ATTACHMENT G

SANTA CLARA
Valley Transportation Authority

Supplemental Memorandum

To: Cristina Jaworski
VTA, Environmental Planning

From: David Kobayashi
VTA, CMA Engineering

Date: October 5, 2012

Subject: Eastridge Transit Center Traffic Evaluation

This memorandum studies the internal roadway operations of the Eastridge Transit Center and Eastridge Shopping Mall. Specifically, this memorandum discusses previous traffic evaluations, methodology of the supplemental study, and results of the supplemental study.

Previous Traffic Evaluations

The Capitol Expressway Transportation Study for the Environmental Impact Statement was prepared by AECOM (AECOM 2010). This study evaluated the effect of the Light Rail Alternative on the transportation system for weekday AM and PM peak hours. The selected analysis peak hours for this analysis are consistent with the Santa Clara Valley Transportation Authority (VTA) Impact Analysis Guidelines.

The Eastridge Transit Center Traffic Evaluation was prepared by Kimley Horn Associates (KHA 2010). This study evaluated the effect of reducing the number of lanes on Eastridge Loop Road from five lanes to three lanes to accommodate sidewalks, landscaping, and bike lanes on seven intersections. The analysis reviewed LOS for weekend midday hours during the holiday season. The selected analysis peak hours for this analysis are intended to represent a worst case scenario. The holiday season scenario is not typical for transportation impact analyses since it represents a condition that exists approximately 10 - 12 days during the year. It should be noted that VTA subsequently decided not to include changes to the capacity of the Eastridge Loop Road in the Eastridge Transit Center Improvement Project.

Purpose and Methodology for Supplement Study

This supplement study was conducted to evaluate internal roadway operations on the typical weekend (Saturday, non-holiday season) during the midday peak hour at three study intersections which are the affected by the proposed light rail project. These intersections are described below and illustrated in Figure 1.

- Eastridge Loop Road/North Mall Internal Driveway: All Way Stop Controlled (AWSC)
- Eastridge Loop Road/Connector Road to Capitol Expressway: Two-Way Stop Controlled (TWSC)
- Capitol Expressway/Connector Road to Capitol Expressway: Signal Controlled

Existing Conditions and Existing + Project Conditions were evaluated similar to the Kimley Horn Evaluation. The existing conditions scenario analyzes the existing traffic conditions with the current configuration of the transit center and current alignment of Eastridge Loop Road. The existing plus project scenario analyzes the existing traffic conditions with the reconfiguration of the transit center and realignment of Eastridge Loop Road (shown in Figure 2 and 3) as follows:

- The Eastridge Loop Road will be re-aligned to the west of its current alignment, with the expanded transit center located north of the connector road to Capitol Expressway.
- The existing dialysis center building, which is to remain, is located to the east of the re-aligned Eastridge Loop.
- The proposed re-alignment of Eastridge Loop Road will maintain the same number lanes as the existing conditions (2 lanes in each direction) with a center turning lane.

The traffic data used in this analysis was obtained from the Eastridge Transit Center Traffic Evaluation (KHA 2010). As stated previously, the 2010 evaluation analyzed traffic volumes with an adjustment factor applied to reflect a holiday shopping season weekend midday peak hour. Unlike the 2010 evaluation, the present supplement study traffic volume analysis is based on the unadjusted traffic volumes of typical weekend midday peak hour.

The study intersections were analyzed using methodologies that are consistent with the VTA - Traffic Level of Service (LOS) Analysis Guidelines dated June 2003. The intersection LOS reported in this memorandum was analyzed using TRAFFIX 7.9 software package and the LOS methodology used in this software is based on the Highway Capacity Manual.

The queue analysis for study intersections are also consistent with the VTA - Traffic Level of Service Analysis Guidelines and based on the following:

- For the signalized intersection, the queues are based on an output from the TRAFFIX 7.9 analysis called “Design Queue Length”. This queue methodology is based on Australian Road Research Report 123.
- For the un-signalized intersections, the queues are based on an output from TRAFFIX 7.9 analysis and are calculated on methods as described in the HCM.

Results: Existing Conditions

The traffic volumes for Existing Conditions are shown in Figure 4. Study intersections 3 and 4 operate at LOS C or better. The unsignalized intersection 4 on Eastridge Loop with the connector road to Capitol Expressway is operating at LOS F. This is reflective of the high delay for the northbound right-turn movement. LOS and delay information is shown in Table 1. Detailed information regarding the LOS analysis is provided in Attachment A.

Table 1: Existing Conditions Intersection LOS

#	Intersection	Intersection Control	Weekend Mid-day Peak hour	
			LOS	Delay (sec/veh)
3	Eastridge Loop/ North Mall Internal Driveway	AWSC [1]	B	10.4
4	Eastridge Loop/ Connector Road to Capitol Expressway	TWSC [2]	F	> 100
5	Capitol Expressway/ Connector Road to Capitol Expressway	Signal	C	22.3

[1] AWSC – All way stop sign
[2] TWSC - Two way stop sign

Table 2 shows a summary of the queue analysis and a comparison of the queue with available storage. Detailed information regarding the queuing analysis is provided in Attachment A.

Table 2: Existing Conditions Queuing Summary

#	Intersection	Weekend Mid-day Peak hour			
		Queue (number of cars per lane)	Queue (ft)	Available Storage (ft)	Movement
3	Eastridge Loop/ North Mall Internal Driveway	1	25	75	NB Left
4	Eastridge Loop/ Connector Road to Capitol Expressway [3]	3	75	430	NB Through
		10	250	430	NB Through-Right
		9	225	100	SB Left
		2	50	600	SB Through
		6	150	150	WB Left
		7	175	150	WB Right
5	Capitol Expressway/ Connector Road to Capitol Expressway	9	225	340	NB Left
		14	350	950	NB Through
		20	500	1600	SB Through
		8	200	300	SB Right
		9	225	130	EB Left
		17	425	165	EB Right

[3] Queue for the 4-way stop sign is calculated using Poisson arrival pattern.

Results: Existing + Project Conditions

The traffic volumes for Existing + Project Conditions are shown in Figure 5. The project will not generate additional trips to the facility, but would have minor redistribution of traffic. About 11 transit buses during the Saturday peak hour that were exiting directly to Capitol Expressway

would now be exiting to Eastridge Loop Road and then to Capitol Expressway. Intersections 3 and 5 operate at LOS C. Intersection 4 operates at LOS F as shown in Table 3. Detailed information regarding the LOS analysis is provided in Attachment A.

Table 3: Existing + Project Conditions Intersection LOS

#	Intersection	Intersection Control	Weekend Mid-day Peak hour		
			LOS	Delay (sec/veh)	Change in Delay (Proposed-Existing) (secs)
3	Eastridge Loop/ North Mall Internal Driveway	AWSC [1]	A	9.7	- 0.7
4	Eastridge Loop/ Connector Road to Capitol Expressway	TWSC [2]	F	>100	0
5	Capitol Expressway/ Connector Road to Capitol Expressway	Signal	C	22.8	0.5

[1] AWSC – All way stop sign
[2] TWSC - Two way stop sign

There is no change in storage for intersections 3 and 5. As the Eastridge Loop Road will be re-aligned to the west of its current alignment, storage for the westbound movement will increase for intersection 4. Table 4 shows a summary of the queue analysis and a comparison of the queue with available storage. There is no increase in queue for any of the intersections due to the project. Detailed information regarding queuing analysis is provided in Attachment A.

Table 4: Existing + Project Conditions Queuing Summary

#	Intersection	Weekend Mid-day Peak hour			
		Queue (number of vehicles per lane)	Queue (ft)	Available Storage (ft)	Movement
3	Eastridge Loop/ North Mall Internal Driveway	1	25	75	NB Left
4	Eastridge Loop/ Connector Road to Capitol Expressway [3]	3	75	430	NB Through
		10	250	430	NB Through-Right
		10	250	100	SB Left
		2	50	600	SB Through
		6	150	200	WB Left
		7	175	200	WB Right
5	Capitol Expressway/ Connector Road to Capitol Expressway	9	225	340	NB Left
		14	350	950	NB Through
		18	450	1600	SB Through
		8	200	300	SB Right
		8	200	130	EB Left
		16	400	165	EB Right

[3] Queue for the 4-way stop sign is calculated using Poisson arrival pattern.

Conclusion

The three study intersections in this supplement analysis operate at the same LOS and queuing conditions in both existing and project scenarios.

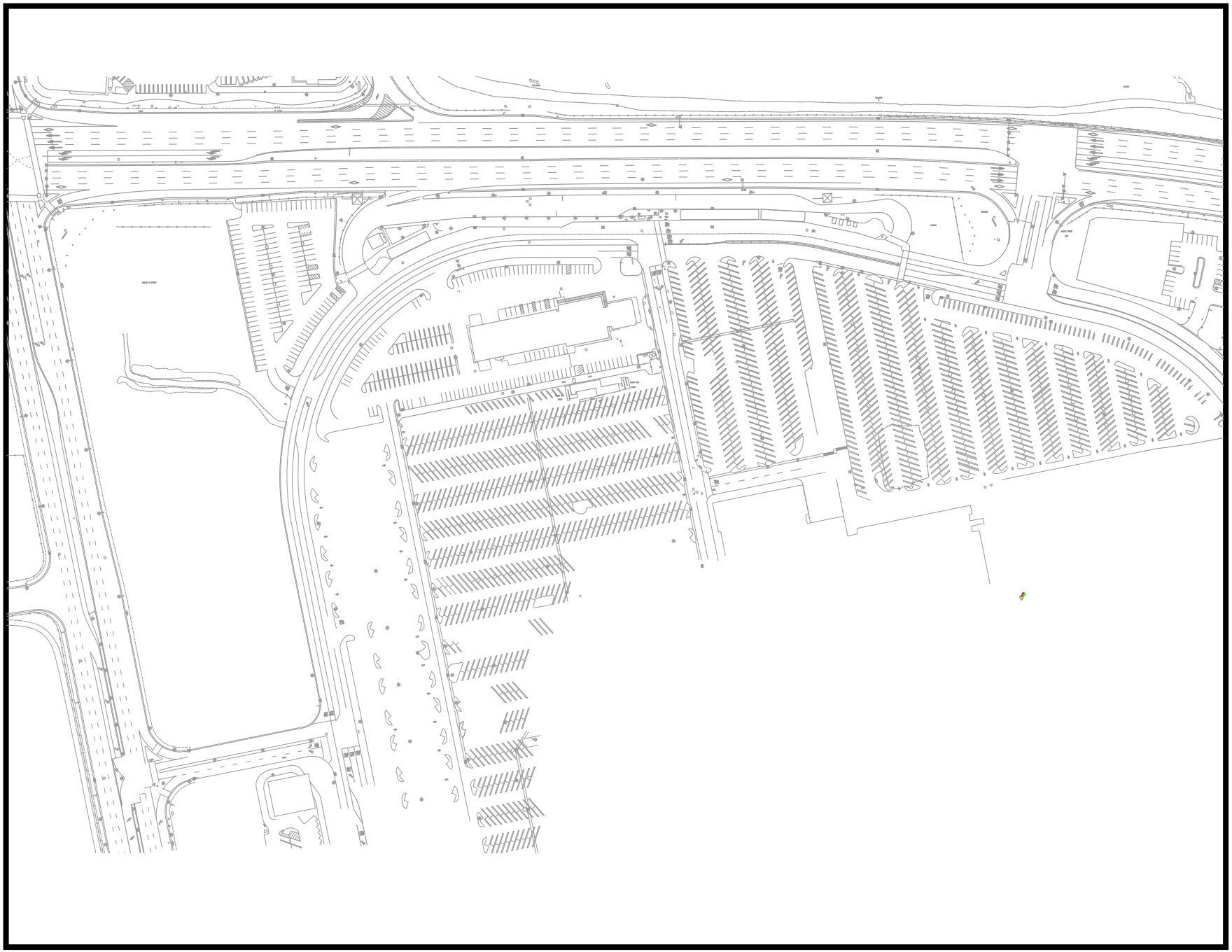

FIGURE 1

EASTRIDGE TRANSIT CENTER - EXISTING SITE PLAN

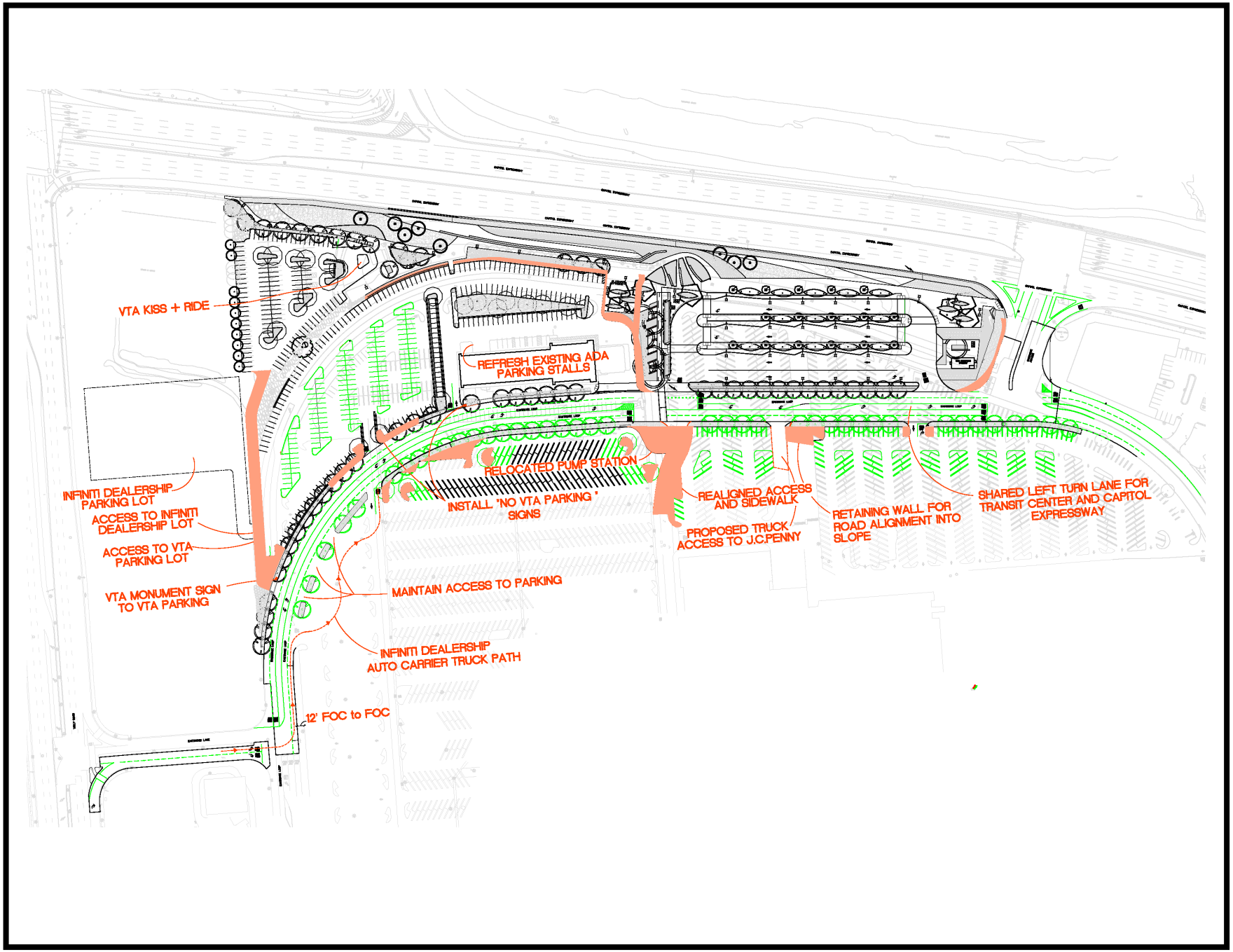

FIGURE 2

EASTRIDGE TRANSIT CENTER - PROPOSED SITE PLAN

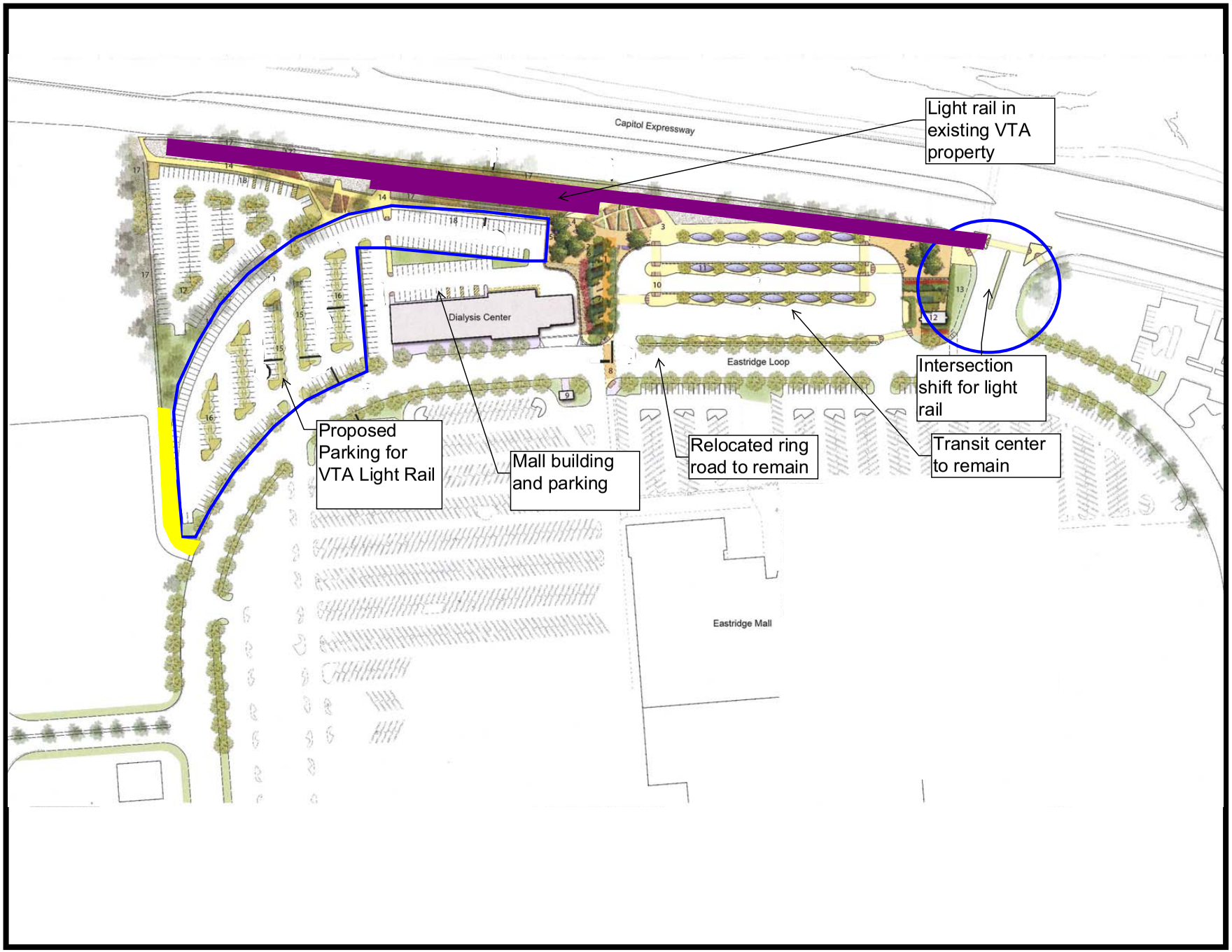

FIGURE 3

CELR EASTRIDGE TRANSIT CENTER AND BUS IMPROVEMENTS

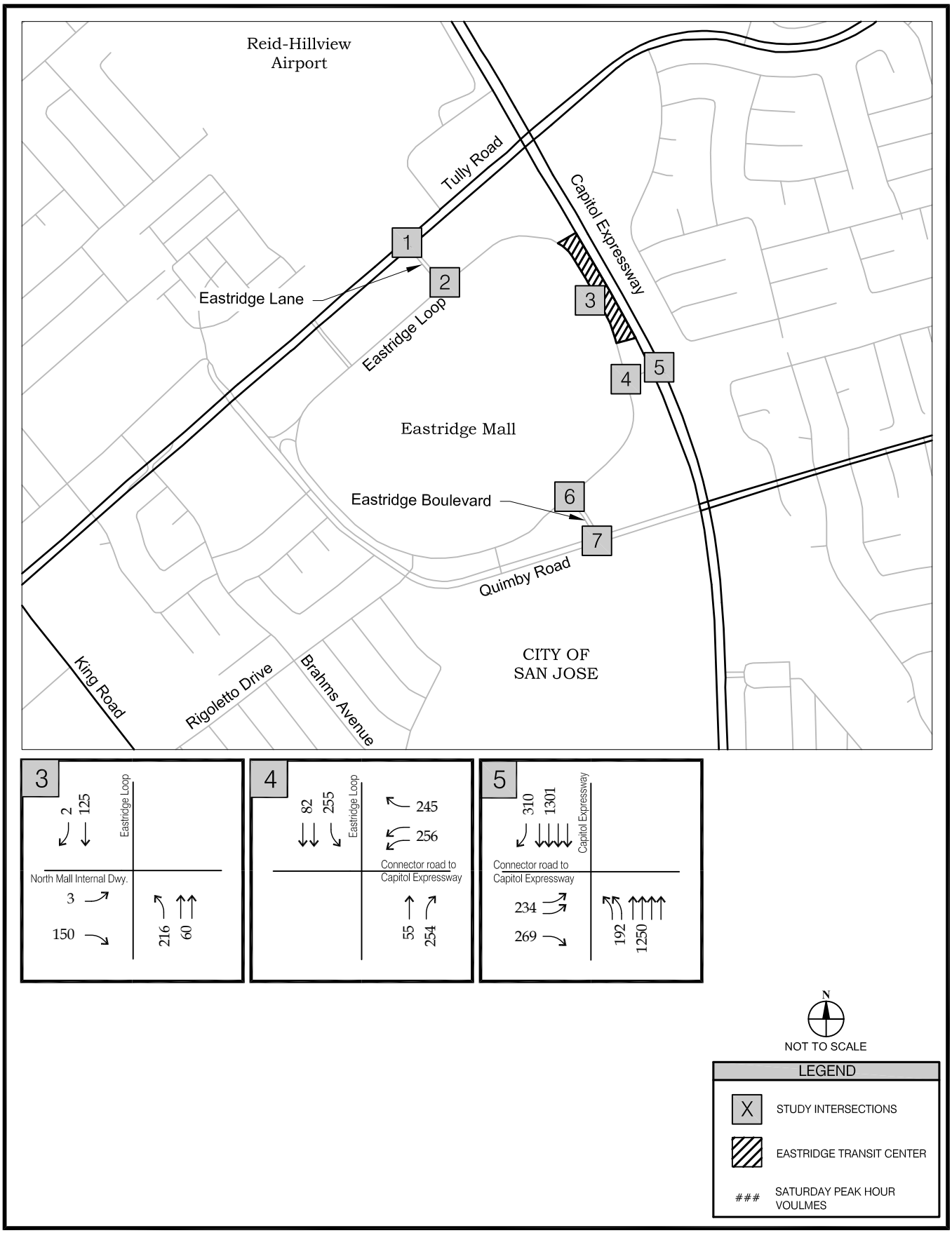

FIGURE 4
EXISTING TRAFFIC VOLUMES

Source: Kimley-Horn & Associates, Inc. TIA, July 2010

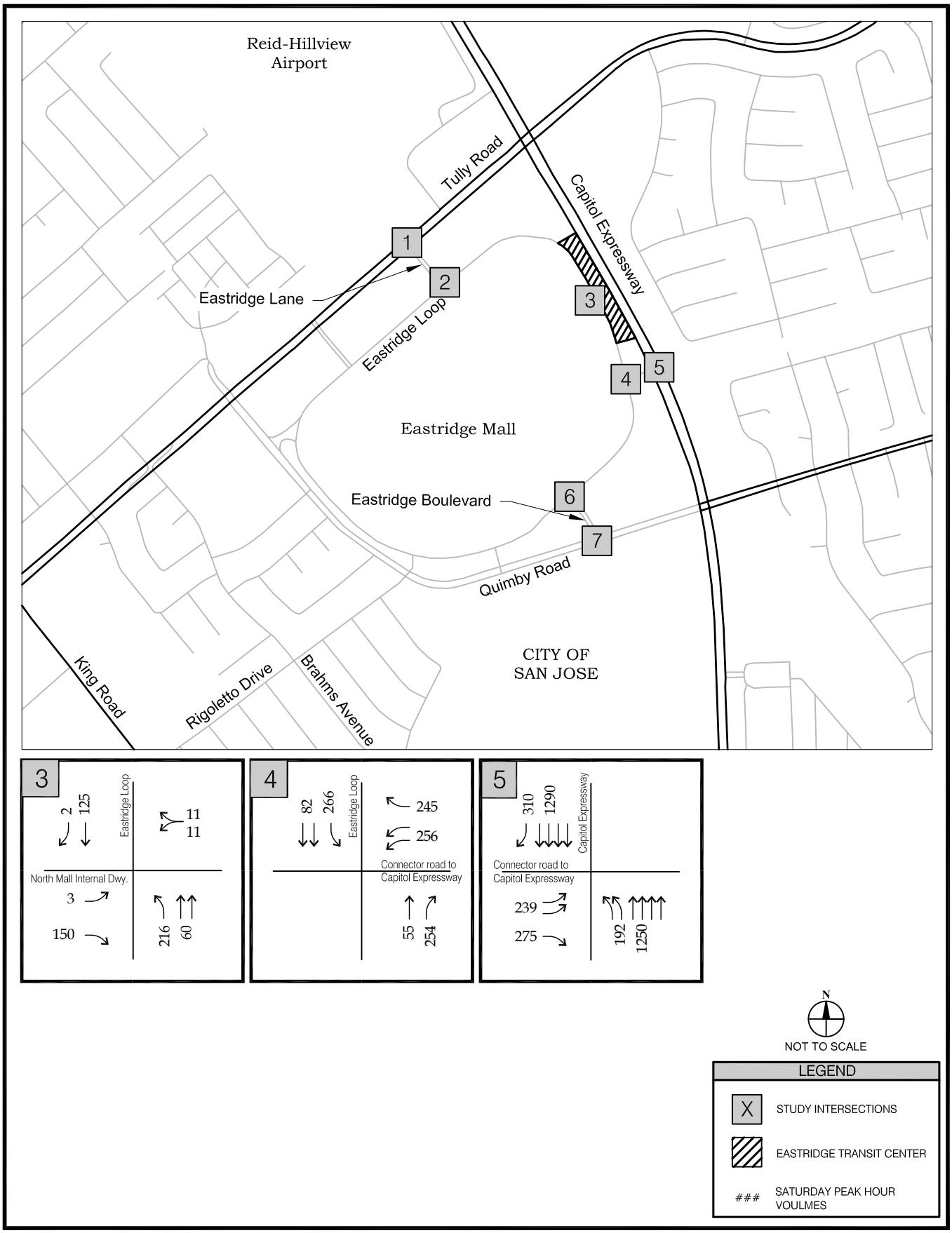

FIGURE 5
EXISTING + PROJECT TRAFFIC VOLUMES

Source: Kimley-Horn & Associates, Inc. TIA, July 2010

Attachment A

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

Intersection #3 North Mall Internal D/W and Eastridge Loop

Cycle (sec):	100	Critical Vol./Cap.(X):	0.423
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	10.4
Optimal Cycle:	0	Level Of Service:	B

Street Name:	Eastridge Loop						North Mall Internal D/W					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2	0 0		0 0 1	1 0		1 0 0	0 1		0 0 1!	0 0	
Volume Module:												
Base Vol:	216	60	0	0	125	2	3	0	150	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	216	60	0	0	125	2	3	0	150	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	216	60	0	0	125	2	3	0	150	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
PHF Volume:	254	71	0	0	147	2	4	0	176	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	254	71	0	0	147	2	4	0	176	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	254	71	0	0	147	2	4	0	176	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.97	0.03	1.00	0.00	1.00	0.00	1.00	0.00
Final Sat.:	601	1302	0	0	1275	20	547	0	673	0	556	0
Capacity Analysis Module:												
Vol/Sat:	0.42	0.05	xxxx	xxxx	0.12	0.12	0.01	xxxx	0.26	xxxx	0.00	xxxx
Crit Moves:	****				****				****		****	
Delay/Veh:	12.6	8.4	0.0	0.0	8.7	8.7	9.0	0.0	9.4	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.6	8.4	0.0	0.0	8.7	8.7	9.0	0.0	9.4	0.0	0.0	0.0
LOS by Move:	B	A	*	*	A	A	A	*	A	*	*	*
ApproachDel:		11.7			8.7			9.4			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		11.7			8.7			9.4			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	0.7	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

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

Intersection #4 Connector to Capitol Expwy. & Eastridge Loop

Cycle (sec):	1	Critical Vol./Cap.(X):	1.547
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	13.7
Optimal Cycle:	0	Level Of Service:	C

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Yield Sign					Yield Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	2	0	0	0	1
Volume Module:																				
Base Vol:	0	55	254			255	82	0			0	0	0			256	0	245		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	55	254			255	82	0			0	0	0			256	0	245		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	0	55	254			255	82	0			0	0	0			256	0	245		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	0.96	0.96	0.96			0.96	0.96	0.96			0.96	0.96	0.96			0.96	0.96	0.96		
PHF Volume:	0	57	265			266	85	0			0	0	0			267	0	255		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
FinalVolume:	0	57	265			266	85	0			0	0	0			267	0	255		
Saturation Flow Module:																				
Sat/Lane:	0	0	0			0	0	0			0	0	0			0	0	0		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	0.00	1.00	1.00			1.00	2.00	0.00			0.00	0.00	0.00			2.00	0.00	1.00		
Final Sat.:	0	171	171			347	694	0			0	0	0			690	0	345		
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.34	1.55			0.77	0.12	0.00			0.00	0.00	0.00			0.39	0.00	0.74		
Crit Moves:			****			****							****					****		
Green/Cycle:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Volume/Cap:	0.00	0.34	1.55			0.77	0.12	0.00			0.00	0.00	0.00			0.39	0.00	0.74		
Delay/Veh:	0.0	3.6	357.7			18.3	1.6	0.0			0.0	0.0	0.0			4.3	0.0	16.6		
Delay Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	0.0	3.6	357.7			18.3	1.6	0.0			0.0	0.0	0.0			4.3	0.0	16.6		
DesignQueue:	0	0	0			0	0	0			0	0	0			0	0	0		

Note: Queue reported is the number of cars per lane.

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 Connector to Capitol Expwy. & Capitol Expwy.

Cycle (sec):	160	Critical Vol./Cap.(X):	0.391
Loss Time (sec):	9 (Y+R=4.0 sec)	Average Delay (sec/veh):	22.3
Optimal Cycle:	33	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			Split Phase			Split Phase		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	7	10	10	7	10	10	7	10	10	0	0	0
Lanes:	2 0	4 0	0	0 0	4 0	1	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	192	1250	0	0	1301	310	234	0	269	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	192	1250	0	0	1301	310	234	0	269	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	192	1250	0	0	1301	310	234	0	269	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	200	1302	0	0	1355	323	244	0	280	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	200	1302	0	0	1355	323	244	0	280	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	200	1302	0	0	1355	323	244	0	280	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	1.00	1.00	0.91	0.85	0.92	1.00	0.85	1.00	1.00	1.00
Lanes:	2.00	4.00	0.00	0.00	4.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	3502	6916	0	0	6916	1615	3502	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.06	0.19	0.00	0.00	0.20	0.20	0.07	0.00	0.17	0.00	0.00	0.00
Crit Moves:	****				****				****			
Green/Cycle:	0.15	0.65	0.00	0.00	0.50	0.80	0.30	0.00	0.44	0.00	0.00	0.00
Volume/Cap:	0.39	0.29	0.00	0.00	0.39	0.25	0.23	0.00	0.39	0.00	0.00	0.00
Uniform Del:	61.9	12.3	0.0	0.0	24.8	4.1	42.5	0.0	30.0	0.0	0.0	0.0
IncremntDel:	0.5	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.4	0.0	0.0	0.0
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Delay/Veh:	62.4	12.4	0.0	0.0	24.9	4.2	42.6	0.0	30.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.4	12.4	0.0	0.0	24.9	4.2	42.6	0.0	30.4	0.0	0.0	0.0
LOS by Move:	E	B	A	A	C	A	D	A	C	A	A	A
HCM2k95thQ:	9	14	0	0	20	8	9	0	17	0	0	0

Note: Queue reported is the number of cars per lane.

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

****

Intersection #3 North Mall Internal D/W and Eastridge Loop

****

Cycle (sec): 100 Critical Vol./Cap.(X): 0.356
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.7
Optimal Cycle: 0 Level Of Service: A

****

Street Name:	Eastridge Loop						North Mall Internal D/W					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	0	0 0	1 1	0	1 0	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	216	60	0	0	125	2	3	0	150	11	0	11
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:	216	60	0	0	125	2	3	0	150	11	0	11
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	216	60	0	0	125	2	3	0	150	11	0	11
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:	216	60	0	0	125	2	3	0	150	11	0	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	216	60	0	0	125	2	3	0	150	11	0	11
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:	216	60	0	0	125	2	3	0	150	11	0	11
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.97	0.03	1.00	0.00	1.00	0.50	0.00	0.50
Final Sat.:	607	1320	0	0	1297	21	561	0	693	302	0	302
Capacity Analysis Module:												
Vol/Sat:	0.36	0.05	xxxx	xxxx	0.10	0.10	0.01	xxxx	0.22	0.04	xxxx	0.04
Crit Moves:	****				****				****	****		
Delay/Veh:	11.5	8.2	0.0	0.0	8.5	8.5	8.8	0.0	8.9	8.8	0.0	8.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.5	8.2	0.0	0.0	8.5	8.5	8.8	0.0	8.9	8.8	0.0	8.8
LOS by Move:	B	A	*	*	A	A	A	*	A	A	*	A
ApproachDel:	10.8			8.5			8.9			8.8		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.8			8.5			8.9			8.8		
LOS by Appr:	B			A			A			A		
AllWayAvgQ:	0.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0

****

Note: Queue reported is the number of cars per lane.

****

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

Intersection #4 Connector to Capitol Expwy. & Eastridge Loop

Cycle (sec):	1	Critical Vol./Cap.(X):	1.547
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	13.6
Optimal Cycle:	0	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Yield Sign			Yield Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1	1 0	0	1 0	2 0	0	0 0	0 0	0	2 0	0 0	1
Volume Module:												
Base Vol:	0	55	254	255	82	0	0	0	0	256	0	245
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	55	254	255	82	0	0	0	0	256	0	245
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Pr. Trips:	0	0	0	11	0	0	0	0	0	0	0	0
Initial Fut:	0	55	254	266	82	0	0	0	0	256	0	245
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	0	57	265	277	85	0	0	0	0	267	0	255
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	57	265	277	85	0	0	0	0	267	0	255
Saturation Flow Module:												
Sat/Lane:	0	0	0	0	0	0	0	0	0	0	0	0
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	171	171	347	694	0	0	0	0	690	0	345
Capacity Analysis Module:												
Vol/Sat:	0.00	0.34	1.55	0.80	0.12	0.00	0.00	0.00	0.00	0.39	0.00	0.74
Crit Moves:			****	****					****			****
Green/Cycle:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume/Cap:	0.00	0.34	1.55	0.80	0.12	0.00	0.00	0.00	0.00	0.39	0.00	0.74
Delay/Veh:	0.0	3.6	357.7	20.8	1.6	0.0	0.0	0.0	0.0	4.3	0.0	16.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	3.6	357.7	20.8	1.6	0.0	0.0	0.0	0.0	4.3	0.0	16.6
DesignQueue:	0	0	0	0	0	0	0	0	0	0	0	0

Note: Queue reported is the number of cars per lane.

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 Connector to Capitol Expwy. & Capitol Expwy.

Cycle (sec):	160	Critical Vol./Cap.(X):	0.366
Loss Time (sec):	9 (Y+R=4.0 sec)	Average Delay (sec/veh):	22.8
Optimal Cycle:	33	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			Split Phase			Split Phase		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	7	10	10	7	10	10	7	10	10	0	0	0
Lanes:	2 0	4 0	0	0 0	4 0	1	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	192	1250	0	0	1209	310	239	0	275	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	192	1250	0	0	1209	310	239	0	275	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	192	1250	0	0	1209	310	239	0	275	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	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:	192	1250	0	0	1209	310	239	0	275	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	192	1250	0	0	1209	310	239	0	275	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	192	1250	0	0	1209	310	239	0	275	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	1.00	1.00	0.91	0.85	0.92	1.00	0.85	1.00	1.00	1.00
Lanes:	2.00	4.00	0.00	0.00	4.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	3502	6916	0	0	6916	1615	3502	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.18	0.00	0.00	0.17	0.19	0.07	0.00	0.17	0.00	0.00	0.00
Crit Moves:	****				****				****			
Green/Cycle:	0.15	0.63	0.00	0.00	0.48	0.79	0.32	0.00	0.47	0.00	0.00	0.00
Volume/Cap:	0.37	0.29	0.00	0.00	0.37	0.24	0.22	0.00	0.37	0.00	0.00	0.00
Uniform Del:	61.2	13.5	0.0	0.0	26.4	4.2	40.2	0.0	27.5	0.0	0.0	0.0
IncremntDel:	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.0
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Delay/Veh:	61.6	13.5	0.0	0.0	26.5	4.3	40.3	0.0	27.8	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.6	13.5	0.0	0.0	26.5	4.3	40.3	0.0	27.8	0.0	0.0	0.0
LOS by Move:	E	B	A	A	C	A	D	A	C	A	A	A
HCM2k95thQ:	9	14	0	0	18	8	8	0	16	0	0	0

Note: Queue reported is the number of cars per lane.

QUEUE CALCULATIONS
Poisson Arrival Pattern

Project:	Eastridge Transit Center		
Intersection:	Connector to Capitol Expwy and Eastridge Loop		
Scenario:	Existing	**Cycle Length (sec.):**	95
Peak Hour:	Saturday Peak Hour	**Vehicle Length (feet):**	25

Move	Hourly Volume	No. of Lanes	Green/ Cycle	Queue per Lane (feet) 50% Level	95% Level
Northbound					
Left	0	0	10%	**#VALUE!**	**#VALUE!**
Through	55	1	20%	**25**	**75**
Through-Right	254	1	10%	**150**	**250**
Southbound					
Left	255	1	20%	**125**	**225**
Through	82	2	30%	**25**	**50**
Right	0	0	20%	**#VALUE!**	**#VALUE!**
Eastbound					
Left	0	1	20%	**0**	**0**
Through	0	0	30%	**#VALUE!**	**#VALUE!**
Right	0	1	10%	**0**	**0**
Westbound					
Left	256	2	20%	**75**	**150**
Through	0	0	30%	**#VALUE!**	**#VALUE!**
Right	245	1	40%	**100**	**175**

QUEUE CALCULATIONS
Poisson Arrival Pattern

Project:	Eastridge Transit Center		
Intersection:	Connector to Capitol Expwy and Eastridge Loop		
Scenario:	Existing + Project	**Cycle Length (sec.):**	95
Peak Hour:	Saturday Peak Hour	**Vehicle Length (feet):**	25

Move	Hourly Volume	No. of Lanes	Green/ Cycle	Queue per Lane (feet) 50% Level	95% Level
Northbound					
Left	0	0	10%	**#VALUE!**	**#VALUE!**
Through	55	1	20%	**25**	**75**
Through-Right	254	1	10%	**150**	**250**
Southbound					
Left	266	1	20%	**125**	**250**
Through	82	2	30%	**25**	**50**
Right	0	0	20%	**#VALUE!**	**#VALUE!**
Eastbound					
Left	0	1	20%	**0**	**0**
Through	0	0	30%	**#VALUE!**	**#VALUE!**
Right	0	1	10%	**0**	**0**
Westbound					
Left	256	2	20%	**75**	**150**
Through	0	0	30%	**#VALUE!**	**#VALUE!**
Right	245	1	40%	**100**	**175**