



## TECHNICAL MEMORANDUM

Date: April 30, 2015

To: Stephanie Holloway – Senior Civil Engineer, Placer County Department of Public Works

From: Alan Telford – Principal, Fehr & Peers

**Subject: Locust Road Circulation Study**

*RS14-3269*

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This memorandum documents the traffic impacts of the proposed one and two roadway closure scenarios on Locust Road.

The basis for the Locust Road analysis contained herein is the Placer Vineyards Specific Plan Revised Draft EIR, completed in June of 2006 by DKS Associates. The transportation study for that EIR assumed that Locust Road would exist as built today. The EIR analyzed intersections and roadway segments throughout the Specific Plan area and reported traffic impacts under Cumulative Plus Specific Plan Buildout conditions.

Locust Road currently extends through the Placer Vineyards Specific Plan from Placer County into Sacramento County. Per direction from County Staff, two proposed closure scenarios were analyzed. The one closure scenario would close Locust Road south of Newton Road (just south of the eastern Locust Road elbow), while the two closure scenario would close Locust Road south of Newton Road and at the Placer County line.

The proposed one closure scenario will result in decreased traffic volumes along Locust Road with increased traffic volumes along Dyer Lane. The two closure scenario will also result in decreased traffic volumes along Locust Road, but with greater increase in traffic along Dyer Lane, 16<sup>th</sup> Street, and Palladay Road. Therefore, the purpose of this traffic analysis is to determine the change in traffic volumes and traffic impacts due to the closures, and if additional mitigation measures are needed beyond those reported in the 2006 EIR.



This memorandum discusses the project's change in distribution and assignment of traffic onto local roadways and intersections, and the change in traffic impacts due to the proposed closure scenarios.



## STUDY LOCATIONS

A list of study roadway segments and intersections was identified in collaboration with County staff to determine traffic impacts of the proposed closure(s).

The following eleven roadway segments were studied as part of the transportation analysis:

1. Locust Road – North of County Line
2. Locust Road – South of Baseline Road
3. Dyer Lane – South of Baseline Road
4. Dyer Lane – South of Town Center
5. Dyer Lane – Tanwood Avenue to 11<sup>th</sup> Street
6. Dyer Lane – 11<sup>th</sup> Street to Watt Avenue
7. Watt Avenue – South of Dyer Lane
8. PFE Road – East of Watt Avenue
9. 16<sup>th</sup> Street – South of Town Center
10. 16<sup>th</sup> Street – South of Dyer Lane
11. Palladay Road – North of County Line

The following five intersections were studied under the one closure scenario:

1. Baseline Road/Dyer Lane
2. W. Town Center/Dyer Lane
3. Dyer Lane/18<sup>th</sup> Street
4. Baseline Road/Locust Road
5. Dyer Lane/Watt Avenue

The following seven intersections were studied under the two closure scenario:

1. Baseline Road/Locust Road
2. Baseline Road/Dyer Lane
3. Dyer Lane/Palladay Road
4. Dyer Lane/16<sup>th</sup> Street
5. Dyer Lane/Watt Avenue
6. Watt Avenue/PFE Road
7. Pleasant Grove S./Riego Road



## LOS EVALUATION CRITERIA

Traffic impacts of the proposed closure(s) were analyzed for study roadway segments and intersections using the following criteria:

Roadway Segments - Roadway operating conditions are described using the concept of Level of Service (LOS), which is a measure of the effects of a number of factors which include travel speed, traffic interruptions, freedom to maneuver, safety, and driving comfort and convenience. The circulation plan diagram in the Placer County General Plan depicts the circulation system by use of a set of roadway functional classifications. Roadways are classified based on the linkages they provide and their function, both of which reflect their relation to the land use patterns, traveler, and general welfare. Table 1 shows the roadway classifications for the roadway segments in this study. Traffic operations were analyzed by comparing the roadway volumes to the County roadway LOS thresholds shown in Table 2.

Intersections – For signalized intersections, the LOS was determined according to the Circular 212 methodology (Transportation Research Board, 1980). Table 3 shows the intersection LOS criteria.

Thresholds of Significance - Potential significant impacts of the closure(s) were evaluated using the following criteria based on the Dry Creek/West Placer Community Plan Final Transportation and Circulation Element, adopted in 2011<sup>1</sup>:

- Within the Community Plan area, a significant impact would occur if a roadway segment or intersection were to worsen from LOS D or E (for the selected locations identified below) or better to LOS E or F, or if a roadway segment already operating at LOS E or F were to increase in congestion by more than five percent, or if an intersection already operating at LOS E or F were to increase in V/C ratio by more than 0.05.

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<sup>1</sup> The Dry Creek/West Placer Community Plan Final Transportation and Circulation Element (2011) contains level of service significance criteria that are different than those contained in the 2006 Placer Vineyards DEIR. Therefore, these thresholds of significance will replace those of the Placer Vineyards Specific Plan Revised Draft EIR (2006).



The Community Plan states that the Capital Improvement Program (CIP) shall be sufficient to maintain LOS D on the Community Plan area road network – given the projected buildout of the Community Plan area and implementation of the CIP, except for the following arterial roadways, roadway segments, and intersections that will operate at the listed LOS when fully improved:

Arterial Roadways -

- Baseline Road – Sutter County Line to Walerga Road/Fiddymment Road: LOS E
- Watt Avenue – Sacramento County Line to Baseline Road: LOS F

Roadway Segments -

- Cook-Riolo Road – Vineyard Road to Baseline Road: LOS E
- Cook-Riolo Road – PFE Road to Vineyard Road: LOS F
- North Antelope Road – PFE Road to Sacramento County Line: LOS E
- PFE Road – Cook-Riolo Road to North Antelope Road: LOS F
- Vineyard Road – Cook-Riolo Road to Foothills Boulevard: LOS F

Intersections –

- Baseline Road/Watt Avenue: LOS F
- Baseline Road/Walerga Road/Fiddymment Road: LOS F
- PFE Road/Cook-Riolo Road: LOS F
- PFE Road/Walerga Road: LOS F
- PFE Road/Antelope Road: LOS F



**TABLE 1:  
 ROADWAY CLASSIFICATION FOR STUDY ROADWAY SEGMENTS**

Roadway Segment	Roadway Classification
Locust Road – North of County Line	Arterial – Moderate Access Control
Locust Road – South of Baseline Road	Arterial – Moderate Access Control
Dyer Lane – South of Baseline Road	Arterial – Moderate Access Control
Dyer Lane – South of Town Center	Arterial – Moderate Access Control
Dyer Lane – Tanwood Avenue to 11 <sup>th</sup> Street	Arterial – Moderate Access Control
Dyer Lane – 11 <sup>th</sup> Street to Watt Avenue	Arterial – Moderate Access Control
Watt Avenue - South of Dyer Lane	Arterial – High Access Control
PFE Road – East of Watt Avenue	Arterial – Moderate Access Control
16 <sup>th</sup> Street – South of Town Center	Arterial – Moderate Access Control
16 <sup>th</sup> Street – South of Dyer Lane	Arterial – Moderate Access Control
Palladay Road – North of County Line	Arterial – Moderate Access Control



**TABLE 2:  
 EVALUATION CRITERIA FOR ROADWAY LOS**

Roadway Capacity Class	Maximum Daily Traffic Volume Per Lane				
	LOS A	LOS B	LOS C	LOS D	LOS E
Arterial – High Access Control	6,000	7,000	8,000	9,000	10,000
Arterial – Moderate Access Control	5,400	6,300	7,200	8,100	9,000
Arterial/Collector – Low Access Control	4,500	5,250	6,000	6,870	7,500
Rural 2-lane Highway – Level Terrain	1,500	2,950	4,800	7,750	12,500
Rural 2-lane Highway – Rolling Terrain	800	2,100	3,800	5,700	10,500

Notes:  
 LOS A – Free Flow/Insignificant Delay  
 LOS B – Stable Operation/Minimal Delay  
 LOS C – Stable Operation/Acceptable Delay  
 LOS D – Approaching Unstable /Tolerable Delay  
 LOS E – Unstable Operation/Significant Delay. Volumes at or near capacity.  
 LOS F – Forced Flow/Excessive Delay. Represents jammed conditions.

Source: *Placer County General Plan Final EIR (1994, pages 4 through 21)*



**TABLE 3:  
 EVALUATION CRITERIA FOR INTERSECTION LOS**

LOS	Signal	Unsignalized
	Volume to Capacity Ratio	Average Control Delay <sup>1</sup>
A	≤ 0.6	≤ 10
B	> 0.6 to 0.7	> 10 to 15
C	> 0.7 to 0.8	> 15 to 25
D	> 0.8 to 0.9	> 25 to 35
E	> 0.9 to 1.0	> 35 to 50
F	> 1.0	> 50

Notes:  
<sup>1</sup> Measure in seconds per vehicle  
 LOS A – Free Flow/Insignificant Delay  
 LOS B – Stable Operation/Minimal Delay  
 LOS C – Stable Operation/Acceptable Delay  
 LOS D – Approaching Unstable /Tolerable Delay  
 LOS E – Unstable Operation/Significant Delay. Volumes at or near capacity.  
 LOS F – Forced Flow/Excessive Delay. Represents jammed conditions.

Source: *Placer County General Plan Final EIR (1994, pages 4 through 21)*



## CHANGE IN TRAFFIC VOLUMES

The trip distribution estimates of project traffic were developed using the year 2035 SACOG travel demand model. Using the difference in trip distribution between the no closure and closure models, the net project traffic differences were added to the intersection traffic forecasts as contained in the 2006 Placer Vineyards EIR technical appendix (Note that the LOS computation sheets were provided by the authors of the EIR transportation study, DKS Associates). The specific title of the 2006 computation sheets is "Cumulative Plus Project".

### **One Closure Scenario:**

Under the one closure scenario, Locust Road would experience a slight reduction in vehicular volume travelling south, while Dyer Lane and surrounding streets would experience a slight increase in volume, as can be seen in Table 4.

Additionally, the shift in volumes would impact various turning movements at the study intersections under the one closure scenario. Figure 1 gives an overview of the differences in turning movements at each of these study intersections. Table 5 provides the LOS and V/C ratios associated with the one closure along Locust Road.

### Roadway Segments:

Under this scenario, an unacceptable condition would be created at one roadway. Dyer Lane from 11<sup>th</sup> Street to Watt Avenue would worsen from LOS D to E. Per the significance criteria previously discussed, this is considered to be a potentially significant impact. The daily traffic volume would increase by 200 vehicles along this segment, from 32,300 to 32,500 vehicles per day. 32,400 is the transition from LOS D to LOS E, so the resulting traffic volume is only 100 vehicles (or 0.3 percent) above LOS D. This roadway segment could be mitigated by widening the roadway from 4 lanes to 6 lanes, improving the LOS to B.

### Intersections:

The one closure scenario does not result in unacceptable LOS at any of the intersections. Though the Baseline Road/Dyer Lane intersection goes from LOS D to E, LOS E is considered



acceptable along this segment of Baseline Road under the Community Plan LOS threshold criteria.

TABLE 4: IMPACT OF NORTH LOCUST ROAD CLOSURE ON ROADWAY SEGMENT LOS							
Roadway Segment	Number of Lanes	Cumulative Plus Project (No Closure)		Cumulative Plus Project with One Closure		Percent Increase in Traffic	ADT Increase
		ADT	LOS	ADT	LOS		
Locust Road – North of County Line	2	17,100	E	16,800	E	-1.8%	-300
Locust Road – South of Baseline Road	2	5,500	A	3,600	A	-34.5%	-1,900
Dyer Lane – South of Baseline Road	4	15,800	A	17,800	A	12.7%	2,000
Dyer Lane – South of Town Center	4	7,300	A	7,700	A	5.5%	400
Dyer Lane – Tanwood Ave to 11 <sup>th</sup> Street	4	25,200	B	25,400	C	0.8%	200
Dyer Lane – 11 <sup>th</sup> Street to Watt Avenue	4	32,300	D	<b>32,500</b>	<b>E</b>	<b>0.6%</b>	<b>200</b>
Watt Avenue – South of Dyer Lane	6	62,900	F	63,000	F	0.2%	100
PFE Road – East of Watt Avenue	4	14,300	A	14,400	A	0.7%	100
16 <sup>th</sup> Street – South of Town Center	4	-*	-*	7,800	A	N/A	N/A
16 <sup>th</sup> Street – South of Dyer Lane	4	16,200	A	16,300	A	0.6%	100
Palladay Road – North of County Line	4	16,600	A	16,700	A	0.6%	100

\*This roadway segment was not analyzed as part of the 2006 EIR.

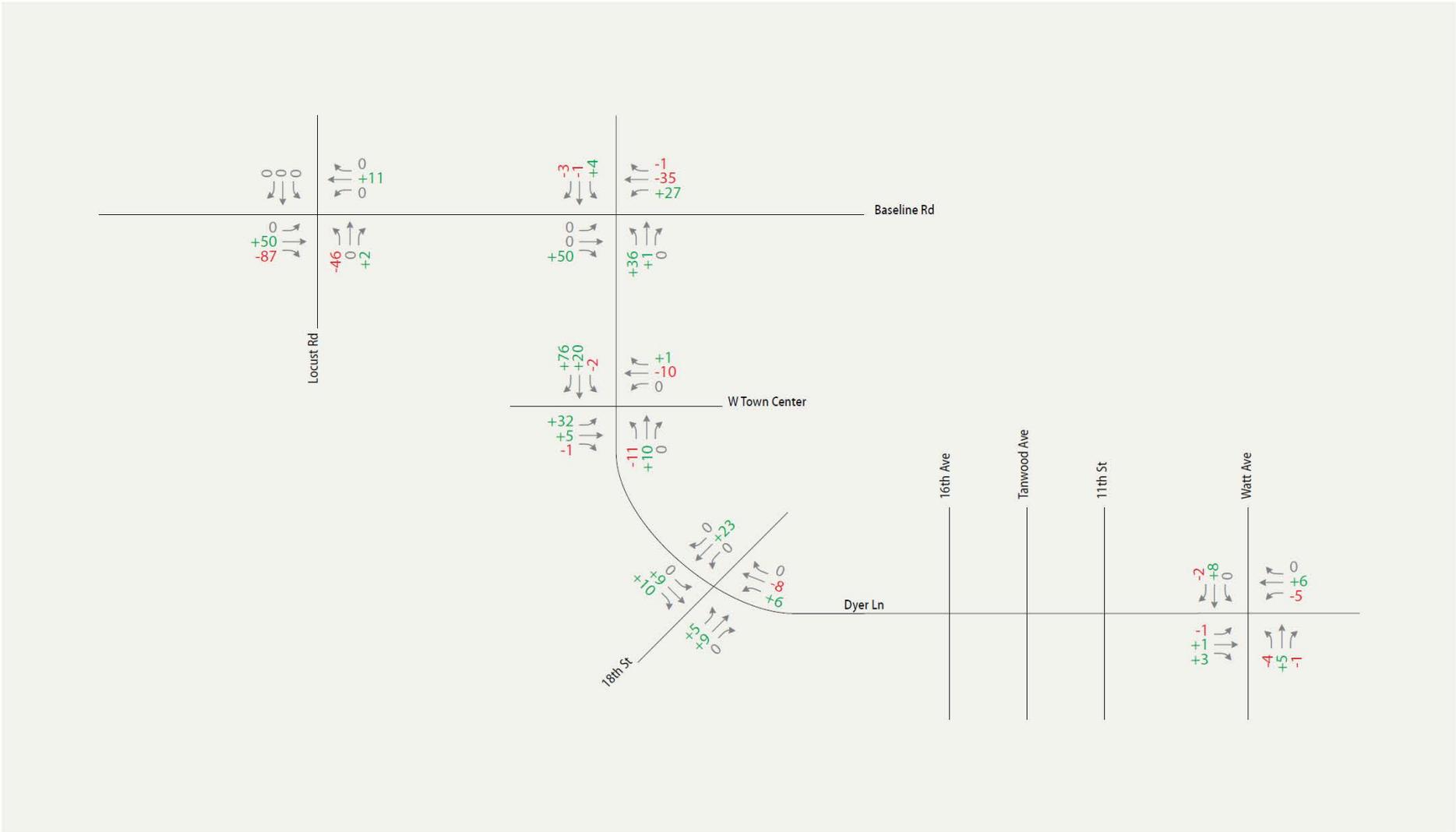


Figure 1  
Locust Road Closure Study  
1 Closure Scenario



<b>TABLE 5: IMPACT OF NORTH LOCUST ROAD CLOSURE ON INTERSECTION PM PEAK HOUR LOS</b>					
<b>Intersection</b>	<b>Cumulative Plus Project (No Closure)</b>		<b>Cumulative Plus Project with One Closure</b>		<b>Increase in V/C Ratio</b>
	<b>Signalized Intersection (V/C Ratio)<sup>1</sup></b>	<b>LOS<sup>1</sup></b>	<b>Signalized Intersection (V/C Ratio)<sup>1</sup></b>	<b>LOS<sup>1</sup></b>	
1. Baseline Road/Dyer Lane	0.90	D	0.92	E	0.02
2. W. Town Center/Dyer Lane	0.54	A	0.58	A	0.04
3. Dyer Lane/18 <sup>th</sup> Street	0.41	A	0.41	A	0.00
4. Baseline Road/Locust Road	0.63 <sup>2</sup>	B <sup>2</sup>	0.61 <sup>2</sup>	B <sup>2</sup>	-0.02
5. Dyer Lane/Watt Avenue	1.06	F	1.06	F	0.00

Notes:  
<sup>1</sup> V/C and LOS for signalized intersections are calculated using the *Transportation Research Board Circular 212* method.  
<sup>2</sup> V/C and LOS calculated using adjusted northbound right turn volumes.  
 Source: Fehr & Peers, 2015

### **Two Closure Scenario:**

Under the two closure scenario, Locust Road would experience a higher reduction in vehicular volume travelling south and north, while Dyer Lane and surrounding streets would experience a greater increase in volume, as can be seen in Table 6.

Additionally, the shift in volumes would impact various turning movements at the study intersections under the two closure scenario. Figure 2 gives an overview of the differences in turning movements at each of these study intersections. Table 7 provides the LOS and V/C ratios associated with the two closures along Locust Road.

#### Roadway Segments:

Under this scenario, one roadway segment would potentially operate unacceptably. Dyer Lane from 11<sup>th</sup> Street to Watt Avenue would worsen from LOS D to E, causing an impact similar to that under the one closure scenario. The two closures would reroute 800 vehicles onto this segment of Dyer Lane, resulting in a 2.5% increase in ADT. This roadway segment could be mitigated by widening the roadway from 4 lanes to 6 lanes, improving the LOS to B.



Intersections:

The two closure scenario would result in a potentially significant impact at one intersection, Dyer Lane/Watt Avenue. This intersection would continue to operate at LOS F with the two closures in place, and the V/C ratio would increase by 0.07, from 1.06 to 1.13. Note that an increase in the V/C ratio by more than 0.05 causes a potentially significant impact. This intersection could be mitigated by adding a second right-turn lane at the intersection's eastbound approach, resulting in a lesser V/C ratio of 1.01.

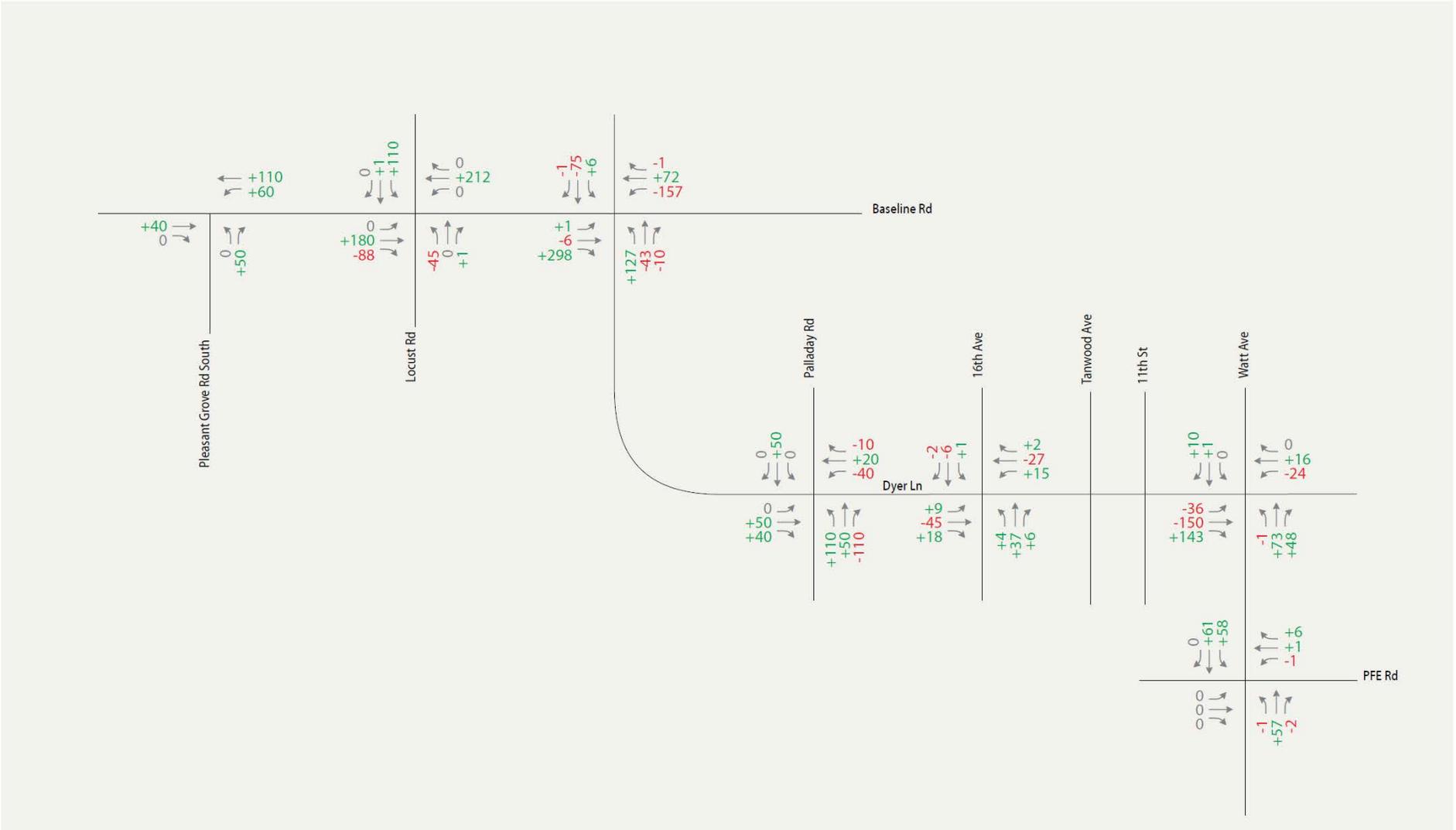


Figure 1  
Locust Road Closure Study  
2 Closure Scenario



<b>TABLE 6:                      IMPACT OF NORTH AND SOUTH LOCUST ROAD CLOSURE ON ROADWAY SEGMENT LOS</b>							
<b>Roadway Segment</b>	<b>Number of Lanes</b>	<b>Cumulative Plus Project (No Closure)</b>		<b>Cumulative Plus Project with Two Closures</b>		<b>Percent Increase in Traffic</b>	<b>ADT Increase</b>
		<b>ADT</b>	<b>LOS</b>	<b>ADT</b>	<b>LOS</b>		
Locust Road – North of County Line	2	17,100	E	700	A	-95.9%	-16,400
Locust Road – South of Baseline Road	2	5,500	A	2,900	A	-47.3%	-2,600
Dyer Lane – South of Baseline Road	4	15,800	A	18,300	A	15.8%	2,500
Dyer Lane – South of Town Center	4	7,300	A	9,800	A	34.2%	2,500
Dyer Lane – Tanwood Ave to 11 <sup>th</sup> Street	4	25,200	B	25,800	C	2.4%	600
Dyer Lane – 11 <sup>th</sup> Street to Watt Avenue	4	32,300	D	<b>33,100</b>	<b>E</b>	<b>2.5%</b>	<b>800</b>
Watt Avenue – South of Dyer Lane	6	62,900	F	65,200	F	3.7%	2,300
PFE Road – East of Watt Avenue	4	14,300	A	15,400	A	7.7%	1,100
16 <sup>th</sup> Street – South of Town Center	4	-*	-*	7,500	A	N/A	N/A
16 <sup>th</sup> Street – South of Dyer Lane	4	16,200	A	16,700	A	3.1%	500
Palladay Road – North of County Line	4	16,600	A	18,100	A	9.0%	1,500

\*This roadway segment was not analyzed as part of the 2006 EIR.



<b>TABLE 7: IMPACT OF NORTH AND SOUTH LOCUST ROAD CLOSURE ON INTERSECTION PM PEAK HOUR LOS</b>					
<b>Intersection</b>	<b>Cumulative Plus Project (No Closure)</b>		<b>Cumulative Plus Project with Two Closures</b>		<b>Increase in V/C Ratio</b>
	<b>Signalized Intersection (V/C Ratio)<sup>1</sup></b>	<b>LOS<sup>1</sup></b>	<b>Signalized Intersection (V/C Ratio)<sup>1</sup></b>	<b>LOS<sup>1</sup></b>	
1. Baseline Road/Locust Road	0.63 <sup>2</sup>	B <sup>2</sup>	0.72 <sup>2</sup>	C <sup>2</sup>	0.09
2. Baseline Road/Dyer Lane	0.90	D	0.85	D	-0.05
3. Dyer Lane/Palladay Road	0.87	D	0.79	C	-0.08
4. Dyer Lane/16 <sup>th</sup> Street	0.66	B	0.64	B	-0.02
5. Dyer Lane/Watt Avenue	1.06	F	<b>1.13</b>	<b>F</b>	<b>0.07</b>
6. Watt Avenue/PFE Road	0.70	C	0.74	C	0.04
7. Pleasant Grove S./Riego Road <sup>3</sup>	0.95 <sup>3</sup>	E <sup>3</sup>	0.99 <sup>3</sup>	E <sup>3</sup>	0.04

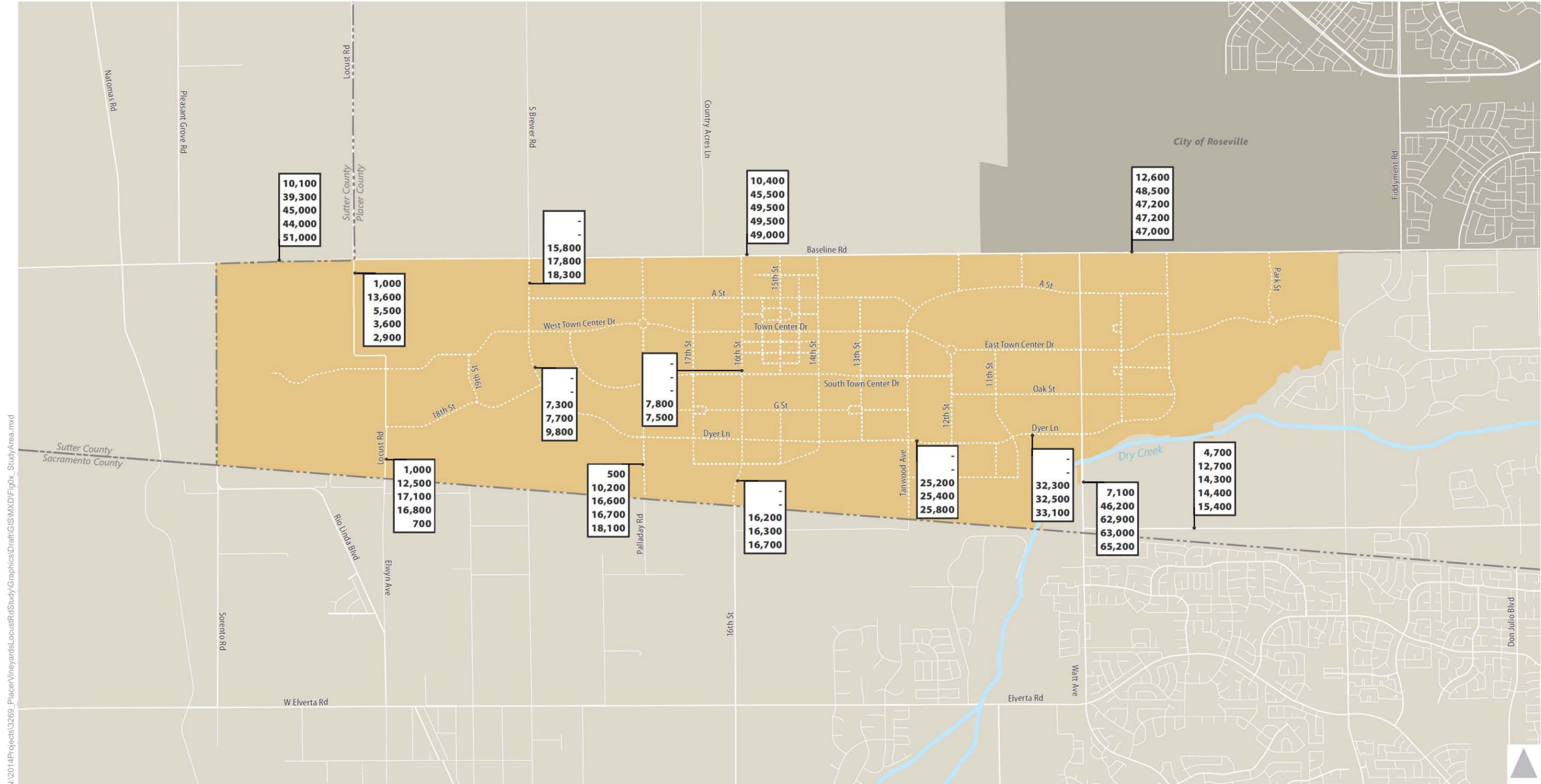
Notes:

<sup>1</sup> V/C and LOS for signalized intersections are calculated using the *Transportation Research Board Circular 212* method.

<sup>2</sup> V/C and LOS calculated using adjusted northbound right turn volumes.

<sup>3</sup> Pleasant Grove South/Riego Road, located in Sutter County, was analyzed using the same levels of significance as the rest of the project for consistency.

Source: Fehr & Peers, 2015



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Figure 3  
 Locust Road Closure Study  
 Average Daily Traffic Volume (ADT) with Locust Road Scenarios