TRAFFIC IMPACT ANALYSIS

AETNA SPRINGS RESORT

POPE VALLEY, CALIFORNIA

This traffic study has been prepared under the supervision of
Pritam Deshmukh, P.E.

Signed _____

LSA

TRAFFIC IMPACT ANALYSIS

AETNA SPRINGS RETREAT

POPE VALLEY, CALIFORNIA

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LSA

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INTRODUCTION

The purpose of this Traffic Impact Analysis (TIA) is to identify the potential traffic impacts associated with a maximum of 200 overnight guests at the Aetna Springs Retreat in the unincorporated area of Pope Valley in Napa County (County), California. The project is located on Aetna Springs Road, west of Pope Valley Road–Butts Canyon Road. Figure 1 shows the location of the proposed project and study area intersections analyzed in this report. A site plan of the Aetna Springs Retreat project is illustrated in Figure 2.

The project includes a maximum of 200 overnight guests at the retreat. The project applicant is renovating the existing buildings in order to facilitate the full restoration and operation of the Aetna Springs Retreat. Other improvements are included as part of the project (i.e., relocation of buildings and a swimming pool and other rehabilitations), but these physical changes are not likely to generate vehicular traffic for purposes of this analysis.

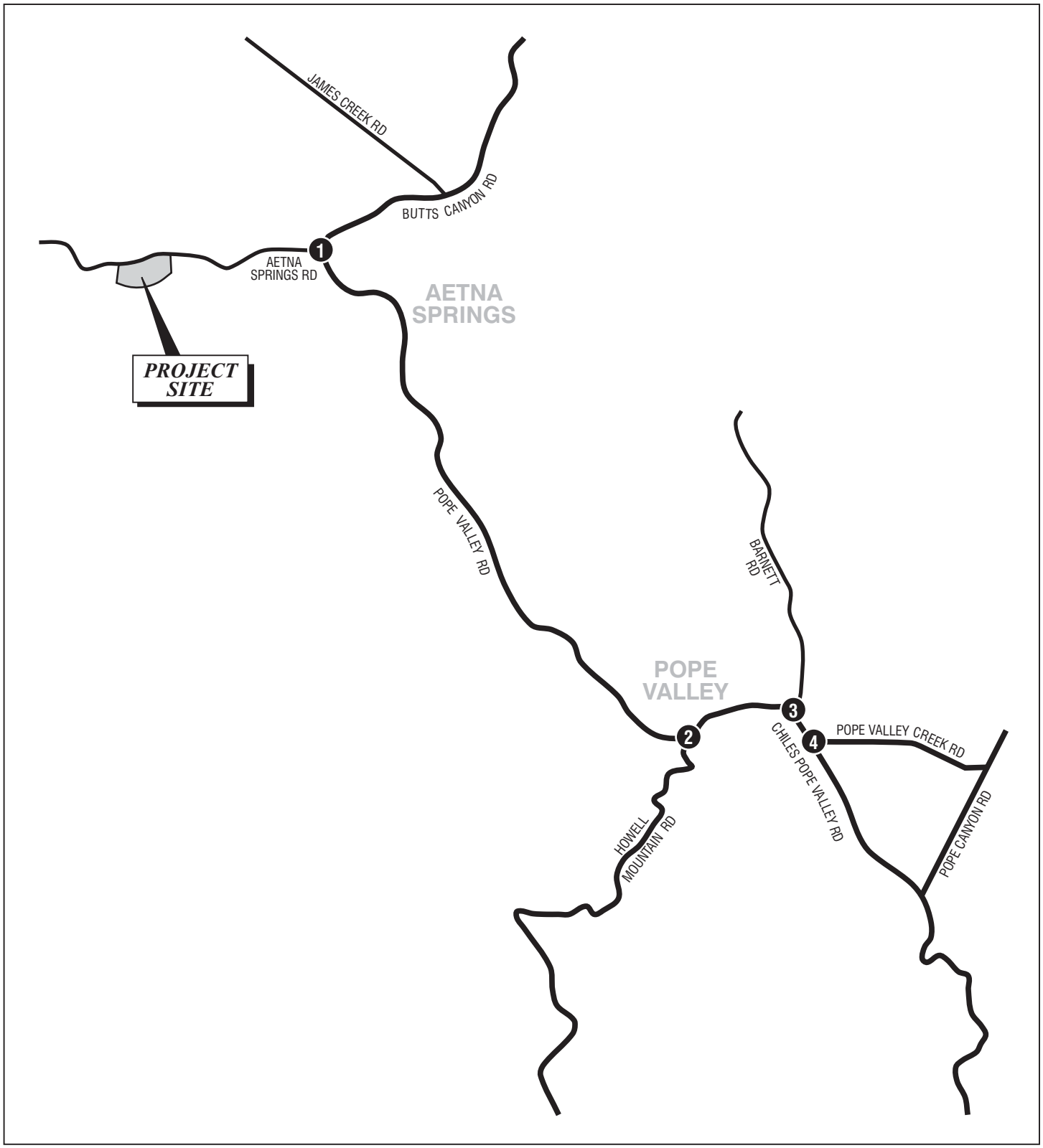
METHODOLOGY

This TIA is prepared in consultation with County Public Works staff and consistent with the requirements of the County Traffic Impact Study Policies (approved May 12, 2008). Although the project already has a use permit for the level of use contemplated, for simplicity, this TIA evaluates traffic impacts against existing conditions. Per discussions with County Public Works staff, the traffic analysis examines existing and existing plus project conditions during the p.m. peak hour.

Study Area. The study area was confirmed with County Public Works staff prior to preparation of the TIA and represents the key locations to assess changes in operation based on traffic generated by the project. The following four intersections are included in the study area, as shown on Figure 1:

1. Pope Valley Road/Aetna Springs Road
2. Howell Mountain Road/Pope Valley Road
3. Chiles Pope Valley Road/Barnett Road
4. Chiles Pope Valley Road/Pope Valley Cross Road

Intersection Level of Service Methodology. To determine the peak-hour study area intersection operations, the 2000 Highway Capacity Manual (HCM 2000) methodology was used to calculate intersection levels of service (LOS) at the unsignalized (i.e., two-way stop-controlled [TWSC]) intersections. The HCM 2000 unsignalized intersection methodology presents LOS in terms of total intersection delay and approach delay of the major and minor streets (in seconds per vehicle). The relationship of delay and LOS at unsignalized intersections is summarized below:



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LEGEND

4 Study Area Intersection

FIGURE 1

N

0 2000 4000

FEET

Aetna Springs Retreat

Project Location and Study Area Intersections

I:\CRS1101\G\Loc & Ints.cdr (10/4/11)

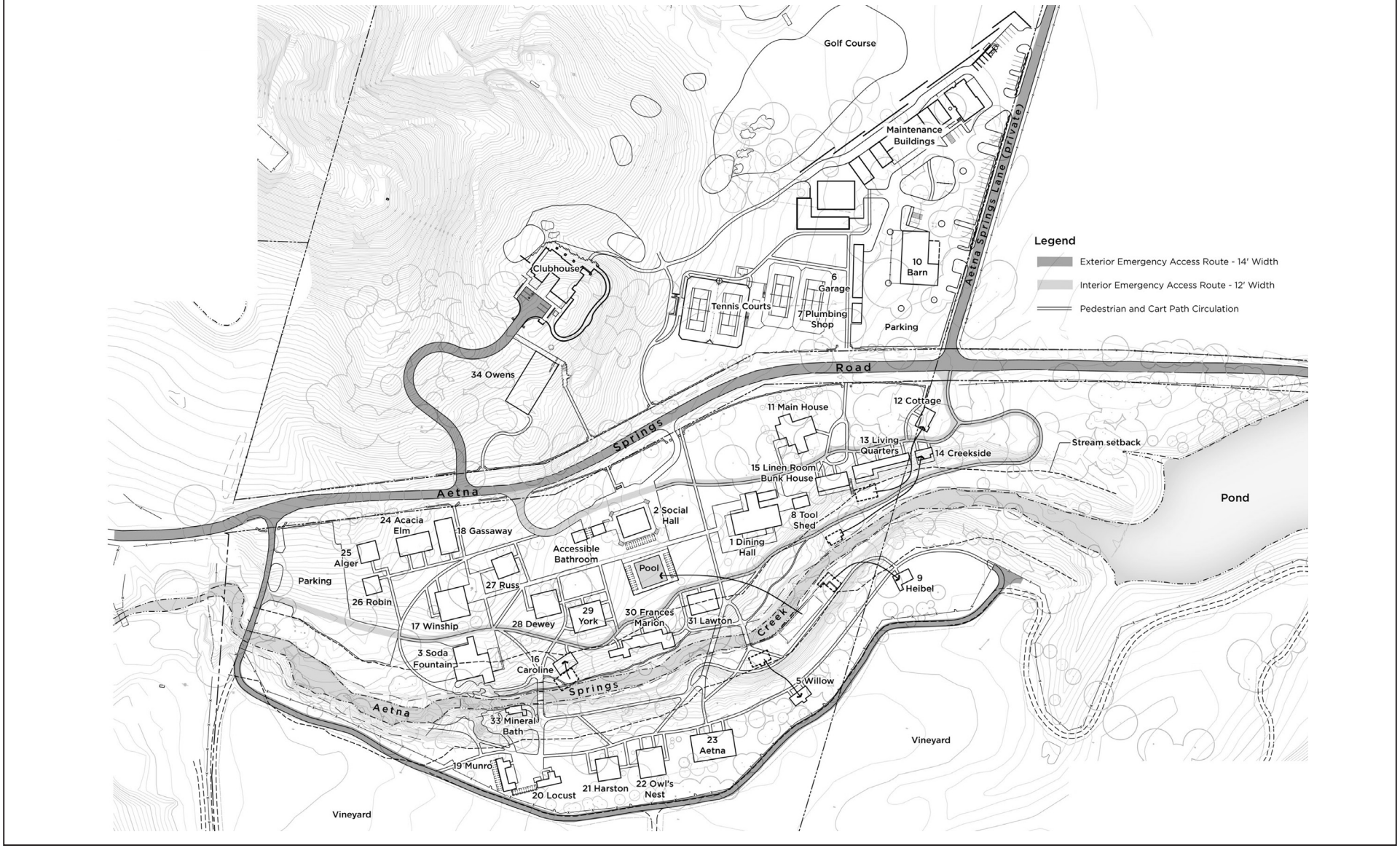

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FIGURE 2

N

0 130 260

FEET

SOURCE: Architectural Resources Group, Inc.

I:\CRS1101\G\Site Plan.cdr (10/4/11)

Aetna Springs Retreat

Site Plan

Level of Service	Unsignalized Intersection Delay (seconds)	Level of Service	Unsignalized Intersection Delay (seconds)
A	≤10.0	D	>25.0 and ≤35.0
B	>10.0 and ≤15.0	E	>35.0 and ≤50.0
C	>15.0 and ≤25.0	F	>50.0

According to County Traffic Impact Study Policies, the County shall seek to maintain LOS D or better at all intersections. If a particular facility has acceptable LOS prior to the addition of project traffic and unacceptable LOS with the addition of project traffic, that change constitutes a significant project impact. If a significant project impact is identified, the project is required to mitigate the impacted location in compliance with the County's policy for acceptable LOS.

EXISTING CONDITIONS

Key roadways in the vicinity of the proposed project are as follows:

1. **Butts Canyon Road.** Butts Canyon Road is a two-lane rural road connecting State Route 29 (SR-29) in the census-designated place of Middleton with Pope Valley Road and Aetna Springs Road. Access to the project site from Butts Canyon Road is provided at Aetna Springs Road.
2. **Pope Valley Road.** Pope Valley Road is a two-lane rural road connecting Butts Canyon Road and Aetna Springs Road with Howell Mountain Road and Chiles Pope Valley Road. Access to the project site from Pope Valley Road is provided at Aetna Springs Road.
3. **Howell Mountain Road.** Howell Mountain Road–Deer Park Road is a two-lane rural road connecting SR-29 in the City of St. Helena with Pope Valley Road and Chiles Pope Valley Road.
4. **Chiles Pope Valley Road.** Chiles Pope Valley Road is a two-lane rural road connecting State Route 128 (SR-128) at the Lake Hennessey City Recreation Area with Pope Valley Road and Howell Mountain Road.
5. **Aetna Springs Road.** Aetna Springs Road is a two-lane rural road that extends west of Pope Valley Road to its terminus at Aetna Mine Road. Direct access to the project site is provided via Aetna Springs Road.

Existing (June 2008) peak-hour traffic volumes were obtained from a traffic analysis conducted in the area by George W. Nickelson. The 2008 traffic volumes are considered to be representative of current traffic conditions within the project study area, as no development activity in the immediate area has occurred within the past 3 years. Therefore, traffic volumes have not significantly changed within the project study area between 2008 and 2011. It should be noted that traffic volumes have decreased in many areas throughout California over the last 3 years due to economic conditions. The existing peak-hour traffic volumes at the four study area intersections are illustrated in Figure 3.

As previously discussed, the HCM methodology was used to determine the LOS at intersections within the study area. The existing (baseline and plus project) HCM worksheets are provided in Appendix A. A summary of existing intersection LOS is presented in Table A.

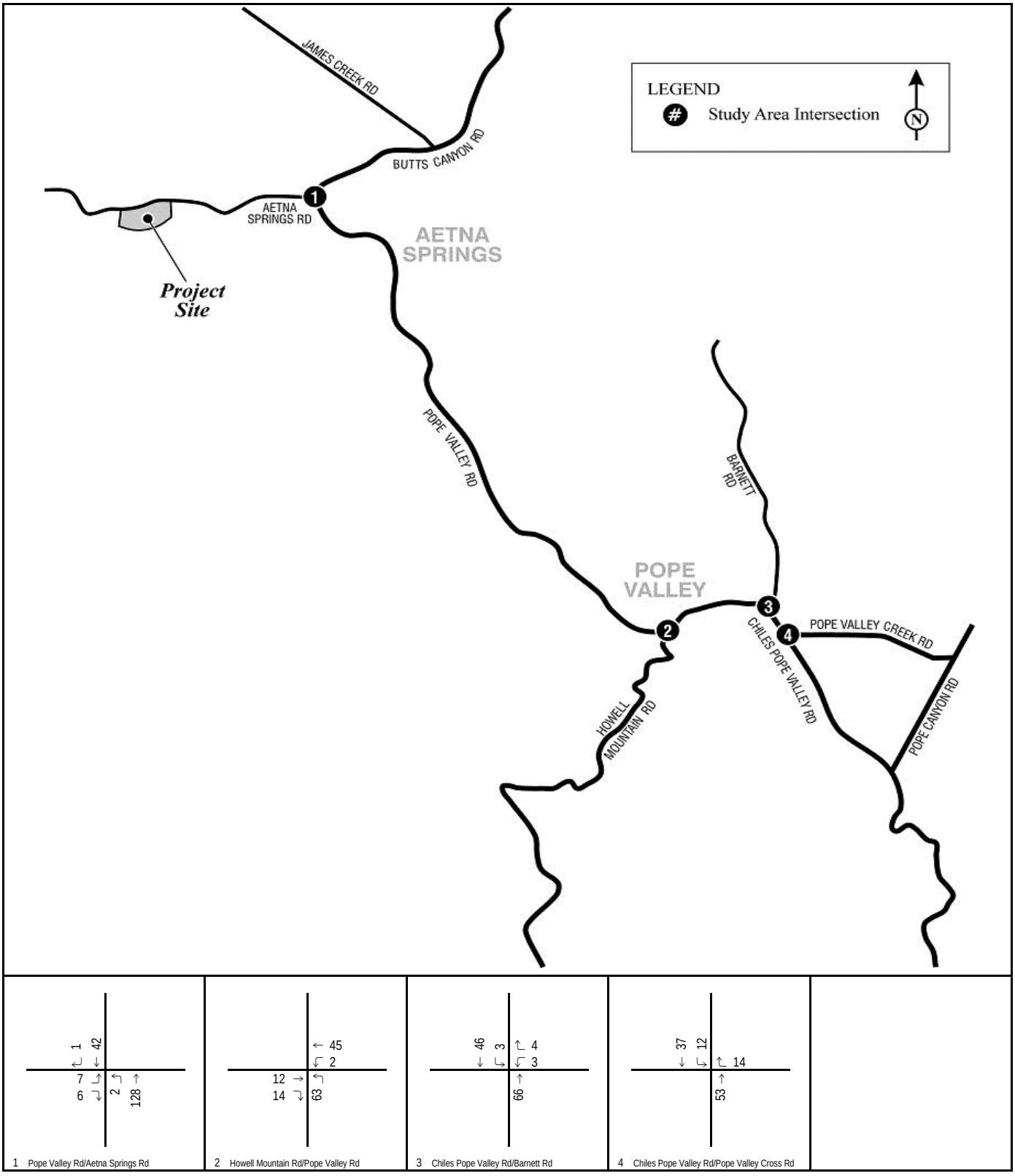

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FIGURE 3

Legend

123456 PM Volume

Aetna Springs Retreat

Existing Peak-Hour Traffic Volumes

P:\CRS1101\excel\existing vol graphic.xls (9/29/2011)

Table A: Existing Level of Service Summary

	Intersection	PM Peak Hour	
		Delay	LOS
1	Pope Valley Road/Aetna Springs Road	9.0	A
2	Howell Mountain Road/Pope Valley Road	9.1	A
3	Chiles Pope Valley Road/Barnett Road	8.8	A
4	Chiles Pope Valley Road/Pope Valley Cross Road	8.6	A

Delay is reported in seconds.
LOS = level of service

As this table indicates, all study area intersections currently operate at LOS A, which is an acceptable LOS per County standards.

PROPOSED PROJECT

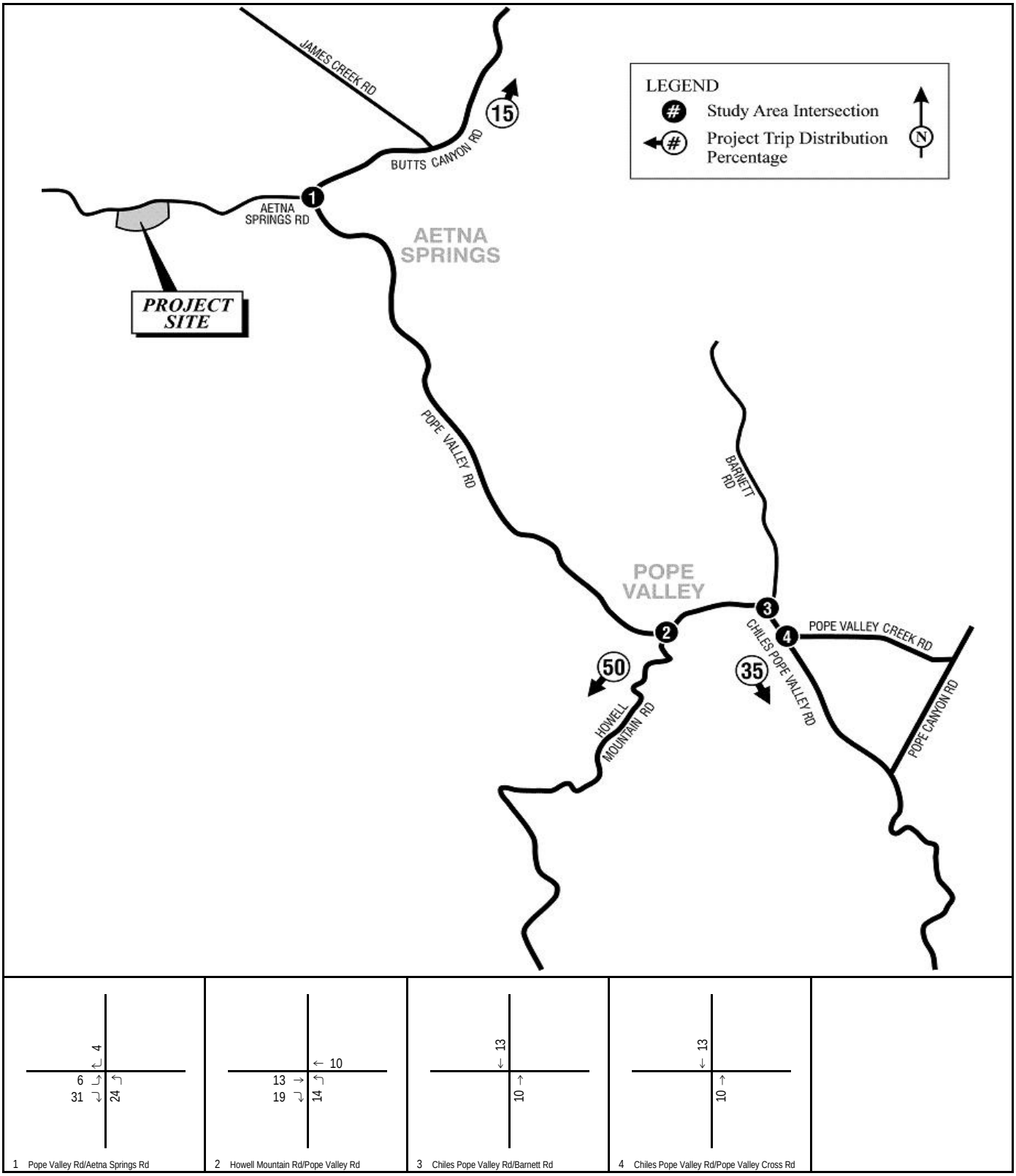
The project proposes to accommodate 200 overnight guests at the Aetna Springs Retreat, which is located west of the Pope Valley Road /Aetna Springs Road intersection. Other improvements include relocation and restoration of existing buildings; however, these project components are considered site amenities that will not generate additional vehicle trips. For trip generation purposes, the project consists of 200 overnight guests.

LSA referenced the Institute of Transportation Engineers (ITE) *Trip Generation* (8th Edition, 2008) (Land Use Code 330 – Resort Hotel) for trip generation purposes. Based on 200 overnight guests, the project is forecast to generate approximately 650 daily trips and 65 p.m. peak-hour trips (28 inbound and 37 outbound). The trip generation includes both guests and employees, and services associated with the operations of the retreat.

Access to the project site is provided via four existing driveways on Aetna Springs Road. The project trips were distributed to the surrounding roadways based on the location of the project in relation to local and regional transportation facilities. The project trip distribution was discussed with County Public Works staff and applied to the project trip generation to arrive at the project trip assignment. The trip distribution percentages were multiplied by the project trip generation to arrive at project-generated trips at each intersection. The project trip distribution and assignment are illustrated in Figure 4. As shown in this figure, 15 percent of the project trips are destined to the north (via Butts Canyon Road) and 85 percent are destined to the south (50 percent via Howell Mountain Road and 35 percent via Chiles Pope Valley Road).

EXISTING PLUS PROJECT CONDITIONS

The existing plus project peak-hour traffic volumes at the four study area intersections are illustrated in Figure 5. Table B provides a summary of existing plus project intersection LOS.



LSA

FIGURE 4

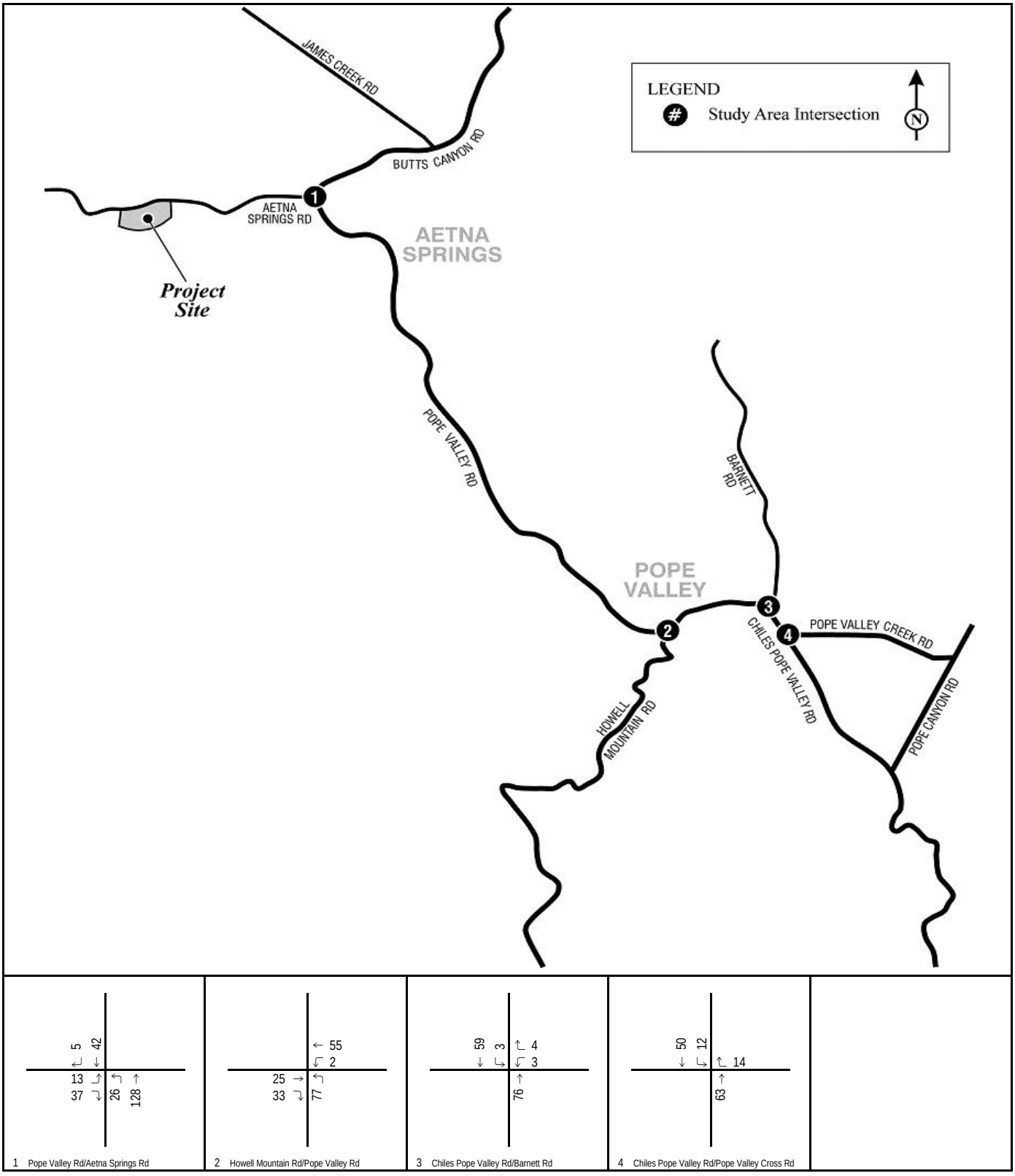
Legend

123456 PM Volume

Aetna Springs Retreat

Project Trip Distribution and Assignment

P:\CRS1101\excel\project vol graphic.xls (9/29/2011)



LSA

FIGURE 5

Legend

123456 PM Volume

Aetna Springs Retreat

Existing Plus Project Peak-Hour Traffic Volumes

P:\CRS1101\excel\existing+project vol graphic.xls (9/29/2011)

Table B: Existing Plus Project Level of Service Summary

	Intersection	Existing PM Peak Hour		Plus Project PM Peak Hour		Significant Impact?
		Delay	LOS	Delay	LOS	
1	Pope Valley Road/Aetna Springs Road	9.0	A	9.0	A	No
2	Howell Mountain Road/Pope Valley Road	9.1	A	9.4	A	No
3	Chiles Pope Valley Road/Barnett Road	8.8	A	8.9	A	No
4	Chiles Pope Valley Road/Pope Valley Cross Road	8.6	A	8.6	A	No

Delay is reported in seconds.
LOS = level of service

As this table indicates, all study area intersections are forecast to operate at acceptable LOS A. Therefore, no significant project impacts are created at study area intersections with implementation of the project.

LEFT-TURN LANE WARRANTS

According to the County Road and Street Standards (adopted August 9, 2011) and County Code Sections 18.112.040 through 18.112.080, construction of a left-turn lane on a County-maintained road (i.e., Aetna Springs Road) shall be considered if one of the following warrants is met:

1. When the plotted point representing the average daily trip (ADT) volume on a County-maintained road and the project ADT volume on a private road exceeds the ADT volume (curve) on the Left-Turn Lane Warrant Graph provided in Appendix B of this report
2. If the corner sight distance in the advancing direction, measured from the driveway, is less than required per Caltrans design standards (usually the posted speed limit multiplied by 11)
3. If traffic conditions or turning movements pose a considerable threat to public life and safety, as recognized by the Director of Public Works

According to the Left-Turn Lane Warrant Graph, the plotted point representing 500 ADT on the County Roadway (Aetna Springs Road) and 300 ADT on the private road (project driveway) is the maximum allowable ADT before a left-turn lane is required. Based on traffic counts obtained from the County website, Aetna Springs Road (west of Pope Valley Road–Butts Canyon Road) has 346 ADT. The 346 ADT on a County Roadway is below the 500 ADT minimum before a left-turn lane should be considered. The potential conflict between east-west through traffic on Aetna Springs Road and project traffic destined to the retreat is low as adequate gaps are provided for left-turn movements into the project site. Therefore, a left-turn lane would not be required at any of the driveways on Aetna Springs Road.

Aetna Springs Road is a relatively narrow, low-speed, low-volume roadway. The sight distance along Aetna Springs Road exceeds 500 feet in each direction. The east–west traffic volumes along Aetna Springs Road would not pose a threat to vehicles turning in/out of the Aetna Springs Retreat. For these reasons, left-turn lanes are neither required nor recommended at the project driveways.

CONCLUSIONS

Based on the LOS analysis of existing and existing plus project conditions, the four study area intersections will continue to operate at acceptable LOS. Therefore, the project is not forecast to create a significant intersection impact.

Based on evaluation of County left-turn lane warrants, adequate access to/from the Aetna Springs Retreat site will be provided along Aetna Springs Road. Therefore, left-turn lanes at the project driveways are not required.

As a result, no traffic/circulation mitigation or improvements are required.

APPENDIX A

HCM WORKSHEETS

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

Intersection #1 Pope Valley Road/Aetna Springs Road

Average Delay (sec/veh): 0.7 Worst Case Level Of Service: A[9.0]

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Uncontrolled						Uncontrolled						Stop Sign						Stop Sign					
Rights:	Include						Include						Include						Include					
Lanes:	0	1	0	0	0		0	0	0	1	0		0	0	1!	0	0		0	0	0	0	0	
Volume Module:																								
Base Vol:	2	128		0		0	42		1			7	0		6			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:	2	128		0		0	42		1			7	0		6			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:	2	128		0		0	42		1			7	0		6			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:	2	128		0		0	42		1			7	0		6			0	0		0			
Reduct Vol:	0	0		0		0	0		0			0	0		0			0	0		0			
FinalVolume:	2	128		0		0	42		1			7	0		6			0	0		0			
Critical Gap Module:																								
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx						6.4	6.5		6.2	xxxxx	xxxx	xxxxx						
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx						3.5	4.0		3.3	xxxxx	xxxx	xxxxx						
Capacity Module:																								
Cnflict Vol:	43	xxxx	xxxxx	xxxx	xxxx	xxxxx						175	175		43	xxxx	xxxx	xxxxx						
Potent Cap.:	1579	xxxx	xxxxx	xxxx	xxxx	xxxxx						820	722		1034	xxxx	xxxx	xxxxx						
Move Cap.:	1579	xxxx	xxxxx	xxxx	xxxx	xxxxx						819	722		1034	xxxx	xxxx	xxxxx						
Volume/Cap:	0.00	xxxx	xxxx	xxxx	xxxx	xxxx						0.01	0.00		0.01	xxxx	xxxx	xxxx						
Level Of Service Module:																								
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Control Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*												
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	906	xxxxx	xxxx	xxxx	xxxxx												
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx	xxxx	xxxxx												
Shrd ConDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.0	xxxxx	xxxxx	xxxx	xxxxx												
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*												
ApproachDel:	xxxxxx			xxxxxx			9.0			xxxxxx														
ApproachLOS:	*			*			A			*														

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

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

Intersection #2 Howell Mountain Road/Pope Valley Road

Average Delay (sec/veh): 4.3 Worst Case Level Of Service: A[9.1]

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						Uncontrolled						Uncontrolled					
Rights:	Include						Include						Include						Include					
Lanes:	1	0	0	0	0		0	0	1!	0	0		0	0	0	1	0		0	1	0	0	0	
Volume Module:																								
Base Vol:	63		0		0		0		0		0		0		12		14		2		45		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:	63		0		0		0		0		0		0		12		14		2		45		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:	63		0		0		0		0		0		0		12		14		2		45		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:	63		0		0		0		0		0		0		12		14		2		45		0	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
FinalVolume:	63		0		0		0		0		0		0		12		14		2		45		0	
Critical Gap Module:																								
Critical Gp:	6.4	xxxx	xxxxx				7.1		6.5		6.2		xxxxx	xxxx	xxxxx				4.1	xxxx	xxxxx			
FollowUpTim:	3.5	xxxx	xxxxx				3.5		4.0		3.3		xxxxx	xxxx	xxxxx				2.2	xxxx	xxxxx			
Capacity Module:																								
Cnflict Vol:	68	xxxx	xxxxx				68		75		45		xxxx	xxxx	xxxxx				26	xxxx	xxxxx			
Potent Cap.:	942	xxxx	xxxxx				930		819		1031		xxxx	xxxx	xxxxx				1601	xxxx	xxxxx			
Move Cap.:	941	xxxx	xxxxx				929		818		1031		xxxx	xxxx	xxxxx				1601	xxxx	xxxxx			
Volume/Cap:	0.07	xxxx	xxxx				0.00		0.00		0.00		xxxx	xxxx	xxxx				0.00	xxxx	xxxx			
Level Of Service Module:																								
2Way95thQ:	0.2	xxxx	xxxxx				xxxx		xxxx		xxxxx		xxxx	xxxx	xxxxx				0.0	xxxx	xxxxx			
Control Del:	9.1	xxxx	xxxxx				xxxxx		xxxx		xxxxx		xxxxx	xxxx	xxxxx				7.3	xxxx	xxxxx			
LOS by Move:	A		*		*		*		*		*		*		*		*		A		*		*	
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx	xxxx	xxxxx				xxxx		0		xxxxx		xxxx	xxxx	xxxxx				xxxx	xxxx	xxxxx			
SharedQueue:	xxxxx	xxxx	xxxxx				xxxxx		xxxx		xxxxx		xxxxx	xxxx	xxxxx				0.0	xxxx	xxxxx			
Shrd ConDel:	xxxxx	xxxx	xxxxx				xxxxx		xxxx		xxxxx		xxxxx	xxxx	xxxxx				7.3	xxxx	xxxxx			
Shared LOS:	*		*		*		*		*		*		*		*		*		A		*		*	
ApproachDel:	9.1						xxxxxx						xxxxxx						xxxxxx					
ApproachLOS:	A						*						*						*					

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

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

Intersection #3 Chiles Pope Valley Road/Barnett Road

Average Delay (sec/veh): 0.7 Worst Case Level Of Service: A[8.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1	0	0	0 1	0	0 0	0 0	0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	0	66	0	3	46	0	0	0	0	3	0	4
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	66	0	3	46	0	0	0	0	3	0	4
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	66	0	3	46	0	0	0	0	3	0	4
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:	0	66	0	3	46	0	0	0	0	3	0	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	66	0	3	46	0	0	0	0	3	0	4
Critical Gap Module:												
Critical Gp:	xxxxx xxxx xxxxx			4.1 xxxx xxxxx			xxxxx xxxx xxxxx			6.4 6.5		6.2
FollowUpTim:	xxxxx xxxx xxxxx			2.2 xxxx xxxxx			xxxxx xxxx xxxxx			3.5 4.0		3.3
Capacity Module:												
Cnflict Vol:	xxxx xxxx xxxxx			66 xxxx xxxxx			xxxx xxxx xxxxx			118 118		66
Potent Cap.:	xxxx xxxx xxxxx			1549 xxxx xxxxx			xxxx xxxx xxxxx			883 776		1003
Move Cap.:	xxxx xxxx xxxxx			1549 xxxx xxxxx			xxxx xxxx xxxxx			881 775		1003
Volume/Cap:	xxxx xxxx xxxx			0.00 xxxx xxxx			xxxx xxxx xxxx			0.00 0.00		0.00
Level Of Service Module:												
2Way95thQ:	xxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx		
Control Del:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx xxxx xxxxx		
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx 947 xxxxx		
SharedQueue:	xxxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx 0.0 xxxxx		
Shrd ConDel:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx 8.8 xxxxx		
Shared LOS:	*	*	*	A	*	*	*	*	*	*	A	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			8.8		
ApproachLOS:	*			*			*			A		

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

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

Intersection #4 Chiles Pope Valley Road/Pope Valley Cross Road

Average Delay (sec/veh): 1.8 Worst Case Level Of Service: A[8.6]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1	0	0	0 1	0	0 0	0 0	0	0 0	0 0	0	0 1
Volume Module:												
Base Vol:	0	53	0	12	37	0	0	0	0	0	0	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:	0	53	0	12	37	0	0	0	0	0	0	14
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	53	0	12	37	0	0	0	0	0	0	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:	0	53	0	12	37	0	0	0	0	0	0	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	53	0	12	37	0	0	0	0	0	0	14
Critical Gap Module:												
Critical Gp:	xxxxx xxxx xxxxx			4.1 xxxx xxxxx			xxxxx xxxx xxxxx			xxxx xxxx		6.2
FollowUpTim:	xxxxx xxxx xxxxx			2.2 xxxx xxxxx			xxxxx xxxx xxxxx			xxxx xxxx		3.3
Capacity Module:												
Cnflict Vol:	xxxx xxxx xxxxx			53 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx		53
Potent Cap.:	xxxx xxxx xxxxx			1566 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx		1020
Move Cap.:	xxxx xxxx xxxxx			1566 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx		1020
Volume/Cap:	xxxx xxxx xxxx			0.01 xxxx xxxx			xxxx xxxx xxxx			xxxx xxxx		0.01
Level Of Service Module:												
2Way95thQ:	xxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx		0.0
Control Del:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx xxxx		8.6
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	A
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx		
SharedQueue:	xxxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx xxxx xxxxx		
Shrd ConDel:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx xxxx xxxxx		
Shared LOS:	*	*	*	A	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			8.6		
ApproachLOS:	*			*			*			A		

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

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

Intersection #1 Pope Valley Road/Aetna Springs Road

Average Delay (sec/veh): 2.6 Worst Case Level Of Service: A[9.0]

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Uncontrolled						Uncontrolled						Stop Sign						Stop Sign					
Rights:	Include						Include						Include						Include					
Lanes:	0	1	0	0	0		0	0	0	1	0		0	0	1!	0	0		0	0	0	0	0	
Volume Module:																								
Base Vol:	2	128		0		0	42		1			7	0		6			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:	2	128		0		0	42		1			7	0		6			0	0		0			
Added Vol:	24	0		0		0	0		4			6	0		31			0	0		0			
PasserByVol:	0	0		0		0	0		0			0	0		0			0	0		0			
Initial Fut:	26	128		0		0	42		5			13	0		37			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:	26	128		0		0	42		5			13	0		37			0	0		0			
Reduct Vol:	0	0		0		0	0		0			0	0		0			0	0		0			
FinalVolume:	26	128		0		0	42		5			13	0		37			0	0		0			
Critical Gap Module:																								
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx						6.4	6.5		6.2	xxxxx	xxxx	xxxxx						
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx						3.5	4.0		3.3	xxxxx	xxxx	xxxxx						
Capacity Module:																								
Cnflict Vol:	47	xxxx	xxxxx	xxxx	xxxx	xxxxx						225	225		45	xxxx	xxxx	xxxxx						
Potent Cap.:	1573	xxxx	xxxxx	xxxx	xxxx	xxxxx						768	678		1031	xxxx	xxxx	xxxxx						
Move Cap.:	1573	xxxx	xxxxx	xxxx	xxxx	xxxxx						758	667		1031	xxxx	xxxx	xxxxx						
Volume/Cap:	0.02	xxxx	xxxx	xxxx	xxxx	xxxx						0.02	0.00		0.04	xxxx	xxxx	xxxx						
Level Of Service Module:																								
2Way95thQ:	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Control Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
LOS by Move:	A	*		*		*	*		*		*	*												
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	943	xxxxx	xxxx	xxxx	xxxxx												
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	xxxx	xxxxx												
Shrd ConDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.0	xxxxx	xxxxx	xxxx	xxxxx												
Shared LOS:	A	*		*		*	*		A		*	*												
ApproachDel:	xxxxxx			xxxxxx			9.0			xxxxxx														
ApproachLOS:	*			*			A			*														

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

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

Intersection #2 Howell Mountain Road/Pope Valley Road

Average Delay (sec/veh): 3.8 Worst Case Level Of Service: A[9.4]

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			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0 0	0 0		0 0 1!	0 0		0 0 0	1 0		0 1 0	0 0	
Volume Module:												
Base Vol:	63	0	0	0	0	0	0	12	14	2	45	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:	63	0	0	0	0	0	0	12	14	2	45	0
Added Vol:	14	0	0	0	0	0	0	13	19	0	10	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	0	0	0	0	0	0	25	33	2	55	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:	77	0	0	0	0	0	0	25	33	2	55	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	77	0	0	0	0	0	0	25	33	2	55	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	xxxxx	7.1	6.5	6.2	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	101	xxxx	xxxxx	101	117	55	xxxx	xxxx	xxxxx	58	xxxx	xxxxx
Potent Cap.:	903	xxxx	xxxxx	886	777	1018	xxxx	xxxx	xxxxx	1559	xxxx	xxxxx
Move Cap.:	902	xxxx	xxxxx	885	776	1018	xxxx	xxxx	xxxxx	1559	xxxx	xxxxx
Volume/Cap:	0.09	xxxx	xxxx	0.00	0.00	0.00	xxxx	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	9.4			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	A			*			*			*		

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

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

Intersection #3 Chiles Pope Valley Road/Barnett Road

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: A[8.9]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1	0	0	0 1	0	0 0	0 0	0	0 0	0 0	1! 0	0
Volume Module:												
Base Vol:	0	66	0	3	46	0	0	0	0	3	0	4
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	66	0	3	46	0	0	0	0	3	0	4
Added Vol:	0	10	0	0	13	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	76	0	3	59	0	0	0	0	3	0	4
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:	0	76	0	3	59	0	0	0	0	3	0	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	76	0	3	59	0	0	0	0	3	0	4
Critical Gap Module:												
Critical Gp:	xxxxx xxxx xxxxx			4.1 xxxx xxxxx			xxxxx xxxx xxxxx			6.4 6.5		6.2
FollowUpTim:	xxxxx xxxx xxxxx			2.2 xxxx xxxxx			xxxxx xxxx xxxxx			3.5 4.0		3.3
Capacity Module:												
Cnflict Vol:	xxxx xxxx xxxxx			76 xxxx xxxxx			xxxx xxxx xxxxx			141 141		76
Potent Cap.:	xxxx xxxx xxxxx			1536 xxxx xxxxx			xxxx xxxx xxxxx			857 754		991
Move Cap.:	xxxx xxxx xxxxx			1536 xxxx xxxxx			xxxx xxxx xxxxx			855 752		991
Volume/Cap:	xxxx xxxx xxxx			0.00 xxxx xxxx			xxxx xxxx xxxx			0.00 0.00		0.00
Level Of Service Module:												
2Way95thQ:	xxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx		
Control Del:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx xxxx xxxxx		
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx xxxx xxxxx			xxxx 928 xxxxx		
SharedQueue:	xxxxx xxxx xxxxx			0.0 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx 0.0 xxxxx		
Shrd ConDel:	xxxxx xxxx xxxxx			7.3 xxxx xxxxx			xxxxx xxxx xxxxx			xxxxx 8.9 xxxxx		
Shared LOS:	*	*	*	A	*	*	*	*	*	*	A	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			8.9		
ApproachLOS:	*			*			*			A		

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

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

Intersection #4 Chiles Pope Valley Road/Pope Valley Cross Road

Average Delay (sec/veh): 1.5 Worst Case Level Of Service: A[8.6]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1	0	0	0 1	0	0 0	0 0	0	0 0	0 0	0	0 1
Volume Module:												
Base Vol:	0	53	0	12	37	0	0	0	0	0	0	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:	0	53	0	12	37	0	0	0	0	0	0	14
Added Vol:	0	10	0	0	13	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	63	0	12	50	0	0	0	0	0	0	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:	0	63	0	12	50	0	0	0	0	0	0	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	63	0	12	50	0	0	0	0	0	0	14
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	63	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	63
Potent Cap.:	xxxx	xxxx	xxxxx	1553	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	1007
Move Cap.:	xxxx	xxxx	xxxxx	1553	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	1007
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	0.0
Control Del:	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	8.6
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	A
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			8.6		
ApproachLOS:	*			*			*			A		

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

APPENDIX B

LEFT-TURN LANE WARRANT GRAPH

Left Turn Lane Warrant Graph