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April 8, 2008

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TRAFFIC IMPACT ANALYSIS FOR THE ESTRELLA RIVER VINEYARD AGRICULTURAL CLUSTER SUBDIVISION (TRACT 2905), COUNTY OF SAN LUIS OBISPO COUNTY

Associated Transportation Engineers (ATE) has prepared the following traffic impact analysis for the Estrella River Vineyard Agricultural Cluster Subdivision (Tract 2905), proposed in the Paso Robles area of San Luis Obispo County. It is understood that the study will be submitted to the County to assist with the environmental review of the project.

PROJECT DESCRIPTION

The project site is located adjacent to Estrella Road just east of Jardine Road in the Paso Robles area as shown in Figure 1. The project includes approximately 562 acres and is currently used for agricultural operations. Approximately 226 acres are planted in vineyards and 44 acres are planted in blueberries. The land owners have submitted an application to the County for an Agricultural Cluster Subdivision to develop 24 single family homes on 1 to 1.5 acre lots in the southwest area of the property. Two additional dwelling units could be constructed on the remaining 534 acre parcel. Figure 2 shows the project site plan. Access to the site is proposed via two roadways connecting to Estrella Road. The two roadways connect within the site, with a loop road serving the 24 single family units in the southwest area of the property (see Figure 2).

EXISTING CONDITIONS

Street Network

The project is served by State Route 46 East (SR 46E), Jardine Road, and Estrella Road (see Figure 1). The following text provides a brief discussion of the study-area roadways.

SR 46E, located south of the project site, is an east-west State highway. Within the Paso Robles area, SR 46E extends as a four-lane divided highway from U.S. Highway 101 to east of Airport Road. SR 46E narrows to two-lanes east of Airport Road and continues east past Jardine Road to the San Joaquin Valley.

Jardine Road, located west of the project site, is a north-south two-lane County road that extends from SR 46E to Estrella Road. The SR 46E/Jardine Road intersection is controlled by STOP signs (Jardine Road stopped).

Estrella Road, located north of the project site, is an east-west County road that extends east from Jardine Road to SR 46E and west from Jardine Road to River Road near San Miguel. The project site front the south side of Estrella Road just east of Jardine Road.

Intersection Operations

Traffic flow on roadway networks is most constrained at intersections, therefore a detailed traffic flow analysis examines the operating conditions of critical intersections during peak travel periods. "Level of Service" (LOS) A through F are used to rate intersection operations, with LOS A indicating free flow operations and LOS F indicating congested operations (more complete definitions of levels of service are attached). San Luis Obispo County considers LOS C as the minimum acceptable operating standard for rural areas.

The SR 46E/Jardine Road intersection is the key intersection identified for assessing potential impacts from traffic generated by the planned residential units. The existing lane geometry for the intersection is shown on Figure 3 and the existing A.M. and P.M. peak hour traffic volumes are shown on Figure 4. The traffic volumes were obtained from the traffic study prepared for the Golden Hill Retail Center Study[1]. Levels of service were calculated for the intersection using the methodology outlined in the Highway Capacity Manual (HCM)[2]. Table 1 lists the existing levels of service for the intersection (calculation worksheets are attached). As shown, the SR 46E/Jardine Road intersection currently operates at LOS B during the A.M. peak hour period and LOS C during the P.M. peak hour period.

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1 Golden Hill Retail Center, Final Transportation Impact Analysis, Fehr & Peers, June, 2007.

2 2000 Highway Capacity Manual, Transportation Research Board, National Research Council, 2000.

Table 1
Existing Intersection Levels of Service

Intersection	Control	Delay / LOS[a]	
		A.M. Peak	P.M. Peak
SR 46E/Jardine Road	Unsignalized	14.7 Sec/LOS B	17.2 Sec/LOS C

[a] LOS based on average number of seconds of delay per vehicle.

Planned Improvements

SR 46E currently extends as a four-lane divided highway from U.S. Highway 101 to east of Airport Road and continues as a two-lane highway east of Airport Road. Caltrans has initiated a project to widen the two-lane section to a four-lane divided highway between Airport Road and the SR 46E/SR 41 junction. Construction on the first phase of the widening project, from Airport Road to Geneseo Road, is scheduled to begin in April 2008 and be completed in 2010. This phase includes improvements to the intersections along the reach, including the SR 46E/Jardine Road intersection. Figure 5 shows the improvements that have been designed for the SR 46E/Jardine Road intersection, which are summarized below.

Eastbound Approach: One left-turn lane, one thru lane, one thru + right-turn lane.
Westbound Approach: One left-turn lane, two thru lanes, one right-turn lane.
Northbound Approach: One left + thru + right-turn lane.
Southbound Approach: One left + thru lane, one right-turn lane (with acceleration lane).

The intersection will remain STOP-sign controlled on the minor approach legs (Jardine Road). The eastbound and westbound left-turn lanes will continue through the intersection as acceleration lanes for the left-turns from the northbound and southbound approaches. These acceleration lanes will allow for a two-stage gap acceptance for left-turning vehicles from the minor approaches. This design feature will allow vehicles to cross one major approach leg and use the acceleration lanes in the median area for merging into the through traffic flows. An acceleration lane is also provided on westbound SR 46E to facilitate the southbound right-turn from Jardine Road onto SR 46E.

THRESHOLDS OF SIGNIFICANCE

San Luis Obispo County

The County has adopted LOS C as the minimum standard for intersection operations in rural areas of the County, with mitigation required for LOS D, LOS E and LOS F operations.

PROJECT-GENERATED TRAFFIC VOLUMES

Trip Generation

Trip generation estimates were calculated for the project based on the Single Family Detached Housing (Land-Use Code #210) rates presented in the Institute of Transportation Engineers (ITE) Trip Generation Manual.[3] Table 2 summarizes the trip generation estimates for the proposed project.

Table 2
Project Trip Generation

Land Use	Size	ADT		A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Single Family Detached Housing	26 Units	9.57	249	0.75	20	1.01	26

The data presented in Table 2 show that the project would generate 249 average daily trips, with 20 trips occurring during the A.M. peak hour period and 26 trips occurring during the P.M. peak hour period.

Trip Distribution

Project-generated traffic was distributed and assigned to the study-area roadway network based on the percentages shown in Table 3 and presented on Figure 6. The trip distribution percentages were developed based on the existing traffic pattern at the SR 46E/Jardine Road intersection and consideration of the population, employment, and commercial centers in the Paso Robles area.

Table 3
Project Trip Distribution

Origin/Destination	Direction	Percentage
SR 46E east of Jardine Road	East	10%
SR 46E west of Jardine Road	West	90%
Total		**100%**

[3] Trip Generation, Institute of Transportation Engineers, 7th edition, 2003

PROJECT-SPECIFIC ANALYSIS

Intersection Operations - No Improvements

Levels of service were calculated for the SR 46E/Jardine Road intersection with the Existing + Project traffic volumes presented on Figure 7. This level of service analysis assumes the existing lane configuration of the SR 46E/Jardine Road intersection prior to the completion of the planned improvements. Table 4 compares the Existing and the Existing + Project levels of service and identifies project-specific impacts.

Table 4
Existing and Existing + Project Intersection Levels of Service
No Improvements

Intersection	Peak Hour	Delay / LOS		
		Existing	Existing + Project	Impact?
SR 46E/Jardine Road	A.M. Peak	14.7 Sec/LOS B	15.1 Sec/LOS C	NO
SR 46E/Jardine Road	P.M. Peak	17.2 Sec/LOS C	17.8 Sec/LOS C	NO

The data presented in Table 4 show that with no improvements, the SR 46E/Jardine Road intersection would operate at LOS C with Existing + Project volumes during the A.M. and P.M. peak hour periods. This meets the San Luis Obispo County LOS C standard. The Estrella River Vineyard Agricultural Cluster Subdivision would not significantly impact the SR 46E/Jardine Road intersection.

Intersection Operations - With Improvements

Levels of service were calculated for the SR 46E/Jardine Road intersection with the Existing + Project traffic volumes and assuming completion of the planned improvements at the SR 46E/Jardine Road intersection, since they are scheduled for construction in the 2008-2010 horizon period. Table 5 compares the Existing and the Existing + Project levels of service with the improvements and identifies project-specific impacts.

Table 5
Existing and Existing + Project Intersection Levels of Service
With Improvements

Intersection	Peak Hour	Delay / LOS		
		Existing	Existing + Project	Impact?
SR 46E/Jardine Road	A.M. Peak	11.4 Sec/LOS B	11.6 Sec/LOS B	NO
SR 46E/Jardine Road	P.M. Peak	11.3 Sec/LOS B	11.4 Sec/LOS B	NO

Levels of service assume planned improvements.

The data presented in Table 5 show that with the implementation of the scheduled improvements, the SR 46E/Jardine Road intersection would operate at LOS B with Existing + Project volumes during the A.M. and P.M. peak hour periods. This meets the San Luis Obispo County LOS C standard. The Estrella River Vineyard Agricultural Cluster Subdivision would not significantly impact the SR 46E/Jardine Road intersection.

CUMULATIVE ANALYSIS

Cumulative Traffic Volumes

Cumulative traffic volume forecasts were taken from the traffic study prepared for the Golden Hill Retail Center Study. Figures 8 and 9 show the Cumulative and the Cumulative + Project A.M. and P.M. peak hour traffic forecasts.

Intersection Operations

Levels of service were calculated for the SR 46E/Jardine Road intersection assuming the Cumulative and the Cumulative + Project A.M. and P.M. peak hour traffic forecasts. The level of service analysis assumes completion of the planned improvements at the intersection. Table 6 compares the Cumulative and the Cumulative + Project levels of service for the intersection and identifies cumulative impacts.

Table 6
Cumulative and Cumulative + Project Intersection Levels of Service
With Improvements

Intersection	Peak Hour	Delay / LOS		
		Cumulative	Cumulative + Project	Impact?
SR 46E/Jardine Road	A.M. Peak	16.1 Sec/LOS C	16.6 Sec/LOS C	NO
SR 46E/Jardine Road	P.M. Peak	14.8 Sec/LOS B	15.2 Sec/LOS C	NO

Levels of service assume planned improvements.

The data presented in Table 6 show that the SR 46E/Jardine Road intersection is forecast to operate at LOS C or better with Cumulative and Cumulative + Project conditions during the A.M. and P.M. peak hour periods. This meets the County's LOS C standard, thus there would be no cumulative impact to the intersection.

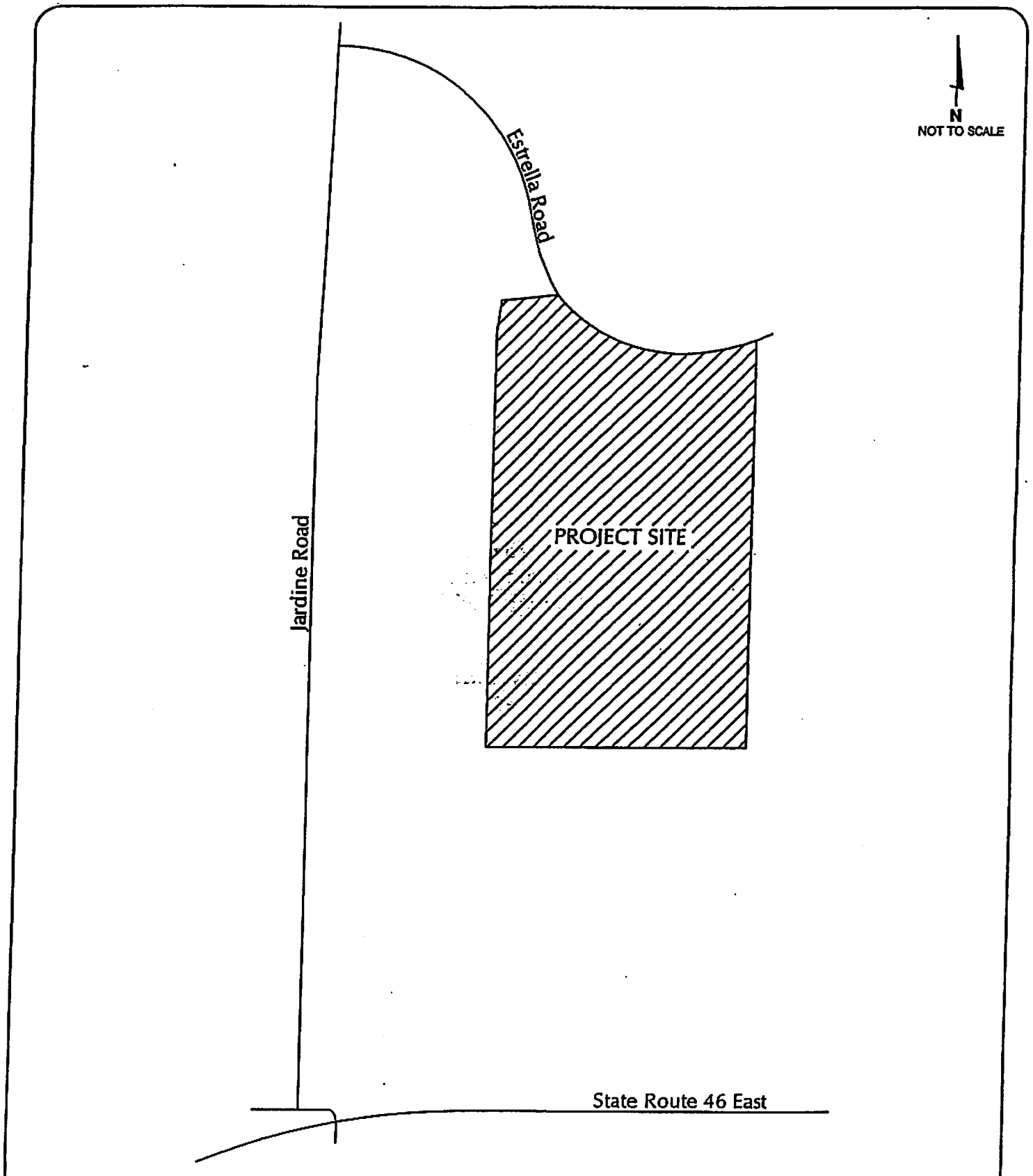
This concludes our traffic impact analysis for the Estrella River Vineyard Agricultural Cluster Subdivision (Tract 2905). We appreciate the opportunity to assist you with the project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Principal Transportation Planner

SAS/DLD/JJK

attachments



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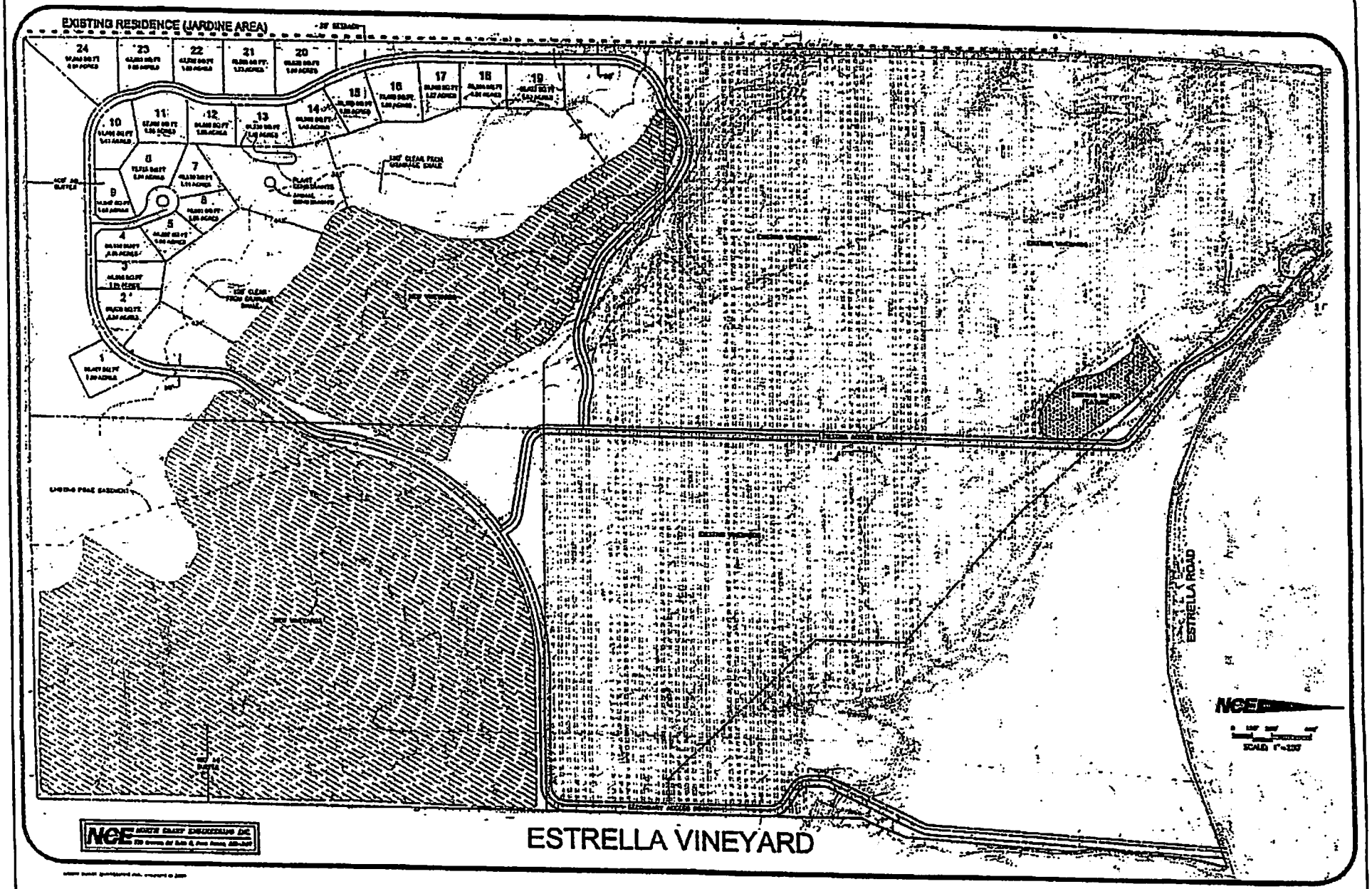
EXISTING STREET NETWORK AND PROJECT SITE LOCATION

FIGURE 1

JJK - 08031



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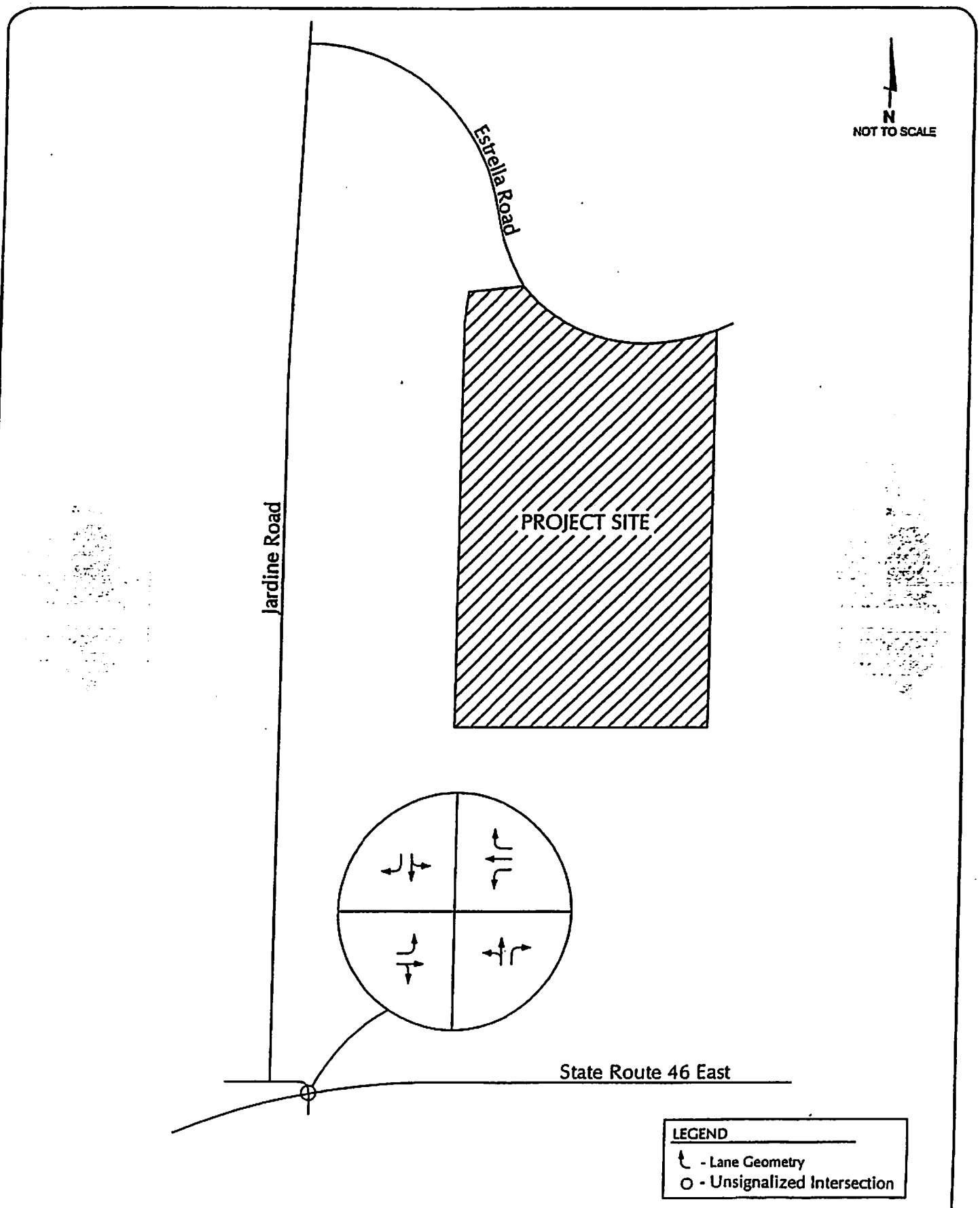
PROJECT SITE PLAN

FIGURE 2

JJK - 08031



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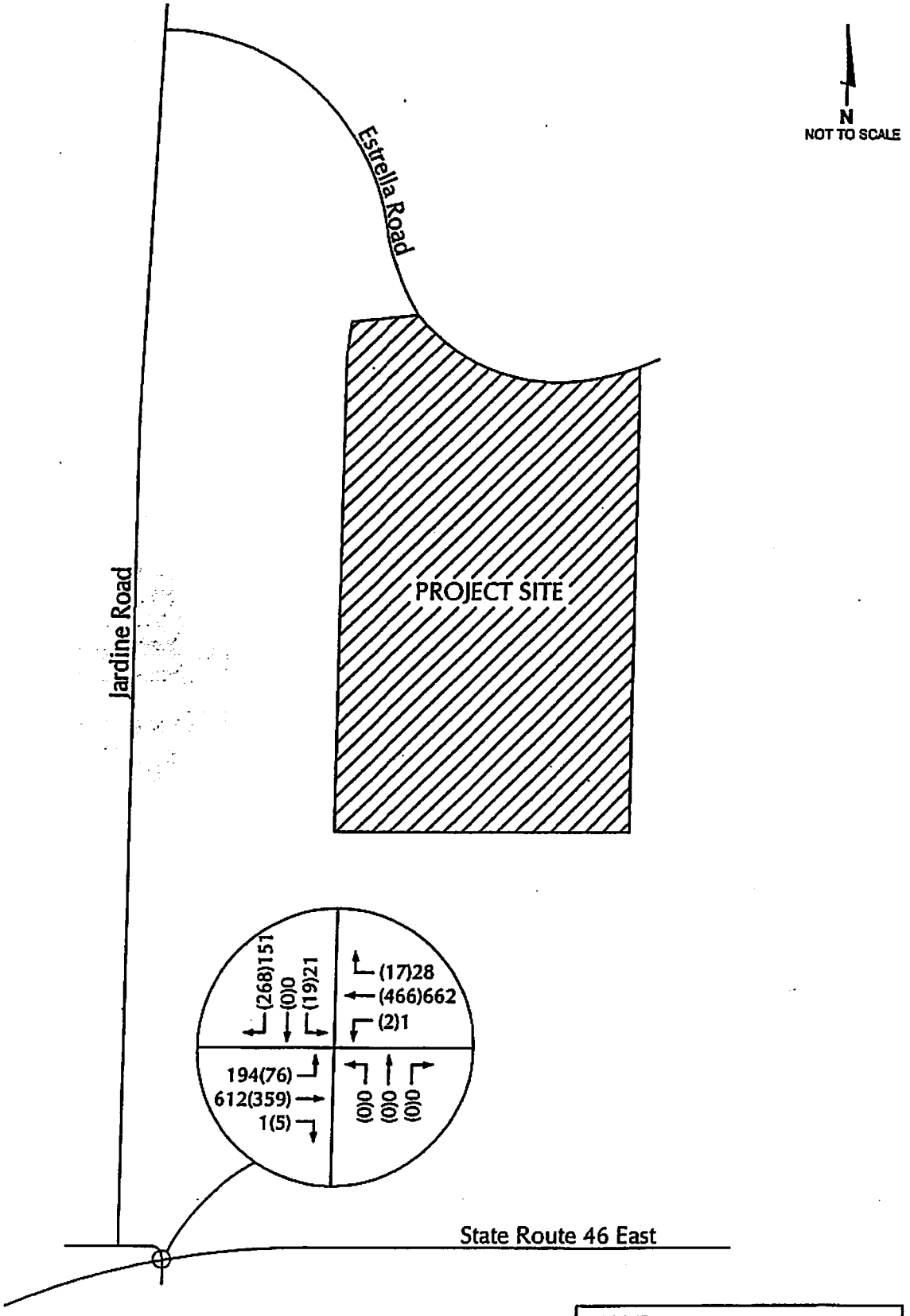
EXISTING INTERSECTION LANE GEOMETRIES

FIGURE 3

JJK - 08031



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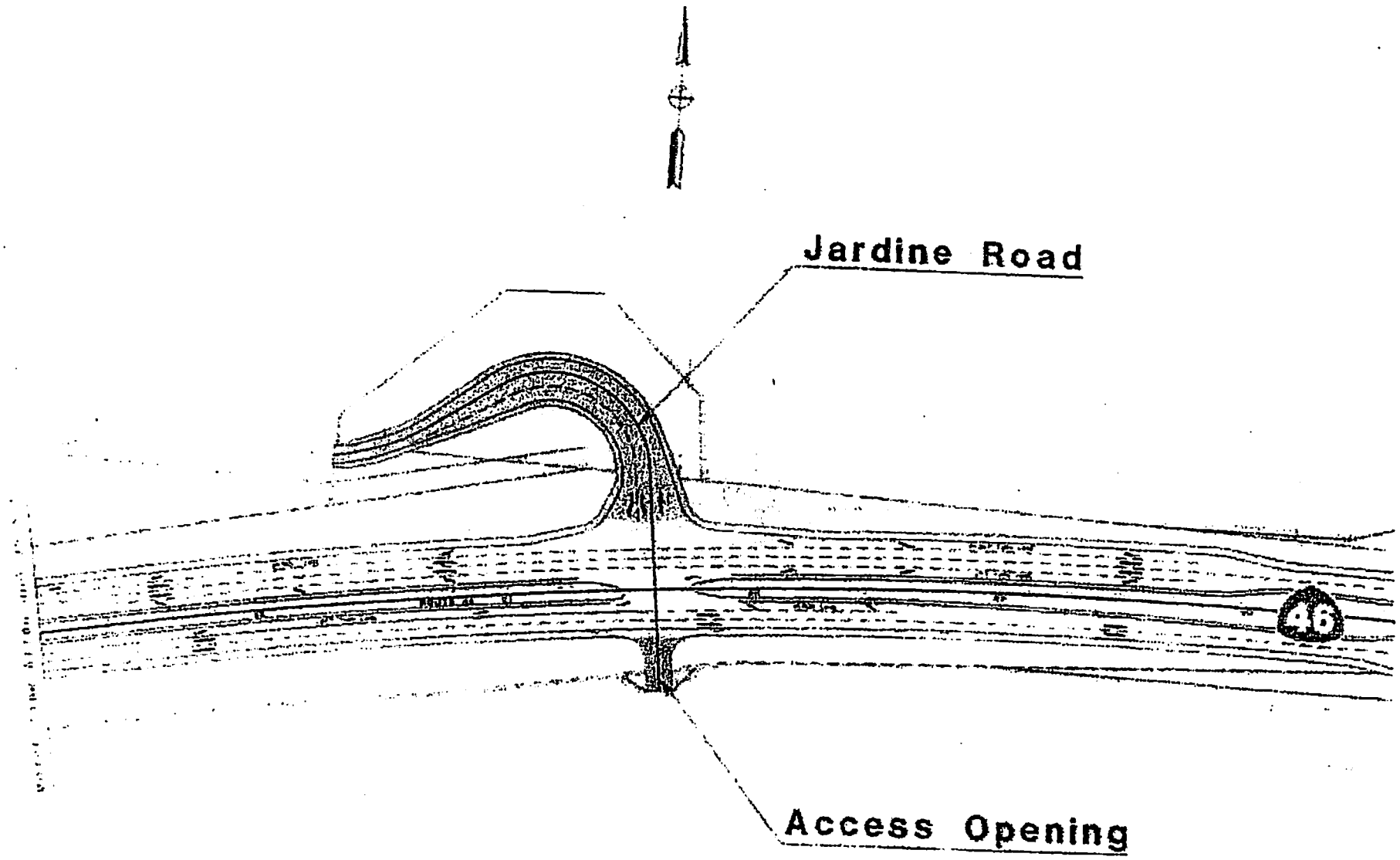
EXISTING TRAFFIC VOLUMES

FIGURE 4

JJK - 08031



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FUTURE INTERSECTION LANE GEOMETRIES

FIGURE 5

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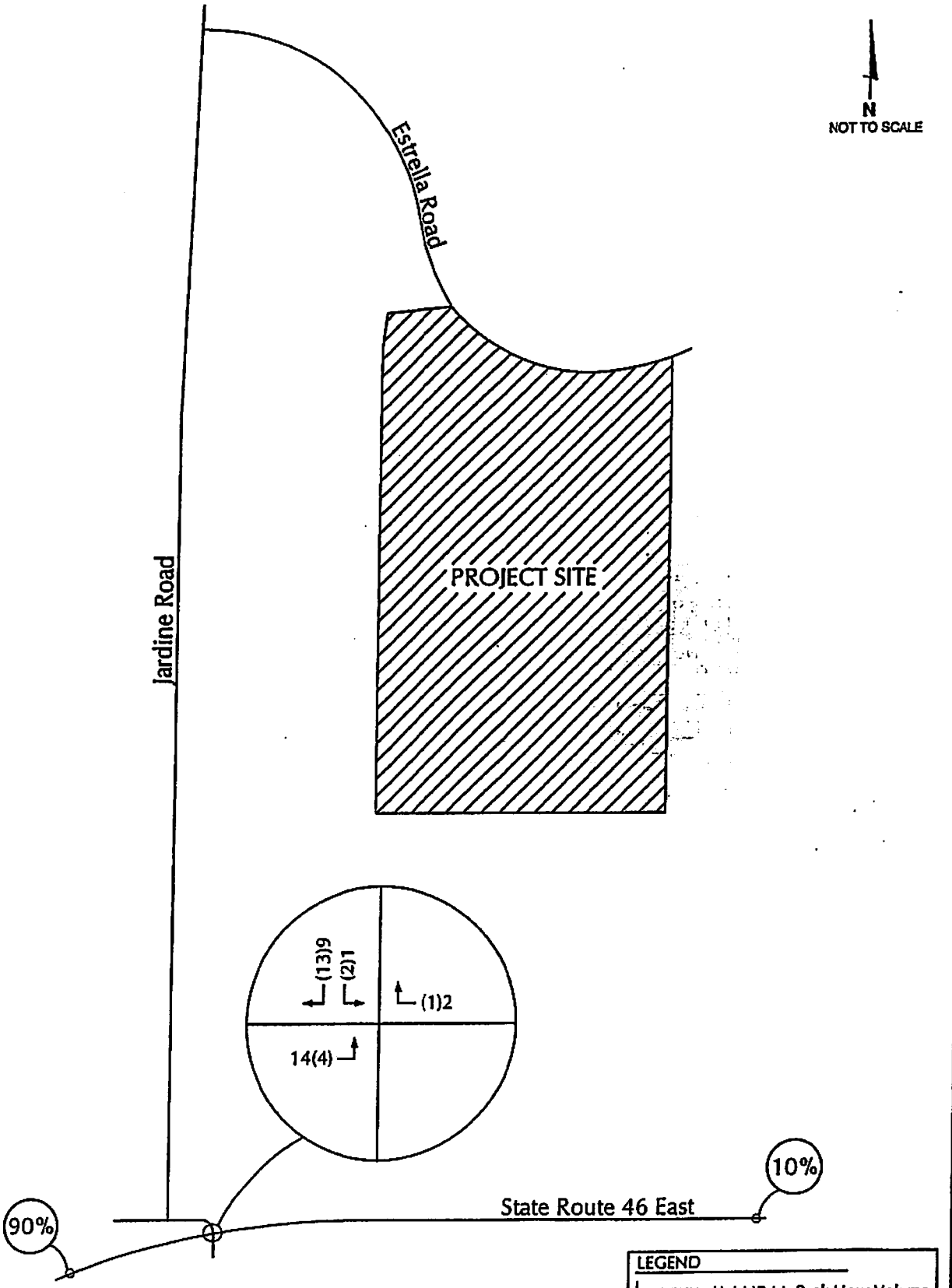

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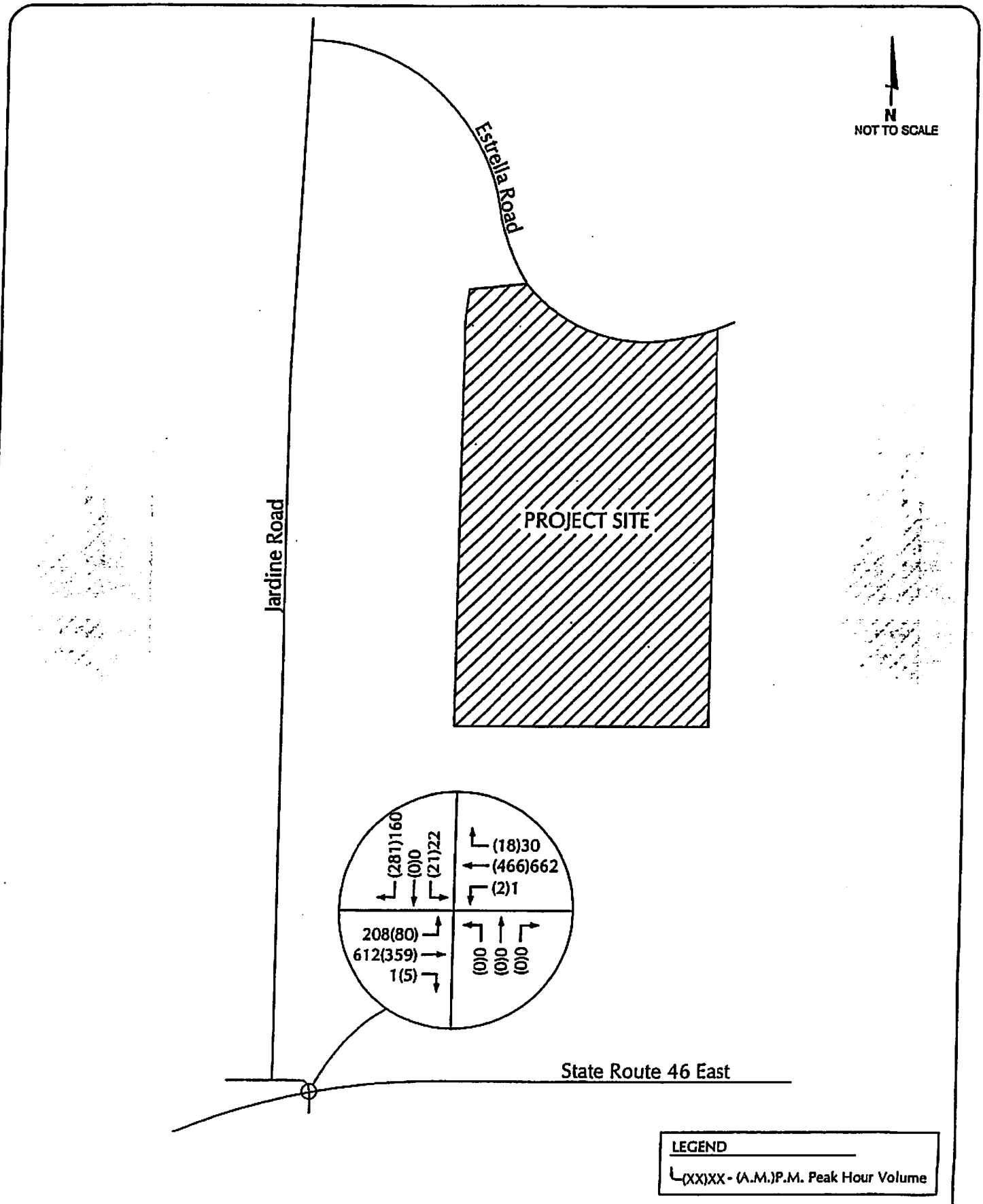
PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 6

JJK - 08031



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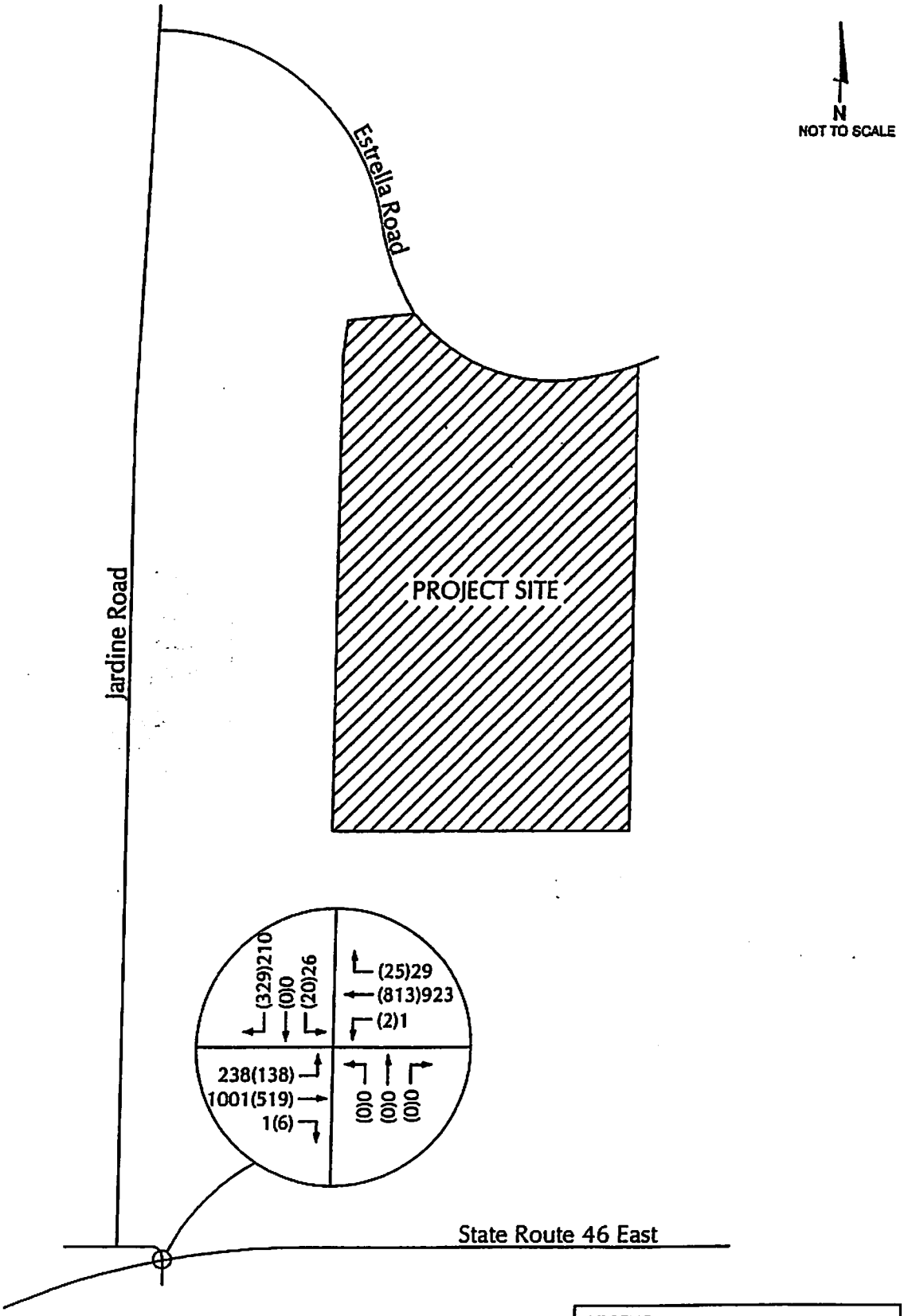
EXISTING + PROJECT TRAFFIC VOLUMES

FIGURE 7

JJK - 08031



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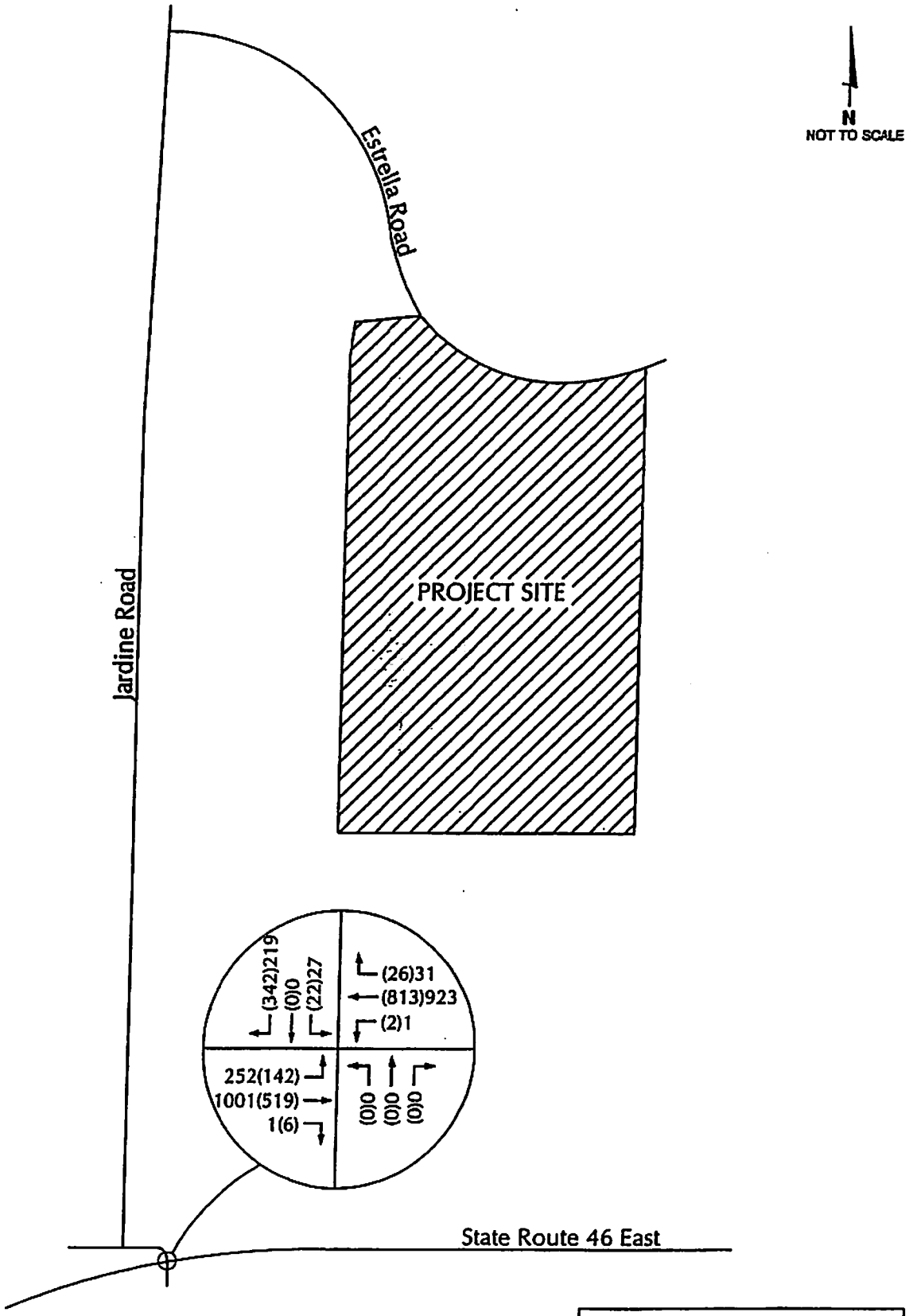
CUMULATIVE TRAFFIC VOLUMES

FIGURE 8

JJK - 08031



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CUMULATIVE + PROJECT TRAFFIC VOLUMES

FIGURE 9

JJK - 08031

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Trip Generation Worksheet - With In/Out Splits
Estella River Vineyard Traffic Study #08031

ESTELLA RIVER VINEYARD

Land Use	Size	Multi-Trip Factor	ADT		A.M.						P.M.					
			Rate	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
1. Single Family Detached Housing	26	1.00	9.57	249	0.75	20	25%	5	75%	15	1.01	26	63%	16	37%	10

Signalized Intersection Level of Service Definitions

LOS	Delay[a]	V/C Ratio	Definition
A	< 10.0	< 0.60	Progression is extremely favorable. Most vehicles arrive during the green phase. Many vehicles do not stop at all.
B	10.1 - 20.0	0.61 - 0.70	Good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
C	20.1 - 35.0	0.71 - 0.80	Only fair progression, longer cycle lengths, or both, result in higher cycle lengths. Cycle lengths may fail to serve queued vehicles, and overflow occurs. Number of vehicles stopped is significant, though many still pass through intersection without stopping.
D	35.1 - 55.0	0.81 - 0.90	Congestion becomes more noticeable. Unfavorable progression, long cycle lengths and high v/c ratios result in longer delays. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	55.1 - 80.0	0.91 - 1.00	High delay values indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent
F	> 80.0	> 1.00	Considered unacceptable for most drivers, this level occurs when arrival flow rates exceed the capacity of lane groups, resulting in many individual cycle failures. Poor progression and long cycle lengths may also contribute to high delay levels.

[a] Average control delay per vehicle in seconds.

Unsignalized Intersection Level of Service Definitions

The HCM[1] uses *control delay* to determine the level of service at unsignalized intersections. Control delay is the difference between the travel time actually experienced at the control device and the travel time that would occur in the absence of the traffic control device. Control delay includes deceleration from free flow speed, queue move-up time, stopped delay and acceleration back to free flow speed.

LOS	Control Delay Seconds per Vehicle
A	< 10.0
B	10.1 - 15.0
C	15.1 - 25.0
D	25.1 - 35.0
E	35.1 - 50.0
F	> 50.0

[1] Highway Capacity Manual, National Research Board, 2000

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EXISTING (NO IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	76	359	5	2	466	17
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	359	5	2	466	17
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	19	0	268
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	19	0	268
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	76	2	0		0	19		268
C (m) (veh/h)	1080	1195			683	215		597
v/c	0.07	0.00			0.00	0.09		0.45
95% queue length	0.23	0.01			0.00	0.29		2.41
Control Delay (s/veh)	8.6	8.0			10.3	23.4		15.9
LOS	A	A			B	C		C
Approach Delay (s/veh)	--	--				16.4		
Approach LOS	--	--				C		

AWD = 14.7 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EXISTING (WITH IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	76	359	5	2	466	17
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	359	5	2	466	17
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	19	0	268
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	19	0	268
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	76	2	0		0	19		268
C (m) (veh/h)	1076	1191			829	529		769
v/c	0.07	0.00			0.00	0.04		0.35
95% queue length	0.23	0.01			0.00	0.11		1.59
Control Delay (s/veh)	8.6	8.0			9.3	12.1		12.2
LOS	A	A			A	B		B
Approach Delay (s/veh)	--	--				12.2		
Approach LOS	--	--				B		

AWD = 11.4 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EX+PROJECT (NO IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	80	359	5	2	466	18
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	80	359	5	2	466	18
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	21	0	281
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	21	0	281
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	80	2	0		0	21		281
C (m) (veh/h)	1079	1195			683	212		597
v/c	0.07	0.00			0.00	0.10		0.47
95% queue length	0.24	0.01			0.00	0.33		2.62
Control Delay (s/veh)	8.6	8.0			10.3	23.8		16.4
LOS	A	A			B	C		C
Approach Delay (s/veh)	--	--				16.9		
Approach LOS	--	--				C		

AWD = 15.1 LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EX+PROJECT (WITH IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
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North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	80	359	5	2	466	18
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	80	359	5	2	466	18
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	21	0	281
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	21	0	281
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	80	2	0		0	21		281
C (m) (veh/h)	1075	1191			829	528		769
v/c	0.07	0.00			0.00	0.04		0.37
95% queue length	0.24	0.01			0.00	0.12		1.72
Control Delay (s/veh)	8.6	8.0			9.3	12.1		12.4
LOS	A	A			A	B		B
Approach Delay (s/veh)	--	--				12.4		
Approach LOS	--	--				B		

AWD = 11.6 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	CUMULATIVE (WITH IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	138	519	6	2	813	25
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	138	519	6	2	813	25
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	20	0	329
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	20	0	329
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	138	2	0		0	20		329
C (m) (veh/h)	792	1038			737	328		594
v/c	0.17	0.00			0.00	0.06		0.55
95% queue length	0.63	0.01			0.00	0.19		3.63
Control Delay (s/veh)	10.5	8.5			9.9	16.7		18.5
LOS	B	A			A	C		C
Approach Delay (s/veh)	--	--				18.4		
Approach LOS	--	--				C		

AWD = 16.1 LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	CU+PROJECT (WITH IMPROVEMENTS)
Analysis Time Period	AM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	142	519	6	2	813	26
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	142	519	6	2	813	26
Percent Heavy Vehicles	2	–	–	2	–	–
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	22	0	342
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	22	0	342
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	142	2	0		0	22		342
C (m) (veh/h)	791	1038			737	327		594
v/c	0.18	0.00			0.00	0.07		0.58
95% queue length	0.66	0.01			0.00	0.22		3.95
Control Delay (s/veh)	10.5	8.5			9.9	16.8		19.2
LOS	B	A			A	C		C
Approach Delay (s/veh)	–	–				19.1		
Approach LOS	–	–				C		

AWD = 16.6 LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EXISTING (NO IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	194	612	1	1	662	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	194	612	1	1	662	28
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	21	0	151
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	21	0	151
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	194	1	0		0	21		151
C (m) (veh/h)	905	966			493	64		462
v/c	0.21	0.00			0.00	0.33		0.33
95% queue length	0.82	0.00			0.00	1.38		1.44
Control Delay (s/veh)	10.1	8.7			12.3	88.1		16.6
LOS	B	A			B	F		C
Approach Delay (s/veh)	--	--				25.3		
Approach LOS	--	--				D		

AWD = 17.2 LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EXISTING (WITH IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	194	612	1	1	662	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	194	612	1	1	662	28
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	21	0	151
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	21	0	151
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	194	1	0		0	21		151
c (m) (veh/h)	900	962			690	308		665
v/c	0.22	0.00			0.00	0.07		0.23
95% queue length	0.82	0.00			0.00	0.22		0.88
Control Delay (s/veh)	10.1	8.7			10.2	17.5		12.0
LOS	B	A			B	C		B
Approach Delay (s/veh)	--	--				12.7		
Approach LOS	--	--				B		

AWD = 11.3 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EX+PROJECT (NO IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	208	612	1	1	662	30
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	208	612	1	1	662	30
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	22	0	160
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	22	0	160
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	208	1	0		0	22		160
c (m) (veh/h)	903	966			493	61		462
v/c	0.23	0.00			0.00	0.36		0.35
95% queue length	0.90	0.00			0.00	1.57		1.57
Control Delay (s/veh)	10.2	8.7			12.3	96.4		16.9
LOS	B	A			B	F		C
Approach Delay (s/veh)	--	--				26.5		
Approach LOS	--	--				D		

AWD = 17.8 LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	EX+PROJECT (WITH IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	208	612	1	1	662	30
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	208	612	1	1	662	30
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	22	0	160
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	22	0	160
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	208	1	0		0	22		160
C (m) (veh/h)	899	962			690	291		665
v/c	0.23	0.00			0.00	0.08		0.24
95% queue length	0.90	0.00			0.00	0.24		0.95
Control Delay (s/veh)	10.2	8.7			10.2	18.4		12.1
LOS	B	A			B	C		B
Approach Delay (s/veh)	--	--				12.9		
Approach LOS	--	--				B		

AWD = 11.4 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	CUMULATIVE (WITH IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	238	1001	1	1	923	29
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	238	1001	1	1	923	29
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	26	0	210
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	26	0	210
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	238	1	0		0	26		210
C (m) (veh/h)	717	687			515	177		547
v/c	0.33	0.00			0.00	0.15		0.38
95% queue length	1.48	0.00			0.00	0.51		1.85
Control Delay (s/veh)	12.5	10.2			12.0	28.8		15.7
LOS	B	B			B	D		C
Approach Delay (s/veh)	--	--				17.1		
Approach LOS	--	--				C		

AWD = 14.8 LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JJK	Intersection	STATE ROUTE 46 E/JARDINE ROAD
Agency/Co.	ATE	Jurisdiction	SAN LUIS OBISPO COUNTY
Date Performed	3/12/2008	Analysis Year	CU+PROJECT (WITH IMPROVEMENTS)
Analysis Time Period	PM PEAK HOUR		

Project Description	ESTELLA RIVER VINEYARD PROJECT #08031
East/West Street:	STATE ROUTE 46 EAST
North/South Street:	JARDINE ROAD
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	252	1001	1	1	923	31
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	252	1001	1	1	923	31
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	0	27	0	219
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	27	0	219
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (veh/h)	252	1	0		0	27		219
C (m) (veh/h)	716	687			515	166		547
v/c	0.35	0.00			0.00	0.16		0.40
95% queue length	1.62	0.00			0.00	0.58		1.98
Control Delay (s/veh)	12.8	10.2			12.0	30.9		16.0
LOS	B	B			B	D		C
Approach Delay (s/veh)	--	--				17.6		
Approach LOS	--	--				C		

AWD = 15.2 LOS C