   123
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:  231  160   490   131   73   58   134 1028   55   222  618   123
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:     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 Volume:   231  160   490   131   73   58   134 1028   55   222  618   123
Reduct Vol:     0    0     0     0    0    0     0    0    0     0    0     0
Reduced Vol:  231  160   490   131   73   58   134 1028   55   222  618   123
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:  231  160   490   131   73   58   134 1028   55   222  618   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500 1500  1500 1500 1500  1500 1500  1500
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 1.00  1.00  1.00 1.11 0.89  1.00 2.00 1.00  1.00 2.50  0.50
Final Sat.:  1500 1500  1500  1500 1672 1328  1500 3000 1500  1500 3753   747
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.11  0.33  0.09 0.04  0.04  0.09 0.34  0.04  0.15 0.16  0.16
Crit Volume:             490   131                  514         222
Crit Moves:             ****  ****                 ****        ****
*******************************************************************************
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-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
*******************************************************************************
Cycle (sec):          145                 Critical Vol./Cap.(X):          1.037
Loss Time (sec):        0                 Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                 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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   32   32     8   32   32     8   32   32     8   32   32
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     508 1118   29   246 1241  121   528  665  746   211  389  229
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:  508 1118   29   246 1241  121   528  665  746   211  389  229
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:     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 Volume:   508 1118   29   246 1241  121   528  665  746   211  389  229
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  508 1118   29   246 1241  121   528  665  746   211  389  229
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:     1.10 1.00  1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00
FinalVolume:  559 1118   29   271 1241  121   581  665  746   232  389  229
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500 1500  1500 1500 1500  1500 1500  1500
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:       2.00 3.00  1.00  2.00 3.00 1.00  2.00 2.00 1.00  2.00 3.00  1.00
Final Sat.:  3000 4500  1500  3000 4500 1500  3000 3000 1500  3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.25  0.02  0.09 0.28  0.08  0.19 0.22  0.50  0.08 0.09  0.15
Crit Volume:  279                 414                   746   116
Crit Moves:  ****                ****                  ****  ****
*******************************************************************************
```



```
Ex+P PM                    Thu May 12, 2011 09:17:41                    Page 5-1
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
*******************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):          0.795
Loss Time (sec):        0                 Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        111                 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:           Include          Include          Include           Ovl
Min. Green:    10   22    0     0   22   10    10   22    0    10   22    0
Y+R:          5.5  5.3  0.0   0.0  5.6  4.0   5.5  5.7  0.0   5.5  5.5  0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      52 1229   36   581  597  235   551  146   30    51  148  879
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:   52 1229   36   581  597  235   551  146   30    51  148  879
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:     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 Volume:    52 1229   36   581  597  235   551  146   30    51  148  879
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   52 1229   36   581  597  235   551  146   30    51  148  879
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:     1.10 1.00  1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.10
FinalVolume:   57 1229   36   639  597  235   606  146   30    56  148  967
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500 1500  1500 1500 1500  1500 1500  1500
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:       2.00 2.91  0.09  2.00 3.00 1.00  2.00 2.49  0.51  2.00 1.00  2.00
Final Sat.:  3000 4372   128  3000 4500 1500  3000 3733   767  3000 1500  3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.28  0.28  0.21 0.13  0.16  0.20 0.04  0.04  0.02 0.10  0.32
Crit Volume:             422   320                  303                  148
Crit Moves:             ****  ****                 ****                 ****
*******************************************************************************
```

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1270	299	0	2124	1326	0
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	*0.57	0.88		*0.70	*1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3026	2787		5216	7353	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3026	2787		5216	7353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1380	325	0	2309	1441	0
RTOR Reduction (vph)	0	15	0	0	0	0
Lane Group Flow (vph)	1380	310	0	2309	1441	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	67.6	67.6		68.0	68.0	
Effective Green, g (s)	67.6	67.6		68.0	68.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1424	1312		2470	3482	
v/s Ratio Prot	c0.46			c0.44	0.20	
v/s Ratio Perm		0.11				
v/c Ratio	0.97	0.24		0.93	0.41	
Uniform Delay, d1	37.0	22.6		35.7	24.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.8	0.1		7.4	0.1	
Delay (s)	53.8	22.7		43.1	24.8	
Level of Service	D	C		D	C	
Approach Delay (s)	47.9			43.1	24.8	
Approach LOS	D			D	C	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	143.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	393	457	2982	0	0	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	*0.70			*0.50
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	3912			2794
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	3912			2794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	427	497	3241	0	0	1405
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	427	492	3241	0	0	1405
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	21.0	21.0	101.0			101.0
Effective Green, g (s)	21.0	21.0	101.0			101.0
Actuated g/C Ratio	0.16	0.16	0.78			0.78
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	555	450	3039			2171
v/s Ratio Prot	0.12		c0.83			0.50
v/s Ratio Perm		c0.18				
v/c Ratio	0.77	1.09	1.07			0.65
Uniform Delay, d1	52.2	54.5	14.5			6.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	6.4	70.1	37.5			0.7
Delay (s)	58.5	124.6	52.0			7.2
Level of Service	E	F	D			A
Approach Delay (s)	94.1		52.0			7.2
Approach LOS	F		D			A

Intersection Summary			
HCM Average Control Delay	47.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	285	239	1711	0	0	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	310	260	1860	0	0	846
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	310	249	1860	0	0	846
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	18.6	18.6	47.5			47.5
Effective Green, g (s)	18.6	18.6	47.5			47.5
Actuated g/C Ratio	0.24	0.24	0.61			0.61
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	824	380	3117			2169
v/s Ratio Prot	0.09	c0.16	c0.37			0.24
v/s Ratio Perm						
v/c Ratio	0.38	0.65	0.60			0.39
Uniform Delay, d1	24.6	26.6	9.2			7.6
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	4.0	0.3			0.1
Delay (s)	24.9	30.6	9.5			7.7
Level of Service	C	C	A			A
Approach Delay (s)	27.5		9.5			7.7
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	11.4
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	670	201	487	0	0	957	0	2644	3	0	926	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.96	0.85			0.85		1.00			0.98	
Flt Protected	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3016	1441			2787		6407			3465	
Flt Permitted	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3016	1441			2787		6407			3465	
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)	728	218	529	0	0	1040	0	2874	3	0	1007	163
RTOR Reduction (vph)	0	22	55	0	0	70	0	0	0	0	10	0
Lane Group Flow (vph)	379	730	289	0	0	970	0	2877	0	0	1160	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	40.0	40.0	40.0			16.2		45.6			65.7	
Effective Green, g (s)	40.0	40.0	40.0			16.2		45.6			65.7	
Actuated g/C Ratio	0.34	0.34	0.34			0.14		0.39			0.56	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	550	1030	492			386		2495			1944	
v/s Ratio Prot	0.24	c0.24				c0.35		c0.45			0.33	
v/s Ratio Perm			0.20									
v/c Ratio	0.69	0.71	0.59			2.51		1.15			0.60	
Uniform Delay, d1	33.2	33.5	31.7			50.4		35.8			17.0	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.6	2.3	1.8			688.7		74.0			0.5	
Delay (s)	36.8	35.7	33.5			739.2		109.7			17.5	
Level of Service	D	D	C			F		F			B	
Approach Delay (s)		35.5			739.2			109.7			17.5	
Approach LOS		D			F			F			B	

Intersection Summary			
HCM Average Control Delay	176.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	117.1	Sum of lost time (s)	15.3
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

2035 Cumulative Conditions

Weekday AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

12/22/2010

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1195	2040	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1299	2217	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	2217				2867	1109
vC1, stage 1 conf vol					2217	
vC2, stage 2 conf vol					649	
vCu, unblocked vol	2217				2867	1109
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	232				66	204

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	433	866	1478	739	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	232	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.51	0.87	0.43	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	
Approach LOS					A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		


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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                          Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
********************************************************************************
Cycle (sec):          159                 Critical Vol./Cap.(X):          1.561
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                 Level Of Service:                    F
********************************************************************************
Street Name:            Hazel Avenue                  Gold Country Boulevard
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:             Include          Include          Include          Include
Min. Green:     8   75   75    36   36   36     8   40   40     8   40   40
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        2  0  3  0  1    1  0  3  1  0    2  0  0  1  1    1  0  0  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:     290 2815   67    45 4510 1728   725   33  437    78   22   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:  290 2815   67    45 4510 1728   725   33  437    78   22   33
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:     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 Volume:   290 2815   67    45 4510 1728   725   33  437    78   22   33
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  290 2815   67    45 4510 1728   725   33  437    78   22   33
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:     1.10 1.00 1.00  1.00 1.00 1.00  1.10 1.00 1.10  1.00 1.00 1.00
FinalVolume:  319 2815   67    45 4510 1728   798   33  481    78   22   33
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 3.00 1.00  1.00 3.00 1.00  2.00 0.13 1.87  1.00 0.40 0.60
Final Sat.:  3000 4500 1500  1500 4500 1500  3000  193 2807  1500  600  900
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.63 0.04  0.03 1.00 1.15  0.27 0.17  0.17  0.05 0.04  0.04
Crit Volume:  160                            1728  399                    55
Crit Moves:  ****                            ****  ****                 ****
********************************************************************************
```

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to DMJM HARRIS, OAKLAND, CA

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--------------------------------------------------------------------------------
                          Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
********************************************************************************
Cycle (sec):          107                 Critical Vol./Cap.(X):          2.999
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                 Level Of Service:                    F
********************************************************************************
Street Name:            Hazel Avenue                  Folsom Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Split Phase      Split Phase        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   26    0     8   26   26     8   47   47     8   46   46
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  1  0  1  1    2  0  1  1  0    1  0  1  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:     123 1740  468   296 2310  641   424  669  256   357 1371  480
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:  123 1740  468   296 2310  641   424  669  256   357 1371  480
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:     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 Volume:   123 1740  468   296 2310  641   424  669  256   357 1371  480
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  123 1740  468   296 2310  641   424  669  256   357 1371  480
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  1.10 1.00 1.10  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  123 1740  468   326 2310  705   466  669  256   357 1371  480
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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 1.00 1.00  1.00 2.00 1.00  2.00 1.45 0.55  1.00 1.00 1.00
Final Sat.:  1500 1500 1500  1500 3000 1500  3000 2170  830  1500 1500 1500
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.08 1.16 0.31  0.22 0.77 0.47  0.16 0.31 0.31  0.24 0.91 0.32
Crit Volume:      1740            1155          233                 1371
Crit Moves:       ****            ****          ****                ****
********************************************************************************
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HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

1/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1516	580	0	2644	2225	1088
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	0.99	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3429	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3429	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1648	630	0	2874	2418	1183
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	1710	566	0	2874	2418	1183
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	22.0	22.0		60.0	30.0	60.0
Effective Green, g (s)	22.0	22.0		60.0	30.0	60.0
Actuated g/C Ratio	0.37	0.37		1.00	0.50	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1257	528		3539	1770	1583
v/s Ratio Prot	c0.50			0.81	c0.68	
v/s Ratio Perm		0.39				0.75
v/c Ratio	1.36	1.07		0.81	1.37	0.75
Uniform Delay, d1	19.0	19.0		0.0	15.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	167.5	60.1		1.5	168.5	3.3
Delay (s)	186.5	79.1		1.5	183.5	3.3
Level of Service	F	E		A	F	A
Approach Delay (s)	159.8			1.5	124.3	
Approach LOS	F			A	F	

Intersection Summary			
HCM Average Control Delay	93.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	129.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	557	290	331	451	870	2721	0	0	4883	142
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	1.00	0.91	0.91	1.00	0.91			0.81	0.81
Frt			0.86	1.00	0.98	0.85	1.00	1.00			1.00	0.85
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)			1611	1770	1665	2882	1770	5085			6033	1282
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)			1611	1770	1665	2882	1770	5085			6033	1282
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	0	605	315	360	490	946	2958	0	0	5308	154
RTOR Reduction (vph)	0	0	244	0	1	1	0	0	0	0	0	15
Lane Group Flow (vph)	0	0	361	315	408	440	946	2958	0	0	5323	124
Turn Type			custom	Prot		Perm	Prot					Perm
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						6
Actuated Green, G (s)			16.1	38.1	58.2	58.2	28.1	120.3			88.2	88.2
Effective Green, g (s)			16.1	38.1	58.2	58.2	28.1	120.3			88.2	88.2
Actuated g/C Ratio			0.09	0.20	0.31	0.31	0.15	0.65			0.47	0.47
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)			139	362	520	899	267	3280			2853	606
v/s Ratio Prot				c0.18	0.25		c0.53	0.58			c0.88	
v/s Ratio Perm			c0.22			0.15						0.10
v/c Ratio			2.60	0.87	0.79	0.49	3.54	0.90			1.87	0.21
Uniform Delay, d1			85.2	71.8	58.5	52.1	79.2	28.1			49.2	28.7
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2			739.3	19.7	7.6	0.4	1153.7	3.9			390.9	0.2
Delay (s)			824.5	91.5	66.1	52.5	1232.9	32.0			440.1	28.9
Level of Service			F	F	E	D	F	C			F	C
Approach Delay (s)		824.5			67.8			323.0			429.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	375.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.99		
Actuated Cycle Length (s)	186.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	152.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

2035 Cumulative Conditions

Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

12/22/2010

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	723	1579	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	786	1716	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	1716				2109	858
vC1, stage 1 conf vol					1716	
vC2, stage 2 conf vol					393	
vCu, unblocked vol	1716				2109	858
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	365				126	300

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	262	524	1144	572	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	365	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.31	0.67	0.34	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	
Approach LOS					A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		


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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
********************************************************************************
Cycle (sec):          159                 Critical Vol./Cap.(X):         1.043
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                 Level Of Service:                  F
********************************************************************************
Street Name:               Hazel Avenue                Gold Country Boulevard
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:          Include          Include          Include          Include
Min. Green:     8    75    75   36    36    36    8    40    40    8    40    40
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        2  0  3  0  1   1  0  3  1  0   2  0  0  1  1   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    1134 3880    38    33 2676   424   355   11   357    67   21    22
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: 1134 3880    38    33 2676   424   355   11   357    67   21    22
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:     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 Volume:  1134 3880    38    33 2676   424   355   11   357    67   21    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 1134 3880    38    33 2676   424   355   11   357    67   21    22
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:     1.10 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  1.00 1.00  1.00
FinalVolume: 1247 3880    38    33 2676   424   391   11   393    67   21    22
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  1.00 3.45  0.55  2.00 0.05  1.95  1.00 0.49  0.51
Final Sat.:  3000 4500  1500  1500 5179   821  3000   82  2918  1500  733   767
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.42 0.86  0.03  0.02 0.52  0.52  0.13 0.13  0.13  0.04 0.03  0.03
Crit Volume:      1293          33              195                     43
Crit Moves:       ****        ****              ****                  ****
********************************************************************************
```



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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
********************************************************************************
Cycle (sec):          107                 Critical Vol./Cap.(X):         2.979
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                 Level Of Service:                  F
********************************************************************************
Street Name:               Hazel Avenue                   Folsom Boulevard
Approach:        North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected         Protected
Rights:          Include          Include          Include          Include
Min. Green:     8    26     0    8    26    26    8    47    47    8    46    46
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        1  0  1  0  1   1  1  0  1  1   2  0  1  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     245 2342   290   269 1735   446   931 1249   167   546  747   601
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:  245 2342   290   269 1735   446   931 1249   167   546  747   601
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:     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 Volume:   245 2342   290   269 1735   446   931 1249   167   546  747   601
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  245 2342   290   269 1735   446   931 1249   167   546  747   601
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  1.10 1.00  1.10  1.10 1.00  1.00  1.00 1.00  1.00
FinalVolume:  245 2342   290   296 1735   491  1024 1249   167   546  747   601
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  1.00  1.00 2.00  1.00  2.00 1.76  0.24  1.00 1.00  1.00
Final Sat.:  1500 1500  1500  1500 3000  1500  3000 2646   354  1500 1500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 1.56  0.19  0.20 0.58  0.33  0.34 0.47  0.47  0.36 0.50  0.40
Crit Volume:      2342               868        512                    747
Crit Moves:       ****              ****        ****                   ****
********************************************************************************
```


HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

1/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1539	457	0	3874	1993	772
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3431	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3431	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1673	497	0	4211	2166	839
RTOR Reduction (vph)	1	2	0	0	0	0
Lane Group Flow (vph)	1722	445	0	4211	2166	839
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	62.0	62.0		150.0	80.0	150.0
Effective Green, g (s)	62.0	62.0		150.0	80.0	150.0
Actuated g/C Ratio	0.41	0.41		1.00	0.53	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1418	596		3539	1887	1583
v/s Ratio Prot	0.50			c1.19	0.61	
v/s Ratio Perm		0.31				0.53
v/c Ratio	1.21	0.75		1.19	1.15	0.53
Uniform Delay, d1	44.0	37.3		75.0	35.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	103.1	5.1		88.5	73.3	1.3
Delay (s)	147.1	42.4		163.5	108.3	1.3
Level of Service	F	D		F	F	A
Approach Delay (s)	125.6			163.5	78.4	
Approach LOS	F			F	E	

Intersection Summary			
HCM Average Control Delay	127.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	162.4%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	974	156	222	847	424	4205	0	0	2997	101
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	1.00	0.91	0.91	1.00	0.91			0.81	0.81
Frt			0.86	1.00	0.94	0.85	1.00	1.00			1.00	0.85
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)			1611	1770	1588	2882	1770	5085			6032	1282
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)			1611	1770	1588	2882	1770	5085			6032	1282
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	0	1059	170	241	921	461	4571	0	0	3258	110
RTOR Reduction (vph)	0	0	179	0	0	0	0	0	0	0	0	19
Lane Group Flow (vph)	0	0	880	170	416	746	461	4571	0	0	3269	80
Turn Type			custom	Prot		Perm	Prot					Perm
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						6
Actuated Green, G (s)			16.8	21.9	42.7	42.7	16.0	124.1			104.1	104.1
Effective Green, g (s)			16.8	21.9	42.7	42.7	16.0	124.1			104.1	104.1
Actuated g/C Ratio			0.10	0.13	0.24	0.24	0.09	0.71			0.60	0.60
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)			155	222	388	704	162	3610			3592	763
v/s Ratio Prot				0.10	c0.26		c0.26	c0.90			0.54	
v/s Ratio Perm			c0.55			0.26						0.06
v/c Ratio			5.68	0.77	1.07	1.06	2.85	1.27			0.91	0.11
Uniform Delay, d1			79.0	74.0	66.1	66.1	79.4	25.4			31.2	15.3
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2			2118.9	14.5	66.3	50.8	847.3	122.1			4.0	0.1
Delay (s)			2197.9	88.5	132.3	116.9	926.7	147.5			35.2	15.3
Level of Service			F	F	F	F	F	F			D	B
Approach Delay (s)		2197.9			118.1			218.9			34.6	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	343.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.85		
Actuated Cycle Length (s)	174.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	16	7	2	2	10	3	382	17	48	831	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	17	8	2	2	11	3	415	18	52	903	109
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1288	1502	506	1003	1547	217	1012			434		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1288	1502	506	1003	1547	217	1012			434		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	95	85	99	99	98	99	100			95		
cM capacity (veh/h)	113	114	512	164	107	788	681			1122		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	30	4	11	211	226	504	560
Volume Left	5	2	0	3	0	52	0
Volume Right	8	0	11	0	18	0	109
cSH	142	130	788	681	1700	1122	1700
Volume to Capacity	0.21	0.03	0.01	0.00	0.13	0.05	0.33
Queue Length 95th (ft)	19	3	1	0	0	4	0
Control Delay (s)	37.2	33.7	9.6	0.2	0.0	1.3	0.0
Lane LOS	E	D	A	A		A	
Approach Delay (s)	37.2	16.5		0.1		0.6	
Approach LOS	E	C					

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	54.5%	ICU Level of Service		A
Analysis Period (min)	15			


```
Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):          155                Critical Vol./Cap.(X):         0.914
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                Level Of Service:                  E
*******************************************************************************
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:           Include          Include          Include          Include
Min. Green:     8   37   37     8   37    0     8   37   37     8   37    0
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      27   54  289    84  172   72    69  602  133   697 1734  122
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:   27   54  289    84  172   72    69  602  133   697 1734  122
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:     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 Volume:    27   54  289    84  172   72    69  602  133   697 1734  122
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   27   54  289    84  172   72    69  602  133   697 1734  122
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:   27   54  289    84  172   72    69  602  133   697 1734  122
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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 1.00 1.00  1.00 1.41 0.59  1.00 2.00 1.00  1.00 2.80 0.20
Final Sat.:  1500 1500 1500  1500 2115  885  1500 3000 1500  1500 4204  296
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.04 0.19  0.06 0.08 0.08  0.05 0.20 0.09  0.46 0.41 0.41
Crit Volume:            289   84                  301       697
Crit Moves:             ****  ****                ****      ****
*******************************************************************************
```



```
Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
*******************************************************************************
Cycle (sec):          145                Critical Vol./Cap.(X):         1.503
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   32   32     8   32   32     8   32   32     8   32   32
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    1105 1524  312   691  531  859   235  702  119   223  765  658
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: 1105 1524  312   691  531  859   235  702  119   223  765  658
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:     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 Volume:  1105 1524  312   691  531  859   235  702  119   223  765  658
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol: 1105 1524  312   691  531  859   235  702  119   223  765  658
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:     1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00
FinalVolume: 1216 1524  312   760  531  859   259  702  119   245  765  658
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 3.00 1.00  2.00 3.00 1.00  2.00 2.00 1.00  2.00 3.00 1.00
Final Sat.:  3000 4500 1500  3000 4500 1500  3000 3000 1500  3000 4500 1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.34 0.21  0.25 0.12 0.57  0.09 0.23 0.08  0.08 0.17 0.44
Crit Volume:  608                         859  129                         658
Crit Moves:   ****                        ****  ****                      ****
*******************************************************************************
```



```
Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         1.117
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include            Ovl
Min. Green:    10   22    0     0   22   10    10   22    0    10   22    0
Y+R:          5.5  5.3  0.0   0.0  5.6  4.0   5.5  5.7  0.0   5.5  5.5  0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      11 1613  368   553 2130  646   580  379   22   125  586  535
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:   11 1613  368   553 2130  646   580  379   22   125  586  535
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:     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 Volume:    11 1613  368   553 2130  646   580  379   22   125  586  535
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   11 1613  368   553 2130  646   580  379   22   125  586  535
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:     1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.00  1.10 1.00 1.10
FinalVolume:   12 1613  368   608 2130  646   638  379   22   138  586  589
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500
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:       2.00 2.44 0.56  2.00 3.00 1.00  2.00 2.84 0.16  2.00 1.50 1.50
Final Sat.:  3000 3664  836  3000 4500 1500  3000 4253  247  3000 2245 2255
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.44 0.44  0.20 0.47 0.43  0.21 0.09 0.09  0.05 0.26 0.26
Crit Volume:            660  304              319                 391
Crit Moves:             ****  ****             ****                ****
*******************************************************************************
```

5: US 50 Eastbound Ramps & Sunrise Boulevard

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1171	569	0	2453	1621	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.94	0.88		0.86	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	4990	2787		6408	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	4990	2787		6408	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1273	618	0	2666	1762	0
RTOR Reduction (vph)	0	54	0	0	0	0
Lane Group Flow (vph)	1273	564	0	2666	1762	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		82.7	82.7	
Effective Green, g (s)	26.1	26.1		82.7	82.7	
Actuated g/C Ratio	0.22	0.22		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1115	623		4537	3600	
v/s Ratio Prot	c0.26			c0.42	0.35	
v/s Ratio Perm		0.20				
v/c Ratio	1.14	0.90		0.59	0.49	
Uniform Delay, d1	45.4	44.1		8.5	7.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	74.8	16.6		0.2	0.1	
Delay (s)	120.2	60.8		8.7	7.7	
Level of Service	F	E		A	A	
Approach Delay (s)	100.8			8.7	7.7	
Approach LOS	F			A	A	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	116.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

6: US 50 Westbound Ramps & Sunrise Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	702	925	2358	0	0	2107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	5085			5085
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	5085			5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	763	1005	2563	0	0	2290
RTOR Reduction (vph)	0	33	0	0	0	0
Lane Group Flow (vph)	763	972	2563	0	0	2290
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	17.7	17.7	120.7			120.7
Effective Green, g (s)	17.7	17.7	120.7			120.7
Actuated g/C Ratio	0.12	0.12	0.82			0.82
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	415	337	4192			4192
v/s Ratio Prot	0.22		c0.50			0.45
v/s Ratio Perm		c0.35				
v/c Ratio	1.84	2.89	0.61			0.55
Uniform Delay, d1	64.4	64.4	4.5			4.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	386.6	856.7	0.3			0.1
Delay (s)	451.0	921.0	4.8			4.3
Level of Service	F	F	A			A
Approach Delay (s)	718.2		4.8			4.3
Approach LOS	F		A			A

Intersection Summary			
HCM Average Control Delay	195.1	HCM Level of Service	F
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	146.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

7: US 50 WB Off-Ramp & Zinfandel Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	741	357	2096	0	0	956
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	805	388	2278	0	0	1039
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	805	384	2278	0	0	1039
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	29.9	29.9	63.0			63.0
Effective Green, g (s)	29.9	29.9	63.0			63.0
Actuated g/C Ratio	0.29	0.29	0.60			0.60
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	984	454	3071			2138
v/s Ratio Prot	0.23	c0.24	c0.45			0.29
v/s Ratio Perm						
v/c Ratio	0.82	0.85	0.74			0.49
Uniform Delay, d1	34.7	35.0	14.8			11.6
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.4	13.6	1.0			0.2
Delay (s)	40.0	48.7	15.8			11.7
Level of Service	D	D	B			B
Approach Delay (s)	42.8		15.8			11.7
Approach LOS	D		B			B

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	104.3	Sum of lost time (s)	11.4
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

8: US 50 EB Off-Ramp & Zinfandel Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	446	767	836	0	0	747	0	3780	22	0	1498	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.96	0.85			0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3060	1441			2787		6402			3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3060	1441			2787		6402			3539	
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)	485	834	909	0	0	812	0	4109	24	0	1628	0
RTOR Reduction (vph)	0	10	10	0	0	166	0	1	0	0	0	0
Lane Group Flow (vph)	436	1228	544	0	0	646	0	4132	0	0	1628	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	48.2	48.2	48.2			16.1		45.4			65.4	
Effective Green, g (s)	48.2	48.2	48.2			16.1		45.4			65.4	
Actuated g/C Ratio	0.39	0.39	0.39			0.13		0.36			0.52	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	621	1180	556			359		2325			1852	
v/s Ratio Prot	0.27	c0.40				c0.23		c0.65			0.46	
v/s Ratio Perm			0.38									
v/c Ratio	0.70	1.04	0.98			1.80		1.78			0.88	
Uniform Delay, d1	32.4	38.4	37.9			54.4		39.8			26.3	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.6	37.4	32.4			370.2		351.6			5.1	
Delay (s)	35.9	75.8	70.3			424.7		391.4			31.4	
Level of Service	D	E	E			F		F			C	
Approach Delay (s)		66.6			424.7			391.4			31.4	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM Average Control Delay	245.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	122.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	119	2	10	2	0	21	2	847	0	0	461	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	2	11	2	0	23	2	921	0	0	501	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	992	1430	254	1188	1434	460	509			921		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	992	1430	254	1188	1434	460	509			921		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	32	98	99	98	100	96	100			100		
cM capacity (veh/h)	191	133	745	140	133	548	1053			737		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	142	2	23	462	460	251	258
Volume Left	129	2	0	2	0	0	0
Volume Right	11	0	23	0	0	0	8
cSH	201	140	548	1053	1700	737	1700
Volume to Capacity	0.71	0.02	0.04	0.00	0.27	0.00	0.15
Queue Length 95th (ft)	112	1	3	0	0	0	0
Control Delay (s)	57.1	31.2	11.9	0.1	0.0	0.0	0.0
Lane LOS	F	D	B	A			
Approach Delay (s)	57.1	13.5		0.0		0.0	
Approach LOS	F	B					

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			


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--------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
********************************************************************************
Cycle (sec):         155                 Critical Vol./Cap.(X):         1.390
Loss Time (sec):       0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   37   37     8   37    0     8   37   37     8   37    0
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     124  168   684   226  124   100   231 1681    41   334  920   139
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:  124  168   684   226  124   100   231 1681    41   334  920   139
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:     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 Volume:   124  168   684   226  124   100   231 1681    41   334  920   139
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  124  168   684   226  124   100   231 1681    41   334  920   139
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:  124  168   684   226  124   100   231 1681    41   334  920   139
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  1.00  1.00 1.11  0.89  1.00 2.00  1.00  1.00 2.61  0.39
Final Sat.:  1500 1500  1500  1500 1661  1339  1500 3000  1500  1500 3909   591
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.11  0.46  0.15 0.07  0.07  0.15 0.56  0.03  0.22 0.24  0.24
Crit Volume:             684   226                 841         334
Crit Moves:             ****  ****               ****        ****
********************************************************************************
```



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--------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
********************************************************************************
Cycle (sec):         145                 Critical Vol./Cap.(X):         1.444
Loss Time (sec):       0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   32   32     8   32   32     8   32   32     8   32   32
Y+R:          4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     646  674   100   591 1671   212   402 1383  1058   357  665   438
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:  646  674   100   591 1671   212   402 1383  1058   357  665   438
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:     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 Volume:   646  674   100   591 1671   212   402 1383  1058   357  665   438
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  646  674   100   591 1671   212   402 1383  1058   357  665   438
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:     1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00
FinalVolume:  711  674   100   650 1671   212   442 1383  1058   393  665   438
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  2.00 3.00  1.00  2.00 2.00  1.00  2.00 3.00  1.00
Final Sat.:  3000 4500  1500  3000 4500  1500  3000 3000  1500  3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.15  0.07  0.22 0.37  0.14  0.15 0.46  0.71  0.13 0.15  0.29
Crit Volume:  355                 557                   1058   196
Crit Moves:  ****                ****                   ****  ****
********************************************************************************
```



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--------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         1.242
Loss Time (sec):       0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include           Ovl
Min. Green:    10   22    0     0   22   10    10   22    0    10   22    0
Y+R:          5.5  5.3  0.0   0.0  5.6  4.0   5.5  5.7  0.0   5.5  5.5  0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      33 1996   100   591 1483   379   736  411    22   360  435   859
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:   33 1996   100   591 1483   379   736  411    22   360  435   859
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:     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 Volume:    33 1996   100   591 1483   379   736  411    22   360  435   859
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   33 1996   100   591 1483   379   736  411    22   360  435   859
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:     1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.00  1.10
FinalVolume:   36 1996   100   650 1483   379   810  411    22   396  435   945
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 2.86  0.14  2.00 3.00  1.00  2.00 2.85  0.15  2.00 1.00  2.00
Final Sat.:  3000 4285   215  3000 4500  1500  3000 4271   229  3000 1500  3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.47  0.47  0.22 0.33  0.25  0.27 0.10  0.10  0.13 0.29  0.31
Crit Volume:       699         325              405                  435
Crit Moves:        ****        ****             ****                 ****
********************************************************************************
```

5: US 50 Eastbound Ramps & Sunrise Boulevard

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1539	747	0	1905	1694	0
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	*0.57	0.88		*0.70	*1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3026	2787		5216	7353	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3026	2787		5216	7353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1673	812	0	2071	1841	0
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	1673	808	0	2071	1841	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	69.0	69.0		67.5	67.5	
Effective Green, g (s)	69.0	69.0		67.5	67.5	
Actuated g/C Ratio	0.48	0.48		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1445	1331		2437	3435	
v/s Ratio Prot	c0.55			c0.40	0.25	
v/s Ratio Perm		0.29				
v/c Ratio	1.16	0.61		0.85	0.54	
Uniform Delay, d1	37.8	27.8		34.0	27.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	79.2	0.8		3.0	0.2	
Delay (s)	116.9	28.6		37.0	27.5	
Level of Service	F	C		D	C	
Approach Delay (s)	88.1			37.0	27.5	
Approach LOS	F			D	C	

Intersection Summary			
HCM Average Control Delay	54.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	144.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	159.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

6: US 50 Westbound Ramps & Sunrise Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	479	1873	2539	0	0	1930
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	*0.70			*0.50
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	3912			2794
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	3912			2794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	521	2036	2760	0	0	2098
RTOR Reduction (vph)	0	12	0	0	0	0
Lane Group Flow (vph)	521	2024	2760	0	0	2098
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	21.0	21.0	101.0			101.0
Effective Green, g (s)	21.0	21.0	101.0			101.0
Actuated g/C Ratio	0.16	0.16	0.78			0.78
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	555	450	3039			2171
v/s Ratio Prot	0.15		0.71			c0.75
v/s Ratio Perm		c0.73				
v/c Ratio	0.94	4.50	0.91			0.97
Uniform Delay, d1	53.9	54.5	11.0			13.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	23.7	1579.4	4.4			12.3
Delay (s)	77.6	1633.9	15.4			25.3
Level of Service	E	F	B			C
Approach Delay (s)	1316.8		15.4			25.3
Approach LOS	F		B			C

Intersection Summary			
HCM Average Control Delay	467.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	159.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

7: US 50 WB Off-Ramp & Zinfandel Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	792	524	2225	0	0	1171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	861	570	2418	0	0	1273
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	861	567	2418	0	0	1273
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	33.2	33.2	65.4			65.4
Effective Green, g (s)	33.2	33.2	65.4			65.4
Actuated g/C Ratio	0.30	0.30	0.59			0.59
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1036	478	3023			2104
v/s Ratio Prot	0.25	c0.36	c0.48			0.36
v/s Ratio Perm						
v/c Ratio	0.83	1.19	0.80			0.61
Uniform Delay, d1	35.8	38.4	17.2			14.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.8	103.4	1.6			0.5
Delay (s)	41.6	141.8	18.8			14.6
Level of Service	D	F	B			B
Approach Delay (s)	81.5		18.8			14.6
Approach LOS	F		B			B

Intersection Summary			
HCM Average Control Delay	35.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

8: US 50 EB Off-Ramps & Zinfandel Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	585	89	491	0	0	1795	0	4147	22	0	1726	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.94	0.85			0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	2954	1441			2787		6403			3539	
Flt Permitted	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	2954	1441			2787		6403			3539	
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)	636	97	534	0	0	1951	0	4508	24	0	1876	0
RTOR Reduction (vph)	0	5	5	0	0	96	0	1	0	0	0	0
Lane Group Flow (vph)	331	637	289	0	0	1855	0	4531	0	0	1876	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	35.2	35.2	35.2			16.2		45.7			65.8	
Effective Green, g (s)	35.2	35.2	35.2			16.2		45.7			65.8	
Actuated g/C Ratio	0.31	0.31	0.31			0.14		0.41			0.59	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	504	925	451			402		2603			2072	
v/s Ratio Prot	0.21	c0.22				c0.67		c0.71			0.53	
v/s Ratio Perm			0.20									
v/c Ratio	0.66	0.69	0.64			4.61		1.74			0.91	
Uniform Delay, d1	33.4	33.8	33.2			48.1		33.4			20.6	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.1	2.1	3.0			1632.3		335.0			6.1	
Delay (s)	36.5	35.9	36.1			1680.4		368.3			26.7	
Level of Service	D	D	D			F		F			C	
Approach Delay (s)		36.1			1680.4			368.3			26.7	
Approach LOS		D			F			F			C	

Intersection Summary			
HCM Average Control Delay	524.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.84		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	15.3
Intersection Capacity Utilization	152.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

5/5/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	1195	2040	264	36	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	1299	2217	287	39	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	2504				3060	1252
vC1, stage 1 conf vol					2361	
vC2, stage 2 conf vol					699	
vCu, unblocked vol	2504				3060	1252
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				29	98
cM capacity (veh/h)	179				55	164

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	458	866	1478	1026	39	3
Volume Left	25	0	0	0	39	0
Volume Right	0	0	0	287	0	3
cSH	179	1700	1700	1700	55	164
Volume to Capacity	0.14	0.51	0.87	0.60	0.71	0.02
Queue Length 95th (ft)	12	0	0	0	74	2
Control Delay (s)	6.6	0.0	0.0	0.0	164.7	27.5
Lane LOS	A				F	D
Approach Delay (s)	2.3		0.0		154.2	
Approach LOS					F	

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		


```
Cml 2035 plus Project - AM Thu May 5, 2011 11:28:28                 Page 2-1
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
******************************************************************************
Cycle (sec):         159               Critical Vol./Cap.(X):         1.675
Loss Time (sec):       0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180               Level Of Service:                  F
******************************************************************************
Street Name:            Hazel Avenue                Gold Country Boulevard
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:           Include          Include          Include          Include
Min. Green:     8   75    75    36   36    36     8   40    40     8   40    40
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  3  0  1   1  0  3  1  0   2  0  0  1  1   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     505 2815    67    45 4510  1777   732   33   466    78   22    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:  505 2815    67    45 4510  1777   732   33   466    78   22    33
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:     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 Volume:   505 2815    67    45 4510  1777   732   33   466    78   22    33
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  505 2815    67    45 4510  1777   732   33   466    78   22    33
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:     1.10 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  1.00 1.00  1.00
FinalVolume:  556 2815    67    45 4510  1777   805   33   513    78   22    33
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  1.00 3.00  1.00  2.00 0.12  1.88  1.00 0.40  0.60
Final Sat.:  3000 4500  1500  1500 4500  1500  3000  181  2819  1500  600   900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.63  0.04  0.03 1.00  1.18  0.27 0.18  0.18  0.05 0.04  0.04
Crit Volume:  278                          1777   403                    55
Crit Moves:  ****                          ****  ****                  ****
******************************************************************************
```

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------------------------------------------------------------------------------
                    Level Of Service Computation Report
          Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
******************************************************************************
Cycle (sec):         107               Critical Vol./Cap.(X):         3.006
Loss Time (sec):       0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180               Level Of Service:                  F
******************************************************************************
Street Name:            Hazel Avenue                   Folsom Boulevard
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   26     0     8   26    26     8   47    47     8   46    46
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  1  0  1  1   2  0  1  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     123 1740   468   298 2311   643   441  669   256   357 1371   489
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:  123 1740   468   298 2311   643   441  669   256   357 1371   489
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:     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 Volume:   123 1740   468   298 2311   643   441  669   256   357 1371   489
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  123 1740   468   298 2311   643   441  669   256   357 1371   489
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  1.10 1.00  1.10  1.10 1.00  1.00  1.00 1.00  1.00
FinalVolume:  123 1740   468   328 2311   707   485  669   256   357 1371   489
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  1.00  1.00 2.00  1.00  2.00 1.45  0.55  1.00 1.00  1.00
Final Sat.:  1500 1500  1500  1500 3000  1500  3000 2170   830  1500 1500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 1.16  0.31  0.22 0.77  0.47  0.16 0.31  0.31  0.24 0.91  0.33
Crit Volume:      1740              1156        243                  1371
Crit Moves:       ****              ****       ****                  ****
******************************************************************************
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HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

5/5/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1648	580	0	2678	2230	1095
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	0.99	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3430	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3430	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1791	630	0	2911	2424	1190
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	1853	566	0	2911	2424	1190
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	27.0	27.0		70.0	35.0	70.0
Effective Green, g (s)	27.0	27.0		70.0	35.0	70.0
Actuated g/C Ratio	0.39	0.39		1.00	0.50	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1323	556		3539	1770	1583
v/s Ratio Prot	c0.54			0.82	c0.68	
v/s Ratio Perm		0.39				0.75
v/c Ratio	1.40	1.02		0.82	1.37	0.75
Uniform Delay, d1	21.5	21.5		0.0	17.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	185.0	43.0		1.6	170.0	3.3
Delay (s)	206.5	64.5		1.6	187.5	3.3
Level of Service	F	E		A	F	A
Approach Delay (s)	173.3			1.6	126.8	
Approach LOS	F			A	F	

Intersection Summary			
HCM Average Control Delay	98.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	557	290	331	499	870	2887	0	0	4894	142
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	
Lane Util. Factor			1.00	1.00	0.91	0.91	1.00	0.91			0.86	
Frt			0.86	1.00	0.98	0.85	1.00	1.00			1.00	
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)			1611	1770	1662	2882	1770	5085			6381	
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)			1611	1770	1662	2882	1770	5085			6381	
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	0	605	315	360	542	946	3138	0	0	5320	154
RTOR Reduction (vph)	0	0	244	0	0	1	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	361	315	414	487	946	3138	0	0	5472	0
Turn Type			custom	Prot		Perm	Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						
Actuated Green, G (s)			16.0	38.2	58.2	58.2	28.1	120.3			88.2	
Effective Green, g (s)			16.0	38.2	58.2	58.2	28.1	120.3			88.2	
Actuated g/C Ratio			0.09	0.20	0.31	0.31	0.15	0.65			0.47	
Clearance Time (s)			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	
Lane Grp Cap (vph)			138	363	519	899	267	3280			3018	
v/s Ratio Prot				c0.18	0.25		c0.53	0.62			c0.86	
v/s Ratio Perm			c0.22			0.17						
v/c Ratio			2.62	0.87	0.80	0.54	3.54	0.96			1.81	
Uniform Delay, d1			85.2	71.7	58.8	53.1	79.2	30.7			49.2	
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2			747.4	19.1	8.3	0.7	1153.7	7.9			367.3	
Delay (s)			832.7	90.8	67.1	53.8	1232.9	38.6			416.4	
Level of Service			F	F	E	D	F	D			F	
Approach Delay (s)		832.7			67.9			315.3			416.4	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	365.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.96		
Actuated Cycle Length (s)	186.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	155.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
1: Gold Country Boulevard & Project Access

5/5/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	723	1579	47	206	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	786	1716	51	224	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			515			
pX, platoon unblocked						
vC, conflicting volume	1767				2143	884
vC1, stage 1 conf vol					1742	
vC2, stage 2 conf vol					402	
vCu, unblocked vol	1767				2143	884
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				0	83
cM capacity (veh/h)	349				122	289

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	266	524	1144	623	224	49
Volume Left	4	0	0	0	224	0
Volume Right	0	0	0	51	0	49
cSH	349	1700	1700	1700	122	289
Volume to Capacity	0.01	0.31	0.67	0.37	1.84	0.17
Queue Length 95th (ft)	1	0	0	0	439	15
Control Delay (s)	0.5	0.0	0.0	0.0	468.4	20.0
Lane LOS	A				F	C
Approach Delay (s)	0.2		0.0		388.1	
Approach LOS					F	

Intersection Summary			
Average Delay	37.4		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		


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---------------------------------------------------------------------------
                     Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
***************************************************************************
Intersection #2 Hazel Avenue / Gold Country Boulevard
***************************************************************************
Cycle (sec):          159                 Critical Vol./Cap.(X):        1.058
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        180                 Level Of Service:                 F
***************************************************************************
Street Name:               Hazel Avenue                Gold Country Boulevard
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:          Include          Include          Include          Include
Min. Green:     8   75    75    36   36    36     8   40    40     8   40    40
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:         2  0  3  0  1   1  0  3  1  0   2  0  0  1  1   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    1172 3880    38    33 2676   433   395   11   537    67   21    22
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: 1172 3880    38    33 2676   433   395   11   537    67   21    22
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:     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 Volume:  1172 3880    38    33 2676   433   395   11   537    67   21    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 1172 3880    38    33 2676   433   395   11   537    67   21    22
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:     1.10 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  1.00 1.00  1.00
FinalVolume: 1289 3880    38    33 2676   433   435   11   591    67   21    22
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  1.00 3.44  0.56  2.00 0.04  1.96  1.00 0.49  0.51
Final Sat.:  3000 4500  1500  1500 5164   836  3000   55  2945  1500  733   767
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.43 0.86  0.03  0.02 0.52  0.52  0.14 0.20  0.20  0.04 0.03  0.03
Crit Volume:      1293          33              217                      43
Crit Moves:       ****        ****             ****                    ****
***************************************************************************
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---------------------------------------------------------------------------
                     Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
***************************************************************************
Intersection #3 Hazel Avenue / Folsom Boulevard
***************************************************************************
Cycle (sec):          107                 Critical Vol./Cap.(X):        2.984
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        180                 Level Of Service:                 F
***************************************************************************
Street Name:               Hazel Avenue                  Folsom Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     8   26     0     8   26    26     8   47    47     8   46    46
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:         1  0  1  0  1   1  1  0  1  1   2  0  1  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     245 2344   290   277 1743   454   933 1249   167   546  747   603
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:  245 2344   290   277 1743   454   933 1249   167   546  747   603
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:     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 Volume:   245 2344   290   277 1743   454   933 1249   167   546  747   603
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  245 2344   290   277 1743   454   933 1249   167   546  747   603
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  1.10 1.00  1.10  1.10 1.00  1.00  1.00 1.00  1.00
FinalVolume:  245 2344   290   305 1743   499  1026 1249   167   546  747   603
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  1.00  1.00 2.00  1.00  2.00 1.76  0.24  1.00 1.00  1.00
Final Sat.:  1500 1500  1500  1500 3000  1500  3000 2646   354  1500 1500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 1.56  0.19  0.20 0.58  0.33  0.34 0.47  0.47  0.36 0.50  0.40
Crit Volume:      2344               871        513                     747
Crit Moves:       ****              ****       ****                    ****
***************************************************************************
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HCM Signalized Intersection Capacity Analysis
4: Eastbound 50 Ramps & Hazel Boulevard

5/9/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1562	457	0	3880	2016	812
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		2.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.95	0.95	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3432	1441		3539	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3432	1441		3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1698	497	0	4217	2191	883
RTOR Reduction (vph)	1	2	0	0	0	0
Lane Group Flow (vph)	1747	445	0	4217	2191	883
Turn Type		Perm				Free
Protected Phases	8!			6!	2	
Permitted Phases		8				Free
Actuated Green, G (s)	62.0	62.0		150.0	80.0	150.0
Effective Green, g (s)	62.0	62.0		150.0	80.0	150.0
Actuated g/C Ratio	0.41	0.41		1.00	0.53	1.00
Clearance Time (s)	4.0	4.0		2.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1419	596		3539	1887	1583
v/s Ratio Prot	0.51			c1.19	0.62	
v/s Ratio Perm		0.31				0.56
v/c Ratio	1.23	0.75		1.19	1.16	0.56
Uniform Delay, d1	44.0	37.3		75.0	35.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	110.3	5.1		89.3	78.8	1.4
Delay (s)	154.3	42.4		164.3	113.8	1.4
Level of Service	F	D		F	F	A
Approach Delay (s)	131.5			164.3	81.5	
Approach LOS	F			F	F	

Intersection Summary			
HCM Average Control Delay	129.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	163.3%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	974	156	222	856	424	4234	0	0	3060	101
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	
Lane Util. Factor			1.00	1.00	0.91	0.91	1.00	0.91			0.86	
Frt			0.86	1.00	0.94	0.85	1.00	1.00			1.00	
Flt Protected			1.00	0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)			1611	1770	1587	2882	1770	5085			6377	
Flt Permitted			1.00	0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)			1611	1770	1587	2882	1770	5085			6377	
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	0	1059	170	241	930	461	4602	0	0	3326	110
RTOR Reduction (vph)	0	0	179	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	880	170	418	753	461	4602	0	0	3434	0
Turn Type			custom	Prot		Perm	Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases			4			8						
Actuated Green, G (s)			16.8	21.9	42.7	42.7	16.0	124.1			104.1	
Effective Green, g (s)			16.8	21.9	42.7	42.7	16.0	124.1			104.1	
Actuated g/C Ratio			0.10	0.13	0.24	0.24	0.09	0.71			0.60	
Clearance Time (s)			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	
Lane Grp Cap (vph)			155	222	388	704	162	3610			3798	
v/s Ratio Prot				0.10	c0.26		c0.26	c0.90			0.54	
v/s Ratio Perm			c0.55			0.26						
v/c Ratio			5.68	0.77	1.08	1.07	2.85	1.27			0.90	
Uniform Delay, d1			79.0	74.0	66.1	66.1	79.4	25.4			31.0	
Progression Factor			1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2			2118.9	14.5	67.9	54.1	847.3	125.9			3.5	
Delay (s)			2197.9	88.5	134.0	120.1	926.7	151.3			34.5	
Level of Service			F	F	F	F	F	F			C	
Approach Delay (s)		2197.9			120.4			221.9			34.5	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	342.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.86		
Actuated Cycle Length (s)	174.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	125.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	16	7	5	2	46	3	382	43	309	831	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	17	8	5	2	50	3	415	47	336	903	109
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1895	2098	506	1585	2129	231	1012			462		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1895	2098	506	1585	2129	231	1012			462		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	81	51	99	84	94	94	100			69		
cM capacity (veh/h)	29	35	512	34	34	771	681			1096		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	30	8	50	211	254	788	560
Volume Left	5	5	0	3	0	336	0
Volume Right	8	0	50	0	47	0	109
cSH	44	34	771	681	1700	1096	1700
Volume to Capacity	0.69	0.22	0.06	0.00	0.15	0.31	0.33
Queue Length 95th (ft)	66	18	5	0	0	33	0
Control Delay (s)	192.7	138.0	10.0	0.2	0.0	6.5	0.0
Lane LOS	F	F	A	A		A	
Approach Delay (s)	192.7	26.9		0.1		3.8	
Approach LOS	F	D					

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			


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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                          Level Of Service Computation Report
                 Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):          155                  Critical Vol./Cap.(X):          0.981
Loss Time (sec):        0                  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                  Level Of Service:                   E
*******************************************************************************
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:           Include          Include          Include          Include
Min. Green:     8   37   37    8   37    0    8   37   37    8   37    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        1  0  1  0  1    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     51   54  300   84  175   72   69  602  308  780 1734  122
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:  51   54  300   84  175   72   69  602  308  780 1734  122
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:     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 Volume:   51   54  300   84  175   72   69  602  308  780 1734  122
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  51   54  300   84  175   72   69  602  308  780 1734  122
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:  51   54  300   84  175   72   69  602  308  780 1734  122
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
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 1.00 1.00 1.00 1.42 0.58 1.00 2.00 1.00 1.00 2.80 0.20
Final Sat.:  1500 1500 1500 1500 2126  874 1500 3000 1500 1500 4204  296
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.04 0.20 0.06 0.08 0.08 0.05 0.20 0.21 0.52 0.41 0.41
Crit Volume:            300   84                      308  780
Crit Moves:             ****  ****                    ****  ****
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          Level Of Service Computation Report
                 Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
*******************************************************************************
Cycle (sec):          145                  Critical Vol./Cap.(X):          1.550
Loss Time (sec):        0                  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                  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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   32   32    8   32   32    8   32   32    8   32   32
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        2  0  3  0  1    2  0  3  0  1    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    1108 1524  312  691  531  923  244  704  119  223  782  658
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: 1108 1524  312  691  531  923  244  704  119  223  782  658
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:     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 Volume:  1108 1524  312  691  531  923  244  704  119  223  782  658
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol: 1108 1524  312  691  531  923  244  704  119  223  782  658
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:     1.10 1.00 1.00 1.10 1.00 1.00 1.10 1.00 1.00 1.10 1.00 1.00
FinalVolume: 1219 1524  312  760  531  923  268  704  119  245  782  658
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
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:       2.00 3.00 1.00 2.00 3.00 1.00 2.00 2.00 1.00 2.00 3.00 1.00
Final Sat.:  3000 4500 1500 3000 4500 1500 3000 3000 1500 3000 4500 1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.34 0.21 0.25 0.12 0.62 0.09 0.23 0.08 0.08 0.17 0.44
Crit Volume: 609                      923  134                      658
Crit Moves:  ****                     ****  ****                    ****
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          Level Of Service Computation Report
                 Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
*******************************************************************************
Cycle (sec):          100                  Critical Vol./Cap.(X):          1.180
Loss Time (sec):        0                  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                  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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Ovl
Min. Green:    10   22    0    0   22   10   10   22    0   10   22    0
Y+R:          5.5  5.3  0.0  0.0  5.6  4.0  5.5  5.7  0.0  5.5  5.5  0.0
Lanes:        2  0  2  1  0    2  0  3  0  1    2  0  2  1  0    2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      11 1613  368  711 2130  646  580  379   22  125  586  556
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:   11 1613  368  711 2130  646  580  379   22  125  586  556
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:     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 Volume:    11 1613  368  711 2130  646  580  379   22  125  586  556
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   11 1613  368  711 2130  646  580  379   22  125  586  556
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:     1.10 1.00 1.00 1.10 1.00 1.00 1.10 1.00 1.00 1.10 1.00 1.10
FinalVolume:   12 1613  368  782 2130  646  638  379   22  138  586  612
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
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:       2.00 2.44 0.56 2.00 3.00 1.00 2.00 2.84 0.16 2.00 1.47 1.53
Final Sat.:  3000 3664  836 3000 4500 1500 3000 4253  247 3000 2202 2298
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.44 0.44 0.26 0.47 0.43 0.21 0.09 0.09 0.05 0.27 0.27
Crit Volume:            660  391             319                  399
Crit Moves:             ****  ****            ****                 ****
*******************************************************************************
```

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1171	569	0	2456	1687	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.94	0.88		0.86	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	4990	2787		6408	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	4990	2787		6408	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1273	618	0	2670	1834	0
RTOR Reduction (vph)	0	47	0	0	0	0
Lane Group Flow (vph)	1273	571	0	2670	1834	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		82.7	82.7	
Effective Green, g (s)	26.1	26.1		82.7	82.7	
Actuated g/C Ratio	0.22	0.22		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1115	623		4537	3600	
v/s Ratio Prot	c0.26			c0.42	0.36	
v/s Ratio Perm		0.20				
v/c Ratio	1.14	0.92		0.59	0.51	
Uniform Delay, d1	45.4	44.3		8.5	7.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	74.8	18.2		0.2	0.1	
Delay (s)	120.2	62.5		8.7	7.9	
Level of Service	F	E		A	A	
Approach Delay (s)	101.3			8.7	7.9	
Approach LOS	F			A	A	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	116.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	130.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	745	925	2361	0	0	2130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	5085			5085
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	5085			5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	1005	2566	0	0	2315
RTOR Reduction (vph)	0	33	0	0	0	0
Lane Group Flow (vph)	810	972	2566	0	0	2315
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	17.7	17.7	120.8			120.8
Effective Green, g (s)	17.7	17.7	120.8			120.8
Actuated g/C Ratio	0.12	0.12	0.82			0.82
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	415	337	4193			4193
v/s Ratio Prot	0.24		c0.50			0.46
v/s Ratio Perm		c0.35				
v/c Ratio	1.95	2.89	0.61			0.55
Uniform Delay, d1	64.4	64.4	4.6			4.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	437.0	856.6	0.3			0.2
Delay (s)	501.4	921.0	4.8			4.3
Level of Service	F	F	A			A
Approach Delay (s)	733.8		4.8			4.3
Approach LOS	F		A			A

Intersection Summary			
HCM Average Control Delay	202.2	HCM Level of Service	F
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	146.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	130.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	741	357	2100	0	0	982
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	805	388	2283	0	0	1067
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	805	384	2283	0	0	1067
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	30.0	30.0	63.0			63.0
Effective Green, g (s)	30.0	30.0	63.0			63.0
Actuated g/C Ratio	0.29	0.29	0.60			0.60
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	986	455	3069			2136
v/s Ratio Prot	0.23	c0.24	c0.45			0.30
v/s Ratio Perm						
v/c Ratio	0.82	0.84	0.74			0.50
Uniform Delay, d1	34.6	35.0	14.9			11.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.3	13.4	1.0			0.2
Delay (s)	39.9	48.5	15.9			11.9
Level of Service	D	D	B			B
Approach Delay (s)	42.7		15.9			11.9
Approach LOS	D		B			B

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	104.4	Sum of lost time (s)	11.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	446	767	968	0	0	747	0	3801	22	0	1524	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.95	0.85			0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3036	1441			2787		6402			3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3036	1441			2787		6402			3539	
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)	485	834	1052	0	0	812	0	4132	24	0	1657	0
RTOR Reduction (vph)	0	9	9	0	0	166	0	1	0	0	0	0
Lane Group Flow (vph)	436	1326	591	0	0	646	0	4155	0	0	1657	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	48.2	48.2	48.2			16.1		45.4			65.4	
Effective Green, g (s)	48.2	48.2	48.2			16.1		45.4			65.4	
Actuated g/C Ratio	0.39	0.39	0.39			0.13		0.36			0.52	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	621	1171	556			359		2325			1852	
v/s Ratio Prot	0.27	c0.44				c0.23		c0.65			0.47	
v/s Ratio Perm			0.41									
v/c Ratio	0.70	1.13	1.06			1.80		1.79			0.89	
Uniform Delay, d1	32.4	38.4	38.4			54.4		39.8			26.7	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.6	70.8	56.2			370.2		356.0			6.0	
Delay (s)	35.9	109.2	94.6			424.7		395.8			32.7	
Level of Service	D	F	F			F		F			C	
Approach Delay (s)		92.0			424.7			395.8			32.7	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	251.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	124.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	119	2	10	22	3	253	2	847	5	46	461	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	2	11	24	3	275	2	921	5	50	501	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1346	1535	254	1290	1536	463	509			926		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1346	1535	254	1290	1536	463	509			926		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	0	98	99	78	97	50	100			93		
cM capacity (veh/h)	50	107	745	111	107	546	1053			734		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	142	27	275	462	466	301	258
Volume Left	129	24	0	2	0	50	0
Volume Right	11	0	275	0	5	0	8
cSH	55	110	546	1053	1700	734	1700
Volume to Capacity	2.61	0.25	0.50	0.00	0.27	0.07	0.15
Queue Length 95th (ft)	366	23	70	0	0	5	0
Control Delay (s)	888.1	48.0	18.1	0.1	0.0	2.4	0.0
Lane LOS	F	E	C	A		A	
Approach Delay (s)	888.1	20.8		0.0		1.3	
Approach LOS	F	C					

Intersection Summary			
Average Delay	69.1		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		


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------------------------------------------------------------------------------
                    Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
******************************************************************************
Cycle (sec):         155                Critical Vol./Cap.(X):         1.448
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8    37    37    8    37     0    8    37    37    8    37     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  0  1  1  0   1  0  2  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     277  168   757  226  125   100  231 1681    72  349  920   139
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:  277  168   757  226  125   100  231 1681    72  349  920   139
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:     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 Volume:   277  168   757  226  125   100  231 1681    72  349  920   139
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  277  168   757  226  125   100  231 1681    72  349  920   139
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:  277  168   757  226  125   100  231 1681    72  349  920   139
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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 1.00  1.00 1.00 1.11  0.89 1.00 2.00  1.00 1.00 2.61  0.39
Final Sat.:  1500 1500  1500 1500 1667  1333 1500 3000  1500 1500 3909   591
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.11  0.50 0.15 0.07  0.08 0.15 0.56  0.05 0.23 0.24  0.24
Crit Volume:             757  226                   841         349
Crit Moves:             ****  ****                  ****        ****
******************************************************************************
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                    Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
******************************************************************************
Cycle (sec):         145                Critical Vol./Cap.(X):         1.447
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8    32    32    8    32    32    8    32    32    8    32    32
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  3  0  1   2  0  3  0  1   2  0  2  0  1   2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     647  674   100  591 1671   224  460 1398  1061  357  668   438
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:  647  674   100  591 1671   224  460 1398  1061  357  668   438
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:     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 Volume:   647  674   100  591 1671   224  460 1398  1061  357  668   438
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  647  674   100  591 1671   224  460 1398  1061  357  668   438
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:     1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00
FinalVolume:  712  674   100  650 1671   224  506 1398  1061  393  668   438
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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:       2.00 3.00  1.00 2.00 3.00  1.00 2.00 2.00  1.00 2.00 3.00  1.00
Final Sat.:  3000 4500  1500 3000 4500  1500 3000 3000  1500 3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.15  0.07 0.22 0.37  0.15 0.17 0.47  0.71 0.13 0.15  0.29
Crit Volume:  356                  557                  1061  196
Crit Moves:  ****                 ****                  ****  ****
******************************************************************************
```

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                    Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Zinfandel Dr / White Rock Rd
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         1.253
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include            Ovl
Min. Green:    10    22     0    0    22    10   10    22     0   10    22     0
Y+R:          5.5  5.3   0.0  0.0  5.6   4.0  5.5  5.7   0.0  5.5  5.5   0.0
Lanes:        2  0  2  1  0   2  0  3  0  1   2  0  2  1  0   2  0  1  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      33 1996   100  619 1483   379  736  411    22  360  435   997
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:   33 1996   100  619 1483   379  736  411    22  360  435   997
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:     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 Volume:    33 1996   100  619 1483   379  736  411    22  360  435   997
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   33 1996   100  619 1483   379  736  411    22  360  435   997
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:     1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.00 1.10 1.00  1.10
FinalVolume:   36 1996   100  681 1483   379  810  411    22  396  435  1097
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500 1500 1500  1500 1500 1500  1500 1500 1500  1500
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:       2.00 2.86  0.14 2.00 3.00  1.00 2.00 2.85  0.15 2.00 1.00  2.00
Final Sat.:  3000 4285   215 3000 4500  1500 3000 4271   229 3000 1500  3000
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.47  0.47 0.23 0.33  0.25 0.27 0.10  0.10 0.13 0.29  0.37
Crit Volume:       699         340              405                    435
Crit Moves:       ****        ****             ****                   ****
******************************************************************************
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1539	747	0	1925	1706	0
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	*0.57	0.88		*0.70	*1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3026	2787		5216	7353	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3026	2787		5216	7353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1673	812	0	2092	1854	0
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	1673	808	0	2092	1854	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	69.0	69.0		67.9	67.9	
Effective Green, g (s)	69.0	69.0		67.9	67.9	
Actuated g/C Ratio	0.48	0.48		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1441	1327		2444	3446	
v/s Ratio Prot	c0.55			c0.40	0.25	
v/s Ratio Perm		0.29				
v/c Ratio	1.16	0.61		0.86	0.54	
Uniform Delay, d1	38.0	28.0		34.2	27.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	80.6	0.8		3.2	0.2	
Delay (s)	118.5	28.8		37.3	27.5	
Level of Service	F	C		D	C	
Approach Delay (s)	89.2			37.3	27.5	
Approach LOS	F			D	C	

Intersection Summary			
HCM Average Control Delay	54.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	144.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	159.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	487	1873	2559	0	0	1934
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.88	*0.70			*0.50
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	2787	3912			2794
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	2787	3912			2794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	529	2036	2782	0	0	2102
RTOR Reduction (vph)	0	12	0	0	0	0
Lane Group Flow (vph)	529	2024	2782	0	0	2102
Turn Type		Perm				
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	21.0	21.0	101.0			101.0
Effective Green, g (s)	21.0	21.0	101.0			101.0
Actuated g/C Ratio	0.16	0.16	0.78			0.78
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	555	450	3039			2171
v/s Ratio Prot	0.15		0.71			c0.75
v/s Ratio Perm		c0.73				
v/c Ratio	0.95	4.50	0.92			0.97
Uniform Delay, d1	54.0	54.5	11.2			13.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	26.8	1579.4	4.9			12.6
Delay (s)	80.8	1633.9	16.1			25.6
Level of Service	F	F	B			C
Approach Delay (s)	1313.6		16.1			25.6
Approach LOS	F		B			C

Intersection Summary			
HCM Average Control Delay	465.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	159.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	792	524	2248	0	0	1176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.6			4.6
Lane Util. Factor	0.97	1.00	0.91			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	1583	5085			3539
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	1583	5085			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	861	570	2443	0	0	1278
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	861	567	2443	0	0	1278
Turn Type		Prot				
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	33.2	33.2	65.4			65.4
Effective Green, g (s)	33.2	33.2	65.4			65.4
Actuated g/C Ratio	0.30	0.30	0.59			0.59
Clearance Time (s)	6.8	6.8	4.6			4.6
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1036	478	3023			2104
v/s Ratio Prot	0.25	c0.36	c0.48			0.36
v/s Ratio Perm						
v/c Ratio	0.83	1.19	0.81			0.61
Uniform Delay, d1	35.8	38.4	17.4			14.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.8	103.4	1.7			0.5
Delay (s)	41.6	141.8	19.1			14.7
Level of Service	D	F	B			B
Approach Delay (s)	81.5		19.1			14.7
Approach LOS	F		B			B

Intersection Summary			
HCM Average Control Delay	35.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	585	89	514	0	0	1795	0	4285	22	0	1731	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.94	0.85			0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	2947	1441			2787		6403			3539	
Flt Permitted	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	2947	1441			2787		6403			3539	
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)	636	97	559	0	0	1951	0	4658	24	0	1882	0
RTOR Reduction (vph)	0	5	5	0	0	96	0	1	0	0	0	0
Lane Group Flow (vph)	337	648	297	0	0	1855	0	4681	0	0	1882	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	35.5	35.5	35.5			16.2		45.7			65.8	
Effective Green, g (s)	35.5	35.5	35.5			16.2		45.7			65.8	
Actuated g/C Ratio	0.31	0.31	0.31			0.14		0.41			0.58	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	507	928	454			401		2596			2066	
v/s Ratio Prot	0.21	c0.22				c0.67		c0.73			0.53	
v/s Ratio Perm			0.21									
v/c Ratio	0.66	0.70	0.65			4.63		1.80			0.91	
Uniform Delay, d1	33.4	33.9	33.3			48.2		33.5			20.8	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.3	2.3	3.4			1637.5		363.0			6.6	
Delay (s)	36.7	36.2	36.7			1685.7		396.5			27.4	
Level of Service	D	D	D			F		F			C	
Approach Delay (s)		36.4			1685.7			396.5			27.4	
Approach LOS		D			F			F			C	

Intersection Summary			
HCM Average Control Delay	534.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.87		
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	15.3
Intersection Capacity Utilization	154.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Nimbus Site

Cumulative 2035 plus Project Conditions Mitigations

Weekday AM Peak Hour

Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)

Intersection #2 Hazel Avenue / Gold Country Boulevard

Cycle (sec):	100	Critical Vol./Cap.(X):	1.352
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	F

Street Name:	Hazel Avenue						Gold Country Boulevard					
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:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	3 0	1	1 0	3 1	1	2 0	0 1	1	1 0	0 1	0
Volume Module:												
Base Vol:	505	2815	67	45	4510	1777	732	33	466	78	22	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:	505	2815	67	45	4510	1777	732	33	466	78	22	33
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:	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 Volume:	505	2815	67	45	4510	1777	732	33	466	78	22	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	505	2815	67	45	4510	1777	732	33	466	78	22	33
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:	1.10	1.00	1.00	1.00	1.00	1.10	1.10	1.00	1.10	1.00	1.00	1.00
FinalVolume:	556	2815	67	45	4510	1955	805	33	513	78	22	33
Saturation Flow Module:												
Sat/Lane:	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
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:	2.00	3.00	1.00	1.00	3.49	1.51	2.00	0.12	1.88	1.00	0.40	0.60
Final Sat.:	3000	4500	1500	1500	5232	2268	3000	181	2819	1500	600	900
Capacity Analysis Module:												
Vol/Sat:	0.19	0.63	0.04	0.03	0.86	0.86	0.27	0.18	0.18	0.05	0.04	0.04
Crit Volume:	278					1293	403				55	
Crit Moves:	****					****	****				****	

Nimbus Site

Cumulative 2035 plus Project Conditions Mitigations

Weekday PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	4	723	1579	47	206	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3538	3524		1770	1583
Flt Permitted		0.95	1.00		0.95	1.00
Satd. Flow (perm)		3351	3524		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	786	1716	51	224	49
RTOR Reduction (vph)	0	0	3	0	0	17
Lane Group Flow (vph)	0	790	1764	0	224	32
Turn Type	Perm					Perm
Protected Phases		4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)		34.0	34.0		11.8	11.8
Effective Green, g (s)		34.0	34.0		11.8	11.8
Actuated g/C Ratio		0.63	0.63		0.22	0.22
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2118	2227		388	347
v/s Ratio Prot			c0.50		c0.13	
v/s Ratio Perm		0.24				0.02
v/c Ratio		0.37	0.79		0.58	0.09
Uniform Delay, d1		4.8	7.3		18.8	16.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	2.0		2.1	0.1
Delay (s)		4.9	9.3		20.9	16.8
Level of Service		A	A		C	B
Approach Delay (s)		4.9	9.3		20.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Existing plus Project Conditions Mitigations

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	9	4	1	1	25	2	209	13	250	495	58
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	4	1	1	27	2	227	14	272	538	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1259	1359	301	1060	1383	121	601			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1259	1359	301	1060	1383	121	601			241		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	97	92	99	99	99	97	100			79		
cM capacity (veh/h)	103	117	696	140	113	908	972			1322		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	17	2	27	116	128	541	332
Volume Left	3	1	0	2	0	272	0
Volume Right	4	0	27	0	14	0	63
cSH	143	125	908	972	1700	1322	1700
Volume to Capacity	0.12	0.02	0.03	0.00	0.08	0.21	0.20
Queue Length 95th (ft)	10	1	2	0	0	19	0
Control Delay (s)	33.6	34.3	9.1	0.2	0.0	5.3	0.0
Lane LOS	D	D	A	A		A	
Approach Delay (s)	33.6	11.0		0.1		3.3	
Approach LOS	D	B					

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	20	237	10	62	890
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	22	258	11	67	967
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						302
pX, platoon unblocked						
vC, conflicting volume	882	134			268	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	882	134			268	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			95	
cM capacity (veh/h)	271	890			1292	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	23	172	97	390	645
Volume Left	1	0	0	67	0
Volume Right	22	0	11	0	0
cSH	803	1700	1700	1292	1700
Volume to Capacity	0.03	0.10	0.06	0.05	0.38
Queue Length 95th (ft)	2	0	0	4	0
Control Delay (s)	9.6	0.0	0.0	1.8	0.0
Lane LOS	A			A	
Approach Delay (s)	9.6	0.0		0.7	
Approach LOS	A				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		


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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
******************************************************************************
Cycle (sec):         155                Critical Vol./Cap.(X):         0.619
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        90                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:           Include          Include          Include          Include
Min. Green:     8   37    37     8   37     0     8   37    37     8   37     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  2    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      43   52   182    49  111    42    40  380   252   527 1151   110
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:   43   52   182    49  111    42    40  380   252   527 1151   110
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:     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 Volume:    43   52   182    49  111    42    40  380   252   527 1151   110
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   43   52   182    49  111    42    40  380   252   527 1151   110
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  1.10  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   43   52   200    49  111    42    40  380   252   527 1151   110
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  2.00  1.00 1.45  0.55  1.00 2.00  1.00  1.00 2.74  0.26
Final Sat.:  1500 1500  3000  1500 2176   824  1500 3000  1500  1500 4107   393
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.03  0.07  0.03 0.05  0.05  0.03 0.13  0.17  0.35 0.28  0.28
Crit Volume:             100    49                        252   527
Crit Moves:              ****  ****                      ****  ****
******************************************************************************
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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
******************************************************************************
Cycle (sec):         145                Critical Vol./Cap.(X):         0.779
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       103                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:           Include          Include          Include          Include
Min. Green:     8   32    32     8   32    32     8   32    32     8   32    32
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  3  0  1    2  0  3  0  2    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     900 1218    62   207  715   709   235  194    72    78  461   140
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:  900 1218    62   207  715   709   235  194    72    78  461   140
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:     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 Volume:   900 1218    62   207  715   709   235  194    72    78  461   140
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  900 1218    62   207  715   709   235  194    72    78  461   140
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:     1.10 1.00  1.00  1.10 1.00  1.10  1.10 1.00  1.00  1.10 1.00  1.00
FinalVolume:  990 1218    62   228  715   780   259  194    72    86  461   140
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  2.00 3.00  2.00  2.00 2.00  1.00  2.00 3.00  1.00
Final Sat.:  3000 4500  1500  3000 4500  3000  3000 3000  1500  3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.27  0.04  0.08 0.16  0.26  0.09 0.06  0.05  0.03 0.10  0.09
Crit Volume:  495                         390   129                    154
Crit Moves:   ****                        ****  ****                   ****
******************************************************************************
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	348	971	1413	0	0	159	0	1214	6	0	1371	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.94	0.85			0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3010	1441			2787		6403			3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3010	1441			2787		6403			3539	
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)	378	1055	1536	0	0	173	0	1320	7	0	1490	0
RTOR Reduction (vph)	0	14	14	0	0	165	0	1	0	0	0	0
Lane Group Flow (vph)	340	1801	800	0	0	8	0	1326	0	0	1490	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	48.4	48.4	48.4			5.5		49.1			58.5	
Effective Green, g (s)	48.4	48.4	48.4			5.5		49.1			58.5	
Actuated g/C Ratio	0.41	0.41	0.41			0.05		0.42			0.49	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	659	1231	590			130		2658			1750	
v/s Ratio Prot	0.21	c0.60				0.00		0.21			c0.42	
v/s Ratio Perm			0.56									
v/c Ratio	0.52	1.46	1.36			0.06		0.50			0.85	
Uniform Delay, d1	26.2	35.0	35.0			53.9		25.5			26.1	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	0.7	213.0	171.4			0.2		0.1			4.2	
Delay (s)	26.9	248.0	206.3			54.1		25.7			30.3	
Level of Service	C	F	F			D		C			C	
Approach Delay (s)		211.2			54.1			25.7			30.3	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	120.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	11.4
Intersection Capacity Utilization	105.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Existing plus Project Conditions Mitigations

Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	1	6	1	0	160	1	488	1	50	271	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	1	7	1	0	174	1	530	1	54	295	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	847	939	149	796	941	266	299			532		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	847	939	149	796	941	266	299			532		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	60	100	99	100	100	76	100			95		
cM capacity (veh/h)	187	248	870	264	248	732	1259			1032		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	83	1	174	266	266	202	152
Volume Left	75	1	0	1	0	54	0
Volume Right	7	0	174	0	1	0	4
cSH	200	264	732	1259	1700	1032	1700
Volume to Capacity	0.41	0.00	0.24	0.00	0.16	0.05	0.09
Queue Length 95th (ft)	47	0	23	0	0	4	0
Control Delay (s)	35.2	18.7	11.4	0.0	0.0	2.7	0.0
Lane LOS	E	C	B	A		A	
Approach Delay (s)	35.2	11.5		0.0		1.5	
Approach LOS	E	B					

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	100	710	0	20	350
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	109	772	0	22	380
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						308
pX, platoon unblocked						
vC, conflicting volume	1005	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1005	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	82			97	
cM capacity (veh/h)	232	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	111	514	257	149	254
Volume Left	2	0	0	22	0
Volume Right	109	0	0	0	0
cSH	593	1700	1700	839	1700
Volume to Capacity	0.19	0.30	0.15	0.03	0.15
Queue Length 95th (ft)	17	0	0	2	0
Control Delay (s)	12.5	0.0	0.0	1.6	0.0
Lane LOS	B			A	
Approach Delay (s)	12.5	0.0		0.6	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		


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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
******************************************************************************
Cycle (sec):         155                Critical Vol./Cap.(X):         0.688
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        90                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:           Include          Include          Include          Include
Min. Green:     8   37    37     8   37     0     8   37    37     8   37     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  2    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     231  160   490   131   73    58   134 1028    55   222  618   123
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:  231  160   490   131   73    58   134 1028    55   222  618   123
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:     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 Volume:   231  160   490   131   73    58   134 1028    55   222  618   123
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  231  160   490   131   73    58   134 1028    55   222  618   123
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  1.10  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  231  160   539   131   73    58   134 1028    55   222  618   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  2.00  1.00 1.11  0.89  1.00 2.00  1.00  1.00 2.50  0.50
Final Sat.:  1500 1500  3000  1500 1672  1328  1500 3000  1500  1500 3753   747
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.11  0.18  0.09 0.04  0.04  0.09 0.34  0.04  0.15 0.16  0.16
Crit Volume:  231                 65              514         222
Crit Moves:  ****                ****             ****        ****
******************************************************************************
```



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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            Circular 212 Planning Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Sunrise Blvd / White Rock Rd
******************************************************************************
Cycle (sec):         145                Critical Vol./Cap.(X):         1.037
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   32    32     8   32    32     8   32    32     8   32    32
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  3  0  1    2  0  3  0  2    2  0  2  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     508 1118    29   246 1241   121   528  665   746   211  389   229
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:  508 1118    29   246 1241   121   528  665   746   211  389   229
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:     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 Volume:   508 1118    29   246 1241   121   528  665   746   211  389   229
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  508 1118    29   246 1241   121   528  665   746   211  389   229
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:     1.10 1.00  1.00  1.10 1.00  1.10  1.10 1.00  1.00  1.10 1.00  1.00
FinalVolume:  559 1118    29   271 1241   133   581  665   746   232  389   229
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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:       2.00 3.00  1.00  2.00 3.00  2.00  2.00 2.00  1.00  2.00 3.00  1.00
Final Sat.:  3000 4500  1500  3000 4500  3000  3000 3000  1500  3000 4500  1500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.25  0.02  0.09 0.28  0.04  0.19 0.22  0.50  0.08 0.09  0.15
Crit Volume:  279                 414                     746   116
Crit Moves:  ****                ****                    ****  ****
******************************************************************************
```

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	670	201	487	0	0	957	0	2640	3	0	926	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Lane Util. Factor	0.91	0.86	0.91			0.88		0.86			0.95	
Frt	1.00	0.96	0.85			0.85		1.00			0.98	
Flt Protected	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1610	3016	1441			2787		6407			3465	
Flt Permitted	0.95	0.98	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1610	3016	1441			2787		6407			3465	
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)	728	218	529	0	0	1040	0	2870	3	0	1007	163
RTOR Reduction (vph)	0	22	55	0	0	70	0	0	0	0	10	0
Lane Group Flow (vph)	379	730	289	0	0	970	0	2873	0	0	1160	0
Turn Type	Split		Perm			custom						
Protected Phases	7	7				5		6			2	
Permitted Phases			7			5						
Actuated Green, G (s)	40.0	40.0	40.0			16.2		45.6			65.7	
Effective Green, g (s)	40.0	40.0	40.0			16.2		45.6			65.7	
Actuated g/C Ratio	0.34	0.34	0.34			0.14		0.39			0.56	
Clearance Time (s)	6.8	6.8	6.8			3.9		4.6			4.6	
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	550	1030	492			386		2495			1944	
v/s Ratio Prot	0.24	c0.24				c0.35		c0.45			0.33	
v/s Ratio Perm			0.20									
v/c Ratio	0.69	0.71	0.59			2.51		1.15			0.60	
Uniform Delay, d1	33.2	33.5	31.7			50.4		35.8			17.0	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.00	
Incremental Delay, d2	3.6	2.3	1.8			688.7		73.3			0.5	
Delay (s)	36.8	35.7	33.5			739.2		109.0			17.5	
Level of Service	D	D	C			F		F			B	
Approach Delay (s)		35.5			739.2			109.0			17.5	
Approach LOS		D			F			F			B	

Intersection Summary			
HCM Average Control Delay	176.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	117.1	Sum of lost time (s)	15.3
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Kilgore-Crawford Site

Cumulative 2035 plus Project Conditions Mitigations

Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	7	5	2	46	3	382	30	200	831	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	8	5	2	50	3	415	33	217	903	109
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											557	
pX, platoon unblocked												
vC, conflicting volume	1658	1847	506	1332	1885	224	1012			448		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1658	1847	506	1332	1885	224	1012			448		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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	99	94	96	94	100			80		
cM capacity (veh/h)	49	59	512	94	56	779	681			1109		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	8	8	50	211	240	669	560
Volume Left	0	5	0	3	0	217	0
Volume Right	8	0	50	0	33	0	109
cSH	512	79	779	681	1700	1109	1700
Volume to Capacity	0.01	0.10	0.06	0.00	0.14	0.20	0.33
Queue Length 95th (ft)	1	8	5	0	0	18	0
Control Delay (s)	12.1	55.7	9.9	0.2	0.0	4.6	0.0
Lane LOS	B	F	A	A		A	
Approach Delay (s)	12.1	16.0		0.1		2.5	
Approach LOS	B	C					

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	56.9%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	16	428	13	109	1263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	17	465	14	118	1373
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						358
pX, platoon unblocked	0.97					
vC, conflicting volume	1396	240			479	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1354	240			479	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			89	
cM capacity (veh/h)	122	761			1079	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	310	169	576	915
Volume Left	2	0	0	118	0
Volume Right	17	0	14	0	0
cSH	482	1700	1700	1079	1700
Volume to Capacity	0.04	0.18	0.10	0.11	0.54
Queue Length 95th (ft)	3	0	0	9	0
Control Delay (s)	12.8	0.0	0.0	2.8	0.0
Lane LOS	B			A	
Approach Delay (s)	12.8	0.0		1.1	
Approach LOS	B				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	63.7%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	16	7	5	2	46	3	382	43	309	831	100
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		0.96			1.00	0.85		0.98			0.99	
Flt Protected		0.99			0.97	1.00		1.00			0.99	
Satd. Flow (prot)		1781			1799	1583		3484			3453	
Flt Permitted		1.00			0.97	1.00		0.95			0.73	
Satd. Flow (perm)		1796			1799	1583		3306			2536	
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)	5	17	8	5	2	50	3	415	47	336	903	109
RTOR Reduction (vph)	0	8	0	0	0	47	0	7	0	0	6	0
Lane Group Flow (vph)	0	22	0	0	7	3	0	458	0	0	1342	0
Turn Type	Perm			Split		Perm	Perm			Perm		
Protected Phases		4		8	8			2			6	
Permitted Phases	4					8	2			6		
Actuated Green, G (s)		1.5			2.9	2.9		26.8			26.8	
Effective Green, g (s)		1.5			2.9	2.9		26.8			26.8	
Actuated g/C Ratio		0.03			0.07	0.07		0.62			0.62	
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)		62			121	106		2051			1573	
v/s Ratio Prot					c0.00							
v/s Ratio Perm		c0.01				0.00		0.14			c0.53	
v/c Ratio		0.36			0.06	0.03		0.22			0.85	
Uniform Delay, d1		20.4			18.9	18.8		3.6			6.6	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		3.5			0.2	0.1		0.1			4.7	
Delay (s)		23.9			19.1	19.0		3.7			11.3	
Level of Service		C			B	B		A			B	
Approach Delay (s)		23.9			19.0			3.7			11.3	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	9.9	HCM Level of Service		A
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	43.2	Sum of lost time (s)		12.0
Intersection Capacity Utilization	62.9%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				


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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
             Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):         155                Critical Vol./Cap.(X):         0.891
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                Level Of Service:                   D
*******************************************************************************
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:           Include          Include          Include          Include
Min. Green:     8   37   37     8   37    0     8   37   37     8   37    0
Y+R:          4.0 4.0  4.0   4.0 4.0  4.0   4.0 4.0  4.0   4.0 4.0  4.0
Lanes:        1  0  1  0  2    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      51   54   300    84  175    72    69  602   308   780 1734   122
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:   51   54   300    84  175    72    69  602   308   780 1734   122
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:     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 Volume:    51   54   300    84  175    72    69  602   308   780 1734   122
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   51   54   300    84  175    72    69  602   308   780 1734   122
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  1.10  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   51   54   330    84  175    72    69  602   308   780 1734   122
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  2.00  1.00 1.42  0.58  1.00 2.00  1.00  1.00 2.80  0.20
Final Sat.:  1500 1500  3000  1500 2126   874  1500 3000  1500  1500 4204   296
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.04  0.11  0.06 0.08  0.08  0.05 0.20  0.21  0.52 0.41  0.41
Crit Volume:             165    84                         308   780
Crit Moves:             ****  ****                       ****  ****
*******************************************************************************
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Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)

Intersection #3 Sunrise Blvd / White Rock Rd

Cycle (sec):	145	Critical Vol./Cap.(X):	1.274
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	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:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	8	32	32		8	32	32		8	32	32		8	32	32	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	2	0	3	0 1	2	0	3	0 2	2	0	2	0 1	2	0	3	0 1
Volume Module:																
Base Vol:	1108	1524	312		691	531	925		244	704	119		223	782	658	
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:	1108	1524	312		691	531	925		244	704	119		223	782	658	
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:	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 Volume:	1108	1524	312		691	531	925		244	704	119		223	782	658	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	1108	1524	312		691	531	925		244	704	119		223	782	658	
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:	1.10	1.00	1.00		1.10	1.00	1.10		1.10	1.00	1.00		1.10	1.00	1.00	
FinalVolume:	1219	1524	312		760	531	1018		268	704	119		245	782	658	
Saturation Flow Module:																
Sat/Lane:	1500	1500	1500		1500	1500	1500		1500	1500	1500		1500	1500	1500	
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:	2.00	3.00	1.00		2.00	3.00	2.00		2.00	2.00	1.00		2.00	3.00	1.00	
Final Sat.:	3000	4500	1500		3000	4500	3000		3000	3000	1500		3000	4500	1500	
Capacity Analysis Module:																
Vol/Sat:	0.41	0.34	0.21		0.25	0.12	0.34		0.09	0.23	0.08		0.08	0.17	0.44	
Crit Volume:	609						509		134						658	
Crit Moves:	****						****		****						****	

Kilgore-Crawford Site

Cumulative 2035 plus Project Conditions Mitigations

Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	10	3	200	2	847	3	30	461	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	11	3	217	2	921	3	33	501	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											556	
pX, platoon unblocked												
vC, conflicting volume	1254	1498	254	1253	1501	462	509			924		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1254	1498	254	1253	1501	462	509			924		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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	99	91	97	60	100			96		
cM capacity (veh/h)	73	116	745	122	115	547	1053			735		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	11	14	217	462	464	283	258
Volume Left	0	11	0	2	0	33	0
Volume Right	11	0	217	0	3	0	8
cSH	745	121	547	1053	1700	735	1700
Volume to Capacity	0.01	0.12	0.40	0.00	0.27	0.04	0.15
Queue Length 95th (ft)	1	10	47	0	0	3	0
Control Delay (s)	9.9	38.8	15.9	0.1	0.0	1.6	0.0
Lane LOS	A	E	C	A		A	
Approach Delay (s)	9.9	17.3		0.0		0.9	
Approach LOS	A	C					

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	52	1047	2	16	546
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	57	1138	2	17	593
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						378
pX, platoon unblocked						
vC, conflicting volume	1471	570			1140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1471	570			1140	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	88			97	
cM capacity (veh/h)	115	465			608	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	70	759	382	215	396
Volume Left	13	0	0	17	0
Volume Right	57	0	2	0	0
cSH	295	1700	1700	608	1700
Volume to Capacity	0.24	0.45	0.22	0.03	0.23
Queue Length 95th (ft)	22	0	0	2	0
Control Delay (s)	20.9	0.0	0.0	1.2	0.0
Lane LOS	C			A	
Approach Delay (s)	20.9	0.0		0.4	
Approach LOS	C				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	39.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	2	10	22	3	253	2	847	5	46	461	7
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	0.85		1.00			1.00	
Flt Protected		0.96			0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1763			1783	1583		3536			3516	
Flt Permitted		0.24			0.96	1.00		0.95			0.67	
Satd. Flow (perm)		440			1783	1583		3374			2373	
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)	129	2	11	24	3	275	2	921	5	50	501	8
RTOR Reduction (vph)	0	5	0	0	0	210	0	1	0	0	1	0
Lane Group Flow (vph)	0	137	0	0	27	65	0	927	0	0	558	0
Turn Type	Perm			Split		Perm	Perm			Perm		
Protected Phases		4		8	8			2			6	
Permitted Phases	4					8	2			6		
Actuated Green, G (s)		16.0			14.0	14.0		17.4			17.4	
Effective Green, g (s)		16.0			14.0	14.0		17.4			17.4	
Actuated g/C Ratio		0.27			0.24	0.24		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)		119			420	373		988			695	
v/s Ratio Prot					0.02							
v/s Ratio Perm		c0.31				c0.04		c0.27			0.23	
v/c Ratio		1.15			0.06	0.17		0.94			0.80	
Uniform Delay, d1		21.7			17.6	18.1		20.5			19.4	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		128.5			0.1	0.2		15.7			6.6	
Delay (s)		150.2			17.7	18.3		36.2			26.1	
Level of Service		F			B	B		D			C	
Approach Delay (s)		150.2			18.3			36.2			26.1	
Approach LOS		F			B			D			C	

Intersection Summary				
HCM Average Control Delay	38.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				


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2035+P PM                    Thu May 12, 2011 09:19:37                  Page 3-1
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-------------------------------------------------------------------------------
                        Level Of Service Computation Report
              Circular 212 Planning Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Kilgore Rd / White Rock Rd
*******************************************************************************
Cycle (sec):          155                Critical Vol./Cap.(X):          1.221
Loss Time (sec):        0                Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        180                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:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     8   37    37     8   37     0     8   37    37     8   37     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  2    1  0  1  1  0    1  0  2  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     277  168   757   226  125   100   231 1681    72   349  920   139
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:  277  168   757   226  125   100   231 1681    72   349  920   139
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:     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 Volume:   277  168   757   226  125   100   231 1681    72   349  920   139
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  277  168   757   226  125   100   231 1681    72   349  920   139
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  1.10  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  277  168   833   226  125   100   231 1681    72   349  920   139
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1500 1500  1500  1500 1500  1500  1500 1500  1500  1500 1500  1500
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 1.00  2.00  1.00 1.11  0.89  1.00 2.00  1.00  1.00 2.61  0.39
Final Sat.:  1500 1500  3000  1500 1667  1333  1500 3000  1500  1500 3909   591
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.11  0.28  0.15 0.07  0.08  0.15 0.56  0.05  0.23 0.24  0.24
Crit Volume:             416   226                   841         349
Crit Moves:             ****  ****                 ****        ****
*******************************************************************************
```

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Level Of Service Computation Report
Circular 212 Planning Method (Base Volume Alternative)

Intersection #3 Sunrise Blvd / White Rock Rd

Cycle (sec): 145 Critical Vol./Cap.(X): 1.447
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 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:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	8	32	32			8	32	32			8	32	32			8	32	32		
Y+R:	4.0	4.0	4.0			4.0	4.0	4.0			4.0	4.0	4.0			4.0	4.0	4.0		
Lanes:	2	0	3	0	1	2	0	3	0	2	2	0	2	0	1	2	0	3	0	1
Volume Module:																				
Base Vol:	647	674	100			591	1671	224			460	1398	1061			357	668	438		
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:	647	674	100			591	1671	224			460	1398	1061			357	668	438		
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:	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 Volume:	647	674	100			591	1671	224			460	1398	1061			357	668	438		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	647	674	100			591	1671	224			460	1398	1061			357	668	438		
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:	1.10	1.00	1.00			1.10	1.00	1.10			1.10	1.00	1.00			1.10	1.00	1.00		
FinalVolume:	712	674	100			650	1671	246			506	1398	1061			393	668	438		
Saturation Flow Module:																				
Sat/Lane:	1500	1500	1500			1500	1500	1500			1500	1500	1500			1500	1500	1500		
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:	2.00	3.00	1.00			2.00	3.00	2.00			2.00	2.00	1.00			2.00	3.00	1.00		
Final Sat.:	3000	4500	1500			3000	4500	3000			3000	3000	1500			3000	4500	1500		
Capacity Analysis Module:																				
Vol/Sat:	0.24	0.15	0.07			0.22	0.37	0.08			0.17	0.47	0.71			0.13	0.15	0.29		
Crit Volume:	356						557						1061			196				
Crit Moves:	****						****						****			****				

Appendix C:

Roadway Segment Analysis Worksheets

Nimbus Site

Roadway Segment Level of Service - Nimbus Site

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Existing Conditions								
					AM Peak Hour			PM Peak Hour			Daily		
					LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C
Existing	1	Hazel Avenue - South of Gold Country Drive	Arterial, high	NB / SB	-	-	-	-	-	-	E	53,200	0.89
	2	US 50 - West of Hazel Avenue Off-Ramp	Caltrans	EB	C	4,650	0.58	D	6,044	0.76	-	-	-
	3	US 50 - East of Hazel Avenue On-Ramp	Caltrans	EB	C	4,478	0.56	C	5,347	0.67	-	-	-
	4	US 50 - West of Hazel Avenue On-Ramp	Caltrans	WB	D	6364.0	0.80	D	5654.0	0.71	-	-	-
	5	US 50 - East of Hazel Avenue On-Ramp	Caltrans	WB	C	4538.0	0.57	C	4097.0	0.51	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Existing plus Project Conditions											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
Existing plus Project	1	Hazel Avenue - South of Gold Country Drive	Arterial, high	NB / SB	-	-	-	-	-	-	-	-	**E**	53,740	0.90	0.01
	2	US 50 - West of Hazel Avenue Off-Ramp	Caltrans	EB	C	4,782	0.60	0.02	D	6,067	0.76	0.00	-	-	-	-
	3	US 50 - East of Hazel Avenue On-Ramp	Caltrans	EB	C	4,485	0.56	0.00	C	5,387	0.67	0.00	-	-	-	-
	4	US 50 - West of Hazel Avenue On-Ramp	Caltrans	WB	D	6,382	0.80	0.00	D	5,759	0.72	0.01	-	-	-	-
	5	US 50 - East of Hazel Avenue On-Ramp	Caltrans	WB	C	4,586	0.57	0.01	C	4,106	0.51	0.00	-	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Cumulative 2035 Conditions								
					AM Peak Hour			PM Peak Hour			Daily		
					LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C
2035	1	Hazel Avenue - South of Gold Country Drive	Arterial, high	NB / SB	-	-	-	-	-	-	E	90,100	1.29
	2	US 50 - West of Hazel Avenue Off-Ramp	Caltrans	EB	C	5,493	0.69	D	6,630	0.83	-	-	-
	3	US 50 - East of Hazel Avenue On-Ramp	Caltrans	EB	C	4,764	0.60	D	5,689	0.71	-	-	-
	4	US 50 - West of Hazel Avenue On-Ramp	Caltrans	WB	**E**	7,564	0.95	D	6,217	0.78	-	-	-
	5	US 50 - East of Hazel Avenue On-Ramp	Caltrans	WB	C	4,828	0.60	C	4,359	0.54	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Cumulative 2035 plus Project Conditions											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
2035 plus Project	1	Hazel Avenue - South of Gold Country Drive	Arterial, high	NB / SB	-	-	-	-	-	-	-	-	**E**	90,640	1.29	0.01
	2	US 50 - West of Hazel Avenue Off-Ramp	Caltrans	EB	D	5,625	0.70	0.02	D	6,653	0.83	0.00	-	-	-	-
	3	US 50 - East of Hazel Avenue On-Ramp	Caltrans	EB	C	4,771	0.60	0.00	D	5,729	0.72	0.01	-	-	-	-
	4	US 50 - West of Hazel Avenue On-Ramp	Caltrans	WB	**E**	7,582	0.95	0.00	D	6,322	0.79	0.01	-	-	-	-
	5	US 50 - East of Hazel Avenue On-Ramp	Caltrans	WB	C	4,876	0.61	0.01	C	4,368	0.55	0.00	-	-	-	-

Notes:

Caltrans roadway segments evaluated using HCM Methodology (volume-to-capacity ratios)

Non-Caltrans roadway segments evaluated using Sacramento County Guidelines methodology for ADT

Kilgore-Crawford Site

Roadway Segment Level of Service - Kilgore Site

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Existing Conditions								
					AM Peak Hour			PM Peak Hour			Daily		
					LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C
Existing	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	-	-	-	-	-	-	D	55,739	1.03
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	**E**	7,224	0.90	**E**	6,761	0.85	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	C	4,650	0.58	D	6,044	0.76	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	D	6364.0	0.80	D	5654.0	0.71	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	**E**	7826.0	0.98	**F**	8032.0	1.00	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Existing plus Project Conditions											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
Existing plus Project	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	-	-	-	-	-	-	-	-	**E**	**55,896**	**1.04**	**0.00**
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	**E**	**7,356**	**0.92**	**0.02**	**E**	**6,784**	**0.85**	**0.00**	-	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	C	4,656	0.58	0.00	D	6,082	0.76	0.00	-	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	D	6,382	0.80	0.00	D	5,769	0.72	0.01	-	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	**E**	**7,869**	**0.98**	**0.01**	**F**	B	1.01	0.00	-	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Cumulative 2035 Conditions								
					AM Peak Hour			PM Peak Hour			Daily		
					LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C
2035	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	-	-	-	-	-	-	**E**	**98,929**	**1.83**
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	**E**	**7,325**	**0.92**	D	6,592	0.82	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	C	5,493	0.69	D	6,630	0.83	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	**E**	**7,564**	**0.95**	D	6,217	0.78	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	**F**	**10,512**	**1.31**	D	5,833	0.73	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Cumulative 2035 plus Project Conditions											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
2035 plus Project	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	E	4,622	0.86	0.01	D	4,154	0.77	0.01	**E**	**99,086**	**1.83**	**0.00**
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	**E**	**7,457**	**0.93**	**0.02**	D	6,615	0.83	0.00	-	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	C	5,499	0.69	0.00	D	6,668	0.83	0.00	-	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	**E**	**7,582**	**0.95**	**0.00**	D	6,332	0.79	0.01	-	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	**F**	**10,555**	**1.32**	**0.01**	D	5,841	0.73	0.00	-	-	-	-

Notes:

Caltrans roadway segments evaluated using HCM Methodology (volume-to-capacity ratios)

Non-Caltrans roadway segments evaluated using Sacramento County Guidelines methodology for ADT

Roadway Segment Level of Service (Mitigated) - Kilgore Site

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Existing plus Project Conditions (Mitigated)											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
Existing plus Project	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	-	-	-	-	-	-	-	-	-	**55,896**	**1.02**	**-0.01**
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	D	**7,356**	**0.74**	**-0.17**	C	**6,784**	**0.68**	**-0.17**	E	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	B	4,656	0.47	-0.12	C	6,082	0.61	-0.15	E	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	C	6,382	0.64	-0.16	C	5,769	0.58	-0.13	E	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	D	**7,869**	**0.79**	**-0.19**	D	8,040	0.80	-0.20	E	-	-	-

Scenario	#	Roadway Segment	Category/ Facility Type	Dir	Cumulative 2035 plus Project Conditions (Mitigated)											
					AM Peak Hour				PM Peak Hour				Daily			
					LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.	LOS	Volume	V/C	V/C Inc.
2035 plus Project	1	Sunrise Boulevard - North of White Rock Road	Arterial, mod	NB / SB	-	-	-	-	-	-	-	-	-	**99,086**	**1.24**	**-0.56**
	2	US 50 - West of Zinfandel Off-Ramp	Caltrans	EB	C	**7,457**	**0.53**	**-0.38**	B	6,615	0.47	-0.35	E	-	-	-
	3	US 50 - East of Sunrise Boulevard On-Ramp	Caltrans	EB	C	5,499	0.55	-0.14	B	6,668	0.48	-0.35	E	-	-	-
	4	US 50 - East of Sunrise Boulevard Off-Ramp	Caltrans	WB	C	**7,582**	**0.54**	**-0.40**	B	6,332	0.45	-0.32	E	-	-	-
	5	US 50 - West of Zinfandel Drive On-Ramp	Caltrans	WB	D	**10,555**	**0.75**	**-0.56**	B	5,841	0.42	-0.31	E	-	-	-

Notes:

Caltrans roadway segments evaluated using HCM Methodology (volume-to-capacity ratios)

Non-Caltrans roadway segments evaluated using Sacramento County Guidelines methodology for ADT

Appendix D:

Ramp Merge/Diverge Analysis Worksheets

Nimbus Site

Existing Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 7

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4650	0.90	Level	5	0	0.976	1.00	5296
Ramp	1003	0.90	Level	5	0	0.976	1.00	1142
UpStream								
DownStream	759	0.90	Level	5	0	0.976	1.00	864

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2084 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4767	9000	
V_{12}	2084	4400:All	
$V_{FO} = V_F - V_R$	3625	9000	
V_R	1142	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -15.6 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.466 (Exhibit 25-19)

S_R= 48.9 mph (Exhibit 25-19)

S_0= 59.0 mph (Exhibit 25-19)

S = 54.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 72 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3647	0.90	Level	5	0	0.976	1.00	4154
Ramp	759	0.90	Level	5	0	0.976	1.00	864
UpStream								
DownStream	72	0.90	Level	0	0	1.000	1.00	80

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.422 using Equation 4

V_{12}= 1368 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4105	See Exhibit 25-7	No
V_{R12}	2232	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.7 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.217 (Exibit 25-19)

S_R= 52.2 mph (Exhibit 25-19)

S_0= 53.4 mph (Exhibit 25-19)

S= 52.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 8

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4538	0.90	Level	5	0	0.976	1.00	5168
Ramp	764	0.90	Level	5	0	0.976	1.00	870
UpStream								
DownStream	891	0.90	Level	5	0	0.976	1.00	1015

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 1987 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	5168	9000	
V_{12}	1987	4400:All	
$V_{FO} = V_F - V_R$	4298	9000	
V_R	870	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -32.7 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.441 (Exhibit 25-19)

S_R= 49.3 mph (Exhibit 25-19)

S_0= 58.0 mph (Exhibit 25-19)

S = 54.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 891 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3774	0.90	Level	5	0	0.976	1.00	4298
Ramp	1699	0.90	Level	5	0	0.976	1.00	1935
UpStream	891	0.90	Level	0	0	1.000	1.00	990
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.188 using Equation 4

V_{12}= 630 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5288	See Exhibit 25-7	No
V_{R12}	2565	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 18.6 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.277 (Exibit 25-19)

S_R= 51.4 mph (Exhibit 25-19)

S_0= 51.9 mph (Exhibit 25-19)

S= 51.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Nimbus Site

Existing Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 7

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6044	0.90	Level	5	0	0.976	1.00	6883
Ramp	1732	0.90	Level	5	0	0.976	1.00	1973
UpStream								
DownStream	762	0.90	Level	5	0	0.976	1.00	868

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2981 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	5851	9000	
V_{12}	2981	4400:All	
$V_{FO} = V_F - V_R$	3878	9000	
V_R	1973	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -7.9 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.541 (Exhibit 25-19)

S_R= 48.0 mph (Exhibit 25-19)

S_0= 58.6 mph (Exhibit 25-19)

S = 52.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 273 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4312	0.90	Level	5	0	0.976	1.00	4911
Ramp	762	0.90	Level	5	0	0.976	1.00	868
UpStream								
DownStream	273	0.90	Level	0	0	1.000	1.00	303

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.421 using Equation 4

V_{12}= 1615 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4699	See Exhibit 25-7	No
V_{R12}	2483	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.7 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.228 (Exibit 25-19)

S_R= 52.0 mph (Exhibit 25-19)

S_0= 52.8 mph (Exhibit 25-19)

S= 52.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4097	0.90	Level	5	0	0.976	1.00	4666
Ramp	825	0.90	Level	5	0	0.976	1.00	940
UpStream								
DownStream	1615	0.90	Level	5	0	0.976	1.00	1839

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 1909 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4666	9000	
V_{12}	1909	4400:All	
$V_{FO} = V_F - V_R$	3726	9000	
V_R	940	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -33.3 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.448 (Exhibit 25-19)

S_R= 49.2 mph (Exhibit 25-19)

S_0= 58.9 mph (Exhibit 25-19)

S = 54.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1615 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3272	0.90	Level	5	0	0.976	1.00	3726
Ramp	767	0.90	Level	5	0	0.976	1.00	874
UpStream	1615	0.90	Level	0	0	1.000	1.00	1794
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.320 using Equation 4

V_{12}= 931 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3781	See Exhibit 25-7	No
V_{R12}	1805	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.2 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.250 (Exibit 25-19)

S_R= 51.8 mph (Exhibit 25-19)

S_0= 53.2 mph (Exhibit 25-19)

S= 52.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Kilgore-Crawford Site

Existing Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp
- [x] Yes [x] On
- [ ] No [ ] Off

L_{up} = 3800 ft

Vu = 409 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp
- [ ] Yes [ ]
- [x] No [ ]

L_{down} = ft

VD = ve

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6364	0.90	Level	5	0	0.976	1.00	7248
Ramp	757	0.90	Level	5	0	0.976	1.00	862
UpStream	409	0.90	Level	5	0	0.976	1.00	466
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2522 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	7248	9000	N
V_{12}	2522	4400:All	N
$V_{FO} = V_F - V_R$	6386	9000	N
V_R	862	4100	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -24.0 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.441 (Exhibit 25-19)

S_R= 49.3 mph (Exhibit 25-19)

S_0= 55.0 mph (Exhibit 25-19)

S = 52.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp
- [x] Yes [x] On
- [ ] No [ ] Off

L_{up} = 1400 ft

Vu = 717 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
- [ ] Yes [ ] On
- [x] No [ ] Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3530	0.90	Level	5	0	0.976	1.00	4020
Ramp	403	0.90	Level	5	0	0.976	1.00	459
UpStream	717	0.90	Level	0	0	1.000	1.00	797
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.562 using Equation 4

V_{12}= 1762 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3595	See Exhibit 25-7	No
V_{R12}	2221	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 11.3 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.177 (Exibit 25-19)

S_R= 52.7 mph (Exhibit 25-19)

S_0= 54.3 mph (Exhibit 25-19)

S= 53.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Ramp: ☑ Yes ☑ No

L_{down} = 11

VD = 49

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7224	0.90	Level	5	0	0.976	1.00	8227
Ramp	2600	0.90	Level	5	0	0.976	1.00	2961
UpStream								
DownStream	494	0.90	Level	5	0	0.976	1.00	563

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 4330 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	8227	9000	N
V_{12}	4330	4400:All	N
$V_{FO} = V_F - V_R$	5266	9000	N
V_R	2961	3800	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 9.1 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.694 (Exhibit 25-19)

S_R= 46.0 mph (Exhibit 25-19)

S_0= 56.6 mph (Exhibit 25-19)

S = 50.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 800 ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6897	0.90	Level	5	0	0.976	1.00	7855
Ramp	929	0.90	Level	5	0	0.976	1.00	1058
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 1174 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	6675	See Exhibit 25-7	No
V_{R12}	2232	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 9.2 (pc/ m/ln)

LOS = A (Exhibit 25-4)

Speed Estimation

M_S = 0.147 (Exibit 25-19)

S_R= 53.1 mph (Exhibit 25-19)

S_0= 48.8 mph (Exhibit 25-19)

S= 50.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Kilgore-Crawford Site

Existing Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 3800 ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp: ☐ Yes ☐ ☑ No ☐

L_{down} = ft

VD = ve

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5654	0.90	Level	5	0	0.976	1.00	6439
Ramp	842	0.90	Level	5	0	0.976	1.00	959
UpStream		0.90	Level	5	0	0.976	1.00	1169
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2384 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	6439	9000	N
V_{12}	2384	4400:All	N
$V_{FO} = V_F - V_R$	5480	9000	N
V_R	959	4100	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -25.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.449 (Exhibit 25-19)

S_R= 49.2 mph (Exhibit 25-19)

S_0= 56.3 mph (Exhibit 25-19)

S = 53.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1400 ft

Vu = 362 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5285	0.90	Level	5	0	0.976	1.00	6019
Ramp	397	0.90	Level	5	0	0.976	1.00	452
UpStream	362	0.90	Level	0	0	1.000	1.00	402
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.563 using Equation 4

V_{12}= 2574 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5027	See Exhibit 25-7	No
V_{R12}	3026	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 17.6 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.221 (Exibit 25-19)

S_R= 52.1 mph (Exhibit 25-19)

S_0= 53.2 mph (Exhibit 25-19)

S= 52.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No; L_{down} = 1; VD = 8

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7325	0.90	Level	5	0	0.976	1.00	8342
Ramp	1335	0.90	Level	5	0	0.976	1.00	1520
UpStream								
DownStream	864	0.90	Level	5	0	0.976	1.00	984

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3294 pc/h

Capacity Checks

	Actual	Maximum	L
V_{FI}=V_F	8342	9000	
V_{12}	3294	4400:All	
$V_{FO} = V_F - V_R$	6822	9000	
V_R	1520	3800	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 0.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.565 (Exhibit 25-19)

S_R= 47.7 mph (Exhibit 25-19)

S_0= 54.4 mph (Exhibit 25-19)

S = 51.5 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 800 ft; VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5779	0.90	Level	5	0	0.976	1.00	6582
Ramp	2253	0.90	Level	5	0	0.976	1.00	2566
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 1004 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	7371	See Exhibit 25-7	No
V_{R12}	3570	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 19.0 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.250 (Exibit 25-19)

S_R= 51.8 mph (Exhibit 25-19)

S_0= 50.0 mph (Exhibit 25-19)

S= 50.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Nimbus Site

Existing plus Project Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 7

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4782	0.90	Level	5	0	0.976	1.00	5446
Ramp	1135	0.90	Level	5	0	0.976	1.00	1293
UpStream								
DownStream	766	0.90	Level	5	0	0.976	1.00	872

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2231 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4902	9000	
V_{12}	2231	4400:All	
$V_{FO} = V_F - V_R$	3609	9000	
V_R	1293	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -14.4 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.479 (Exhibit 25-19)

S_R= 48.8 mph (Exhibit 25-19)

S_0= 59.0 mph (Exhibit 25-19)

S = 53.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 72 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3654	0.90	Level	5	0	0.976	1.00	4162
Ramp	766	0.90	Level	5	0	0.976	1.00	872
UpStream								
DownStream	72	0.90	Level	0	0	1.000	1.00	80

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.421 using Equation 4

V_{12}= 1367 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4119	See Exhibit 25-7	No
V_{R12}	2239	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.8 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.218 (Exibit 25-19)

S_R= 52.2 mph (Exhibit 25-19)

S_0= 53.4 mph (Exhibit 25-19)

S= 52.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 8

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4586	0.90	Level	5	0	0.976	1.00	5223
Ramp	812	0.90	Level	5	0	0.976	1.00	925
UpStream								
DownStream	891	0.90	Level	5	0	0.976	1.00	1015

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2042 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	5223	9000	
V_{12}	2042	4400:All	
$V_{FO} = V_F - V_R$	4298	9000	
V_R	925	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -32.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.446 (Exhibit 25-19)

S_R= 49.2 mph (Exhibit 25-19)

S_0= 58.0 mph (Exhibit 25-19)

S = 54.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 891 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3774	0.90	Level	5	0	0.976	1.00	4298
Ramp	1717	0.90	Level	5	0	0.976	1.00	1955
UpStream	891	0.90	Level	0	0	1.000	1.00	990
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.185 using Equation 4

V_{12}= 621 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5308	See Exhibit 25-7	No
V_{R12}	2576	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 18.7 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.277 (Exibit 25-19)

S_R= 51.4 mph (Exhibit 25-19)

S_0= 51.9 mph (Exhibit 25-19)

S= 51.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Nimbus Site

Existing plus Project Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 7

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6067	0.90	Level	5	0	0.976	1.00	6910
Ramp	1755	0.90	Level	5	0	0.976	1.00	1999
UpStream								
DownStream	797	0.90	Level	5	0	0.976	1.00	908

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3006 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	5874	9000	
V_{12}	3006	4400:All	
$V_{FO} = V_F - V_R$	3875	9000	
V_R	1999	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -7.7 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.543 (Exhibit 25-19)

S_R= 47.9 mph (Exhibit 25-19)

S_0= 58.6 mph (Exhibit 25-19)

S = 52.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 273 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4347	0.90	Level	5	0	0.976	1.00	4951
Ramp	797	0.90	Level	5	0	0.976	1.00	908
UpStream								
DownStream	273	0.90	Level	0	0	1.000	1.00	303

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.417 using Equation 4

V_{12}= 1609 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4770	See Exhibit 25-7	No
V_{R12}	2517	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 15.9 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.229 (Exibit 25-19)

S_R= 52.0 mph (Exhibit 25-19)

S_0= 52.7 mph (Exhibit 25-19)

S= 52.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4106	0.90	Level	5	0	0.976	1.00	4676
Ramp	834	0.90	Level	5	0	0.976	1.00	950
UpStream								
DownStream	1615	0.90	Level	5	0	0.976	1.00	1839

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 1919 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4676	9000	
V_{12}	1919	4400:All	
$V_{FO} = V_F - V_R$	3726	9000	
V_R	950	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -33.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.449 (Exhibit 25-19)

S_R= 49.2 mph (Exhibit 25-19)

S_0= 58.9 mph (Exhibit 25-19)

S = 54.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1615 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3272	0.90	Level	5	0	0.976	1.00	3726
Ramp	872	0.90	Level	5	0	0.976	1.00	993
UpStream	1615	0.90	Level	0	0	1.000	1.00	1794
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.306 using Equation 4

V_{12}= 888 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3900	See Exhibit 25-7	No
V_{R12}	1881	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.7 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.252 (Exibit 25-19)

S_R= 51.7 mph (Exhibit 25-19)

S_0= 53.2 mph (Exhibit 25-19)

S= 52.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Kilgore-Crawford Site

Existing plus Project Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 3800 ft

Vu = 409 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp: ☐ Yes ☐ ☑ No ☐

L_{down} = ft

VD = ve

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6406	0.90	Level	5	0	0.976	1.00	7296
Ramp	799	0.90	Level	5	0	0.976	1.00	910
UpStream	409	0.90	Level	5	0	0.976	1.00	466
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2570 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	7296	9000	N
V_{12}	2570	4400:All	N
$V_{FO} = V_F - V_R$	6386	9000	N
V_R	910	4100	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -23.6 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.445 (Exhibit 25-19)

S_R= 49.2 mph (Exhibit 25-19)

S_0= 55.0 mph (Exhibit 25-19)

S = 52.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1400 ft

Vu = 723 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3536	0.90	Level	5	0	0.976	1.00	4027
Ramp	409	0.90	Level	5	0	0.976	1.00	466
UpStream	723	0.90	Level	0	0	1.000	1.00	803
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.561 using Equation 4

V_{12}= 1763 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3608	See Exhibit 25-7	No
V_{R12}	2229	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 11.4 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.177 (Exibit 25-19)

S_R= 52.7 mph (Exhibit 25-19)

S_0= 54.3 mph (Exhibit 25-19)

S= 53.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Ramp: ☑ Yes ☑ No

L_{down} = 11

VD = 49

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7351	0.90	Level	5	0	0.976	1.00	8372
Ramp	2727	0.90	Level	5	0	0.976	1.00	3106
UpStream								
DownStream	494	0.90	Level	5	0	0.976	1.00	563

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 4475 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	8372	9000	N
V_{12}	4475	4400:All	Y
$V_{FO} = V_F - V_R$	5266	9000	N
V_R	3106	3800	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 10.3 (pc/ mi /ln)

LOS= F (Exhibit 25-4)

Speed Estimation

D_s = 0.708 (Exhibit 25-19)

S_R= 45.8 mph (Exhibit 25-19)

S_0= 56.6 mph (Exhibit 25-19)

S = 50.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 800 ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6914	0.90	Level	5	0	0.976	1.00	7874
Ramp	946	0.90	Level	5	0	0.976	1.00	1077
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 1177 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	6707	See Exhibit 25-7	No
V_{R12}	2254	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 9.4 (pc/ m/ln)

LOS = A (Exhibit 25-4)

Speed Estimation

M_S = 0.148 (Exibit 25-19)

S_R= 53.1 mph (Exhibit 25-19)

S_0= 48.8 mph (Exhibit 25-19)

S= 50.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Kilgore-Crawford Site

Existing plus Project Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On; ☐ No ☐ Off

L_{up} = 3800 ft

Vu = 324 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Ramp: ☐ Yes ☐; ☑ No ☐

L_{down} = ft

VD = ve

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5662	0.90	Level	5	0	0.976	1.00	6448
Ramp	850	0.90	Level	5	0	0.976	1.00	968
UpStream	324	0.90	Level	5	0	0.976	1.00	369
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2393 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	6448	9000	N
V_{12}	2393	4400:All	N
$V_{FO} = V_F - V_R$	5480	9000	N
V_R	968	4100	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -25.1 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.450 (Exhibit 25-19)

S_R= 49.1 mph (Exhibit 25-19)

S_0= 56.3 mph (Exhibit 25-19)

S = 53.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On; ☐ No ☐ Off

L_{up} = 1400 ft

Vu = 398 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On; ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5321	0.90	Level	5	0	0.976	1.00	6060
Ramp	433	0.90	Level	5	0	0.976	1.00	493
UpStream	398	0.90	Level	0	0	1.000	1.00	442
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.558 using Equation 4

V_{12}= 2568 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5099	See Exhibit 25-7	No
V_{R12}	3061	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 17.8 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.224 (Exibit 25-19)

S_R= 52.1 mph (Exhibit 25-19)

S_0= 53.1 mph (Exhibit 25-19)

S= 52.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Ramp: ☑ Yes ☑ No ☐

L_{down} = 11

VD = 86

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7348	0.90	Level	5	0	0.976	1.00	8369
Ramp	1358	0.90	Level	5	0	0.976	1.00	1547
UpStream								
DownStream	864	0.90	Level	5	0	0.976	1.00	984

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3321 pc/h

Capacity Checks

	Actual	Maximum	LO
$V_{FI}=V_F$	8369	9000	N
V_{12}	3321	4400:All	N
$V_{FO} = V_F - V_R$	6822	9000	N
V_R	1547	3800	N

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 0.4 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.567 (Exhibit 25-19)

S_R= 47.6 mph (Exhibit 25-19)

S_0= 54.4 mph (Exhibit 25-19)

S = 51.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Existing plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 800 ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5891	0.90	Level	5	0	0.976	1.00	6709
Ramp	2365	0.90	Level	5	0	0.976	1.00	2693
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 1024 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	7591	See Exhibit 25-7	No
V_{R12}	3717	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 20.1 (pc/ m/ln)

LOS = C (Exhibit 25-4)

Speed Estimation

M_S = 0.271 (Exibit 25-19)

S_R= 51.5 mph (Exhibit 25-19)

S_0= 49.8 mph (Exhibit 25-19)

S= 50.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Nimbus Site

2035 Cumulative Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp	Terrain Level	Downstrean Ramp
☐ Yes ☐ On		☑ Yes
☑ No ☐ Off		☐ No
L_{up} = ft		L_{down} = 2
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 40.0 mph	VD = 2
	Sketch (show lanes, L_A, L_D,V_R,V_f)	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5493	0.90	Level	5	0	0.976	1.00	6256
Ramp	2096	0.90	Level	5	0	0.976	1.00	2387
UpStream								
DownStream	279	0.90	Level	5	0	0.976	1.00	318

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3149 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Capacity Checks

	Actual	Maximum	L
V_{FI}=V_F	5318	9000	
V_{12}	3149	4400:All	
V_{FO} = V_F - V_R	2931	9000	
V_R	2387	4100	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = -6.5 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Speed Estimation

D_s = 0.578 (Exhibit 25-19)

S_R= 47.5 mph (Exhibit 25-19)

S_0= 60.0 mph (Exhibit 25-19)

S = 51.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☑ On
☑ No ☐ Off		☐ No ☐ Off
L_{up} = ft		L_{down} = 700 ft
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 50.0 mph	VD = 279 veh/h
	Sketch (show lanes, L_A, L_D,V_R,V_f)	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3397	0.90	Level	5	0	0.976	1.00	3869
Ramp	1088	0.90	Level	5	0	0.976	1.00	1239
UpStream								
DownStream	279	0.90	Level	0	0	1.000	1.00	310

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.375 using Equation 4

V_{12}= 1132 pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4257	See Exhibit 25-7	No
V_{R12}	2371	4600:All	No

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
V_{FO} = V_F - V_R		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.6 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

M_S = 0.223 (Exibit 25-19)

S_R= 52.1 mph (Exhibit 25-19)

S_0= 53.4 mph (Exhibit 25-19)

S= 52.7 mph (Exhibit 25-14)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4827	0.90	Level	5	0	0.976	1.00	5497
Ramp	1072	0.90	Level	5	0	0.976	1.00	1221
UpStream								
DownStream	1391	0.90	Level	5	0	0.976	1.00	1584

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2333 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	5497	9000	
V_{12}	2333	4400:All	
$V_{FO} = V_F - V_R$	4276	9000	
V_R	1221	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -29.7 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.473 (Exhibit 25-19)

S_R= 48.9 mph (Exhibit 25-19)

S_0= 58.1 mph (Exhibit 25-19)

S = 53.8 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1391 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3755	0.90	Level	5	0	0.976	1.00	4277
Ramp	2417	0.90	Level	5	0	0.976	1.00	2753
UpStream	1391	0.90	Level	0	0	1.000	1.00	1546
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.086 using Equation 4

V_{12}= 285 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	6090	See Exhibit 25-7	No
V_{R12}	3038	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 21.9 (pc/ m/ln)

LOS = C (Exhibit 25-4)

Speed Estimation

M_S = 0.307 (Exibit 25-19)

S_R= 51.0 mph (Exhibit 25-19)

S_0= 51.3 mph (Exhibit 25-19)

S= 51.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Nimbus Site

2035 Cumulative Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 2

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6630	0.90	Level	5	0	0.976	1.00	7551
Ramp	1996	0.90	Level	5	0	0.976	1.00	2273
UpStream								
DownStream	282	0.90	Level	5	0	0.976	1.00	321

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3253 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	6041	9000	
V_{12}	3253	4400:All	
$V_{FO} = V_F - V_R$	3768	9000	
V_R	2273	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -5.6 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.568 (Exhibit 25-19)

S_R= 47.6 mph (Exhibit 25-19)

S_0= 58.8 mph (Exhibit 25-19)

S = 52.2 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 282 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4634	0.90	Level	5	0	0.976	1.00	5278
Ramp	772	0.90	Level	5	0	0.976	1.00	879
UpStream								
DownStream	282	0.90	Level	0	0	1.000	1.00	313

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.420 using Equation 4

V_{12}= 1730 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4996	See Exhibit 25-7	No
V_{R12}	2609	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 16.6 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.234 (Exibit 25-19)

S_R= 52.0 mph (Exhibit 25-19)

S_0= 52.5 mph (Exhibit 25-19)

S= 52.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4358	0.90	Level	5	0	0.976	1.00	4963
Ramp	1225	0.90	Level	5	0	0.976	1.00	1395
UpStream								
DownStream	1721	0.90	Level	5	0	0.976	1.00	1960

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2323 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4963	9000	
V_{12}	2323	4400:All	
$V_{FO} = V_F - V_R$	3568	9000	
V_R	1395	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -29.8 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.489 (Exhibit 25-19)

S_R= 48.6 mph (Exhibit 25-19)

S_0= 59.1 mph (Exhibit 25-19)

S = 53.7 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1721 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3133	0.90	Level	5	0	0.976	1.00	3568
Ramp	1362	0.90	Level	5	0	0.976	1.00	1551
UpStream	1721	0.90	Level	0	0	1.000	1.00	1912
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.236 using Equation 4

V_{12}= 656 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4335	See Exhibit 25-7	No
V_{R12}	2207	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 16.0 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.261 (Exibit 25-19)

S_R= 51.6 mph (Exhibit 25-19)

S_0= 53.0 mph (Exhibit 25-19)

S= 52.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 3800 ft
Vu = 1026 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 40.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream A Ramp
☐ Yes ☐ (
☑ No ☐ (
L_{down} = ft
VD = veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7564	0.90	Level	5	0	0.976	1.00	8615
Ramp	1627	0.90	Level	5	0	0.976	1.00	1853
UpStream	1026	0.90	Level	5	0	0.976	1.00	1169
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =0.260 using Equation 0
V_{12} = 3611 pc/h

Capacity Checks

	Actual	Maximum	LOS
V_{FI}=V_F	8615	9000	No
V_{12}	3611	4400:All	No
$V_{FO} = V_F - V_R$	6762	9000	No
V_R	1853	4100	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -14.6 (pc/ mi /ln)
LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.530 (Exhibit 25-19)
S_R= 48.1 mph (Exhibit 25-19)
S_0= 54.5 mph (Exhibit 25-19)
S = 51.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1400 ft
V_u = 1171 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 50.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3920	0.90	Level	5	0	0.976	1.00	4464
Ramp	402	0.90	Level	5	0	0.976	1.00	458
UpStream	1171	0.90	Level	0	0	1.000	1.00	1301
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= 0.562 using Equation 4
V_{12}= 1957 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3940	See Exhibit 25-7	No
V_{R12}	2415	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 12.8 (pc/ m/ln)
LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.185 (Exibit 25-19)
S_R= 52.6 mph (Exhibit 25-19)
S_0= 54.1 mph (Exhibit 25-19)
S= 53.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation
V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)
LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ran
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp	Terrain Level	Downstream A Ramp
☐ Yes ☐ On		☑ Yes ☑ (
☑ No ☐ Off		☐ No ☐ (
L_{up} = ft		L_{down} = 110
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 35.0 mph	VD = 948
	Sketch (show lanes, L_A, L_D,V_R,V_f)	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6761	0.90	Level	5	0	0.976	1.00	7700
Ramp	2049	0.90	Level	5	0	0.976	1.00	2334
UpStream								
DownStream	948	0.90	Level	5	0	0.976	1.00	1080

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =0.260 using Equation 0
V_{12}= pc/h	V_{12} = 3729 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS
V_{FO}		See Exhibit 25-7		V_{FI}=V_F	7700	9000	No
				V_{12}	3729	4400:All	No
V_{R12}		4600:All		V_{FO} = V_F - V_R	5366	9000	No
				V_R	2334	3800	No

Level of Service Determination (if not F)

Merge Areas	Diverge Areas
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 3.9 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= A (Exhibit 25-4)

Speed Estimation

Merge Areas	Diverge Areas
M_S = (Exibit 25-19)	D_s = 0.638 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 46.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= 56.5 mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 51.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☑ On
☑ No ☐ Off		☐ No ☐ Off
L_{up} = ft		L_{down} = 800 ft
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 50.0 mph	VD = veh/h
	Sketch (show lanes, L_A, L_D,V_R,V_f)	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7681	0.90	Level	5	0	0.976	1.00	8748
Ramp	2831	0.90	Level	5	0	0.976	1.00	3224
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= 0.209 using Equation 0	P_{FD} = using Equation
V_{12}= 1306 pc/h	V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}	9472	See Exhibit 25-7	Yes	V_{FI}=V_F		See Exhibit 25-14	
				V_{12}		4400:All	
V_{R12}	4530	4600:All	No	V_{FO} = V_F - V_R		See Exhibit 25-14	
				V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

Merge Areas	Diverge Areas
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = 26.2 (pc/ m/ln)	D_R = (pc/ m/ln)
LOS = F (Exhibit 25-4)	LOS= (Exhibit 25-4)

Speed Estimation

Merge Areas	Diverge Areas
M_S = 0.473 (Exibit 25-19)	D_s = (Exhibit 25-19)
S_R= 48.9 mph (Exhibit 25-19)	S_R= mph (Exhibit 25-19)
S_0= 47.4 mph (Exhibit 25-19)	S_0= mph (Exhibit 25-19)
S= 48.1 mph (Exhibit 25-14)	S = mph (Exhibit 25-15)

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Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 3800 ft
Vu = 870 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 40.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream A Ramp
☐ Yes ☐ (
☑ No ☐ (
L_{down} = ft
VD = veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6217	0.90	Level	5	0	0.976	1.00	7080
Ramp	2352	0.90	Level	5	0	0.976	1.00	2679
UpStream	870	0.90	Level	5	0	0.976	1.00	991
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =0.260 using Equation 0
V_{12} = 3823 pc/h

Capacity Checks

	Actual	Maximum	LOS
$V_{FI}=V_F$	7080	9000	No
V_{12}	3823	4400:All	No
$V_{FO} = V_F - V_R$	4401	9000	No
V_R	2679	4100	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -12.8 (pc/ mi /ln)
LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.604 (Exhibit 25-19)
S_R= 47.1 mph (Exhibit 25-19)
S_0= 57.9 mph (Exhibit 25-19)
S = 51.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1400 ft
V_u = 758 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 50.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5192	0.90	Level	5	0	0.976	1.00	5913
Ramp	680	0.90	Level	5	0	0.976	1.00	774
UpStream	758	0.90	Level	0	0	1.000	1.00	842
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= 0.522 using Equation 4
V_{12}= 2348 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5268	See Exhibit 25-7	No
V_{R12}	3122	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 18.2 (pc/ m/ln)
LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.229 (Exibit 25-19)
S_R= 52.0 mph (Exhibit 25-19)
S_0= 52.9 mph (Exhibit 25-19)
S= 52.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation
V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)
LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ran
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level: S_{FF} = 55.0 mph; S_{FR} = 35.0 mph; Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream A Ramp: ☑ Yes ☑ (☐ No ☐ (; L_{down} = 110; VD = 205 veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6592	0.90	Level	5	0	0.976	1.00	7508
Ramp	1165	0.90	Level	5	0	0.976	1.00	1327
UpStream								
DownStream	2051	0.90	Level	5	0	0.976	1.00	2336

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2934 pc/h

Capacity Checks

	Actual	Maximum	LOS
$V_{FI}=V_F$	7508	9000	No
V_{12}	2934	4400:All	No
$V_{FO} = V_F - V_R$	6181	9000	No
V_R	1327	3800	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -2.9 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.547 (Exhibit 25-19)

S_R= 47.9 mph (Exhibit 25-19)

S_0= 55.3 mph (Exhibit 25-19)

S = 52.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level: S_{FF} = 55.0 mph; S_{FR} = 50.0 mph; Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 800 ft; VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4517	0.90	Level	5	0	0.976	1.00	5144
Ramp	2732	0.90	Level	5	0	0.976	1.00	3111
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 839 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	7124	See Exhibit 25-7	No
V_{R12}	3950	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 21.7 (pc/ m/ln)

LOS = C (Exhibit 25-4)

Speed Estimation

M_S = 0.314 (Exibit 25-19)

S_R= 50.9 mph (Exhibit 25-19)

S_0= 51.1 mph (Exhibit 25-19)

S= 51.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Nimbus Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plu Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 2

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5625	0.90	Level	5	0	0.976	1.00	6406
Ramp	2228	0.90	Level	5	0	0.976	1.00	2537
UpStream								
DownStream	286	0.90	Level	5	0	0.976	1.00	326

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3293 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Capacity Checks

	Actual	Maximum	L
V_{FI}=V_F	5446	9000	
V_{12}	3293	4400:All	
$V_{FO} = V_F - V_R$	2909	9000	
V_R	2537	4100	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -5.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Speed Estimation

D_s = 0.591 (Exhibit 25-19)

S_R= 47.3 mph (Exhibit 25-19)

S_0= 60.0 mph (Exhibit 25-19)

S = 51.6 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 279 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3404	0.90	Level	5	0	0.976	1.00	3877
Ramp	1095	0.90	Level	5	0	0.976	1.00	1247
UpStream								
DownStream	279	0.90	Level	0	0	1.000	1.00	310

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.374 using Equation 4

V_{12}= 1132 pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4272	See Exhibit 25-7	No
V_{R12}	2379	4600:All	No

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 14.7 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

M_S = 0.223 (Exibit 25-19)

S_R= 52.1 mph (Exhibit 25-19)

S_0= 53.4 mph (Exhibit 25-19)

S= 52.7 mph (Exhibit 25-14)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plu Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4875	0.90	Level	5	0	0.976	1.00	5552
Ramp	1120	0.90	Level	5	0	0.976	1.00	1276
UpStream								
DownStream	1391	0.90	Level	5	0	0.976	1.00	1584

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2388 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Capacity Checks

	Actual	Maximum	L
V_{FI}=V_F	5552	9000	
V_{12}	2388	4400:All	
V_{FO} = V_F - V_R	4276	9000	
V_R	1276	4100	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -29.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Speed Estimation

D_s = 0.478 (Exhibit 25-19)

S_R= 48.8 mph (Exhibit 25-19)

S_0= 58.1 mph (Exhibit 25-19)

S = 53.7 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1391 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3755	0.90	Level	5	0	0.976	1.00	4277
Ramp	2435	0.90	Level	5	0	0.976	1.00	2773
UpStream	1391	0.90	Level	0	0	1.000	1.00	1546
DownStream								

Merge Areas | Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.083 using Equation 4

V_{12}= 277 pc/h

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	6110	See Exhibit 25-7	No
V_{R12}	3050	4600:All	No

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
V_{FO} = V_F - V_R		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.0 (pc/ m/ln)

LOS = C (Exhibit 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

M_S = 0.308 (Exibit 25-19)

S_R= 51.0 mph (Exhibit 25-19)

S_0= 51.3 mph (Exhibit 25-19)

S= 51.1 mph (Exhibit 25-14)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Nimbus Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plu Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 2

VD = 3

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6653	0.90	Level	5	0	0.976	1.00	7577
Ramp	2019	0.90	Level	5	0	0.976	1.00	2299
UpStream								
DownStream	317	0.90	Level	5	0	0.976	1.00	361

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3277 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	6062	9000	
V_{12}	3277	4400:All	
$V_{FO} = V_F - V_R$	3763	9000	
V_R	2299	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -5.4 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.570 (Exhibit 25-19)

S_R= 47.6 mph (Exhibit 25-19)

S_0= 58.8 mph (Exhibit 25-19)

S = 52.2 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 700 ft

VD = 282 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4669	0.90	Level	5	0	0.976	1.00	5317
Ramp	807	0.90	Level	5	0	0.976	1.00	919
UpStream								
DownStream	282	0.90	Level	0	0	1.000	1.00	313

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.415 using Equation 4

V_{12}= 1722 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5067	See Exhibit 25-7	No
V_{R12}	2641	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 16.9 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.236 (Exibit 25-19)

S_R= 51.9 mph (Exhibit 25-19)

S_0= 52.4 mph (Exhibit 25-19)

S= 52.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Hazel Avenue (off-ra
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plu Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 40.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstrean Ramp: ☑ Yes ☐ No

L_{down} = 1

VD = 1

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4367	0.90	Level	5	0	0.976	1.00	4974
Ramp	1234	0.90	Level	5	0	0.976	1.00	1405
UpStream								
DownStream	1721	0.90	Level	5	0	0.976	1.00	1960

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2333 pc/h

Capacity Checks

	Actual	Maximum	L
$V_{FI}=V_F$	4974	9000	
V_{12}	2333	4400:All	
$V_{FO} = V_F - V_R$	3569	9000	
V_R	1405	4100	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -29.7 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.489 (Exhibit 25-19)

S_R= 48.6 mph (Exhibit 25-19)

S_0= 59.1 mph (Exhibit 25-19)

S = 53.7 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	SB Hazel Ave (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1550 ft

Vu = 1721 veh/h

Terrain Level

S_{FF} = 55.0 mph S_{FR} = 50.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3133	0.90	Level	5	0	0.976	1.00	3568
Ramp	1467	0.90	Level	5	0	0.976	1.00	1671
UpStream	1721	0.90	Level	0	0	1.000	1.00	1912
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.221 using Equation 4

V_{12}= 615 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	4455	See Exhibit 25-7	No
V_{R12}	2286	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 16.6 (pc/ m/ln)

LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.264 (Exibit 25-19)

S_R= 51.6 mph (Exhibit 25-19)

S_0= 52.9 mph (Exhibit 25-19)

S= 52.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 3800 ft
Vu = 1026 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 40.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream A Ramp
☐ Yes ☐ (
☑ No ☐ (
L_{down} = ft
VD = veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7606	0.90	Level	5	0	0.976	1.00	8662
Ramp	1669	0.90	Level	5	0	0.976	1.00	1901
UpStream	1026	0.90	Level	5	0	0.976	1.00	1169
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =0.260 using Equation 0
V_{12} = 3659 pc/h

Capacity Checks

	Actual	Maximum	LOS
V_{FI}=V_F	8662	9000	No
V_{12}	3659	4400:All	No
$V_{FO} = V_F - V_R$	6761	9000	No
V_R	1901	4100	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -14.2 (pc/ mi /ln)
LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.534 (Exhibit 25-19)
S_R= 48.1 mph (Exhibit 25-19)
S_0= 54.5 mph (Exhibit 25-19)
S = 51.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1400 ft
V_u = 1171 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 50.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3926	0.90	Level	5	0	0.976	1.00	4471
Ramp	408	0.90	Level	5	0	0.976	1.00	465
UpStream	1171	0.90	Level	0	0	1.000	1.00	1301
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= 0.561 using Equation 4
V_{12}= 1957 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	3953	See Exhibit 25-7	No
V_{R12}	2422	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 12.9 (pc/ m/ln)
LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.185 (Exibit 25-19)
S_R= 52.6 mph (Exhibit 25-19)
S_0= 54.0 mph (Exhibit 25-19)
S= 53.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation
V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)
LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ran
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level: S_{FF} = 55.0 mph; S_{FR} = 35.0 mph; Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream A Ramp: ☑ Yes ☑ ☐ No ☐; L_{down} = 110; VD = 948

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6888	0.90	Level	5	0	0.976	1.00	7845
Ramp	2176	0.90	Level	5	0	0.976	1.00	2478
UpStream								
DownStream	948	0.90	Level	5	0	0.976	1.00	1080

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 3873 pc/h

Capacity Checks

	Actual	Maximum	LOS
$V_{FI}=V_F$	7845	9000	No
V_{12}	3873	4400:All	No
$V_{FO} = V_F - V_R$	5367	9000	No
V_R	2478	3800	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 5.2 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.651 (Exhibit 25-19)

S_R= 46.5 mph (Exhibit 25-19)

S_0= 56.5 mph (Exhibit 25-19)

S = 51.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday AM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; Vu = veh/h

Terrain Level: S_{FF} = 55.0 mph; S_{FR} = 50.0 mph; Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 800 ft; VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	7698	0.90	Level	5	0	0.976	1.00	8767
Ramp	2848	0.90	Level	5	0	0.976	1.00	3244
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 1310 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	9511	See Exhibit 25-7	Yes
V_{R12}	4554	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 26.3 (pc/ m/ln)

LOS = F (Exhibit 25-4)

Speed Estimation

M_S = 0.482 (Exibit 25-19)

S_R= 48.7 mph (Exhibit 25-19)

S_0= 47.4 mph (Exhibit 25-19)

S= 48.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Boulevard (off-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 3800 ft
Vu = 870 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 40.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream A Ramp
☐ Yes ☐ (
☑ No ☐ (
L_{down} = ft
VD = veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6225	0.90	Level	5	0	0.976	1.00	7090
Ramp	2360	0.90	Level	5	0	0.976	1.00	2688
UpStream	870	0.90	Level	5	0	0.976	1.00	991
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =0.260 using Equation 0
V_{12} = 3833 pc/h

Capacity Checks

	Actual	Maximum	LOS
V_{FI}=V_F	7090	9000	No
V_{12}	3833	4400:All	No
$V_{FO} = V_F - V_R$	4402	9000	No
V_R	2688	4100	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = -12.7 (pc/ mi /ln)
LOS= A (Exhibit 25-4)

Speed Estimation

D_s = 0.605 (Exhibit 25-19)
S_R= 47.1 mph (Exhibit 25-19)
S_0= 57.9 mph (Exhibit 25-19)
S = 51.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst2		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	NB Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 Conditions

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1400 ft
V_u = 758 veh/h

Terrain Level
S_{FF} = 55.0 mph S_{FR} = 50.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	5228	0.90	Level	5	0	0.976	1.00	5954
Ramp	716	0.90	Level	5	0	0.976	1.00	815
UpStream	758	0.90	Level	0	0	1.000	1.00	842
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= 0.517 using Equation 4
V_{12}= 2341 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	5341	See Exhibit 25-7	No
V_{R12}	3156	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 18.4 (pc/ m/ln)
LOS = B (Exhibit 25-4)

Speed Estimation

M_S = 0.233 (Exibit 25-19)
S_R= 52.0 mph (Exhibit 25-19)
S_0= 52.9 mph (Exhibit 25-19)
S= 52.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation
V_{12} = pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
$V_{FO} = V_F - V_R$		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/ m/ln)
LOS= (Exhibit 25-4)

Speed Estimation

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	US 50 EB
Agency or Company	AECOM	Junction	Zinfandel Drive (off-ran
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description JOC DWR El Camino Relocation Project EIS/EIR

Inputs

Upstream Adj Ramp	Terrain Level	Downstream A Ramp
☐ Yes ☐ On		☑ Yes ☑ (
☑ No ☐ Off		☐ No ☐ (
L_{up} = ft		L_{down} = 110
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = 205 veh

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	6615	0.90	Level	5	0	0.976	1.00	7534
Ramp	1188	0.90	Level	5	0	0.976	1.00	1353
UpStream								
DownStream	2051	0.90	Level	5	0	0.976	1.00	2336

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= using Equation

V_{12}= pc/h

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =0.260 using Equation 0

V_{12} = 2960 pc/h

Capacity Checks (Merge Areas)

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Capacity Checks (Diverge Areas)

	Actual	Maximum	LOS
V_{FI}=V_F	7534	9000	No
V_{12}	2960	4400:All	No
V_{FO} = V_F - V_R	6181	9000	No
V_R	1353	3800	No

Level of Service Determination (if not F) (Merge Areas)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge Areas)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = -2.7 (pc/ mi /ln)

LOS= A (Exhibit 25-4)

Speed Estimation (Merge Areas)

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Speed Estimation (Diverge Areas)

D_s = 0.550 (Exhibit 25-19)

S_R= 47.9 mph (Exhibit 25-19)

S_0= 55.3 mph (Exhibit 25-19)

S = 52.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst2		Freeway/Dir of Travel	US 50 WB
Agency or Company	AECOM	Junction	Sunrise Blvd (on-ramp)
Date Performed	5/4/2011	Jurisdiction	
Analysis Time Period	Weekday PM Peak Hour	Analysis Year	Cumulative 2035 plus Project

Project Description DWR JOC Relocation Project EIR/EIS

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☑ On
☑ No ☐ Off		☐ No ☐ Off
L_{up} = ft		L_{down} = 800 ft
Vu = veh/h	S_{FF} = 55.0 mph S_{FR} = 50.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	4629	0.90	Level	5	0	0.976	1.00	5272
Ramp	2844	0.90	Level	5	0	0.976	1.00	3239
UpStream								
DownStream		0.90	Level	0	0	1.000	1.00	

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM}= 0.209 using Equation 0

V_{12}= 860 pc/h

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation

V_{12} = pc/h

Capacity Checks (Merge Areas)

	Actual	Maximum	LOS F?
V_{FO}	7352	See Exhibit 25-7	No
V_{R12}	4099	4600:All	No

Capacity Checks (Diverge Areas)

	Actual	Maximum	LOS F?
V_{FI}=V_F		See Exhibit 25-14	
V_{12}		4400:All	
V_{FO} = V_F - V_R		See Exhibit 25-14	
V_R		See Exhibit 25-3	

Level of Service Determination (if not F) (Merge Areas)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.8 (pc/ m/ln)

LOS = C (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge Areas)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/ m/ln)

LOS= (Exhibit 25-4)

Speed Estimation (Merge Areas)

M_S = 0.346 (Exibit 25-19)

S_R= 50.5 mph (Exhibit 25-19)

S_0= 50.9 mph (Exhibit 25-19)

S= 50.7 mph (Exhibit 25-14)

Speed Estimation (Diverge Areas)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Appendix E:

95th Percentile Queue Analysis Worksheets

Nimbus Site

Existing Conditions

Weekday AM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	935	155	743	1072	825
v/c Ratio	0.78	0.27	0.21	0.63	0.52
Control Delay	22.5	7.8	0.1	10.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	7.8	0.1	10.6	1.2
Queue Length 50th (ft)	109	9	0	101	0
Queue Length 95th (ft)	#273	56	0	144	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1195	567	3539	2766	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	0.27	0.21	0.39	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	339	105	380	345	433	811	3471	145
v/c Ratio	0.58	0.64	0.86	0.67	1.51	0.23	1.34	0.18
Control Delay	5.3	95.1	76.9	34.7	290.5	10.5	189.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	83.0	0.0
Total Delay	5.3	95.1	76.9	34.7	290.5	10.5	272.5	18.9
Queue Length 50th (ft)	0	116	417	193	~675	113	~1857	63
Queue Length 95th (ft)	11	197	557	315	#1010	177	#2178	128
Internal Link Dist (ft)			883			106	623	
Turn Bay Length (ft)		100			125			
Base Capacity (vph)	584	637	804	804	287	3539	2595	826
Starvation Cap Reductn	0	0	0	0	0	0	315	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.16	0.47	0.43	1.51	0.23	1.52	0.18

Intersection Summary

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

Nimbus Site

Existing Conditions

Weekday PM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1798	85	1826	949	828
v/c Ratio	0.89	0.10	0.52	0.80	0.52
Control Delay	25.1	9.0	0.5	40.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	9.0	0.5	40.5	1.2
Queue Length 50th (ft)	512	25	0	309	0
Queue Length 95th (ft)	612	47	0	#545	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	3373	1413	3539	1191	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.06	0.52	0.80	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	586	83	425	390	209	2857	2170	107
v/c Ratio	1.35	0.60	1.14	1.15	1.24	0.77	0.70	0.11
Control Delay	200.6	92.5	147.0	150.8	209.1	16.1	24.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	10.0	4.7	0.0
Total Delay	200.6	92.5	147.0	150.8	209.1	26.1	28.7	6.3
Queue Length 50th (ft)	~580	91	~582	~536	~290	663	578	19
Queue Length 95th (ft)	#863	151	#822	#769	#468	709	627	47
Internal Link Dist (ft)			883			106	623	
Turn Bay Length (ft)		100			125			
Base Capacity (vph)	433	398	567	517	168	3728	3127	997
Starvation Cap Reductn	0	0	0	0	0	885	879	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	0.21	0.75	0.75	1.24	1.00	0.97	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

Existing Conditions

Weekday AM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	487	336	1886	2755
v/c Ratio	1.42	0.89	0.44	0.64
Control Delay	254.7	76.6	3.1	4.5
Queue Delay	0.0	0.0	0.9	0.0
Total Delay	254.7	76.6	4.0	4.5
Queue Length 50th (ft)	~508	~196	137	275
Queue Length 95th (ft)	#635	#325	147	287
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	343	378	4728	4728
Starvation Cap Reductn	0	0	2399	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.42	0.89	0.81	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramp & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	340	1705	780	173	1304	1462
v/c Ratio	0.51	1.35	1.28	0.43	0.50	0.84
Control Delay	30.5	191.4	168.1	3.3	26.1	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	44.9
Total Delay	30.5	191.4	168.1	3.3	26.1	76.2
Queue Length 50th (ft)	215	~1018	~845	0	208	488
Queue Length 95th (ft)	340	#1245	#1175	0	240	585
Internal Link Dist (ft)		332			111	280
Turn Bay Length (ft)						
Base Capacity (vph)	665	1266	610	629	2767	1984
Starvation Cap Reductn	0	0	0	0	0	645
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.35	1.28	0.28	0.47	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

Existing Conditions

Weekday PM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	418	497	3220	1401
v/c Ratio	0.75	1.09	1.06	0.65
Control Delay	61.6	119.1	51.1	8.2
Queue Delay	0.0	0.0	51.8	0.0
Total Delay	61.6	119.1	102.9	8.2
Queue Length 50th (ft)	175	~265	~1417	299
Queue Length 95th (ft)	234	#391	#1517	372
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	555	455	3039	2171
Starvation Cap Reductn	0	0	306	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	1.09	1.18	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramps & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	371	741	338	1040	2727	1164
v/c Ratio	0.68	0.71	0.62	2.28	1.09	0.59
Control Delay	39.7	36.0	28.5	605.5	82.2	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	21.2
Total Delay	39.7	36.0	28.5	605.5	82.2	40.3
Queue Length 50th (ft)	260	268	172	~710	~688	292
Queue Length 95th (ft)	376	344	280	#911	#833	410
Internal Link Dist (ft)		116			798	255
Turn Bay Length (ft)						
Base Capacity (vph)	668	1270	648	456	2504	1960
Starvation Cap Reductn	0	0	0	0	0	825
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.58	0.52	2.28	1.09	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Nimbus Site

Existing plus Project Conditions

Weekday AM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1079	155	780	1077	833
v/c Ratio	0.90	0.27	0.22	0.63	0.53
Control Delay	30.9	7.9	0.1	10.6	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	7.9	0.1	10.6	1.3
Queue Length 50th (ft)	134	9	0	101	0
Queue Length 95th (ft)	#336	56	0	144	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1194	565	3539	2761	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.90	0.27	0.22	0.39	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	339	105	406	371	433	991	3471	145
v/c Ratio	0.56	0.65	0.88	0.76	1.54	0.29	1.36	0.18
Control Delay	4.9	96.8	78.0	51.1	302.1	12.0	200.5	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	84.0	0.0
Total Delay	4.9	96.8	78.0	51.1	302.1	12.0	284.6	19.8
Queue Length 50th (ft)	0	120	454	303	~702	158	~1935	67
Queue Length 95th (ft)	11	197	602	438	#1017	227	#2202	129
Internal Link Dist (ft)			883			106	623	
Turn Bay Length (ft)		100			125			
Base Capacity (vph)	601	625	786	761	282	3477	2550	812
Starvation Cap Reductn	0	0	0	0	0	0	308	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.17	0.52	0.49	1.54	0.29	1.55	0.18

Intersection Summary

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

Nimbus Site

Existing plus Project Conditions

Weekday PM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/9/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1823	85	1833	974	872
v/c Ratio	0.89	0.10	0.52	0.83	0.55
Control Delay	25.1	8.8	0.5	43.2	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	8.8	0.5	43.2	1.4
Queue Length 50th (ft)	527	25	0	327	0
Queue Length 95th (ft)	628	47	0	#585	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	3357	1406	3539	1171	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.06	0.52	0.83	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	586	83	428	396	209	3140	2238	107
v/c Ratio	1.36	0.60	1.16	1.17	1.25	0.86	0.72	0.11
Control Delay	203.4	92.8	152.0	158.9	211.5	19.7	24.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	33.2	8.5	0.0
Total Delay	203.4	92.8	152.0	158.9	211.5	52.8	33.1	6.5
Queue Length 50th (ft)	~582	91	~589	~551	~290	848	609	20
Queue Length 95th (ft)	#865	151	#832	#786	#468	901	661	48
Internal Link Dist (ft)			883			106	623	
Turn Bay Length (ft)		100			125			
Base Capacity (vph)	431	396	564	514	167	3668	3111	992
Starvation Cap Reductn	0	0	0	0	0	733	858	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.36	0.21	0.76	0.77	1.25	1.07	0.99	0.11

Intersection Summary

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

Kilgore-Crawford Site

Existing plus Project Conditions

Weekday AM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	534	336	1889	2780
v/c Ratio	1.58	0.90	0.44	0.64
Control Delay	319.5	79.0	3.0	4.5
Queue Delay	0.0	0.0	0.9	0.0
Total Delay	319.5	79.0	3.9	4.5
Queue Length 50th (ft)	~575	~198	137	280
Queue Length 95th (ft)	#705	#326	147	292
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	337	373	4728	4728
Starvation Cap Reductn	0	0	2397	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.58	0.90	0.81	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramp & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	340	1815	814	173	1327	1489
v/c Ratio	0.52	1.46	1.35	0.43	0.50	0.85
Control Delay	31.1	239.8	198.0	3.4	26.0	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	63.9
Total Delay	31.1	239.8	198.0	3.4	26.0	95.4
Queue Length 50th (ft)	224	~1162	~937	0	212	503
Queue Length 95th (ft)	340	#1359	#1243	0	245	604
Internal Link Dist (ft)		332			111	280
Turn Bay Length (ft)						
Base Capacity (vph)	659	1244	603	625	2769	1964
Starvation Cap Reductn	0	0	0	0	0	654
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.46	1.35	0.28	0.48	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

Existing plus Project Conditions

Weekday PM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	427	497	3241	1405
v/c Ratio	0.77	1.09	1.07	0.65
Control Delay	62.4	119.1	53.8	8.2
Queue Delay	0.0	0.0	50.2	0.0
Total Delay	62.4	119.1	104.0	8.2
Queue Length 50th (ft)	179	~265	~1435	301
Queue Length 95th (ft)	238	#391	#1535	374
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	555	455	3039	2171
Starvation Cap Reductn	0	0	295	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	1.09	1.18	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramp & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	379	752	344	1040	2877	1170
v/c Ratio	0.69	0.72	0.63	2.29	1.15	0.60
Control Delay	40.0	35.8	29.1	608.6	107.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	22.3
Total Delay	40.0	35.8	29.1	608.6	107.8	41.7
Queue Length 50th (ft)	268	272	179	~720	~773	303
Queue Length 95th (ft)	387	349	290	#911	#905	412
Internal Link Dist (ft)		116			798	255
Turn Bay Length (ft)						
Base Capacity (vph)	666	1266	645	455	2495	1953
Starvation Cap Reductn	0	0	0	0	0	816
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.59	0.53	2.29	1.15	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Nimbus Site

2035 Cumulative Conditions

Weekday AM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1711	567	2874	2418	1183
v/c Ratio	1.36	1.07	0.81	1.37	0.75
Control Delay	189.7	83.0	2.1	188.3	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	189.7	83.0	2.1	188.3	3.3
Queue Length 50th (ft)	~440	~259	0	~628	0
Queue Length 95th (ft)	#566	#450	0	#760	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1257	529	3539	1770	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.36	1.07	0.81	1.37	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	605	315	409	441	946	2958	5462
v/c Ratio	1.58	0.87	0.79	0.49	3.56	0.90	1.81
Control Delay	297.6	95.3	69.8	53.6	1178.1	33.8	394.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	69.0	39.6
Total Delay	297.6	95.3	69.8	53.6	1178.1	102.8	434.5
Queue Length 50th (ft)	~737	378	503	241	~2055	1079	~2923
Queue Length 95th (ft)	#1053	502	657	301	#2489	1358	#3138
Internal Link Dist (ft)			883			106	623
Turn Bay Length (ft)		100			125		
Base Capacity (vph)	383	590	735	1271	266	3280	3020
Starvation Cap Reductn	0	0	0	0	0	715	140
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.58	0.53	0.56	0.35	3.56	1.15	1.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Nimbus Site

2035 Cumulative Conditions

Weekday PM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1723	447	4211	2166	839
v/c Ratio	1.21	0.75	1.19	1.15	0.53
Control Delay	141.0	46.3	96.6	106.5	1.3
Queue Delay	0.0	0.0	0.0	77.3	0.0
Total Delay	141.0	46.3	96.6	183.9	1.3
Queue Length 50th (ft)	~1062	402	~717	~1304	0
Queue Length 95th (ft)	#1199	560	#771	#1434	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1421	598	3539	1887	1583
Starvation Cap Reductn	0	0	0	248	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.21	0.75	1.19	1.32	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	1059	170	416	746	461	4571	3368
v/c Ratio	3.18	0.77	1.07	1.06	2.85	1.27	0.89
Control Delay	1005.0	95.5	127.2	112.7	867.7	147.7	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	25.6	58.9
Total Delay	1005.0	95.5	127.2	112.7	867.7	173.4	93.3
Queue Length 50th (ft)	~1916	191	~582	~517	~896	~2384	920
Queue Length 95th (ft)	#2282	280	#790	#618	#1183	#2560	1067
Internal Link Dist (ft)			883			106	623
Turn Bay Length (ft)		100			125		
Base Capacity (vph)	333	385	528	957	162	3611	3799
Starvation Cap Reductn	0	0	0	0	0	156	818
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	3.18	0.44	0.79	0.78	2.85	1.32	1.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday AM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	763	1005	2563	2290
v/c Ratio	1.85	2.73	0.62	0.55
Control Delay	421.9	806.9	4.8	4.3
Queue Delay	0.0	0.0	0.5	0.0
Total Delay	421.9	806.9	5.3	4.3
Queue Length 50th (ft)	~456	~748	236	190
Queue Length 95th (ft)	#1042	#1534	248	201
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	413	368	4847	4847
Starvation Cap Reductn	0	0	1607	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.85	2.73	0.79	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramp & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	436	1238	554	812	4133	1628
v/c Ratio	0.70	1.04	0.98	1.55	1.78	0.88
Control Delay	39.7	74.5	70.8	283.5	379.0	33.2
Queue Delay	0.0	0.0	0.0	0.0	2.1	146.8
Total Delay	39.7	74.5	70.8	283.5	381.1	180.0
Queue Length 50th (ft)	323	~624	471	~447	~1465	591
Queue Length 95th (ft)	461	#779	#739	#588	#1514	707
Internal Link Dist (ft)		332			111	280
Turn Bay Length (ft)						
Base Capacity (vph)	621	1190	565	525	2325	1852
Starvation Cap Reductn	0	0	0	0	6	625
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.04	0.98	1.55	1.78	1.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

2035 Cumulative Conditions

Weekday PM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	521	2036	2760	2098
v/c Ratio	0.94	4.41	0.91	0.97
Control Delay	79.6	1551.4	16.9	26.7
Queue Delay	0.0	0.0	51.8	0.0
Total Delay	79.6	1551.4	68.6	26.7
Queue Length 50th (ft)	226	~1814	713	898
Queue Length 95th (ft)	#333	#1963	847	#1354
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	555	462	3039	2171
Starvation Cap Reductn	0	0	562	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	4.41	1.11	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramps & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	331	642	294	1951	4532	1876
v/c Ratio	0.66	0.69	0.64	3.92	1.74	0.91
Control Delay	39.6	37.1	38.8	1333.0	361.2	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	127.5
Total Delay	39.6	37.1	38.8	1333.0	361.2	157.3
Queue Length 50th (ft)	225	231	193	~1432	~1426	592
Queue Length 95th (ft)	329	299	293	#1772	#1704	#978
Internal Link Dist (ft)		116			798	255
Turn Bay Length (ft)						
Base Capacity (vph)	695	1279	626	498	2601	2071
Starvation Cap Reductn	0	0	0	0	0	611
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.47	3.92	1.74	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Nimbus Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/6/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1854	567	2911	2424	1190
v/c Ratio	1.40	1.02	0.82	1.37	0.75
Control Delay	208.0	68.0	2.3	191.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	208.0	68.0	2.3	191.1	3.3
Queue Length 50th (ft)	~571	~272	0	~743	0
Queue Length 95th (ft)	#703	#494	0	#878	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1324	556	3539	1770	1583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.40	1.02	0.82	1.37	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	605	315	414	488	946	3138	5474
v/c Ratio	1.58	0.87	0.80	0.54	3.56	0.96	1.81
Control Delay	298.0	95.1	71.0	55.1	1178.1	39.7	396.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	85.2	38.8
Total Delay	298.0	95.1	71.0	55.1	1178.1	124.9	435.7
Queue Length 50th (ft)	~738	378	513	273	~2059	1257	~2938
Queue Length 95th (ft)	#1053	502	665	336	#2489	#1626	#3148
Internal Link Dist (ft)			883			106	623
Turn Bay Length (ft)		100			125		
Base Capacity (vph)	383	589	732	1270	266	3279	3019
Starvation Cap Reductn	0	0	0	0	0	650	137
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.58	0.53	0.57	0.38	3.56	1.19	1.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Nimbus Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

Queues
4: Eastbound 50 Ramps & Hazel Boulevard

5/9/2011

Lane Group	EBL	EBR	NBT	SBT	SBR
Lane Group Flow (vph)	1748	447	4217	2191	883
v/c Ratio	1.23	0.75	1.19	1.16	0.56
Control Delay	148.1	46.3	97.4	111.9	1.4
Queue Delay	0.0	0.0	0.0	76.5	0.0
Total Delay	148.1	46.3	97.4	188.5	1.4
Queue Length 50th (ft)	~1089	402	~723	~1331	0
Queue Length 95th (ft)	#1225	560	#776	#1459	0
Internal Link Dist (ft)	492		121	90	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1421	598	3539	1887	1583
Starvation Cap Reductn	0	0	0	243	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.23	0.75	1.19	1.33	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: Tributary Point Drive & Hazel Boulevard

5/6/2011

Lane Group	EBR	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	1059	170	418	753	461	4602	3436
v/c Ratio	3.18	0.77	1.08	1.07	2.85	1.27	0.90
Control Delay	1005.0	95.5	128.7	115.4	867.7	151.5	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	23.6	65.5
Total Delay	1005.0	95.5	128.7	115.4	867.7	175.1	101.1
Queue Length 50th (ft)	~1916	191	~587	~526	~896	~2411	960
Queue Length 95th (ft)	#2282	280	#796	#629	#1183	#2586	1111
Internal Link Dist (ft)			883			106	623
Turn Bay Length (ft)		100			125		
Base Capacity (vph)	333	385	527	957	162	3611	3799
Starvation Cap Reductn	0	0	0	0	0	143	799
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	3.18	0.44	0.79	0.79	2.85	1.33	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday AM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	810	1005	2566	2315
v/c Ratio	1.96	2.73	0.62	0.56
Control Delay	471.0	807.5	4.8	4.3
Queue Delay	0.0	0.0	0.5	0.0
Total Delay	471.0	807.5	5.3	4.3
Queue Length 50th (ft)	~496	~748	237	195
Queue Length 95th (ft)	#1109	#1534	248	205
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	413	368	4847	4847
Starvation Cap Reductn	0	0	1605	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.96	2.73	0.79	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramp & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	436	1335	600	812	4156	1657
v/c Ratio	0.70	1.13	1.06	1.55	1.79	0.89
Control Delay	39.7	106.4	92.7	283.5	383.4	34.4
Queue Delay	0.0	0.0	0.0	0.0	2.1	152.1
Total Delay	39.7	106.4	92.7	283.5	385.4	186.6
Queue Length 50th (ft)	323	~727	~580	~447	~1477	610
Queue Length 95th (ft)	461	#883	#831	#588	#1525	728
Internal Link Dist (ft)		332			111	280
Turn Bay Length (ft)						
Base Capacity (vph)	621	1179	564	525	2325	1852
Starvation Cap Reductn	0	0	0	0	6	615
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.13	1.06	1.55	1.79	1.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Kilgore-Crawford Site

2035 Cumulative plus Project Conditions

Weekday PM Peak Hour

6: US 50 Westbound Ramps & Sunrise Boulevard

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	529	2036	2782	2102
v/c Ratio	0.95	4.41	0.92	0.97
Control Delay	82.2	1551.4	17.5	27.1
Queue Delay	0.0	0.0	52.9	0.0
Total Delay	82.2	1551.4	70.4	27.1
Queue Length 50th (ft)	230	~1814	733	905
Queue Length 95th (ft)	#340	#1963	871	#1358
Internal Link Dist (ft)	597		290	90
Turn Bay Length (ft)	150	150		
Base Capacity (vph)	555	462	3039	2171
Starvation Cap Reductn	0	0	549	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.95	4.41	1.12	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: US 50 EB Off-Ramps & Zinfandel Drive

Lane Group	EBL	EBT	EBR	WBR	NBT	SBT
Lane Group Flow (vph)	337	653	302	1951	4682	1882
v/c Ratio	0.66	0.70	0.66	3.93	1.81	0.91
Control Delay	39.8	37.3	39.3	1338.0	389.4	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	129.9
Total Delay	39.8	37.3	39.3	1338.0	389.4	160.5
Queue Length 50th (ft)	230	236	201	~1439	~1502	604
Queue Length 95th (ft)	336	305	303	#1772	#1775	#985
Internal Link Dist (ft)		116			798	255
Turn Bay Length (ft)						
Base Capacity (vph)	692	1272	624	496	2592	2064
Starvation Cap Reductn	0	0	0	0	0	606
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.51	0.48	3.93	1.81	1.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Appendix F:

Signal Warrant Worksheets

Nimbus Site

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Cumulative 2035 plus Project Conditions – weekday AM peak hour
Intersection: 1. Project Access / Gold Country Boulevard

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied)

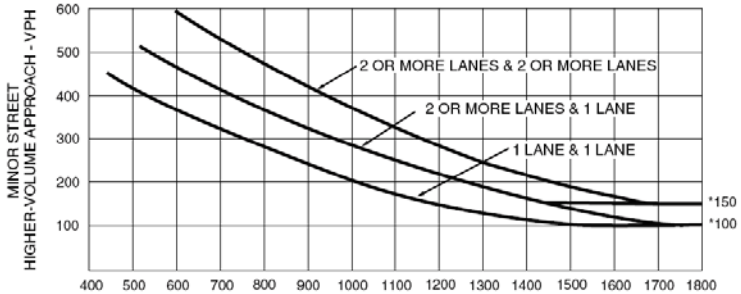
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☐ No ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☒ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		3,235				
Highest Approaches – Minor Street		39				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Cumulative 2035 plus Project Conditions – weekday PM peak hour
Intersection: 1. Project Access / Gold Country Boulevard

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☒ NO ☐
(All parts 1, 2, and 3 below must be satisfied)

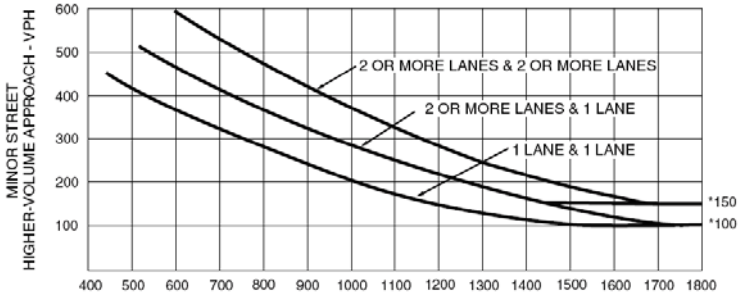
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☒ No ☐
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☒ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		2,302				
Highest Approaches – Minor Street		251				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Kilgore-Crawford Site

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Existing plus Project Conditions – weekday AM peak hour
Intersection: 1. Kilgore Road / Crawford Drive

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied)

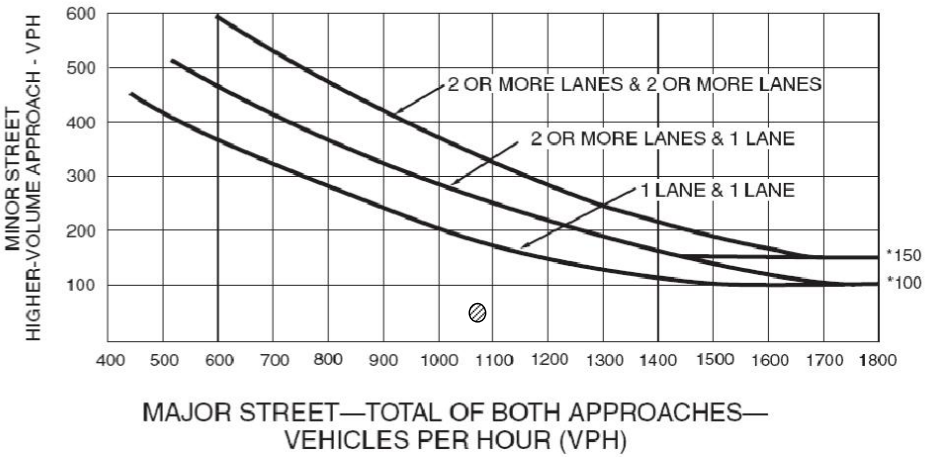
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☐ No ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		1,079				
Highest Approaches – Minor Street		46				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Existing plus Project Conditions – weekday PM peak hour
Intersection: 1. Kilgore Road / Crawford Drive

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied)

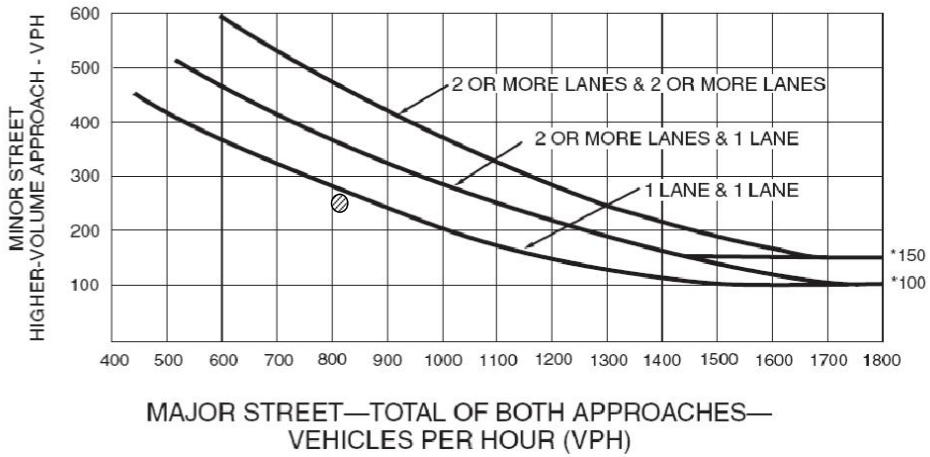
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☐ No ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		815				
Highest Approaches – Minor Street		256				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Cumulative 2035 plus Project Conditions – weekday AM peak hour
Intersection: 1. Kilgore Road / Crawford Drive

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied)

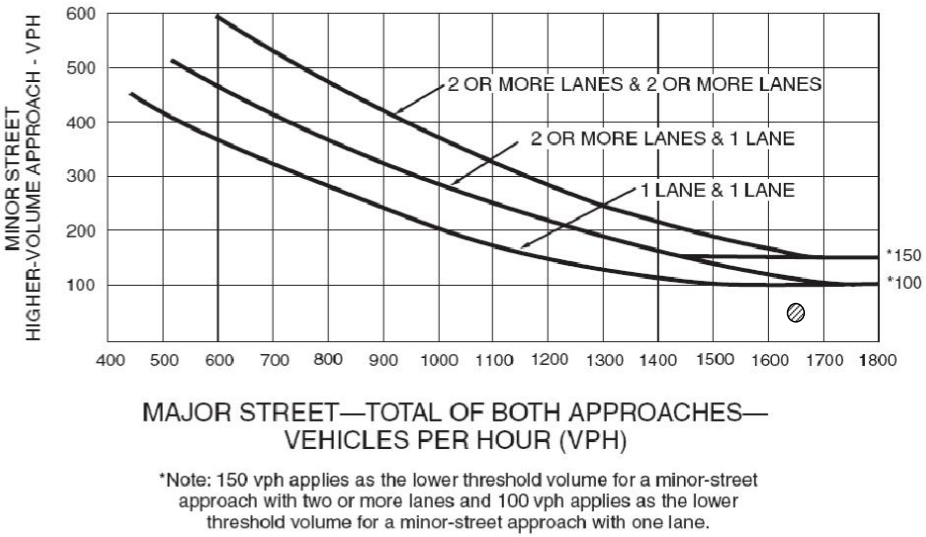
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☐ No ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		1668				
Highest Approaches – Minor Street		53				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet
Warrant 3: Peak Hour
(*from the MUTCD 2003 California Supplement*)

Scenario: Cumulative 2035 plus Project Conditions – weekday PM peak hour
Intersection: 1. Kilgore Road / Crawford Drive

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☒ NO ☐
(All parts 1, 2, and 3 below must be satisfied)

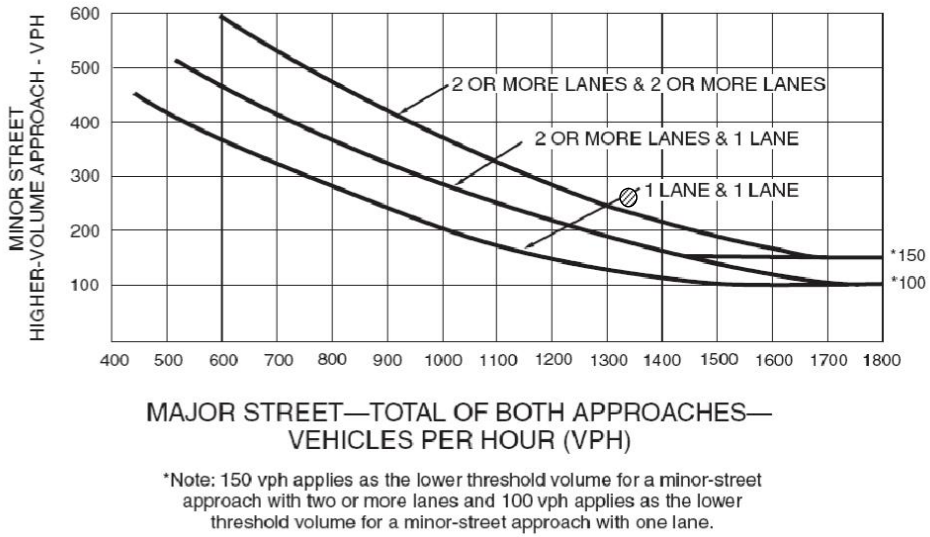
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — Yes ☒ No ☐
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — Yes ☒ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — Yes ☒ No ☐

PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More				
Both Approaches – Major Street		1368				
Highest Approaches – Minor Street		278				

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Appendix C5

Noise Monitoring and Modeling Results

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

AECOM

Project: JOC

Date: **12/13/10 - 12/14/10**

Site: Nimbus Site A

Hour	Leq	Lmax	L50	L90
13:00	43.7	60.6	40.4	37.3
14:00	47.6	75.3	41.7	38.9
15:00	43.5	59.4	41.7	38.8
16:00	45.9	65.2	42.9	40.3
17:00	43.0	55.6	42.2	40.1
18:00	43.1	53.0	42.2	39.6
19:00	44.7	60.2	43.8	41.1
20:00	43.8	62.8	41.9	39.7
21:00	41.4	57.8	40.0	38.4
22:00	40.0	54.2	39.5	37.5
23:00	39.7	53.0	39.3	37.3
0:00	38.1	47.4	37.6	35.5
1:00	37.8	54.9	35.7	33.5
2:00	36.5	49.4	35.2	33.3
3:00	37.7	50.0	36.3	34.2
4:00	36.9	47.4	36.5	34.0
5:00	41.9	53.3	40.4	38.1
6:00	44.2	50.9	44.2	41.5
7:00	49.9	57.1	49.7	45.0
8:00	50.0	60.4	49.3	47.5
9:00	51.2	63.0	50.3	47.9
10:00	49.6	55.9	49.5	48.1
11:00	71.1	100.1	53.8	48.0
12:00	57.4	88.4	55.2	53.9

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	59.7	65.0	45.6	43.0
Nighttime (10 p.m. - 7 a.m.)	40.0	51.2	38.3	36.1

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	71.1	100.1	55.2	53.9
Nighttime (10 p.m. - 7 a.m.)	44.2	54.9	44.2	41.5

Percentage of Energy

Daytime	99%
Nighttime	1%

Calculated L_{dn}, dBA

58.0

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

Project: JOC

Date: **12/14/10 - 12/15/10**

Site: Nimbus Site A

Hour	Leq	Lmax	L50	L90
13:00	55.9	80.6	55.1	53.9
14:00	58.4	89.6	55.6	53.7
15:00	53.9	67.9	53.7	52.2
16:00	55.4	67.5	54.5	52.9
17:00	56.8	68.4	56.6	55.4
18:00	58.2	68.1	58.2	56.8
19:00	53.0	64.3	52.7	50.4
20:00	52.0	63.2	51.7	49.7
21:00	50.8	65.4	49.5	46.9
22:00	47.4	55.0	47.1	45.4
23:00	46.9	54.2	46.7	45.0
0:00	44.1	57.1	43.6	42.0
1:00	43.5	52.8	43.1	41.7
2:00	42.0	52.1	41.5	39.0
3:00	42.8	55.8	41.5	38.4
4:00	45.1	55.3	44.7	41.0
5:00	45.9	58.0	45.8	44.4
6:00	49.0	55.4	48.6	46.0
7:00	51.5	62.1	50.9	49.4
8:00	53.7	64.2	52.9	51.1
9:00	58.0	85.2	55.7	51.1
10:00	49.7	76.5	46.9	44.5
11:00	46.0	63.0	44.9	43.3
12:00	45.0	61.5	44.1	41.2

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	54.7	69.8	52.2	50.2
Nighttime (10 p.m. - 7 a.m.)	45.7	55.1	44.7	42.6

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	58.4	89.6	58.2	56.8
Nighttime (10 p.m. - 7 a.m.)	49.0	58.0	48.6	46.0

Percentage of Energy

Daytime	93%
Nighttime	7%

Calculated L_{dn}, dBA

55.1

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

Project: JOC

Date: **12/15/10 - 12/16/10**

Site: Nimbus Site A

Hour	Leq	Lmax	L50	L90
13:00	51.1	74.4	45.1	42.6
14:00	48.1	62.5	46.5	44.0
15:00	45.5	65.7	44.7	42.4
16:00	45.4	65.2	43.8	41.3
17:00	46.0	61.7	44.8	42.3
18:00	47.4	55.3	46.8	45.1
19:00	48.4	57.9	48.3	47.0
20:00	50.9	58.6	50.8	48.7
21:00	51.6	61.2	51.4	49.0
22:00	47.1	55.6	46.9	46.0
23:00	47.3	54.9	46.9	45.7
0:00	46.7	56.4	45.9	44.7
1:00	44.8	55.3	44.3	42.2
2:00	44.4	50.9	44.0	42.4
3:00	46.0	53.8	45.5	43.6
4:00	46.5	53.4	46.0	43.8
5:00	47.8	53.8	47.6	46.0
6:00	50.5	55.2	50.3	49.2
7:00	51.4	59.2	51.0	49.9
8:00	51.7	57.5	51.6	50.0
9:00	48.4	57.8	48.1	44.5
10:00	42.8	56.2	41.8	39.3
11:00	43.3	61.5	40.3	38.0
12:00	45.5	61.8	43.2	39.4

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	48.7	61.1	46.5	44.2
Nighttime (10 p.m. - 7 a.m.)	47.1	54.4	46.4	44.8

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	51.7	74.4	51.6	50.0
Nighttime (10 p.m. - 7 a.m.)	50.5	56.4	50.3	49.2

Percentage of Energy

Daytime	71%
Nighttime	29%

Calculated L_{dn}, dBA

53.8

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

Project: JOC

Date: **12/13/10 - 12/14/10**

Site: Nimbus Site B

Hour	Leq	Lmax	L50	L90
13:00	51.4	65.1	50.5	48.0
14:00	53.4	71.9	52.4	50.1
15:00	53.2	67.0	52.2	49.1
16:00	53.8	70.7	52.4	49.4
17:00	49.3	59.0	48.6	45.8
18:00	52.3	59.6	52.0	49.7
19:00	54.0	60.2	53.8	51.7
20:00	51.6	63.0	51.0	48.4
21:00	47.3	60.3	46.5	44.4
22:00	46.4	56.8	45.7	43.8
23:00	44.6	54.2	43.7	41.6
0:00	42.3	53.5	41.6	40.2
1:00	42.7	55.4	41.3	39.6
2:00	43.1	54.6	42.2	40.4
3:00	43.2	58.9	42.3	40.4
4:00	43.1	57.7	42.4	40.3
5:00	46.7	57.0	44.9	42.8
6:00	48.7	55.9	48.4	45.7
7:00	53.3	60.7	52.9	49.3
8:00	53.6	63.2	53.1	51.1
9:00	55.4	67.1	55.2	52.2
10:00	54.5	66.7	54.2	52.6
11:00	53.4	66.8	52.6	51.0
12:00	54.3	76.3	53.6	52.3

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	53.1	65.2	52.1	49.7
Nighttime (10 p.m. - 7 a.m.)	45.1	56.0	43.6	41.6

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	55.4	76.3	55.2	52.6
Nighttime (10 p.m. - 7 a.m.)	48.7	58.9	48.4	45.7

Percentage of Energy

Daytime	91%
Nighttime	9%

Calculated L_{dn}, dBA

54.0

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

Project: JOC

Date: **12/14/10 - 12/15/10**

Site: Nimbus Site B

Hour	Leq	Lmax	L50	L90
13:00	54.9	69.7	54.2	52.9
14:00	54.2	61.4	53.7	52.3
15:00	52.8	59.2	52.4	50.6
16:00	54.4	66.9	53.3	51.0
17:00	55.5	60.6	55.3	53.6
18:00	57.1	62.2	56.9	55.5
19:00	52.8	60.3	52.3	50.5
20:00	52.8	59.2	52.4	49.8
21:00	51.5	66.4	50.1	47.7
22:00	50.4	56.8	50.1	48.3
23:00	50.0	57.6	49.7	47.9
0:00	48.4	60.9	47.8	46.3
1:00	49.5	57.9	49.1	47.5
2:00	45.5	56.6	44.7	43.0
3:00	47.2	59.2	46.5	44.7
4:00	51.3	57.0	50.9	49.1
5:00	52.3	59.7	52.2	50.9
6:00	55.2	60.1	55.1	53.0
7:00	57.1	67.8	56.8	55.1
8:00	58.1	69.1	57.6	56.0
9:00	55.9	64.0	55.6	53.6
10:00	53.6	63.6	53.1	50.3
11:00	54.2	72.3	52.9	50.3
12:00	56.5	67.4	53.9	51.0

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	55.2	64.7	54.0	52.0
Nighttime (10 p.m. - 7 a.m.)	50.8	58.4	49.6	47.8

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	58.1	72.3	57.6	56.0
Nighttime (10 p.m. - 7 a.m.)	55.2	60.9	55.1	53.0

Percentage of Energy

Daytime	82%
Nighttime	18%

Calculated L_{dn}, dBA

58.2

Attachment C9-1A

Long-Term 24-Hour Continuous Noise Monitoring

Model Input Sheet

Project: JOC

Date: **12/15/10 - 12/16/10**

Site: Nimbus Site B

Hour	Leq	Lmax	L50	L90
13:00	55.8	74.6	52.9	50.1
14:00	54.4	62.6	53.9	51.7
15:00	54.8	61.8	54.3	51.7
16:00	55.8	69.7	54.0	51.4
17:00	54.5	69.2	53.5	51.4
18:00	55.5	65.8	54.8	53.1
19:00	57.4	66.8	57.2	55.4
20:00	57.3	63.3	56.8	54.9
21:00	56.3	62.6	55.8	53.6
22:00	55.4	61.3	55.2	53.4
23:00	54.9	60.3	54.6	53.0
0:00	53.3	60.2	53.0	51.7
1:00	52.3	68.1	52.2	51.1
2:00	52.0	57.1	51.8	50.4
3:00	51.8	58.0	51.6	50.2
4:00	51.0	59.5	50.5	47.4
5:00	54.0	60.2	53.7	52.0
6:00	56.4	60.9	56.2	54.6
7:00	57.3	62.8	57.0	55.5
8:00	58.9	70.3	58.1	56.3
9:00	55.4	67.3	55.1	53.5
10:00	51.9	61.0	51.5	48.9
11:00	51.5	65.2	50.4	48.3
12:00	52.7	70.1	50.5	47.9

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	55.7	66.2	54.4	52.2
Nighttime (10 p.m. - 7 a.m.)	53.8	60.6	53.2	51.5

Uppermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	58.9	74.6	58.1	56.3
Nighttime (10 p.m. - 7 a.m.)	56.4	68.1	56.2	54.6

Percentage of Energy

Daytime	72%
Nighttime	28%

Calculated L_{dn}, dBA

60.5

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing - Nimbus Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Gold Country Boulevard	Tributary Crossings	Project Access	11,845	30	100	98.5	1	0.5	87		13	
2	Gold Country Boulevard	Project Access	Hazel Avenue	11,845	30	100	98.5	1	0.5	87		13	
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	1,055	30	100	98.5	1	0.5	87		13	
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	17,255	45	100	97	2	1	80		20	
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	16,060	45	100	97	2	1	80		20	
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	48,075	45	100	97	2	1	80		20	
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	48,305	45	100	97	2	1	80		20	
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	50,885	45	100	97	2	1	80		20	
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	19,895	45	100	97	2	1	80		20	
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	2,735	30	100	97	2	1	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing - Nimbus Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Gold Country Boulevard	Tributary Crossings	Project Access	56.9	47.5	51.6	58.4	17	36	78	168	361
2	Gold Country Boulevard	Project Access	Hazel Avenue	56.9	47.5	51.6	58.4	17	36	78	168	361
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	46.4	37.0	41.1	47.9	3	7	16	33	72
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	64.6	56.0	57.5	65.9	53	114	246	529	1140
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	64.3	55.7	57.2	65.5	50	109	234	504	1087
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	69.1	60.5	61.9	70.3	105	226	486	1048	2257
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	69.1	60.5	62.0	70.3	105	226	488	1051	2265
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	69.3	60.7	62.2	70.6	109	234	505	1088	2345
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	65.2	56.6	58.1	66.5	58	125	270	582	1254
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	51.5	45.3	49.4	54.2	9	19	41	88	190

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing Plus Project - Nimbus Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Gold Country Boulevard	Tributary Crossings	Project Access	12,085	30	100	98.5	1	0.5	87		13	
2	Gold Country Boulevard	Project Access	Hazel Avenue	14,650	30	100	98.5	1	0.5	87		13	
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	1,055	30	100	98.5	1	0.5	87		13	
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	17,525	45	100	97	2	1	80		20	
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	16,155	45	100	97	2	1	80		20	
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	48,595	45	100	97	2	1	80		20	
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	50,590	45	100	97	2	1	80		20	
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	52,885	45	100	97	2	1	80		20	
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	22,705	45	100	97	2	1	80		20	
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	2,735	30	100	97	2	1	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing Plus Project - Nimbus Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Gold Country Boulevard	Tributary Crossings	Project Access	57.0	47.6	51.7	58.5	17	37	79	170	366
2	Gold Country Boulevard	Project Access	Hazel Avenue	57.8	48.4	52.5	59.3	19	42	90	193	416
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	46.4	37.0	41.1	47.9	3	7	16	33	72
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	64.7	56.1	57.6	65.9	53	115	248	535	1152
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	64.3	55.7	57.2	65.6	51	109	235	506	1091
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	69.1	60.5	62.0	70.4	106	227	490	1055	2274
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	69.3	60.7	62.2	70.5	108	234	503	1084	2336
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	69.5	60.9	62.4	70.7	112	241	518	1117	2406
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	65.8	57.2	58.7	67.0	64	137	295	635	1369
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	51.5	45.3	49.4	54.2	9	19	41	88	190

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Nimbus Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Gold Country Boulevard	Tributary Crossings	Project Access	27,685	30	100	98.5	1	0.5	87		13	
2	Gold Country Boulevard	Project Access	Hazel Avenue	27,685	30	100	98.5	1	0.5	87		13	
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	2,350	30	100	98.5	1	0.5	87		13	
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	41,345	45	100	97	2	1	80		20	
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	36,715	45	100	97	2	1	80		20	
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	86,240	45	100	97	2	1	80		20	
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	81,735	45	100	97	2	1	80		20	
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	94,345	45	100	97	2	1	80		20	
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	62,050	45	100	97	2	1	80		20	
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	52,895	30	100	97	2	1	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Nimbus Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Gold Country Boulevard	Tributary Crossings	Project Access	60.6	51.2	55.3	62.1	30	64	137	295	637
2	Gold Country Boulevard	Project Access	Hazel Avenue	60.6	51.2	55.3	62.1	30	64	137	295	637
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	49.8	40.5	44.6	51.3	6	12	26	57	123
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	68.4	59.8	61.3	69.6	95	204	440	948	2042
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	67.9	59.3	60.8	69.1	88	189	406	875	1886
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	71.6	63.0	64.5	72.8	155	333	718	1547	3333
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	71.4	62.8	64.2	72.6	149	322	693	1493	3216
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	72.0	63.4	64.9	73.2	164	354	762	1642	3539
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	70.2	61.6	63.0	71.4	124	268	577	1242	2676
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	64.4	58.1	62.2	67.1	64	137	295	636	1371

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 Plus Project - Nimbus Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Gold Country Boulevard	Tributary Crossings	Project Access	27,925	30	100	98.5	1	0.5	87		13	
2	Gold Country Boulevard	Project Access	Hazel Avenue	30,490	30	100	98.5	1	0.5	87		13	
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	2,350	30	100	98.5	1	0.5	87		13	
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	36,615	45	100	97	2	1	80		20	
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	36,810	45	100	97	2	1	80		20	
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	86,760	45	100	97	2	1	80		20	
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	84,020	45	100	97	2	1	80		20	
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	95,700	45	100	97	2	1	80		20	
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	62,415	45	100	97	2	1	80		20	
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	52,895	30	100	97	2	1	80		20	
11	Project Access Road	Gold Country Boulevard	Project Site	3,040	25	100	99	0.5	0.5	87		13	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 Plus Project - Nimbus Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Gold Country Boulevard	Tributary Crossings	Project Access	60.6	51.2	55.3	62.1	30	64	138	297	640
2	Gold Country Boulevard	Project Access	Hazel Avenue	61.0	51.6	55.7	62.5	32	68	146	315	679
3	Gold Country Boulevard	Hazel Avenue	Nimbus Dam	49.8	40.5	44.6	51.3	6	12	26	57	123
4	Folsom Boulevard	Mercantile Drive	Hazel Avenue	67.9	59.3	60.8	69.1	87	188	406	874	1883
5	Folsom Boulevard	Hazel Avenue	Aerojet Drive	67.9	59.3	60.8	69.1	88	189	407	877	1889
6	Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	71.6	63.0	64.5	72.9	155	335	721	1553	3346
7	Hazel Avenue	Gold Country Boulevard	U.S. 50 Southbound Ramp	71.5	62.9	64.4	72.7	152	328	706	1520	3275
8	Hazel Avenue	U.S. 50 Southbound Ramp	U.S. 50 Northbound Ramp	72.0	63.4	64.9	73.3	166	357	770	1658	3572
9	Hazel Avenue	U.S. 50 Northbound Ramp	Folsom Boulevard	70.2	61.6	63.1	71.4	125	269	579	1247	2687
10	Hazel Avenue	Folsom Boulevard	Albany Avenue	64.4	58.1	62.2	67.1	64	137	295	636	1371
11	Project Access Road	Gold Country Boulevard	Project Site	48.7	37.4	45.0	50.5	5	11	23	50	107

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing - Kilgore Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Kilgore Road	International Drive	Crawford Drive	7,440	45	100	98.5	1	0.5	87		13	
2	Kilgore Road	Crawford Drive	White Rock Road	8,215	45	100	98.5	1	0.5	87		13	
3	Kilgore Road	White Rock Road	Sun Center Drive	5,355	35	100	98.5	1	0.5	87		13	
4	Sunrise Boulevard	Sanders Drive	White Rock Road	34,240	45	100	95.5	2.5	2	80		20	
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	32,880	45	100	95.5	2.5	2	80		20	
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	45,615	45	100	95.5	2.5	2	80		20	
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	42,285	45	100	95.5	2.5	2	80		20	
8	White Rock Road	Prospect Park Drive	Kilgore Road	18,245	45	100	95.5	2.5	2	80		20	
9	White Rock Road	Kilgore Road	Sunrise Boulevard	23,895	45	100	95.5	2.5	2	80		20	
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	14,370	45	100	95.5	2.5	2	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing - Kilgore Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Kilgore Road	International Drive	Crawford Drive	59.9	48.2	49.7	60.6	24	51	109	235	507
2	Kilgore Road	Crawford Drive	White Rock Road	60.3	48.7	50.1	61.0	25	54	117	251	541
3	Kilgore Road	White Rock Road	Sun Center Drive	55.3	45.1	47.3	56.3	12	26	57	122	264
4	Sunrise Boulevard	Sanders Drive	White Rock Road	67.5	59.9	63.5	69.5	92	199	428	923	1988
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	67.3	59.8	63.3	69.3	90	193	417	898	1935
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	68.8	61.2	64.7	70.7	112	241	518	1117	2406
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	68.4	60.9	64.4	70.4	106	229	493	1062	2288
8	White Rock Road	Prospect Park Drive	Kilgore Road	64.8	57.2	60.7	66.7	61	131	281	606	1306
9	White Rock Road	Kilgore Road	Sunrise Boulevard	66.0	58.4	61.9	67.9	73	156	337	726	1564
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	63.7	56.2	59.7	65.7	52	111	240	517	1114

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing Plus Project - Kilgore Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Kilgore Road	International Drive	Crawford Drive	7,470	45	100	98.5	1	0.5	87		13	
2	Kilgore Road	Crawford Drive	White Rock Road	11,230	45	100	98.5	1	0.5	87		13	
3	Kilgore Road	White Rock Road	Sun Center Drive	5,375	35	100	98.5	1	0.5	87		13	
4	Sunrise Boulevard	Sanders Drive	White Rock Road	34,480	45	100	95.5	2.5	2	80		20	
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	35,245	45	100	95.5	2.5	2	80		20	
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	47,040	45	100	95.5	2.5	2	80		20	
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	46,950	45	100	95.5	2.5	2	80		20	
8	White Rock Road	Prospect Park Drive	Kilgore Road	18,430	45	100	95.5	2.5	2	80		20	
9	White Rock Road	Kilgore Road	Sunrise Boulevard	26,695	45	100	95.5	2.5	2	80		20	
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	14,555	45	100	95.5	2.5	2	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : Existing Plus Project - Kilgore Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Kilgore Road	International Drive	Crawford Drive	59.9	48.2	49.7	60.6	24	51	109	236	508
2	Kilgore Road	Crawford Drive	White Rock Road	61.7	50.0	51.5	62.4	31	67	144	310	667
3	Kilgore Road	White Rock Road	Sun Center Drive	55.4	45.1	47.3	56.3	12	26	57	123	264
4	Sunrise Boulevard	Sanders Drive	White Rock Road	67.5	60.0	63.5	69.5	93	200	430	927	1997
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	67.6	60.1	63.6	69.6	94	203	437	941	2026
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	68.9	61.3	64.9	70.9	114	246	529	1140	2456
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	68.9	61.3	64.8	70.8	114	245	529	1139	2453
8	White Rock Road	Prospect Park Drive	Kilgore Road	64.8	57.3	60.8	66.8	61	132	283	610	1315
9	White Rock Road	Kilgore Road	Sunrise Boulevard	66.4	58.9	62.4	68.4	78	168	363	781	1684
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	63.8	56.2	59.8	65.8	52	112	242	522	1124

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Kilgore Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Kilgore Road	International Drive	Crawford Drive	12,820	45	100	98.5	1	0.5	87		13	
2	Kilgore Road	Crawford Drive	White Rock Road	14,155	45	100	98.5	1	0.5	87		13	
3	Kilgore Road	White Rock Road	Sun Center Drive	7,805	35	100	98.5	1	0.5	87		13	
4	Sunrise Boulevard	Sanders Drive	White Rock Road	41,600	45	100	95.5	2.5	2	80		20	
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	42,520	45	100	95.5	2.5	2	80		20	
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	61,560	45	100	95.5	2.5	2	80		20	
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	73,230	45	100	95.5	2.5	2	80		20	
8	White Rock Road	Prospect Park Drive	Kilgore Road	28,670	45	100	95.5	2.5	2	80		20	
9	White Rock Road	Kilgore Road	Sunrise Boulevard	37,560	45	100	95.5	2.5	2	80		20	
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	34,560	45	100	95.5	2.5	2	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Kilgore Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Kilgore Road	International Drive	Crawford Drive	62.3	50.6	52.1	62.9	34	73	157	338	729
2	Kilgore Road	Crawford Drive	White Rock Road	62.7	51.0	52.5	63.4	36	78	168	361	778
3	Kilgore Road	White Rock Road	Sun Center Drive	57.0	46.7	48.9	58.0	16	34	73	157	339
4	Sunrise Boulevard	Sanders Drive	White Rock Road	68.4	60.8	64.3	70.3	105	226	488	1050	2263
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	68.5	60.9	64.4	70.4	107	230	495	1066	2296
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	70.1	62.5	66.0	72.0	136	294	633	1364	2939
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	70.8	63.2	66.8	72.8	153	330	711	1531	3299
8	White Rock Road	Prospect Park Drive	Kilgore Road	66.7	59.2	62.7	68.7	82	177	380	820	1766
9	White Rock Road	Kilgore Road	Sunrise Boulevard	67.9	60.3	63.9	69.9	98	211	455	981	2114
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	67.6	60.0	63.5	69.5	93	200	431	928	2000

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Kilgore Site
Ground Type : Soft
K Factor :
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Kilgore Road	International Drive	Crawford Drive	12,820	45	100	98.5	1	0.5	87		13	
2	Kilgore Road	Crawford Drive	White Rock Road	14,155	45	100	98.5	1	0.5	87		13	
3	Kilgore Road	White Rock Road	Sun Center Drive	7,805	35	100	98.5	1	0.5	87		13	
4	Sunrise Boulevard	Sanders Drive	White Rock Road	41,600	45	100	95.5	2.5	2	80		20	
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	42,520	45	100	95.5	2.5	2	80		20	
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	61,560	45	100	95.5	2.5	2	80		20	
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	73,230	45	100	95.5	2.5	2	80		20	
8	White Rock Road	Prospect Park Drive	Kilgore Road	28,670	45	100	95.5	2.5	2	80		20	
9	White Rock Road	Kilgore Road	Sunrise Boulevard	37,560	45	100	95.5	2.5	2	80		20	
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	34,560	45	100	95.5	2.5	2	80		20	

Attachment C9-1B

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : Joint Operations Center Relocation Project
Project Number : 10110165.01
Modeling Condition : 2035 No Project - Kilgore Site
Metric (L_{eq}, L_{dn}, CNEL) : L_{dn}

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Kilgore Road	International Drive	Crawford Drive	62.3	50.6	52.1	62.9	34	73	157	338	729
2	Kilgore Road	Crawford Drive	White Rock Road	62.7	51.0	52.5	63.4	36	78	168	361	778
3	Kilgore Road	White Rock Road	Sun Center Drive	57.0	46.7	48.9	58.0	16	34	73	157	339
4	Sunrise Boulevard	Sanders Drive	White Rock Road	68.4	60.8	64.3	70.3	105	226	488	1050	2263
5	Sunrise Boulevard	White Rock Road	U.S. 50 Northbound Ramp	68.5	60.9	64.4	70.4	107	230	495	1066	2296
6	Sunrise Boulevard	U.S. 50 Northbound Ramp	U.S. 50 Southbound Ramp	70.1	62.5	66.0	72.0	136	294	633	1364	2939
7	Sunrise Boulevard	U.S. 50 Southbound Ramp	Zinfandel Drive	70.8	63.2	66.8	72.8	153	330	711	1531	3299
8	White Rock Road	Prospect Park Drive	Kilgore Road	66.7	59.2	62.7	68.7	82	177	380	820	1766
9	White Rock Road	Kilgore Road	Sunrise Boulevard	67.9	60.3	63.9	69.9	98	211	455	981	2114
10	White Rock Road	Sunrise Boulevard	Fitzgerald Road	67.6	60.0	63.5	69.5	93	200	431	928	2000

Attachment C9-1C

Project-Generated Construction Source Noise Prediction Model

Joint Operations Center Project

Site Preparation

Location	Distance to Nearest Receiver in Feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	1,067	55.0
	50	88.2
	130	77.3
	150	75.7
	200	72.4
	250	69.8
	300	67.7
	350	66.0
	400	64.4
	450	63.1
	500	61.9
	550	60.8
	600	59.8

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 Feet[1]	Usage Factor[1]
Clam Shovel (dropping)	93	0.2
Dump Truck	84	0.4
Grader	85	0.4
Backhoe	80	0.4

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Clam Shovel (dropping)	86.0
Dump Truck	80.0
Grader	81.0
Backhoe	76.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
88.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Attachment C9-1C

Project-Generated Construction Source Noise Prediction Model

Joint Operations Center Project

Building Construction

Location	Distance to Nearest Receiver in Feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	896	55.0
	50	86.3
	130	75.4
	150	73.8
	200	70.5
	250	67.9
	300	65.8
	350	64.1
	400	62.5
	450	61.2
	500	60.0
	550	58.9
	600	57.9

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 Feet[1]	Usage Factor[1]
Auger Drill Rig	85	0.2
Paver	85	0.5
Crane	85	0.16
Pneumatic Tools	85	0.5

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Auger Drill Rig	78.0
Paver	82.0
Crane	77.0
Pneumatic Tools	82.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
86.3

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Nimbus Site

Neighborhood Receptors 1

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	215	4	860	64.7	500	3	41.7	
PL2	215	4	860	64.7	500	3	41.7	
PL3	215	4	860	64.7	1200	3	34.1	
PL4	215	4	860	64.7	900	3	0.0	Shielded

Combined Noise Level: 45.1 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Nimbus Site

Neighborhood Receptors 2

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	215	4	860	64.7	620	3	0.0	Shielded
PL2	215	4	860	64.7	260	3	47.4	
PL3	215	4	860	64.7	700	3	38.8	
PL4	215	4	860	64.7	720	3	0.0	Shielded

Combined Noise Level: 48.0 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Nimbus Site

Neighborhood Receptors 3

AECOM

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	215	4	860	64.7	1000	3	0.0	Shielded
PL2	215	4	860	64.7	900	3	36.6	
PL3	215	4	860	64.7	280	3	46.8	
PL4	215	4	860	64.7	720	3	38.6	

Combined Noise Level: 47.7 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Nimbus Site

American River Parkway Receptors 1

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	215	4	860	64.7	800	3	0.0	Shielded
PL2	215	4	860	64.7	900	3	0.0	Shielded
PL3	215	4	860	64.7	400	3	43.7	
PL4	215	4	860	64.7	400	3	43.7	

Combined Noise Level: 46.7 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Nimbus Site

American River Parkway Receptors 2

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	215	4	860	64.7	460	3	42.5	
PL2	215	4	860	64.7	860	3	0.0	Shielded
PL3	215	4	860	64.7	900	3	36.6	
PL4	215	4	860	64.7	340	3	45.1	

Combined Noise Level: 47.4 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Kilgore Site

Neighborhood Receptors

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	180	4	720	64.0	415	5	40.6	
PL2	685	4	2740	69.8	830	8	37.4	Shielded

Combined Noise Level: 42.3 dBA Leq

Attachment C9-1D

Project-Generated Parking Lot Noise Prediction Model

Joint Operations Center Project - Kilgore Site

Bike Trail Receptors

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips/Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.	Notes
PL1	180	4	720	64.0	275	0	49.2	
PL2	685	4	2740	69.8	800	5	40.7	Shielded

Combined Noise Level: 49.7 dBA Leq

Attachment C9-1E

Packaged HVAC Noise Prediction Model
Joint Operations Center Project - Nimbus Site
Neighborhood Receptors

Project Name : Joint Operations Center Project
Project Number : 10110165.01
Metric (L_{eq}, L_{dn}) : L_{eq}
Cooling Capacity / 1,000 Sq Ft: 1.2

ID	Building Description	Square Footage	Cooling Capacity, Tons	Shielding Offset	L_w	Distance to Receptor	L_p @ Receptor
1	Flood Operations Center	7,500	9		98.5	700	43.6
2	Office Spaces	91,750	110		111.5	480	59.9
3	Water Project Operations	91,750	110		111.5	360	62.4

Combined Noise Level:
64.4 dBA Leq

Source: Bolt Beranek and Newman Inc. (BBN). 1981. *Noise Control for Buildings and Manufacturing Plants* . Cambridge MA.
Notes: L_w = sound power; L_p = sound pressure in dBA

Attachment C9-1E

Packaged HVAC Noise Prediction Model
Joint Operations Center Project - Nimbus Site
American River Parkway Receptors

AECOM

Project Name : Joint Operations Center Project
Project Number : 10110165.01
Metric (L_{eq}, L_{dn}) : L_{eq}
Cooling Capacity / 1,000 Sq Ft: 1.2

ID	Building Description	Square footage	Cooling Capacity, Tons	Shielding Offset	L_w	Distance to Receptor	L_p @ Receptor
1	Flood Operations Center	7,500	9		98.5	340	49.8
2	Office Spaces	91,750	110		111.5	500	59.5
3	Water Project Operations	91,750	110		111.5	640	57.4

Combined Noise Level:
61.9 dBA Leq

Source: Bolt Beranek and Newman Inc. (BBN). 1981. *Noise Control for Buildings and Manufacturing Plants* . Cambridge MA.
Notes: L_w = sound power; L_p = sound pressure in dBA

Attachment C9-1E

Packaged HVAC Noise Prediction Model
Joint Operations Center Project - Kilgore Site
Neighborhood Receptors

Project Name : Joint Operations Center Project
Project Number : 10110165.01
Metric (L_{eq}, L_{dn}) : L_{eq}
Cooling Capacity / 1,000 Sq Ft: 1.2

ID	Building Description	Square footage	Cooling Capacity, Tons	Shielding Offset	L_w	Distance to Receptor	L_p @ Receptor
1	Flood Operations Center	7,500	9		98.5	1075	39.8
2	Office Spaces	183,500	220		115.1	800	59.1

Combined Noise Level:
59.1 dBA Leq

Source: Bolt Beranek and Newman Inc. (BBN). 1981. *Noise Control for Buildings and Manufacturing Plants* . Cambridge MA.
Notes: L_w = sound power; L_p = sound pressure in dBA

Attachment C9-1E

Packaged HVAC Noise Prediction Model
Joint Operations Center Project - Kilgore Site
American River Parkway Receptors

AECOM

Project Name : Joint Operations Center Project
Project Number : 10110165.01
Metric (L_{eq}, L_{dn}) : L_{eq}
Cooling Capacity / 1,000 Sq Ft: 1.2

ID	Building Description	Square footage	Cooling Capacity, Tons	Shielding Offset	L_w	Distance to Receptor	L_p @ Receptor
1	Flood Operations Center	7,500	9		98.5	400	48.4
2	Office Spaces	183,500	220		115.1	240	69.5

Combined Noise Level:
69.6 dBA Leq

Source: Bolt Beranek and Newman Inc. (BBN). 1981. *Noise Control for Buildings and Manufacturing Plants* . Cambridge MA.
Notes: L_w = sound power; L_p = sound pressure in dBA