

# **Appendix N**

## Traffic/Transportation Supporting Information

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**EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT  
SANTA BARBARA COUNTY, CALIFORNIA**

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**REVISED TRAFFIC AND CIRCULATION STUDY**

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**DRAFT**

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November 30, 2017

ATE #13079

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Prepared for:

Padre Associates  
369 Pacific Street  
San Luis Obispo, CA 93401

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**ASSOCIATED TRANSPORTATION ENGINEERS**

100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110-1686 • (805) 687-4418 • FAX (805) 682-8509

November 30, 2016

13079R06

Crystahl Taylor  
Padre Associates  
369 Pacific Street  
San Luis Obispo, CA 93401

***REVISED TRAFFIC AND CIRCULATION STUDY FOR THE  
EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT, COUNTY OF SANTA BARBARA***

Associated Transportation Engineers (ATE) has prepared the following revised traffic and circulation study for the East Cat Canyon Oil Field Redevelopment Project located southeast of the Orcutt area of Santa Barbara County. It is understood that the traffic impact analyses will be incorporated in the environmental impact report being prepared for the project.

Associated Transportation Engineers



Scott A. Schell, AICP, PTP  
Principal Transportation Planner

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Associated Transportation Engineers (ATE) has prepared the following revised traffic and circulation study for the East Cat Canyon Oil Field Redevelopment Project located southeast of the Orcutt area of Santa Barbara County. It is understood that the traffic impact analyses will be incorporated in the environmental impact report being prepared for the project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP  
Principal Transportation Planner

## **INTRODUCTION**

The following study contains an analysis of potential traffic and circulation impacts associated with the East Cat Canyon Oil Field Redevelopment Project (the "Project"). The report provides information relative to existing and future traffic conditions within the Project study area. The study evaluates the potential traffic impacts associated with the Project using County of Santa Barbara impact criteria. While the Project will be implemented in two phases (Phase I and II), the study evaluates the peak maximum number of trips, which will occur during Phase II. The study also contains an analysis of the Project's potential impacts to the Congestion Management Program facilities in the project vicinity.

## **PROJECT DESCRIPTION**

The Project site is located within East Cat Canyon approximately 10 miles southeast of the Santa Maria-Orcutt area in northern Santa Barbara County. Figure 1 shows the approximate location of the Project site. The main property entrance is located at 6516 Cat Canyon Road. The Project involves the re-establishment of oil production in an existing oil field by drilling and operating oil/gas production wells, steam injection wells, observation wells, Sisquoc water production wells, Sisquoc water injection wells, and fresh water wells. In addition, there will be a steam generation site, a production group station, a central processing plant, gathering and distribution pipelines, and related ancillary equipment. The Project will be implemented in phases to maximize efficiency, allow for optimization, and help level peak construction activity. Surface facility construction will occur in two phases (Phase I and Phase II). Well drilling and completion and well related infrastructure will occur over a multi-year program. Operations will commence with the first steam injection, beginning in "Year 0". The well drilling program will occur from "Year -1" through "Year 19".

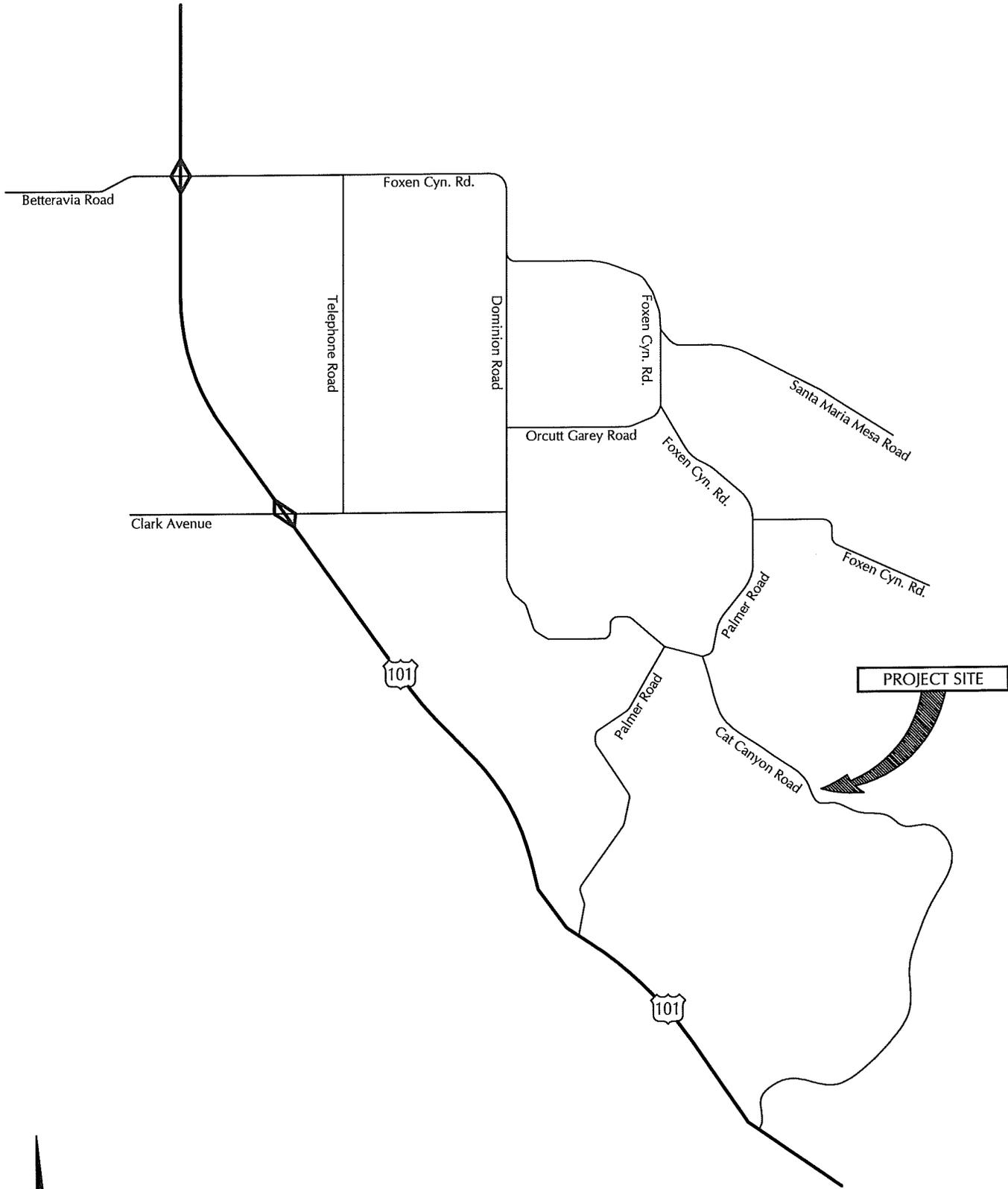
## **TRAFFIC STUDY METHODOLOGIES**

The following section reviews the key elements of the methodologies used in the traffic and circulation study.

### **Traffic Scenarios**

The traffic study assesses potential impacts generated by three Project options. Each option generates the same level of traffic; however, the three options assess impacts assuming three different routing of trucks hauling light crude oil and produced crude oil on the roadway network in the Project study area. Existing, Existing + Project, Cumulative and Cumulative + Project analyses are provided for each Project option.

For purposes of this study, the evaluation includes the maximum number of trips at the peak of the Project, which would occur in Phase II.



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PROJECT SITE LOCATION/EXISTING STREET NETWORK

FIGURE 1

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## **Existing Conditions**

Existing conditions are assessed for the Project study-area roadway system using traffic counts collected in October 2016 for this study (count data is contained in the Technical Appendix for reference). The traffic data collection effort and subsequent analyses include Average Daily Traffic (ADT) volumes for Project study-area roadways as well as A.M. and P.M. peak hour turning movements for the Project study-area intersections. The ADT volumes represent traffic that travels on a specific roadway segment over an average 24-hour weekday period. Traffic flow is most constrained at intersections; therefore, the more detailed traffic analysis examines operating conditions at key intersections during peak commuter travel periods. Intersection turning movement counts were collected from 7:00 to 9:00 A.M. during the morning commuter period and from 4:00 to 6:00 P.M. during the evening commuter period. The one-hour periods containing the highest volumes of traffic are considered the A.M. and P.M. peak hours.

## **Cumulative Conditions**

Cumulative traffic volumes were forecast using a list of approved and pending projects provided by the County of Santa Barbara (County) (the list is included in the Technical Appendix along with a map showing the location of each project). Most of the cumulative projects that are located east of the U.S. 101 corridor are oil/gas projects, which generate relatively low traffic volumes. There are also a few lot splits and other minor projects east of the U.S. 101 corridor that would generate minor traffic increases. As a conservative assumption, the cumulative traffic volumes for the Project study-area roadways and intersections east of U.S. 101 were forecast by assuming a ½ percent per year growth factor for a period of 20 years (10% total traffic increase). The cumulative list also includes several commercial and housing developments west of the U.S. 101 corridor in the Orcutt community and Santa Maria area, which would add traffic to the U.S. 101/Clark Avenue interchange and the U.S. 101/Betteravia Road interchange. The cumulative traffic volumes for these interchanges were therefore forecast using the Orcutt-Santa Maria Traffic Model (a computerized model that forecasts traffic volumes assuming approved and pending development projects in the Orcutt-Santa Maria region).

## **Level of Service Definitions and Standards**

Levels of Service (LOS) A through F are used to rate traffic operations, with LOS A indicating free flow operations and LOS F indicating congested operations. More detailed descriptions are included in the Technical Appendix. The County considers LOS C as the minimum acceptable operating standard for the roadways and intersections within the Project study-area. The U.S. 101/Betteravia Road interchange is located within the City of Santa Maria. The City of Santa Maria considers LOS D as the minimum acceptable operating standard for intersections within their jurisdiction.

## Level of Service Calculation Methods

Existing and future operations were analyzed for the Project study-area roadways based on standard engineering roadway design capacities (roadway capacities are summarized in the Technical Appendix). Levels of service for the Project study-area intersections that are controlled by stop signs were analyzed using the operations methods contained in the Highway Capacity Manual.<sup>1</sup> For intersections controlled by traffic signals, levels of service were analyzed using the Intersection Capacity Utilization (ICU) method. Both methods have been adopted by the County for traffic impact studies. Since levels of service for Stop-sign controlled intersections are based on the average delay per vehicle, delay data was collected at the Project study-area intersections for the stop sign level of service analyses. Level of service calculation worksheets are contained in the Technical Appendix for reference.

## THRESHOLDS OF SIGNIFICANCE

The County's thresholds of significance for traffic impacts were used to assess the project's potential to generate project-specific and/or cumulative traffic impacts. The County's thresholds are listed below.

- A. An impact is considered significant if the addition of project traffic to an intersection increases the volume to capacity (V/C) ratio by the following values:

Intersection Level of Service (Including Project)	Increase in V/C or Trips Greater Than
LOS A	0.20
LOS B	0.15
LOS C	0.10
LOS D	15 Trips
LOS E	10 Trips
LOS F	5 Trips

- B. The project's access to a major road or arterial road would require access that would create an unsafe situation, a new traffic signal or major revisions to an existing traffic signal.
- C. The project adds traffic to a roadway that has design features (e.g., narrow width, road-side ditches, sharp curves, poor sight distance, inadequate pavement structure) that would become a potential safety problem with the addition of project traffic.
- D. Project traffic would utilize a substantial portion of an intersection's capacity where the intersection is currently operating at an acceptable level of service (LOS A - LOS C) but with cumulative traffic would degrade, or approach LOS D (V/C 0.81) or lower. Substantial is

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<sup>1</sup> Highway Capacity Manual, Transportation Research Board, 2010.

defined as a minimum change of 0.03 for intersections which would operate from 0.80 to 0.85, a change of 0.02 for intersections which would operate from 0.86 to 0.90, and a change of 0.01 for intersections operating at anything lower.

The County has developed the administrative policy of defining a significant roadway impact if a project would increase traffic volumes by more than 1.0% on roadways that currently exceed the Acceptable Capacity or are forecast to exceed the Acceptable Capacity under cumulative conditions.

## **PROJECT IMPACTS – OPTION 1**

As noted, this traffic study assesses potential impacts for three Project options. Each option generates the same level of traffic; however, the impact analyses assume three different routes for trucks hauling light crude oil and produced crude oil. Figure 2 shows the local travel route for tanker trucks under Option 1. As shown, the route for inbound trucks per is southbound U.S. 101 to Clark Avenue to Dominion Road to Palmer Road to Cat Canyon Road. The same route in reverse would be used for outbound trucks.

### **Existing Street Network**

The street network that serves Project Option 1 includes highways, arterial streets and collector streets, as illustrated in Figure 1. The following text provides a brief discussion of the major components of the Project study-area street network for Option 1.

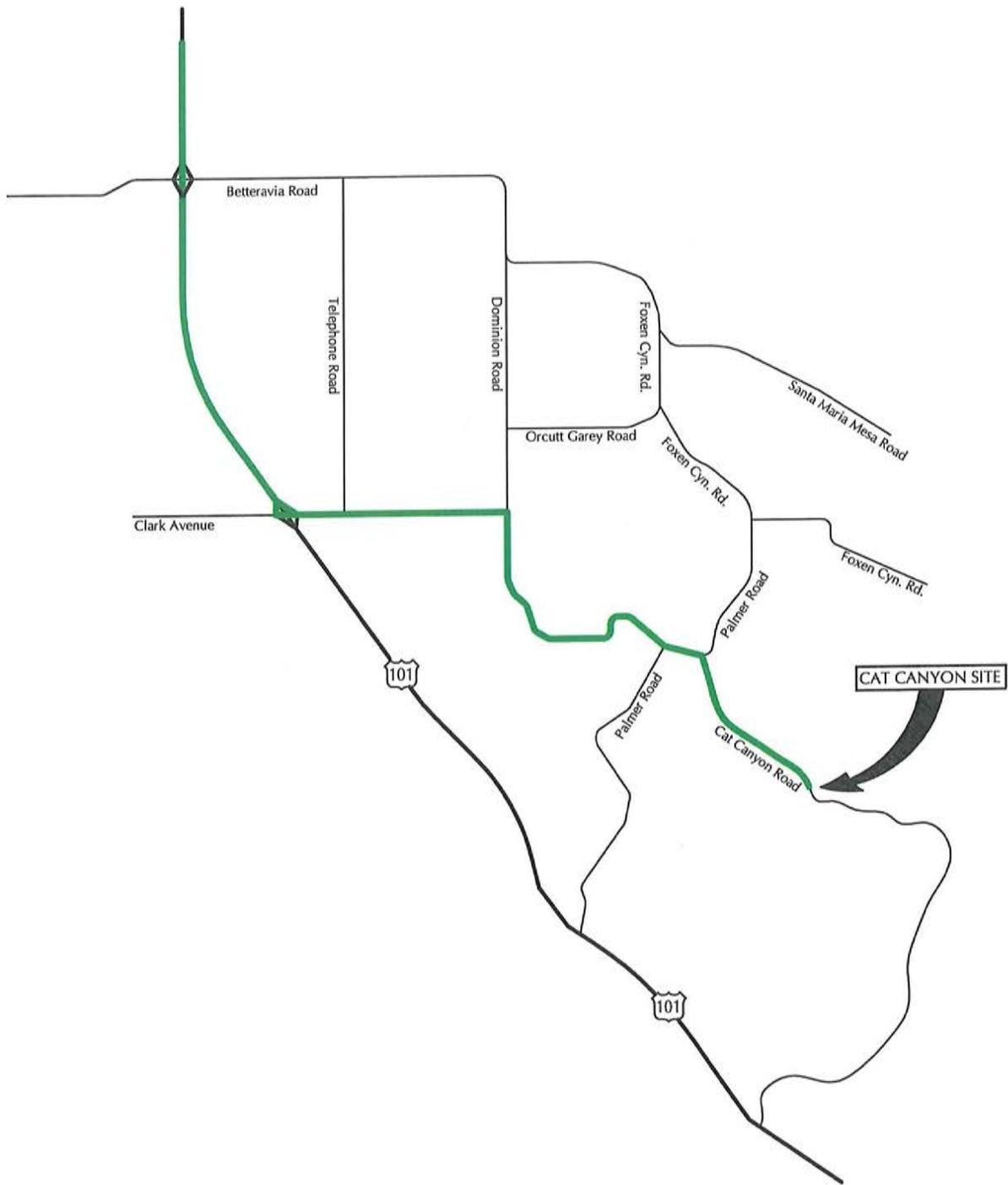
**U.S. 101**, located west of the Project site, is a north-south freeway that provides regional access to the Santa Maria-Orcutt area. U.S. 101 contains 2 lanes in each direction on the segments north and south of Clark Avenue. The U.S. 101/Clark Avenue interchange provides regional access to the Project site.

**Clark Avenue** is a 2-lane arterial that extends between Dominion Road on the east and U.S. 101 on the west. This segment serves agricultural and residential uses. Clark Avenue also extends west of U.S. 101 as a 4-lane arterial, traversing the Orcutt community.

**Dominion Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and Palmer Road on the south. This segment mostly serves oil facilities and ranch lands.

**Palmer Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and U.S. 101 on the south. There is a short segment of Palmer Road that connects Dominion Road and Cat Canyon Road. This segment mostly serves oil facilities and ranch lands.

**Cat Canyon Road** is a 2-lane collector road that extends between Palmer Road on the north and U.S. 101 on the south. This segment mostly serves oil facilities and ranch lands. Cat Canyon Road provides direct access to the Project site via the existing Long Canyon Road intersection.



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OPTION 1 TRUCK ROUTE

FIGURE 2

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## Existing Roadway Operations

Figure 3 presents the Existing ADT volumes for the key roadway segments that serve Option 1. Table 1 shows the Existing ADT volumes and levels of service for the key roadways.

**Table 1**  
**Existing Roadway Operations – Option 1**

Roadway Segment	Classification	ADT Volume	LOS
Clark Avenue e/o U.S. 101	2-Lane Arterial	5,700	LOS A
Clark Avenue e/o Telephone Road	2-Lane Arterial	4,250	LOS A
Dominion Road s/o Clark Avenue	2-Lane Collector	850	LOS A
Cat Canyon Road s/o Palmer Road	2-Lane Collector	600	LOS A

As shown in Table 1, the Project study-area roadways currently operate at LOS A, which indicates very good operations. The existing roadway operations meet the County's LOS C standard.

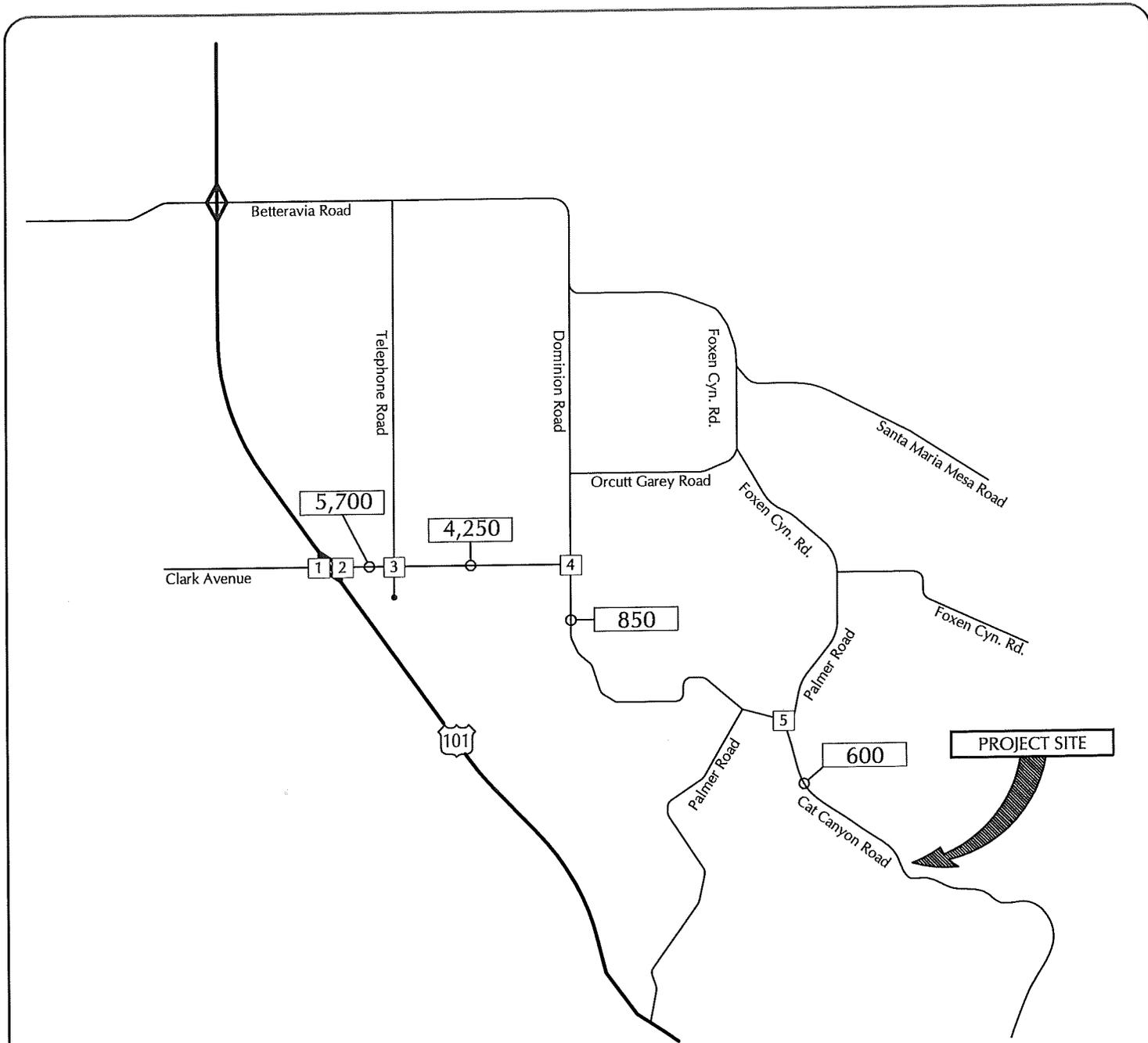
## Existing Intersection Operations

Figure 3 shows the Existing A.M. and P.M. peak hour traffic volumes for the key intersections identified for analysis for Option 1. Figure 4 shows the lane geometries and traffic controls for the key intersections. Table 2 presents the Existing A.M. and P.M. peak hour levels of service for the Project study-area intersections for Option 1.

**Table 2**  
**Existing Intersection Operations – Option 1**

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
U.S. 101 SB Ramps/Clark Avenue	Stop Sign	12.8 Sec.	LOS B	8.5 Sec.	LOS A
U.S. 101 NB Ramps/Clark Avenue	Stop Sign	8.5 Sec.	LOS A	11.5 Sec.	LOS B
Telephone Road/Clark Avenue	Stop Sign	9.3 Sec.	LOS A	10.2 Sec.	LOS B
Dominion Road/Clark Avenue	Stop Sign	8.9 Sec.	LOS A	8.3 Sec.	LOS A
Palmer Road/Cat Canyon Road	Stop Sign	8.2 Sec.	LOS A	8.4 Sec.	LOS A
LOS based on average delay per vehicle in seconds pursuant to HCM procedures.					

As shown in Table 2, all of the Project study-area intersections for Option 1 operate at LOS A or LOS B during the A.M. and P.M. peak periods, which indicate very good operations and meet the County's LOS C standard.



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LEGEND

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

1	2	3	4	5
545(311) 104(98) 0(0)		14(16) 1(1) 78(94)	63(51)	
458(703) 57(137)	359(594) 220(202)	65(46) 126(151) 4(3)	32(70) 27(23)	4(24) 16(21)
	(119)278 (23)7	(111)206 (102)128	(14)30 (116)297 (2)2	(3)7 (3)2
	(1)2)21 (1)0 (44)157	(3)1 (4)0 (4)4	(3)11 (15)43	(3)3 (1)1)27

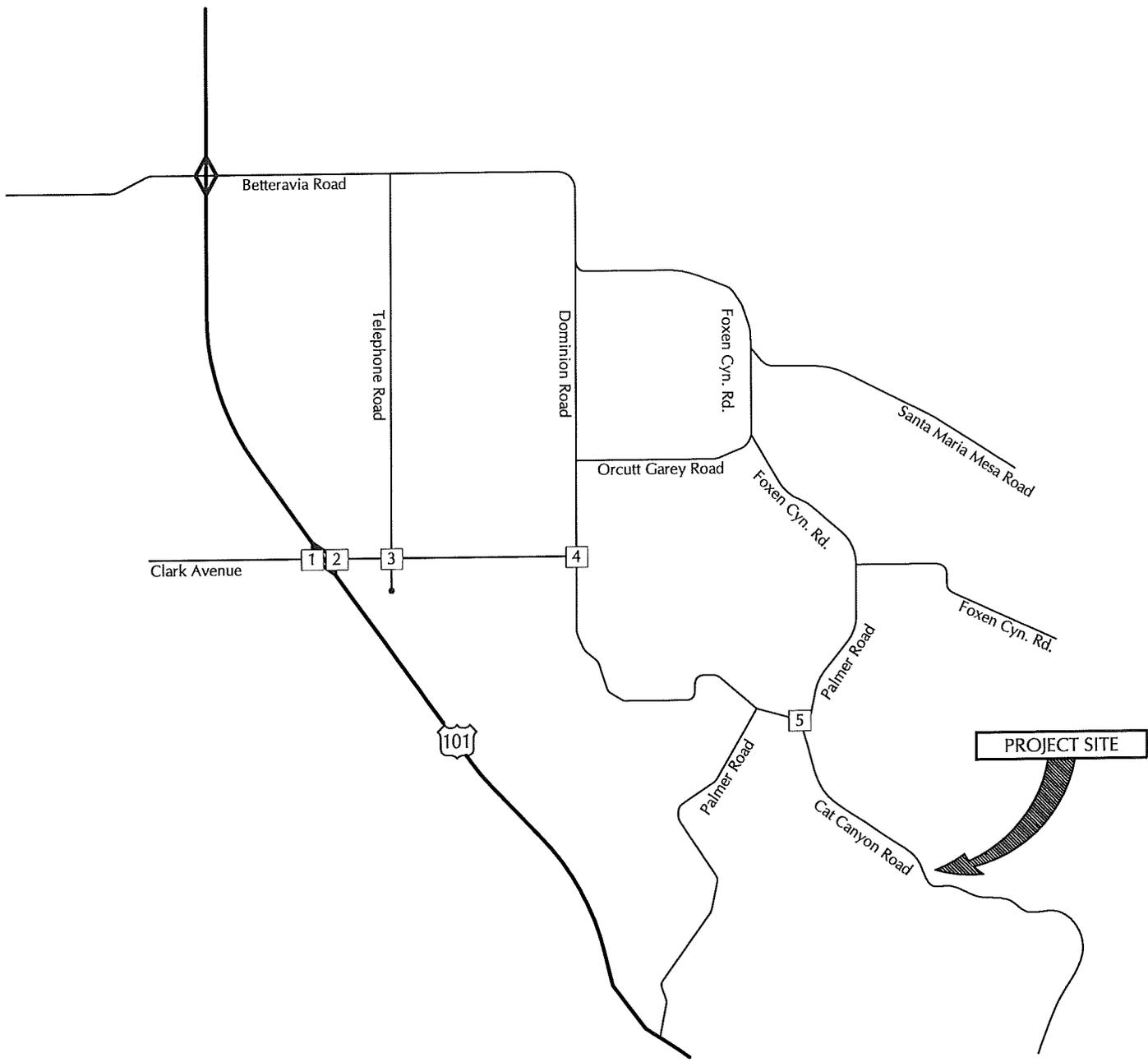


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EXISTING TRAFFIC VOLUMES - OPTION 1

FIGURE 3

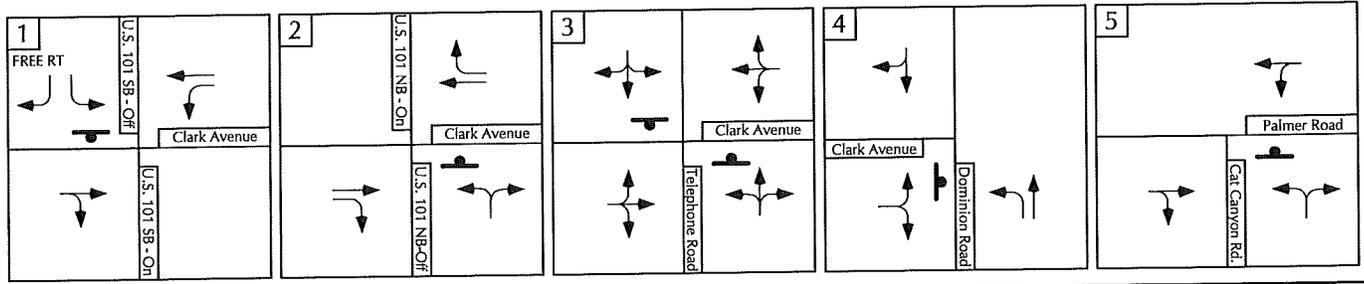
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**LEGEND**

- Lane Geometry
- Stopped Approach



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**INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS - OPTION 1**

**FIGURE 4**

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## Project Trip Generation – All Options

As noted, each of the Project options would generate the same level of traffic. The following trip generation analysis therefore applies to all 3 of the Project options.

Trip generation estimates were calculated for the Project based on operational information provided by the applicant. The applicant provided detailed information for employees and equipment required for the various phases of the Project, including the number of employees and schedules, material and equipment deliveries, and light crude oil import/produced crude oil export by trucks. Table 3 shows the peak trip generation estimates developed for the Project. It is important to note that the trip generation estimates include traffic that would be generated on a day-to-day basis (operations) as well as traffic that would be generated during peak drilling phases (construction). Thus, the traffic impact analysis is worst case in nature since it combines day-to-day traffic generated by operations and traffic generated during peak drilling phases.

**Table 3**  
**Peak Project Trip Generation – All Options**

Component	Number Per Day	Shift	Trip Generation				
			ADT	A.M. Peak		P.M. Peak	
				In	Out	In	Out
<b>Employees – Operations</b>							
Aera 9/80 Employees(1)	48	6:30 AM-4:15 PM	144	0	0	0	48
Aera 12H Employees(2)	5	6:00 AM/PM-6:00 PM/AM	15	0	0	0	0
Contract 9/80 Employees(1)	25	6:30 AM-4:15 PM	75	0	0	0	25
Contract 12H Employees(2)	14	6:00 AM/PM-6:00 PM/AM	42	0	0	0	0
Subtotal			276	0	0	0	73
<b>Employees – Drilling</b>							
Aera 9/80 Employees(1)	6	6:30 AM-4:15 PM	18	0	0	0	6
Contract 12H Employees(2)	7	6:00 AM/PM-6:00 PM/AM	21	0	0	0	0
Subtotal			39	0	0	0	0
				0	0	0	0
				0	0	0	6
Bulk Material & Waste Deliveries(3)	4	NA	8	0	1	1	0
Miscellaneous Material Deliveries(3)	5	NA	10	0	1	1	0
Light Crude Oil Import/Produced Crude Oil Export(4)	99.5	NA	199	4	4	4	4
<b>Totals</b>			<b>532</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>83</b>
(1) 9/80 workers. Shift starts at 6:30 A.M. and ends at 4:15 P.M. ADT assumes 50% of employee leave site for lunch break. (2) 12-hour shift workers. Shifts = 6:00 A.M. to 6:00 P.M.; and 6:00 P.M. to 6:00 A.M. ADT assumes 50% of employees leave site for lunch break. (3) Deliveries assumes one inbound + one outbound trip per delivery. A.M. and P.M. peak hour trip generation assumes 10% of trips during each peak hour. (4) Light Crude Oil Import/Produced Crude Oil Export assumes one inbound + one outbound trip per truck. A.M. and P.M. peak hour trip generation assumes 4 trucks inbound and outbound per hour.							

Table 3 shows that the Project is forecast to generate 532 average daily trips, with 10 trips occurring during the A.M. peak hour and 89 trips occurring during the P.M. peak hour.

### Trip Distribution – Option 1

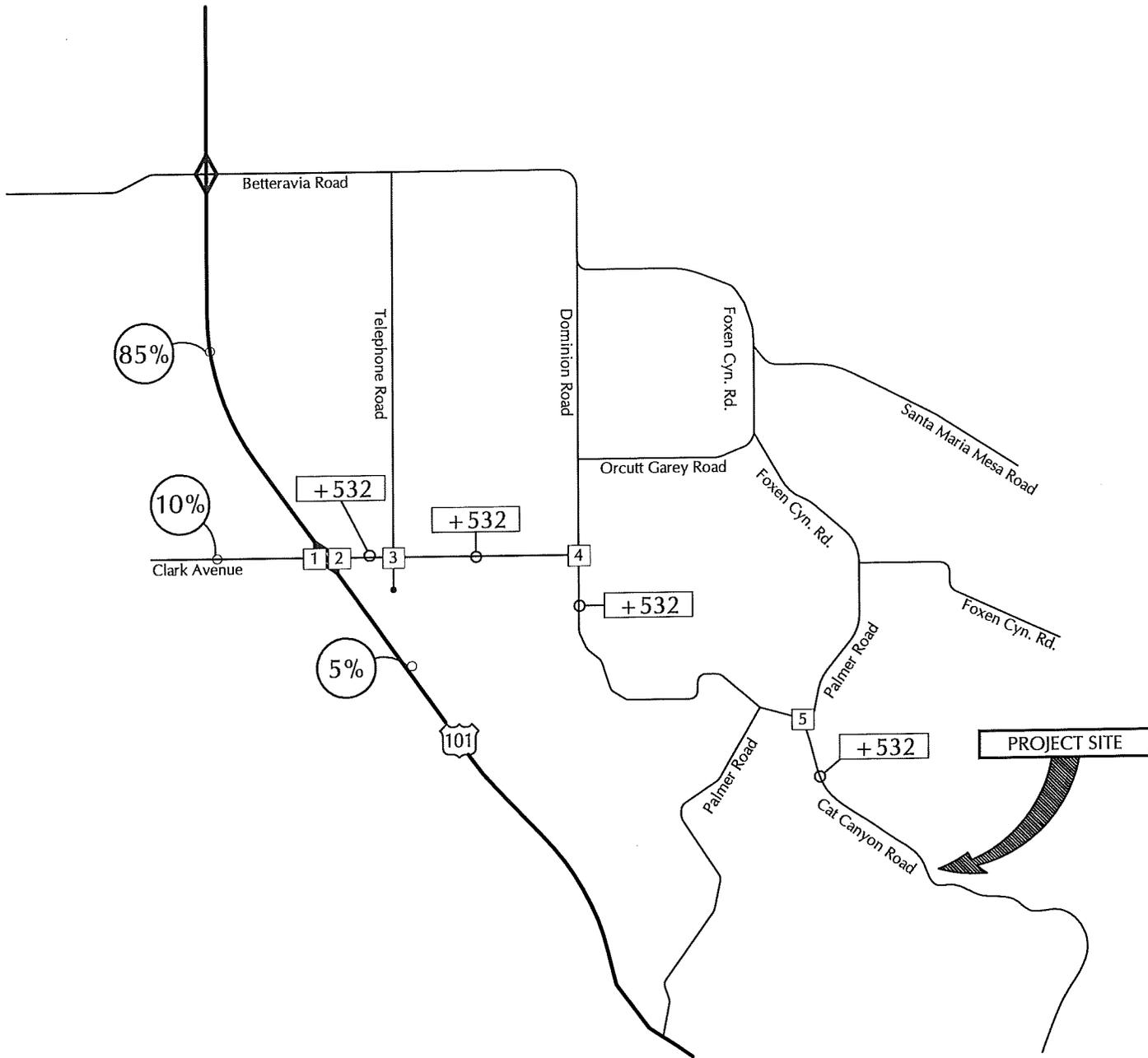
As shown on Figure 4, the travel route for the 99 inbound trucks per day that would transport light crude oil and produced crude oil under Option 1 is southbound U.S. 101 to Clark Avenue to Dominion Road to Palmer Road to Cat Canyon Road. The same route in reverse would be used for outbound trucks. The trip distribution pattern developed for the other traffic generated under Option 1 is based on anticipated travel routes for employees and material/equipment deliveries. All of the traffic generated by the Project would use the Clark Avenue to Dominion Road to Palmer Road to Cat Canyon Road route when traveling to/from the site. Furthermore, most all of the traffic would use U.S. 101 to access Clark Avenue, with a minor amount of traffic anticipated from the Orcutt community via Clark Avenue west of U.S. 101. The trip distribution pattern is summarized in Table 4. Figure 5 shows the assignment of project-generated trips to the Project study-area street network for Option 1. The Existing + Project volumes for Option 1 are shown on Figure 6.

**Table 4**  
**Project Trip Distribution – Option 1**

<b>Origin/Destination</b>	<b>Direction</b>	<b>Percentage</b>
U.S. 101 via Clark Avenue(1)	North	85%
U.S. 101 via Clark Avenue	South	5%
Clark Avenue	West	10%
<b>Total</b>		<b>100%</b>
(1) Tanker trucks would use U.S. 101/Clark Avenue interchange under Option 1.		

### Existing + Project Roadway Impacts – Option 1

Table 5 compares the Existing and Existing + Project roadway levels of service and identifies project-specific roadway impacts for Option 1 based on County thresholds.



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- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

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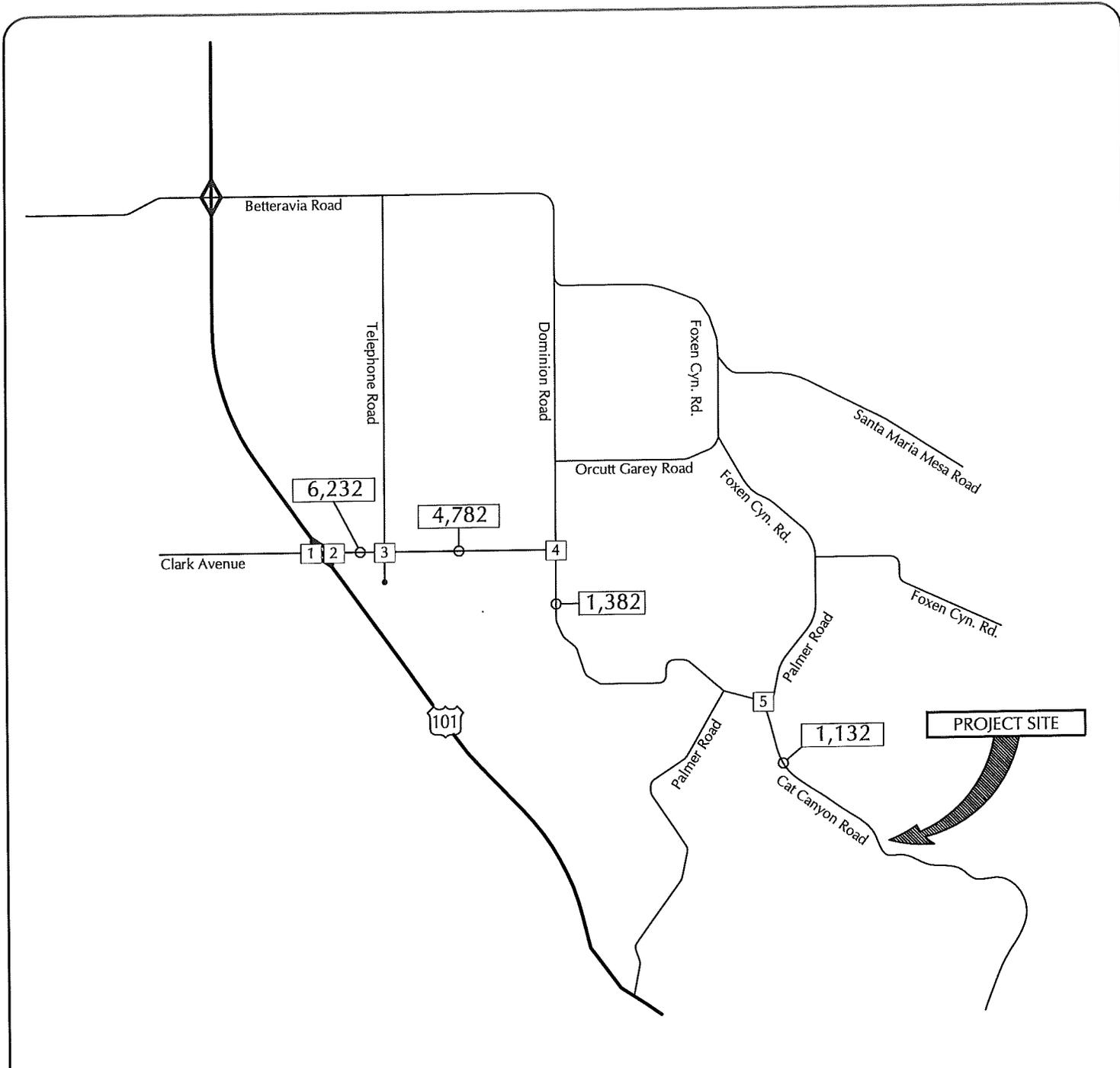


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PROJECT TRIP DISTRIBUTION AND ASSIGNMENT - OPTION 1

FIGURE 5

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<p>1</p> <p>110(102) 0(0) 545(311)</p> <p>← (119)286 ← (23)11</p> <p>458(703) 57(137)</p>	<p>2</p> <p>← (117)277 ← (102)140</p> <p>359(594) 226(206)</p> <p>← (12)21 ← (1)0 ← (44)157</p>	<p>3</p> <p>14(16) 1(1) 78(94)</p> <p>← (14)30 ← (122)380 ← (2)2</p> <p>65(46) 132(155) 4(3)</p> <p>← (3)1 ← (4)0 ← (4)4</p>	<p>4</p> <p>6(9) 63(51)</p> <p>32(70) 33(27)</p> <p>← (3)11 ← (21)126</p>	<p>5</p> <p>← (3)7 ← (3)2</p> <p>4(24) 22(25)</p> <p>← (3)3 ← (17)110</p>
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EXISTING + PROJECT TRAFFIC VOLUMES - OPTION 1

FIGURE 6

EKM - #13079

**Table 5  
Existing + Project Roadway Operations – Option 1**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Existing	Existing + Project		
Clark Avenue e/o U.S. 101	5,700 / LOS A	6,232 / LOS A	532	No
Clark Avenue e/o Telephone Road	4,250 / LOS A	4,782 / LOS A	532	No
Dominion Road s/o Clark Avenue	850 / LOS A	1,382 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	600 / LOS A	1,132 / LOS A	532	No
NOTE: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.				

As shown in Table 5, the Project study-area roadways are forecast to continue to operate at LOS A with the addition of Project traffic for Option 1, which meets the County's LOS C standard. Thus, the East Cat Canyon Oil Field Redevelopment Project would not generate project-specific roadway impacts under Option 1.

**Existing + Project Intersection Impacts – Option 1**

Tables 6 and 7 compare the Existing and Existing + Project levels of service for the Project study-area intersections for Option 1 and identify project-specific intersection impacts based on County thresholds.

**Table 6  
Existing + Project A.M. Peak Hour Intersection Operations – Option 1**

Intersection	Existing		Existing + Project		Impact?
	Delay	LOS	Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue	12.8 Sec.	LOS B	12.8 Sec.	LOS B	No
U.S. 101 NB Ramps/Clark Avenue	8.5 Sec.	LOS A	8.6 Sec.	LOS A	No
Telephone Road/Clark Avenue	9.3 Sec.	LOS A	9.9 Sec.	LOS A	No
Dominion Road/Clark Avenue	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Palmer Road/Cat Canyon Road	8.2 Sec.	LOS A	8.5 Sec.	LOS A	No
NOTE: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.					

**Table 7**  
**Existing + Project P.M. Peak Hour Intersection Operations – Option 1**

Intersection	Existing		Existing + Project		Impact?
	Delay	LOS	Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue	8.5 Sec.	LOS A	8.6 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue	11.5 Sec.	LOS B	11.8 Sec.	LOS B	No
Telephone Road/Clark Avenue	10.2 Sec.	LOS B	10.8 Sec.	LOS B	No
Dominion Road/Clark Avenue	8.3 Sec.	LOS A	8.3 Sec.	LOS A	No
Palmer Road/Cat Canyon Road	8.4 Sec.	LOS A	9.0 Sec.	LOS A	No
NOTE: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.					

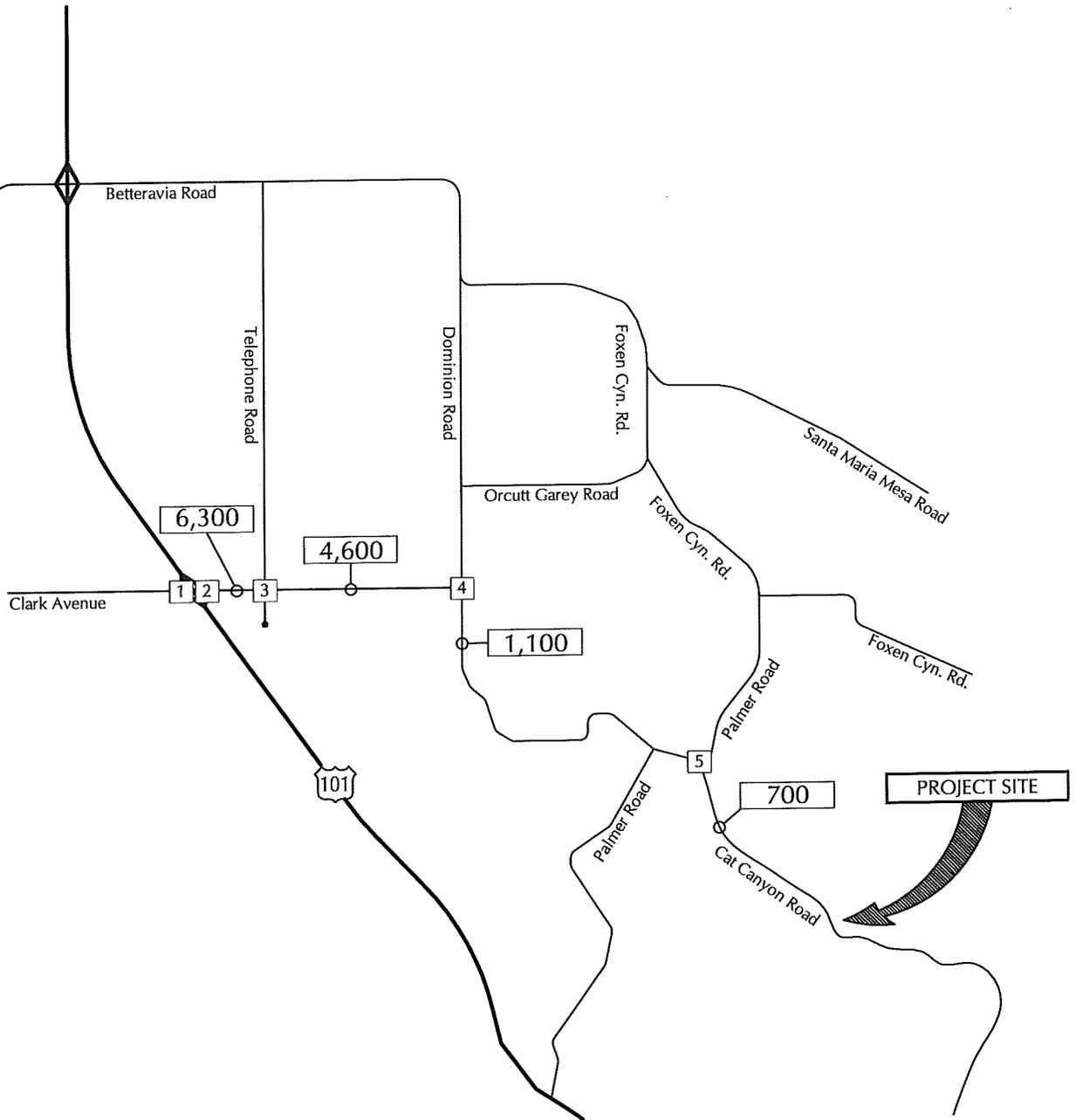
As shown in Tables 6 and 7, the Project study-area intersections are forecast to operate at LOS A or LOS B with Existing + Project traffic for Option 1, which meets the County's LOS C standard. The East Cat Canyon Oil Field Redevelopment Project would not generate project-specific intersection impacts under Option 1.

**Cumulative + Project Roadway Impacts – Option 1**

Cumulative and Cumulative + Project traffic volumes for Option 1 are shown on Figures 7 and 8. Table 8 compares the Cumulative and Cumulative + Project roadway levels of service for Option 1 and identifies cumulative roadway impacts based on County thresholds.

**Table 8**  
**Cumulative + Project Roadway Operations – Option 1**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Cumulative	Cumulative + Project		
Clark Avenue e/o U.S. 101	6,300 / LOS A	6,832 / LOS A	532	No
Clark Avenue e/o Telephone Road	4,600 / LOS A	5,132 / LOS A	532	No
Dominion Road s/o Clark Avenue	1,100 / LOS A	1,632 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	700 / LOS A	1,232 / LOS A	532	No
NOTE: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.				



NOT TO SCALE

LEGEND

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

1	2	3	4	5
110(115) 895(432)	(130)380 (29)16	(226)232 (115)183	15(20) 5(5)	(5)12 (5)5
573(836) 76(159)	473(701) 237(223)	71(55) 142(172) 7(7)	12(19) 77(59)	8(28) 20(26)
	(17)26 (47)198	(19)33 (129)337 (6)2	36(78) 33(34)	(4)6 (15)36
		(8)4 (6)5 (7)5	(6)18 (21)60	

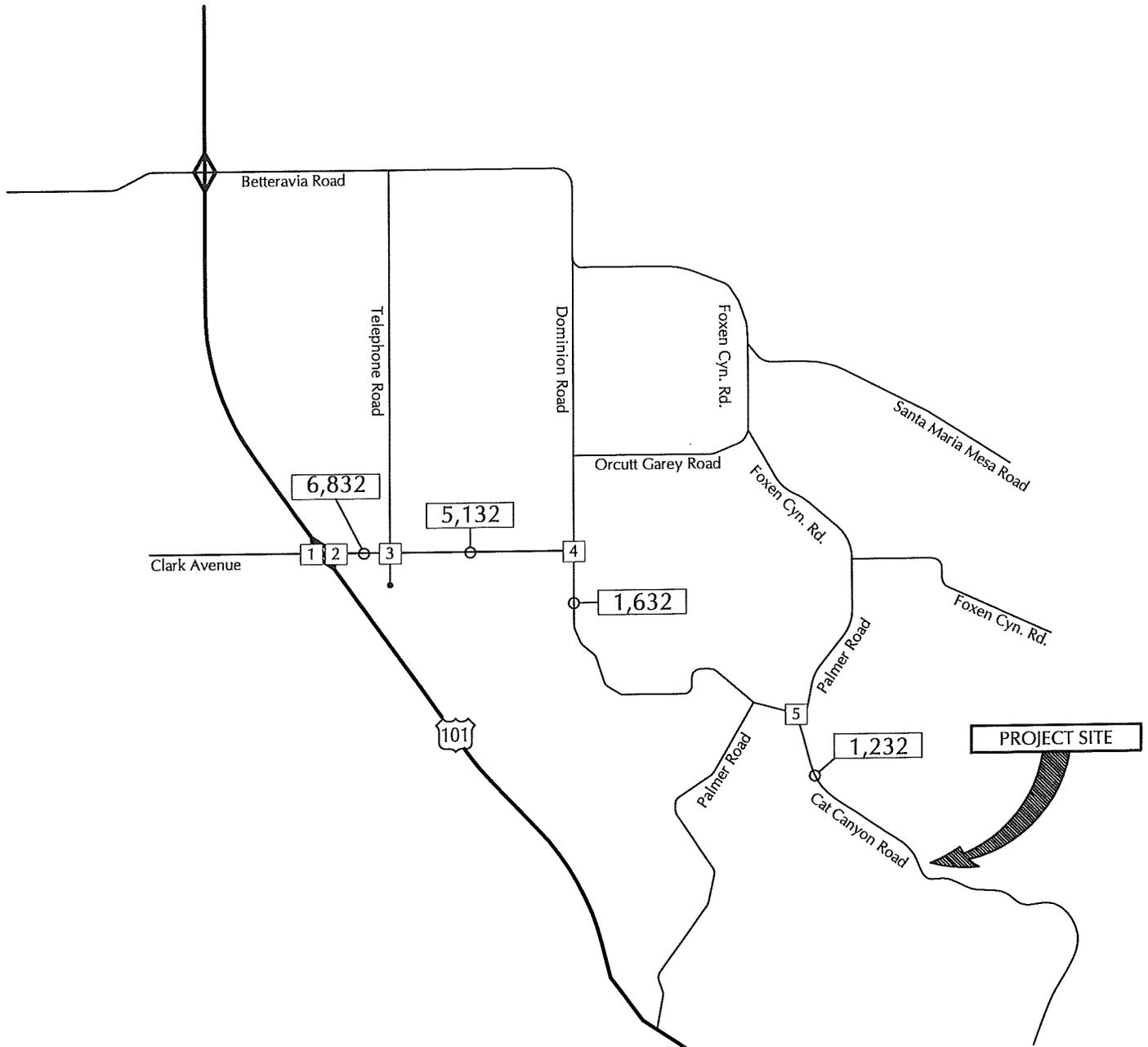


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CUMULATIVE TRAFFIC VOLUMES - OPTION 1

FIGURE 7

EKM - #13079



  
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**LEGEND**

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>1</b>            116(119)            895(432)         </div> <div style="border: 1px solid black; padding: 5px;">           573(836)            76(159)         </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>2</b>            (130)388            (29)20         </div> <div style="border: 1px solid black; padding: 5px;">           473(701)            243(227)         </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>3</b>            15(20)            5(5)            89(101)         </div> <div style="border: 1px solid black; padding: 5px;">           71(55)            148(176)            7(7)         </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>4</b>            12(19)            77(59)         </div> <div style="border: 1px solid black; padding: 5px;">           36(78)            39(38)         </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>5</b>            (5)12            (5)5         </div> <div style="border: 1px solid black; padding: 5px;">           8(28)            26(30)         </div>
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**CUMULATIVE + PROJECT TRAFFIC VOLUMES - OPTION 1**

FIGURE 8

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As shown, the Project study-area roadways are forecast to operate at LOS A under Cumulative and Cumulative + Project conditions for Option 1. Thus, Option 1 for the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative roadway impacts.

**Cumulative + Project Intersection Impacts – Option 1**

Tables 9 and 10 compare the Cumulative and Cumulative + Project levels of service for the Project study-area intersections for Option 1 and identify cumulative impacts based on County thresholds.

**Table 9  
Cumulative + Project A.M. Peak Hour Intersection Operations – Option 1**

Intersection	Cumulative		Cumulative + Project		Impact?
	Delay	LOS	Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue	15.2 Sec.	LOS C	15.2 Sec.	LOS C	No
U.S. 101 NB Ramps/Clark Avenue	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Telephone Road/Clark Avenue	9.8 Sec.	LOS A	9.9 Sec.	LOS A	No
Dominion Road/Clark Avenue	9.0 Sec.	LOS A	9.0 Sec.	LOS A	No
Palmer Road/Cat Canyon Road	8.3 Sec.	LOS A	8.4 Sec.	LOS A	No

NOTE: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.

**Table 10  
Cumulative + Project P.M. Peak Hour Intersection Operations – Option 1**

Intersection	Cumulative		Cumulative + Project		Impact?
	Delay	LOS	Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue	9.0 Sec.	LOS A	9.3 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue	21.3 Sec.	LOS C	22.6 Sec.	LOS C	No
Telephone Road/Clark Avenue	11.5 Sec.	LOS B	11.8 Sec.	LOS B	No
Dominion Road/Clark Avenue	8.5 Sec.	LOS A	8.4 Sec.	LOS A	No
Palmer Road/Cat Canyon Road	8.5 Sec.	LOS A	9.0 Sec.	LOS A	No

NOTE: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.

Tables 9 and 10 show that the Project study-area intersections are forecast to operate at LOS C or better under Cumulative + Project conditions, which meets the County's LOS C standard. Thus, Option 1 for the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative intersection impacts.

## PROJECT IMPACTS – OPTION 2

Option 2 is the same as the other Project options except for the routing of tanker trucks. Option 2 assesses potential roadway and intersection impacts generated by the Project assuming the truck route shown on Figure 9. As shown, inbound trucks would travel on southbound U.S. 101 to Betteravia Road to Telephone Road to Clark Avenue to Dominion Road to Palmer Road to Cat Canyon Road. Outbound trucks would use the same route in reverse.

### Existing Street Network

The following text provides a brief discussion of the major components of the Project study-area street network for Option 2 (see Figure 1 for illustration of street network).

**U.S. 101**, located west of the Project site, is a north-south freeway that provides regional access to the Santa Maria-Orcutt area. U.S. 101 contains 2 lanes in each direction on the segments north and south of Clark Avenue. The U.S. 101/Clark Avenue interchange and U.S. 101/Betteravia Road interchange provide regional access to the Project site under Option 2.

**Clark Avenue** is a 2-lane arterial that extends between Dominion Road on the east and U.S. 101 on the west. This segment serves agricultural and residential uses. Clark Avenue also extends west of U.S. 101 as a 4-lane arterial, traversing the Orcutt community.

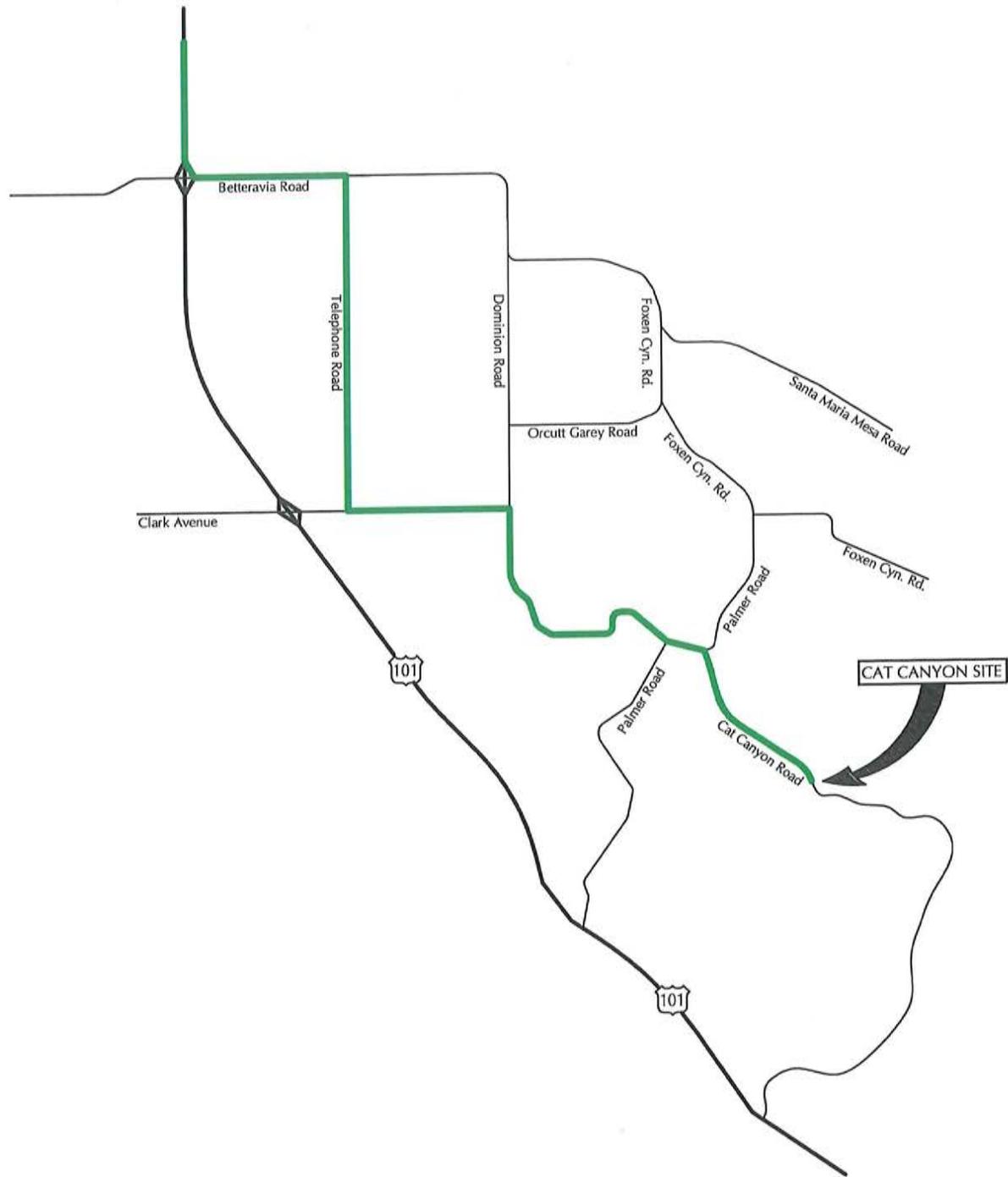
**Dominion Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and Palmer Road on the south. This segment mostly serves oil facilities and ranch lands.

**Palmer Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and U.S. 101 on the south. There is a short segment of Palmer Road that connects Dominion Road and Cat Canyon Road. This segment mostly serves oil facilities and ranch lands.

**Cat Canyon Road** is a 2-lane collector road that extends between Palmer Road on the north and U.S. 101 on the south. This segment mostly serves oil facilities and ranch lands. Cat Canyon Road provides direct access to the Project site.

**Betteravia Road** is a 4-lane arterial road between U.S. 101 and Nicholson Avenue just east of U.S. 101; and is a 2-lane arterial road between Nicholson Avenue and Telephone Road. The 4-lane segment east of U.S. 101 serves a truck stop and service stations; and the 2-lane segment between Nicholson Avenue and Telephone Road serves mostly agricultural uses.

**Telephone Road** is a 2-lane collector road that extends between Betteravia Road and Clark Avenue. This segment mostly serves residential and agricultural uses.



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OPTION 2 TRUCK ROUTE

FIGURE 9

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## Existing Roadway Operations

Figure 10 shows the Existing ADT volumes for the key roadway segments that serve Option 2. Table 11 shows the existing ADT volumes and levels of service for the key roadways.

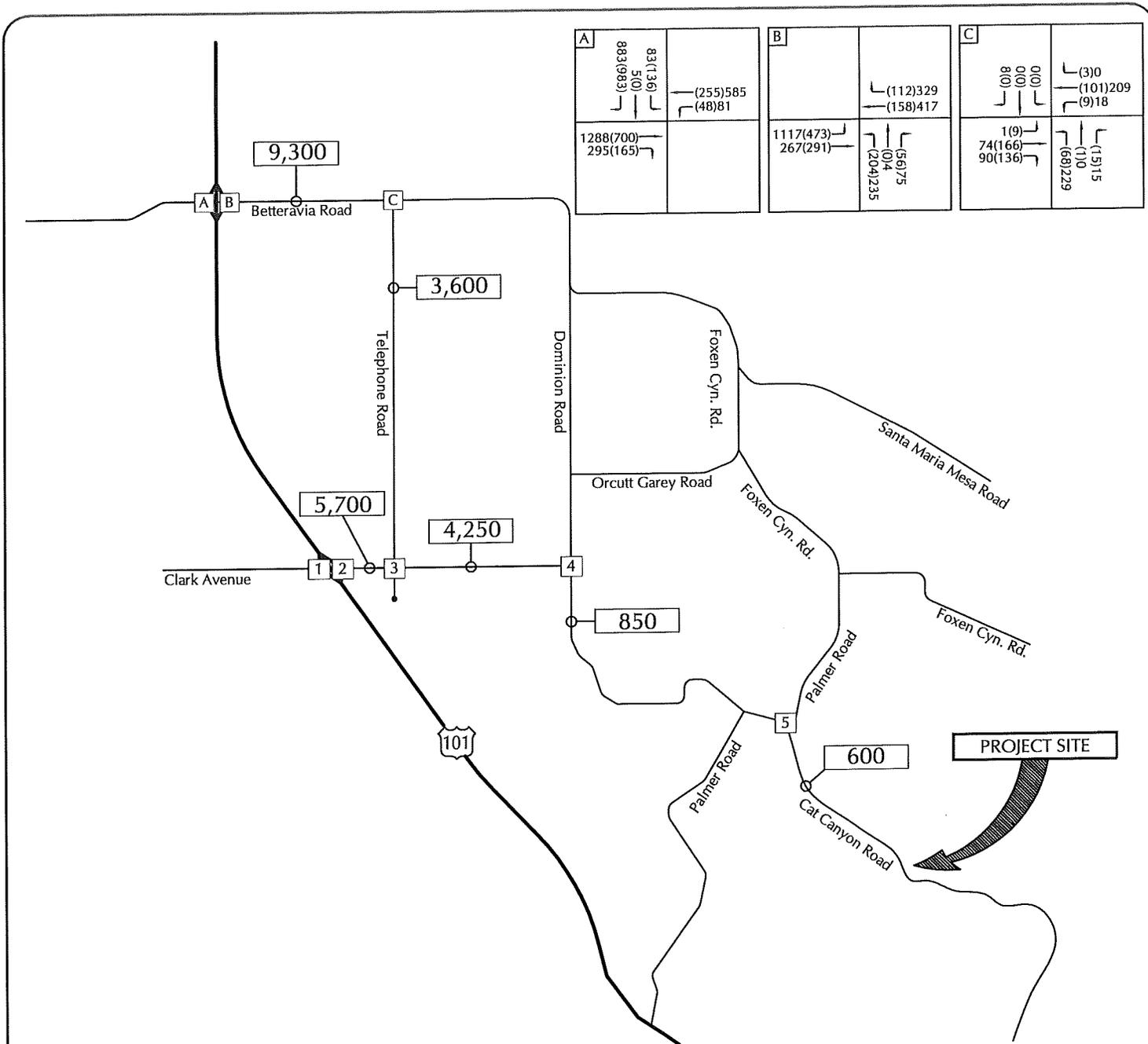
**Table 11**  
**Existing Roadway Operations – Option 2**

Roadway Segment	Classification	ADT Volume	LOS
Clark Avenue e/o U.S. 101	2-Lane Arterial	5,700	LOS A
Clark Avenue e/o Telephone Road	2-Lane Arterial	4,250	LOS A
Dominion Road s/o Clark Avenue	2-Lane Collector	850	LOS A
Cat Canyon Road s/o Palmer Road	2-Lane Collector	600	LOS A
Betteravia Road e/o U.S. 101	4-Lane Arterial	9,300	LOS A
Telephone Road s/o Betteravia Road	2-Lane Collector	3,600	LOS A

As shown in Table 11, the Project study-area roadways currently operate at LOS A, which meets the County's LOS C standard.

## Existing Intersection Operations

Figure 10 shows the Existing A.M. and P.M. peak hour traffic volumes for the key intersections identified for analysis for Option 2. Figure 11 shows the lane geometries and traffic controls for the key intersections. Table 12 presents the Existing A.M. and P.M. peak hour levels of service for the Project study-area intersections for Option 2.



<b>A</b>	83(136) 5(0) 883(983)	(255)585 (48)81	<b>B</b>	(112)329 (158)417	<b>C</b>	(3)0 (101)209 (9)18
	1288(700) 295(165)			1117(473) 267(291)		1(9) 74(166) 90(136)
				(56)75 (0)4 (204)235		(15)15 (1)0 (68)229

LEGEND

X - Average Daily Traffic Volume

(XX)XX - (A.M.)P.M. Peak Hour Volume

N  
NOT TO SCALE

<b>1</b>	104(98) 0(0) 545(311)	(119)278 (23)7	<b>2</b>	(111)206 (102)128	<b>3</b>	14(16) 1(1) 78(94)	(14)30 (116)297 (2)2	<b>4</b>	6(9) 63(51)	(3)7 (3)2
	458(703) 57(137)			(12)21 (1)0 (44)157		65(46) 126(151) 4(3)	(3)1 (4)0 (4)4		32(70) 27(23)	(3)3 (1)27
									(3)11 (15)43	
										4(24) 16(21)

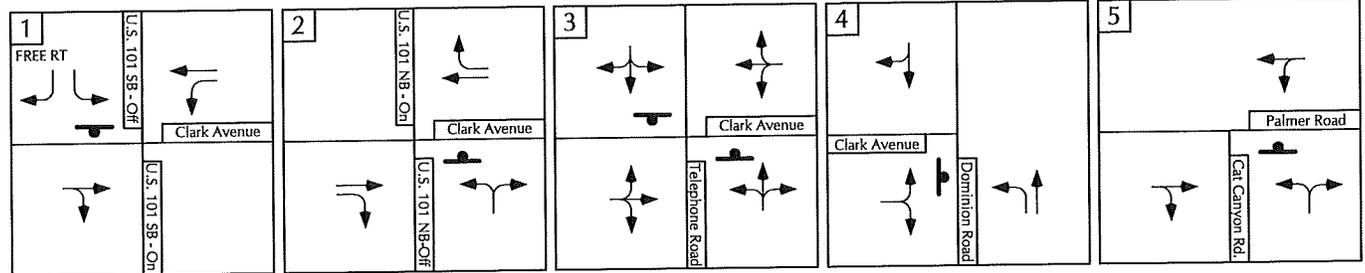
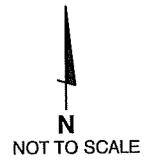
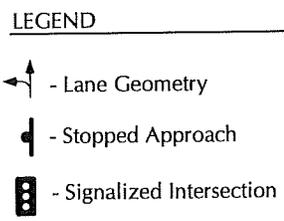
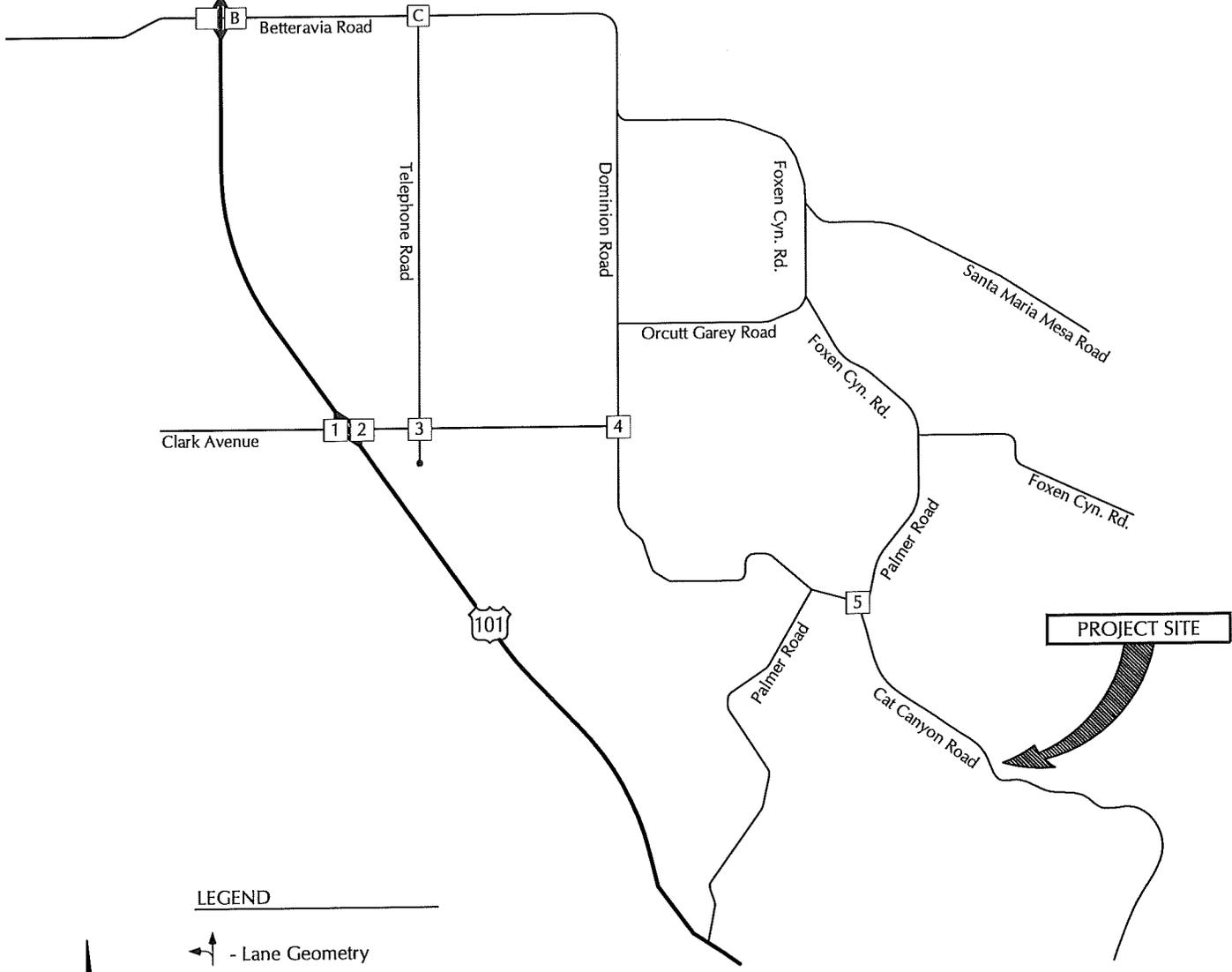
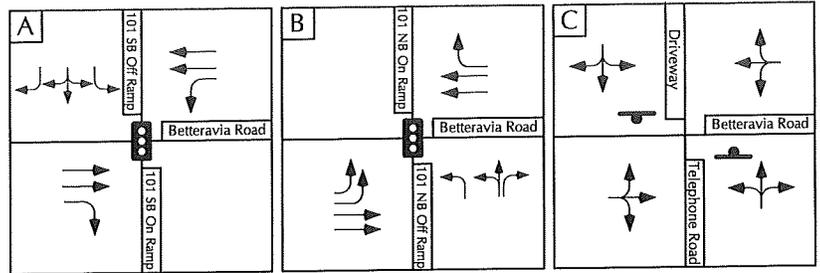


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EXISTING TRAFFIC VOLUMES - OPTION 2

FIGURE 10

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**INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS - OPTION 2**

**FIGURE 11**

EKM - #13079

**Table 12**  
**Existing Intersection Operations – Option 2**

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		ICU or Delay	LOS	ICU or Delay	LOS
U.S. 101 SB Ramps/Clark Avenue(1)	Stop Sign	12.8 Sec.	LOS B	8.5 Sec.	LOS A
U.S. 101 NB Ramps/Clark Avenue(1)	Stop Sign	8.5 Sec.	LOS A	11.5 Sec.	LOS B
Telephone Road/Clark Avenue(1)	Stop Sign	9.3 Sec.	LOS A	10.2 Sec.	LOS B
Dominion Road/Clark Avenue(1)	Stop Sign	8.9 Sec.	LOS A	8.3 Sec.	LOS A
Palmer Road/Cat Canyon Road(1)	Stop Sign	8.2 Sec.	LOS A	8.4 Sec.	LOS A
U.S. 101 SB Ramps/Betteravia Road(2)	Signal	0.73	LOS C	0.78	LOS C
U.S. 101 NB Ramps/Betteravia Road(2)	Signal	0.36	LOS A	0.65	LOS B
Telephone Road/Betteravia Road(1)	Stop Sign	10.8 Sec.	LOS B	14.9 Sec.	LOS B
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.					
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.					

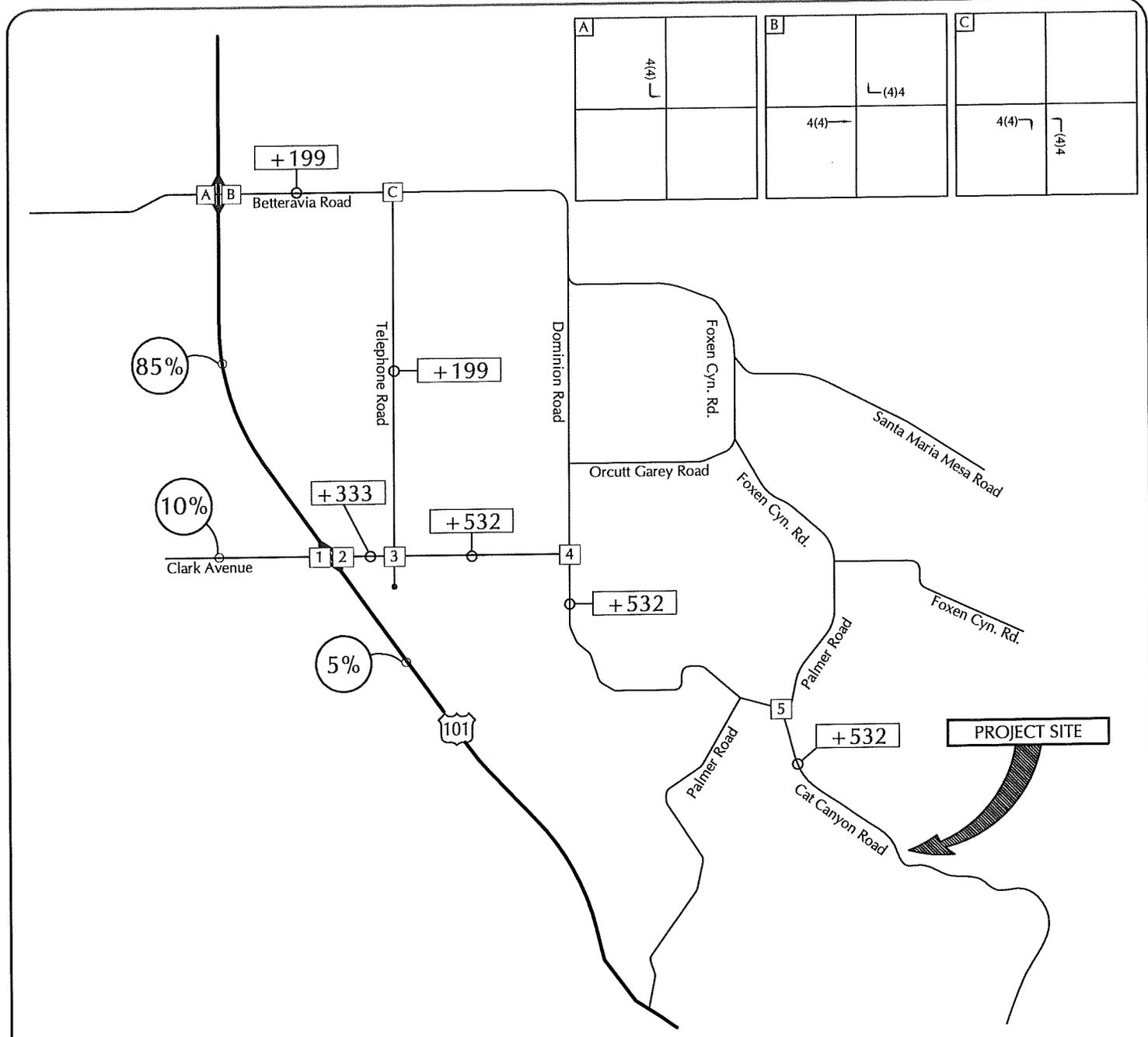
As shown in Table 12, the Project study-area intersections for Option 2 operate at LOS C or better during the A.M. and P.M. peak periods, which meet the County's LOS C standard.

### **Trip Generation**

As noted, each Project options generates the same level of traffic. Thus, Option 2 is forecast to generate 532 average daily trips, with 10 trips occurring during the A.M. peak hour and 89 trips occurring during the P.M. peak hour (see Table 3).

### **Trip Distribution – Option 2**

Figure 9 shows the travel route for the 99 tanker trucks per day under Option 2. As shown, inbound trucks would travel on southbound U.S. 101 to Betteravia Road to Telephone Road to Clark Avenue to Dominion Road to Palmer Road to Cat Canyon Road. Outbound trucks would use the same route in reverse. The trip distribution pattern for the remaining traffic generated under Option 2 would be the same as the other options. The trip distribution pattern for Option 2 is summarized in Table 13. Figure 12 shows the assignment of project-generated trips for Option 2 and the Existing + Project volumes for Option 2 are shown on Figure 13.



A		B		C	
	4(4)		L(4)4		
		4(4)		4(4)	L(4)4



NOT TO SCALE

LEGEND

- X - Average Daily Traffic Volume
- L(XX)XX - (A.M.)P.M. Peak Hour Volume

1		2		3		4		5
	2(0)		L(2)67 L(0)12		4(4)			
		2(0)		2(0)		6(4)	L(6)83	
								6(4)
								L(6)83

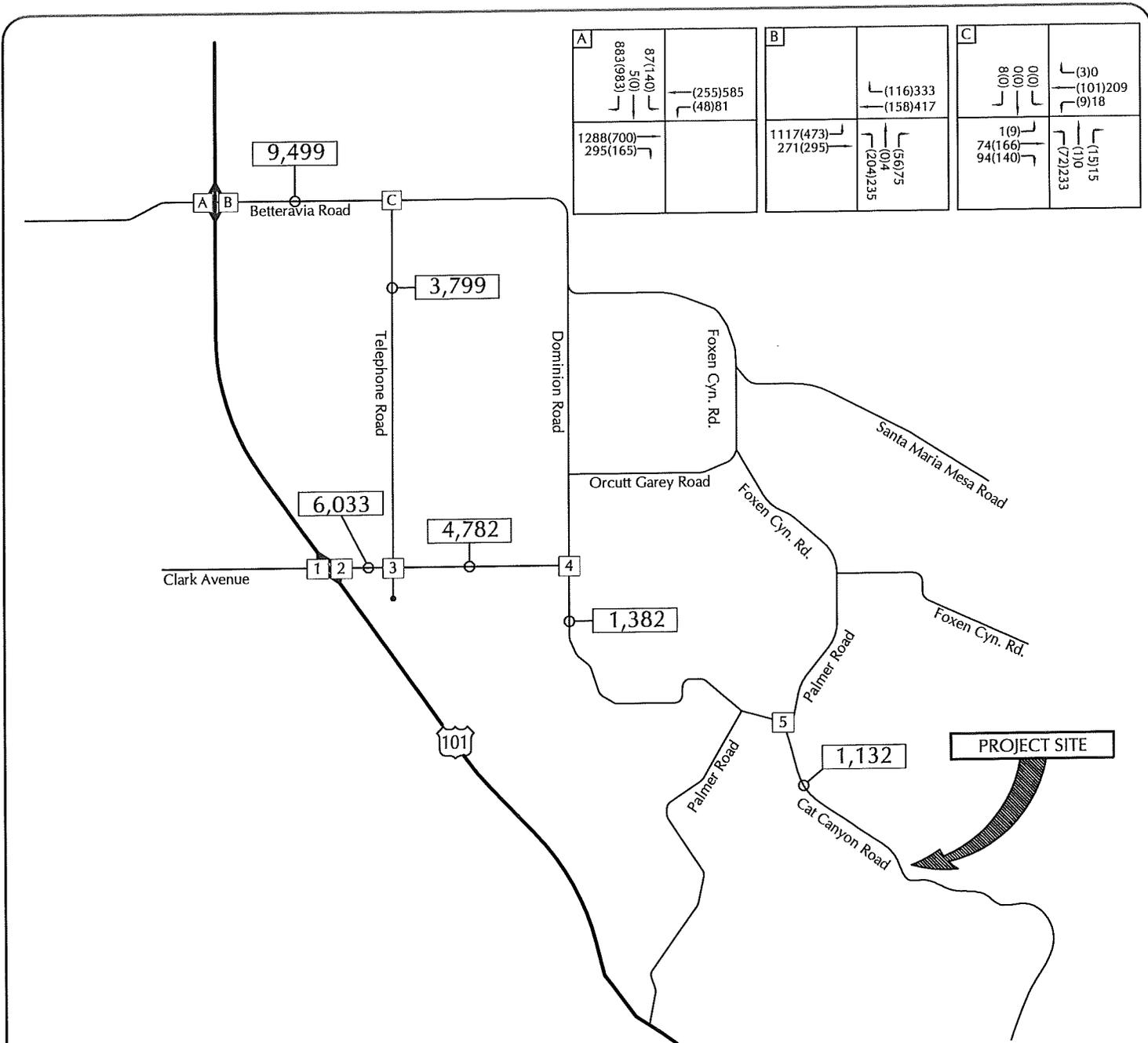


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PROJECT TRIP DISTRIBUTION AND ASSIGNMENT - OPTION 2

FIGURE 12

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<b>A</b>	87(140) 5(0) 883(983)	(255)585 (48)81	<b>B</b>	(116)333 (158)417	<b>C</b>	0(0) 0(0) 8(0)	(3)0 (101)209 (9)18
	1288(700) 295(165)			1117(473) 271(295)		1(9) 74(166) 94(140)	(15)15 (1)0 (72)233
				(56)75 (0)4 (204)235			

**LEGEND**

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

NOT TO SCALE

<b>1</b>	106(98) 0(0) 545(311)	(119)286 (23)11	<b>2</b>	(113)273 (102)140	<b>3</b>	18(20) 1(1) 78(94)	(18)34 (118)376 (2)2	<b>4</b>	6(9) 63(51)	(3)11 (21)126	<b>5</b>	(3)7 (3)2
	458(703) 57(137)			(12)21 (1)0 (44)157		65(46) 128(151) 4(3)	(3)1 (4)0 (4)4		32(70) 33(27)			4(24) 22(25)
												(3)3 (17)110



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**EXISTING + PROJECT TRAFFIC VOLUMES - OPTION 2**

**FIGURE 13**

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**Table 13  
Project Trip Distribution – Option 2**

Origin/Destination	Direction	Percentage
U.S. 101 via Clark Avenue(1)	North	85%
U.S. 101 via Clark Avenue	South	5%
Clark Avenue	West	10%
<b>Total</b>		<b>100%</b>
(1) Tanker trucks would use U.S. 101/Betteravia Road interchange under Option 2.		

**Existing + Project Roadway Impacts – Option 2**

Table 14 compares the Existing and Existing + Project roadway levels of service and identifies project-specific roadway impacts for Option 2 based on County thresholds.

**Table 14  
Existing + Project Roadway Operations – Option 2**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Existing	Existing + Project		
Clark Avenue e/o U.S. 101	5,700 / LOS A	6,033 / LOS A	333	No
Clark Avenue e/o Telephone Road	4,250 / LOS A	4,782 / LOS A	532	No
Dominion Road s/o Clark Avenue	850 / LOS A	1,382 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	600 / LOS A	1,132 / LOS A	532	No
Betteravia Road e/o U.S. 101	9,300 / LOS A	9,499 / LOS A	199	No
Telephone Road s/o Betteravia Road	3,600 / LOS A	3,799 / LOS A	199	No
NOTE: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.				

As shown, the Project study-area roadways would continue to operate at LOS A with the addition of Project traffic under Option 2, which meets the County’s LOS C standard. Thus, the East Cat Canyon Oil Field Redevelopment Project would not generate project-specific roadway impacts under Option 2.

**Existing + Project Intersection Impacts – Option 2**

Tables 15 and 16 compare the Existing and Existing + Project levels of service for the Project study-area intersections and identify project-specific impacts based on County thresholds.

**Table 15**  
**Existing + Project A.M. Peak Hour Intersection Operations – Option 2**

Intersection	Existing		Existing + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	12.8 Sec.	LOS B	12.8 Sec.	LOS B	No
U.S. 101 NB Ramps/Clark Avenue(1)	8.5 Sec.	LOS A	8.5 Sec.	LOS A	No
Telephone Road/Clark Avenue(1)	9.3 Sec.	LOS A	9.5 Sec.	LOS A	No
Dominion Road/Clark Avenue(1)	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.2 Sec.	LOS A	8.5 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.73	LOS C	0.73	LOS C	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.36	LOS A	0.36	LOS A	No
Telephone Road/Betteravia Road(1)	10.8 Sec.	LOS B	10.9 Sec.	LOS B	No

NOTES: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

**Table 16**  
**Existing + Project P.M. Peak Hour Intersection Operations – Option 2**

Intersection	Existing		Existing + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	8.5 Sec.	LOS A	8.6 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue(1)	11.5 Sec.	LOS B	11.7 Sec.	LOS B	No
Telephone Road/Clark Avenue(1)	10.2 Sec.	LOS B	11.0 Sec.	LOS B	No
Dominion Road/Clark Avenue(1)	8.3 Sec.	LOS A	8.3 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.4 Sec.	LOS A	9.0 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.78	LOS C	0.78	LOS C	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.65	LOS B	0.65	LOS B	No
Telephone Road/Betteravia Road(1)	14.9 Sec.	LOS B	15.1 Sec.	LOS C	No

NOTES: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

As shown in Tables 15 and 16, the Project study-area intersections are forecast to operate at LOS C or better with Existing + Project traffic under Option 2, which meets the County's LOS C standard. The East Cat Canyon Oil Field Redevelopment Project would not generate project-specific intersection impacts under Option 2.

**Cumulative + Project Roadway Impacts – Option 2**

Cumulative and Cumulative + Project traffic volumes for Option 2 are shown on Figures 14 and 15. Table 17 compares the Cumulative and Cumulative + Project roadway levels of service for Option 2 and identifies cumulative impacts based on County thresholds.

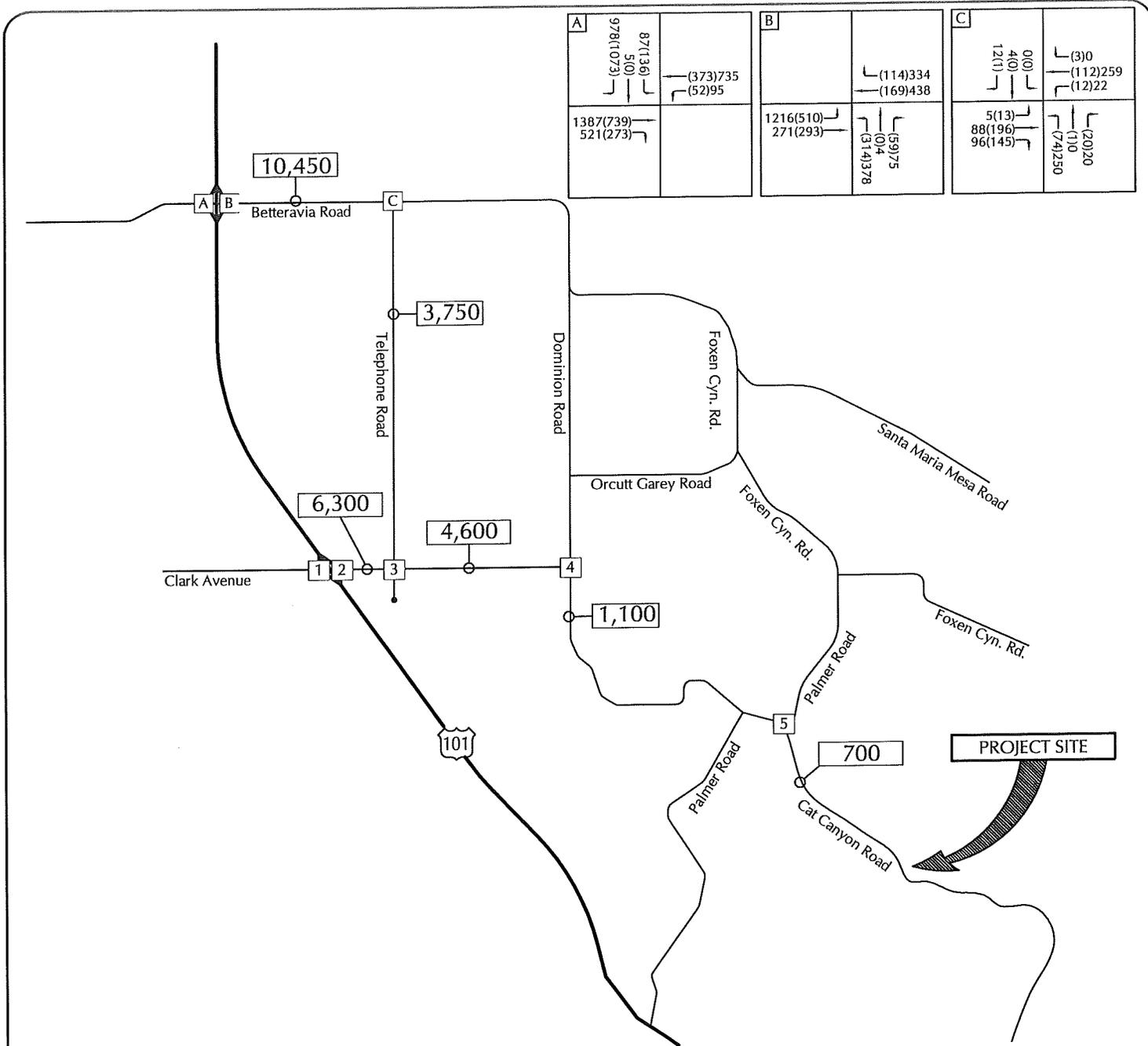
**Table 17  
Cumulative + Project Roadway Operations – Option 2**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Cumulative	Cumulative + Project		
Clark Avenue e/o U.S. 101	6,300 / LOS A	6,633/ LOS A	333	No
Clark Avenue e/o Telephone Road	4,600 / LOS A	5,132/ LOS A	532	No
Dominion Road s/o Clark Avenue	1,100 / LOS A	1,632 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	700 / LOS A	1,232 / LOS A	532	No
Betteravia Road e/o U.S. 101	10,450 / LOS A	10,649 / LOS A	199	No
Telephone Road s/o Betteravia Road	3,750 / LOS A	3,949 / LOS A	199	No
NOTE: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.				

As shown, the Project study-area roadways are forecast to operate at LOS A under Cumulative and Cumulative + Project conditions for Option 2. Thus, the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative roadway impacts under Option 2.

**Cumulative + Project Intersection Impacts – Option 2**

Tables 18 and 19 compare the Cumulative and Cumulative + Project levels of service for the Project study-area intersections for Option 2 and identify cumulative impacts based on County thresholds.



<b>A</b>	87(136) 5(0) 978(1073)	(373)735 (52)95	<b>B</b>	(114)334 (169)438	<b>C</b>	0(0) 4(0) 12(1)	(3)0 (112)259 (12)22
	1387(739) 521(273)		1216(510) 271(293)	(59)75 (0)4 (31)4378		5(13) 88(196) 96(145)	(20)20 (1)0 (7)4250

LEGEND

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

NOT TO SCALE

<b>1</b>	110(115) 895(432)	(130)380 (29)16	<b>2</b>	(226)232 (115)183	<b>3</b>	15(20) 5(5) 89(101)	(19)33 (129)337 (6)2	<b>4</b>	12(19) 77(59)	(6)18 (21)60	<b>5</b>	(5)12 (5)5
	573(836) 76(159)		473(701) 237(223)	(17)26 (47)198	71(55) 142(172) 7(7)	(7)5 (8)4 (6)5	36(78) 33(34)				8(28) 20(26)	(4)6 (15)36

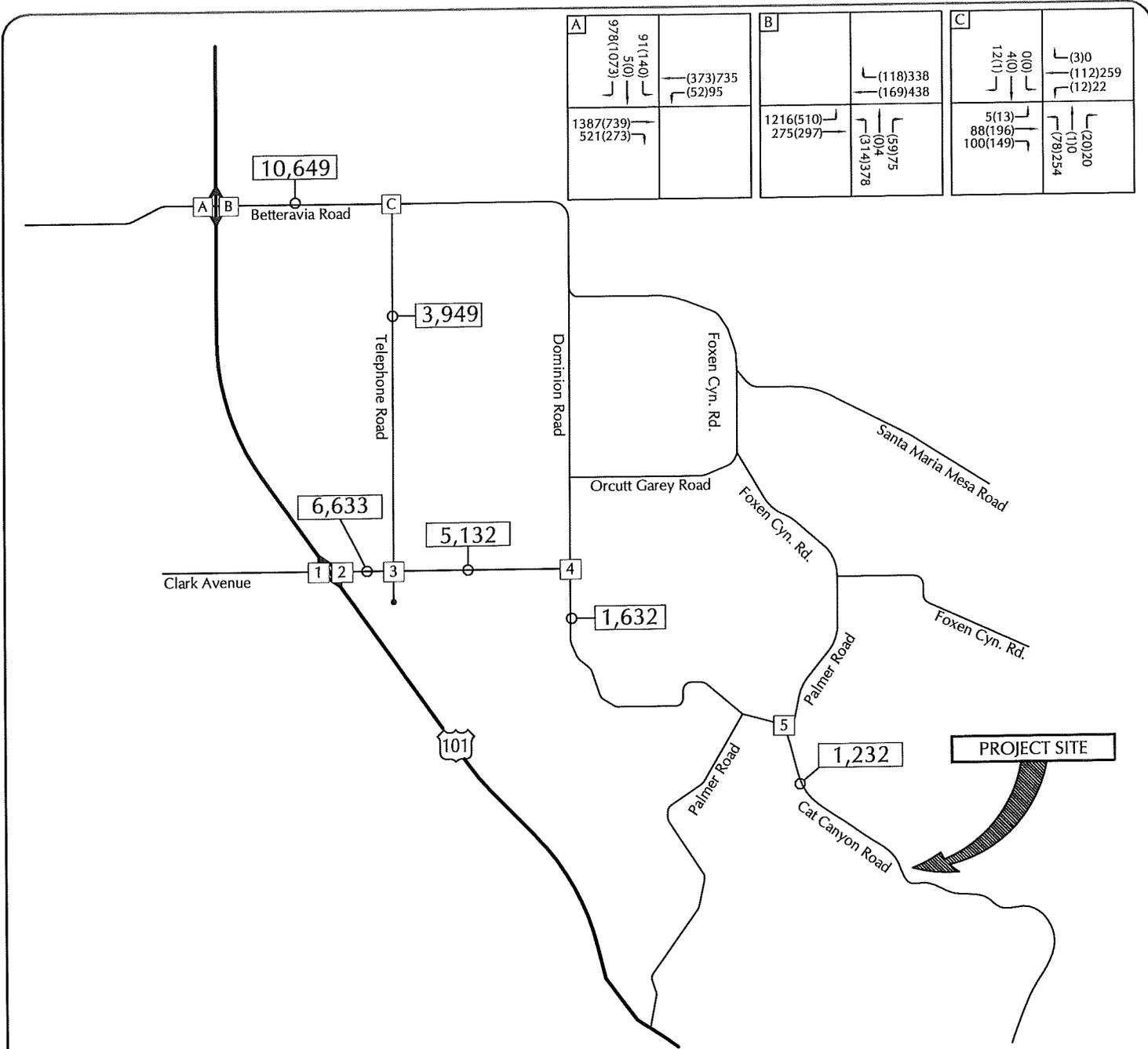


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CUMULATIVE TRAFFIC VOLUMES - OPTION 2

FIGURE 14

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<b>A</b>	91(140) 5(0) 978(1073)	(373)735 (52)95	<b>B</b>		(118)338 (169)438	<b>C</b>	0(0) 4(0) 12(1)	(3)0 (112)259 (12)22
	1387(739) 521(273)			1216(510) 275(297)	(59)75 0(4) (31)4378		5(13) 88(196) 100(149)	(20)20 (1)0 (78)254

**LEGEND**

X - Average Daily Traffic Volume

(XX)XX - (A.M.)P.M. Peak Hour Volume

NOT TO SCALE

<b>1</b>	112(115) 895(432)	(130)388 (29)20	<b>2</b>		(228)299 (115)195	<b>3</b>	19(24) 5(5) 89(101)	(23)37 (131)416 (6)2	<b>4</b>	12(19) 77(59)	(6)18 (27)143	<b>5</b>		(5)12 (5)5
	573(836) 76(159)			473(701) 239(223)	(17)26 (47)198		71(55) 144(172) 7(7)	(7)5 (8)4 (6)5		36(78) 39(38)			8(28) 26(30)	(4)6 (21)119



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CUMULATIVE + PROJECT TRAFFIC VOLUMES - OPTION 2

FIGURE 15

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**Table 18**  
**Cumulative + Project A.M. Peak Hour Intersection Operations – Option 2**

Intersection	Cumulative		Cumulative + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	15.2 Sec.	LOS C	15.2 Sec.	LOS C	No
U.S. 101 NB Ramps/Clark Avenue(1)	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Telephone Road/Clark Avenue(1)	9.8 Sec.	LOS A	10.0 Sec.	LOS A	No
Dominion Road/Clark Avenue(1)	9.0 Sec.	LOS A	9.0 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.3 Sec.	LOS A	8.4 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.81	LOS D	0.82	LOS D	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.41	LOS A	0.41	LOS A	No
Telephone Road/Betteravia Road(1)	11.7 Sec.	LOS B	11.9 Sec.	LOS B	No

NOTES: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

**Table 19**  
**Cumulative + Project P.M. Peak Hour Intersection Operations – Option 2**

Intersection	Cumulative		Cumulative + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	9.0 Sec.	LOS A	9.3 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue(1)	21.3 Sec.	LOS C	22.3 Sec.	LOS C	No
Telephone Road/Clark Avenue(1)	11.5 Sec.	LOS B	12.0 Sec.	LOS B	No
Dominion Road/Clark Avenue(1)	8.5 Sec.	LOS A	8.4 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.5 Sec.	LOS A	9.0 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.88	LOS D	0.89	LOS D	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.74	LOS C	0.74	LOS C	No
Telephone Road/Betteravia Road(1)	18.5 Sec.	LOS C	18.8 Sec.	LOS C	No

NOTES: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

Tables 18 and 19 show that most of the Project study-area intersections are forecast to operate at LOS C or better under Cumulative + Project conditions, which meets the County's LOS C standard. The U.S. 101 SB Ramps/Betteravia Road intersection is forecast to operate at LOS D during the A.M. and P.M. peak hour periods, which meets the City of Santa Maria LOS D standard. Thus, Option 2 for the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative intersection impacts based on adopted thresholds.

### **PROJECT IMPACTS – OPTION 3**

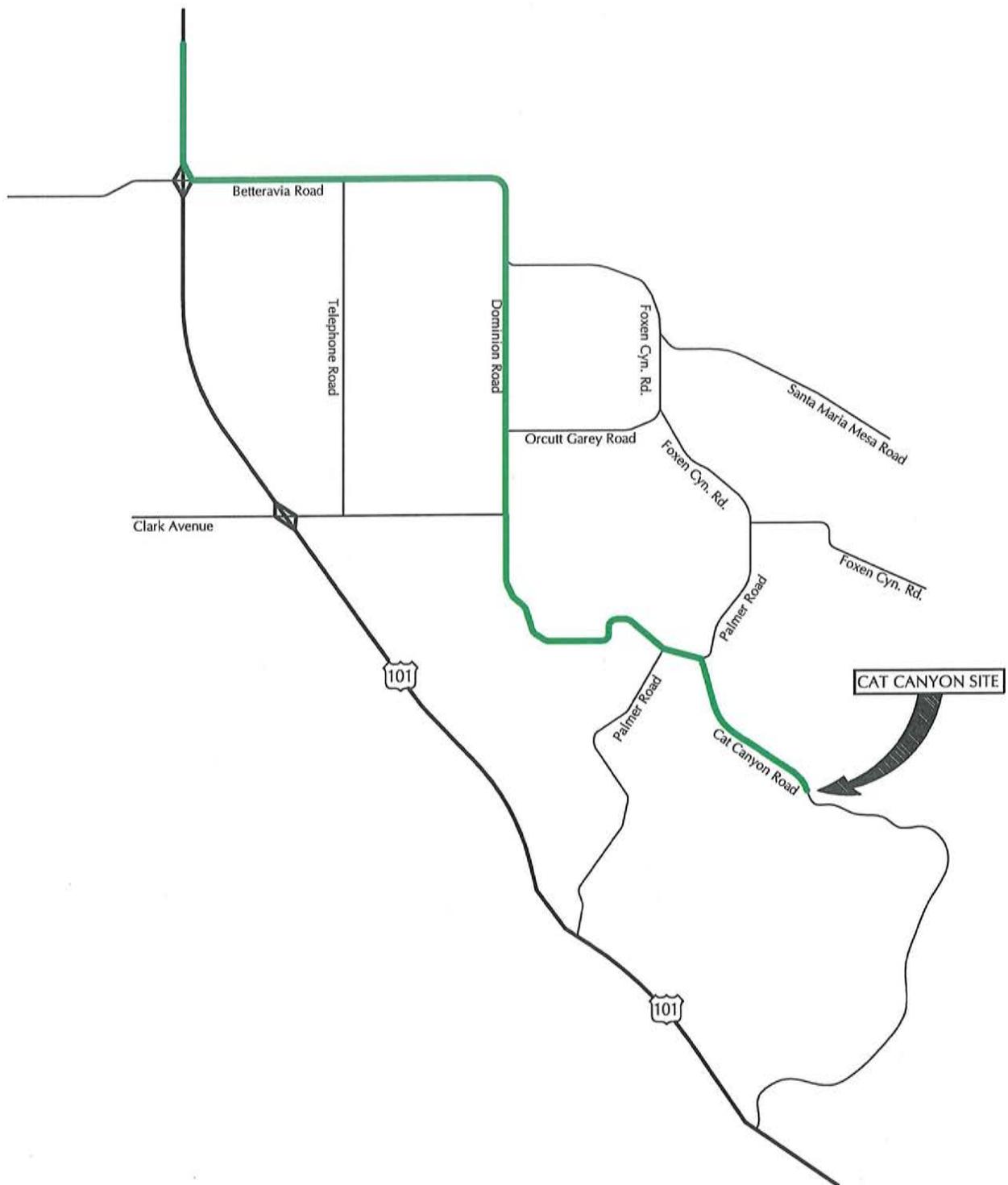
Option 3 is the same as the other Project options except for the routing of tanker trucks. Option 3 assesses potential roadway and intersection impacts generated by the Project assuming the truck route shown on Figure 16. As shown, inbound trucks would travel on southbound U.S. 101 to Betteravia Road to Dominion Road to Palmer Road to Cat Canyon Road. Outbound trucks would use the same route in reverse.

#### **Existing Street Network**

The following text provides a brief discussion of the major components of the Project study-area street network for Option 3 (see Figure 1 for illustration of street network).

**U.S. 101**, located west of the Project site, is a north-south freeway that provides regional access to the Santa Maria-Orcutt area. U.S. 101 contains 2 lanes in each direction on the segments north and south of Clark Avenue. The U.S. 101/Clark Avenue interchange and U.S. 101/Betteravia Road interchange provide regional access to the Project site.

**Clark Avenue** is a 2-lane arterial that extends between Dominion Road on the east and U.S. 101 on the west. This segment serves agricultural and residential uses. Clark Avenue also extends west of U.S. 101 as a 4-lane arterial, traversing the Orcutt community.



OPTION 3 TRUCK ROUTE

FIGURE 16



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**Dominion Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and Palmer Road on the south. This segment mostly serves oil facilities and ranch lands.

**Palmer Road** is a 2-lane collector road that extends between Foxen Canyon Road on the north and U.S. 101 on the south. There is a short segment of Palmer Road that connects Dominion Road and Cat Canyon Road. This segment mostly serves oil facilities and ranch lands.

**Cat Canyon Road** is a 2-lane collector road that extends between Palmer Road on the north and U.S. 101 on the south. This segment mostly serves oil facilities and ranch lands. Cat Canyon Road provides direct access to the Project site.

**Betteravia Road** is a 4-lane arterial road between U.S. 101 and Nicholson Avenue just east of U.S. 101; and is a 2-lane arterial road between Nicholson Avenue and Telephone Road. The 4-lane segment east of U.S. 101 serves a truck stop and service stations; and the 2-lane segment between Nicholson Avenue and Dominion Road serves mostly agricultural uses.

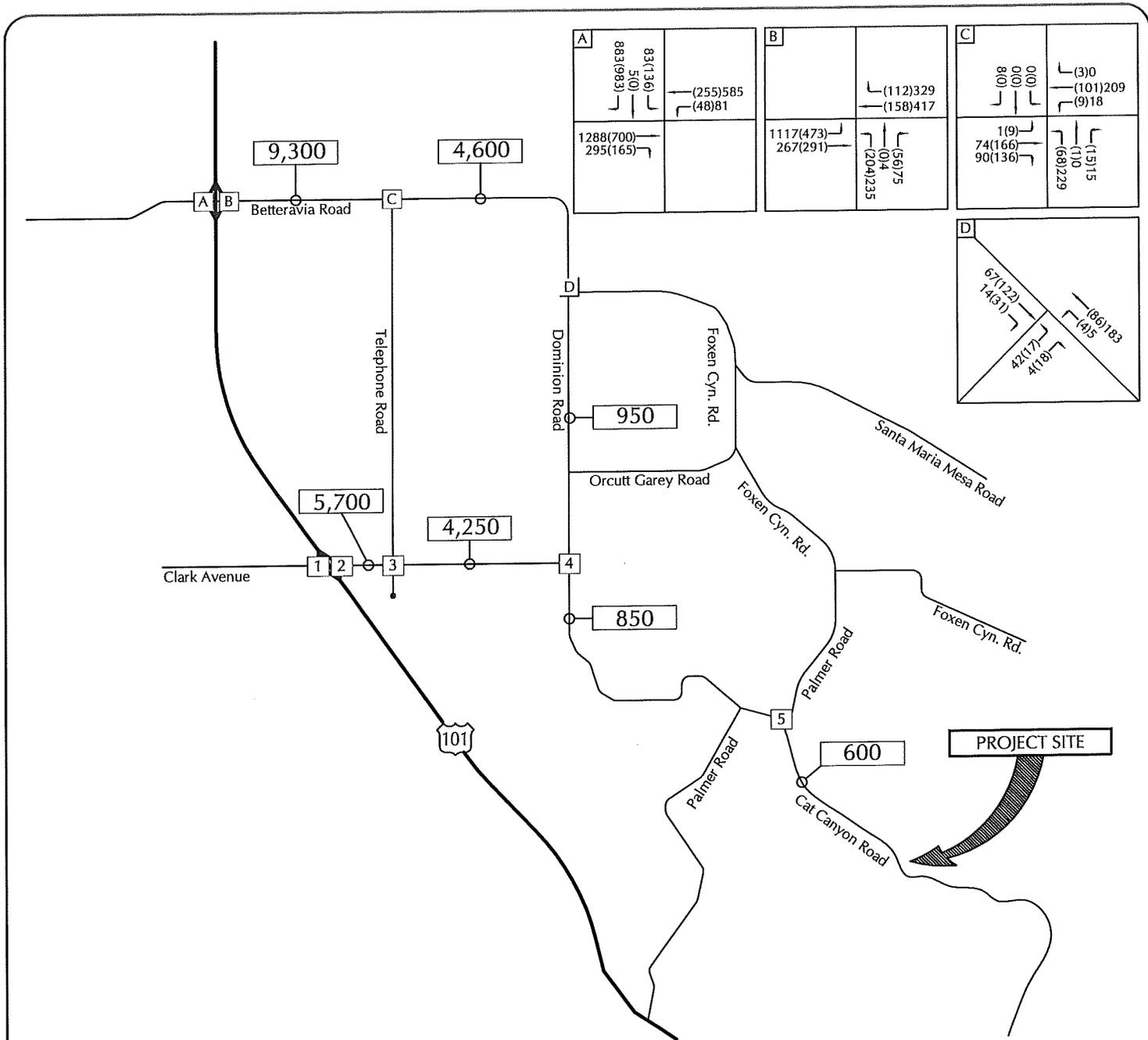
### Existing Roadway Operations

Figure 17 presents the Existing ADT volumes for the key roadway segments that serve Option 3. Table 20 shows the existing ADT volumes and levels of service for the key roadways.

**Table 20**  
**Existing Roadway Operations – Option 3**

Roadway Segment	Classification	ADT Volume	LOS
Clark Avenue e/o U.S. 101	2-Lane Arterial	5,700	LOS A
Clark Avenue e/o Telephone Road	2-Lane Arterial	4,250	LOS A
Dominion Road s/o Clark Avenue	2-Lane Collector	850	LOS A
Cat Canyon Road s/o Palmer Road	2-Lane Collector	600	LOS A
Betteravia Road e/o U.S. 101	4-Lane Arterial	9,300	LOS A
Betteravia Road e/o Telephone Road	2-Lane Arterial	4,600	LOS A
Dominion Road n/o Clark Avenue	2-Lane Collector	950	LOS A

As shown, the Project study-area roadways currently operate at LOS A, which meets the County's LOS C standard.



<b>A</b>	83(136) 5(0) 883(983)	(255)585 (48)81	<b>B</b>	(112)329 (158)417	<b>C</b>	0(0) 0(0) 8(0)	(3)0 (101)209 (9)18
	1288(700) 295(165)			1117(473) 267(291)		1(9) 74(166) 90(136)	(15)15 (1)0 (68)229
				(56)75 (0)4 (204)235			

<b>D</b>	67(122) 14(31)	(86)183 (4)5
	42(17) 4(18)	

**LEGEND**

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

N  
NOT TO SCALE

<b>1</b>	104(98) 0(0) 545(311)	(119)278 (23)7	<b>2</b>		(111)206 (102)128
	458(703) 57(137)			359(594) 220(202)	(12)21 (1)0 (44)157

<b>3</b>	14(16) 1(1) 78(94)	(14)30 (116)297 (2)2	<b>4</b>	6(9) 63(51)	(3)11 (15)43
	65(46) 126(151) 4(3)	(3)1 (4)0 (4)4		32(70) 27(23)	

<b>5</b>		(3)7 (3)2
	4(24) 16(21)	(3)3 (1)227



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**EXISTING TRAFFIC VOLUMES - OPTION 3**

FIGURE 17

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## Existing Intersection Operations

Figure 17 shows the Existing A.M. and P.M. peak hour traffic volumes for the key intersections identified for analysis for Option 3. Figure 18 shows the lane geometries and traffic controls for the key intersections. Table 21 presents the Existing A.M. and P.M. peak hour levels of service for the Project study-area intersections for Option 3.

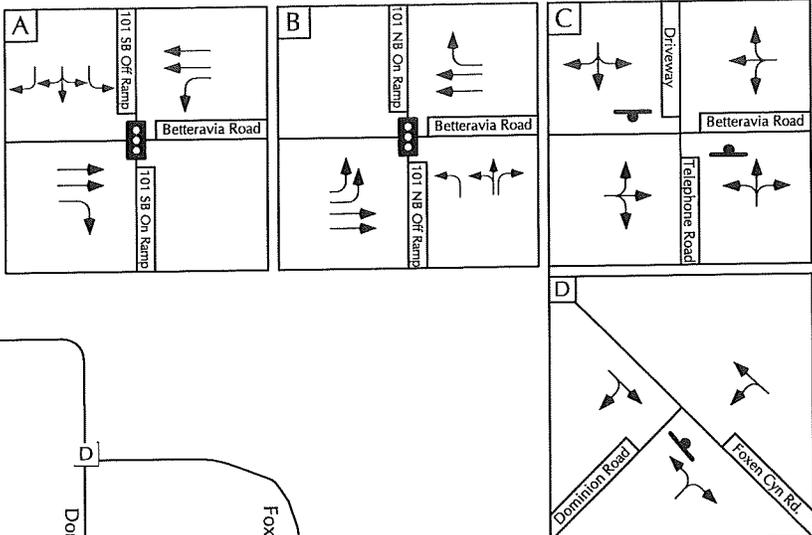
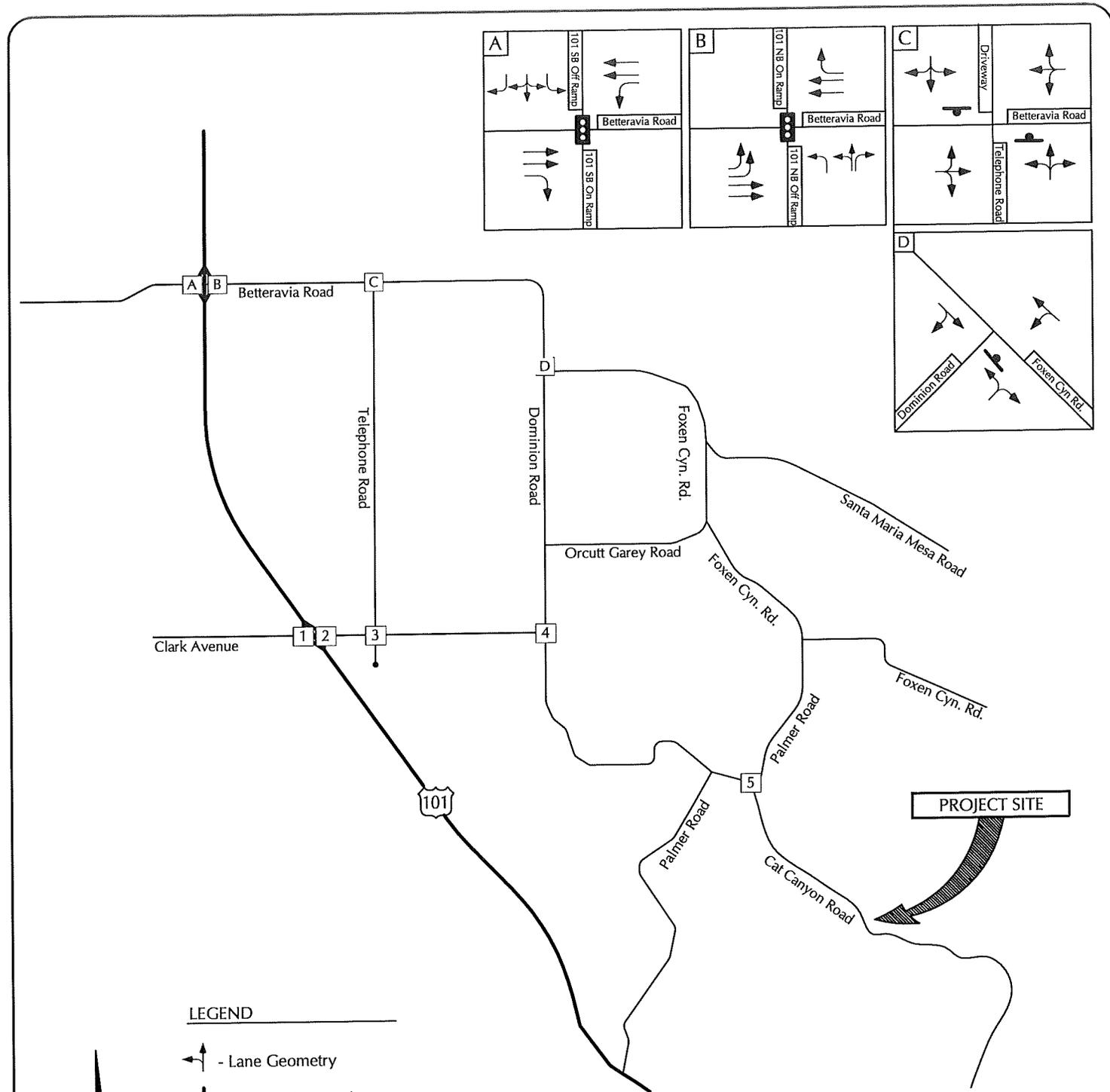
**Table 21**  
**Existing Intersection Operations – Option 3**

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		ICU or Delay	LOS	ICU or Delay	LOS
U.S. 101 SB Ramps/Clark Avenue(1)	Stop Sign	12.8 Sec.	LOS B	8.5 Sec.	LOS A
U.S. 101 NB Ramps/Clark Avenue(1)	Stop Sign	8.5 Sec.	LOS A	11.5 Sec.	LOS B
Telephone Road/Clark Avenue(1)	Stop Sign	9.3 Sec.	LOS A	10.2 Sec.	LOS B
Dominion Road/Clark Avenue(1)	Stop Sign	8.9 Sec.	LOS A	8.3 Sec.	LOS A
Palmer Road/Cat Canyon Road(1)	Stop Sign	8.2 Sec.	LOS A	8.4 Sec.	LOS A
U.S. 101 SB Ramps/Betteravia Road(2)	Signal	0.73	LOS C	0.78	LOS C
U.S. 101 NB Ramps/Betteravia Road(2)	Signal	0.36	LOS A	0.65	LOS B
Telephone Road/Betteravia Road(1)	Stop Sign	10.8 Sec.	LOS B	14.9 Sec.	LOS B
Dominion Road/Foxen Canyon Road(1)	Stop Sign	8.2 Sec.	LOS A	8.1 Sec.	LOS A
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.					
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.					

As shown, the Project study-area intersections for Option 3 operate at LOS C or better during the A.M. and P.M. peak periods, which meet the County's LOS C standard.

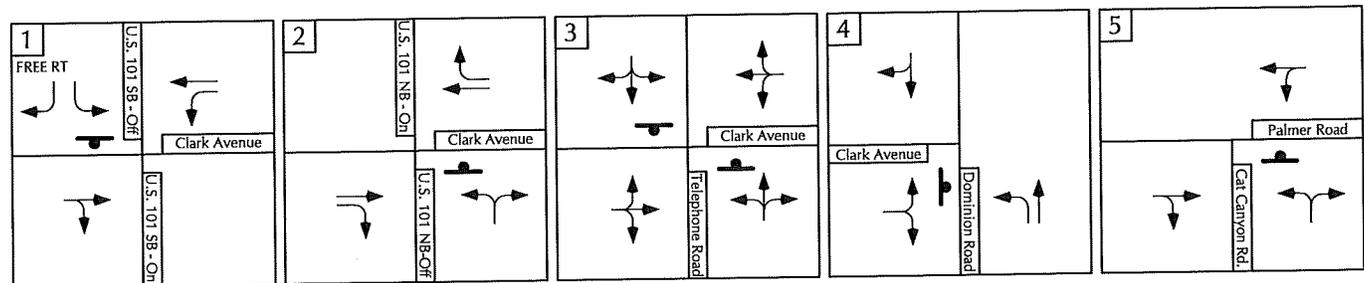
## Trip Generation

Option 3 is forecast to generate 532 average daily trips, with 10 trips occurring during the A.M. peak hour and 89 trips occurring during the P.M. peak hour (same as other options - see Table 3).



**LEGEND**

- Lane Geometry
  - Stopped Approach
  - Signalized Intersection
- N  
NOT TO SCALE



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**INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS - OPTION 3**

**FIGURE 18**

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### Trip Distribution – Option 3

As shown in Figure 16, the 99 trucks per day transporting light crude oil and produced crude oil under Option 3 would travel southbound U.S. 101 to Betteravia Road to Dominion Road to Palmer Road to Cat Canyon Road. Outbound trucks would use the same route in reverse. The trip distribution pattern for the remaining traffic generated under Option 3 would be the same as the other options. The trip distribution pattern is summarized in Table 22 and Figure 19 shows the assignment of project-generated trips for Option 3. The Existing + Project volumes for Option 3 are shown on Figure 20.

**Table 22**  
**Project Trip Distribution – Option 3**

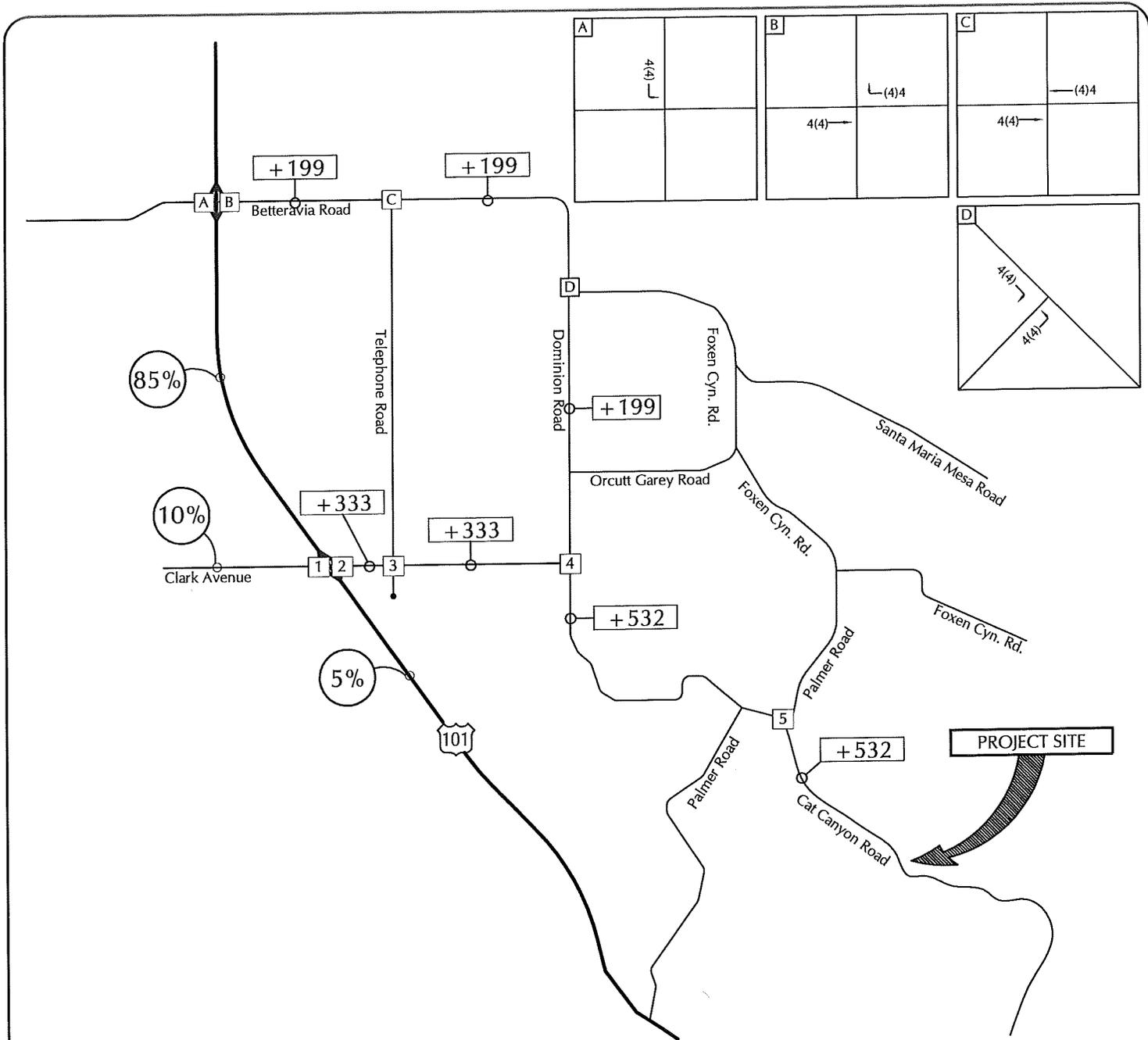
Origin/Destination	Direction	Percentage
U.S. 101 via Clark Avenue(1)	North	85%
U.S. 101 via Clark Avenue	South	5%
Clark Avenue	West	10%
<b>Total</b>		<b>100%</b>
(1) Tanker trucks would use U.S. 101/Betteravia Road interchange under Option 3.		

### Existing + Project Roadway Impacts – Option 3

Table 23 compares the Existing and Existing + Project roadway levels of service and identifies project-specific impacts for Option 3 based on County thresholds.

**Table 23**  
**Existing + Project Roadway Operations – Option 3**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Existing	Existing + Project		
Clark Avenue e/o U.S. 101	5,700 / LOS A	6,033 / LOS A	333	No
Clark Avenue e/o Telephone Road	4,250 / LOS A	4,583 / LOS A	333	No
Dominion Road s/o Clark Avenue	850 / LOS A	1,382 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	600 / LOS A	1,132 / LOS A	532	No
Betteravia Road e/o U.S. 101	9,300 / LOS A	9,499 / LOS A	199	No
Betteravia Road e/o Telephone Road	4,600 / LOS A	4,799 / LOS A	199	No
Dominion Road n/o Clark Avenue	950 / LOS A	1,149 / LOS A	199	No
NOTE: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.				



A		B		C	
	4(4)		L(4)4		←(4)4
			4(4)→		4(4)→
				D	
					4(4)↘
					↘(4)4

LEGEND

X - Average Daily Traffic Volume

L(XX)XX - (A.M.)P.M. Peak Hour Volume

N  
NOT TO SCALE

1		2		3		4		5
	2(0)↘		L(2)67		←(2)79		4(4)↘	
	←(0)8		←(0)12		2(0)↘		2(0)↘	
	↘(0)4						↘(4)4	
			2(0)→		2(0)→		↘(2)79	
								6(4)↘
								↘(6)83

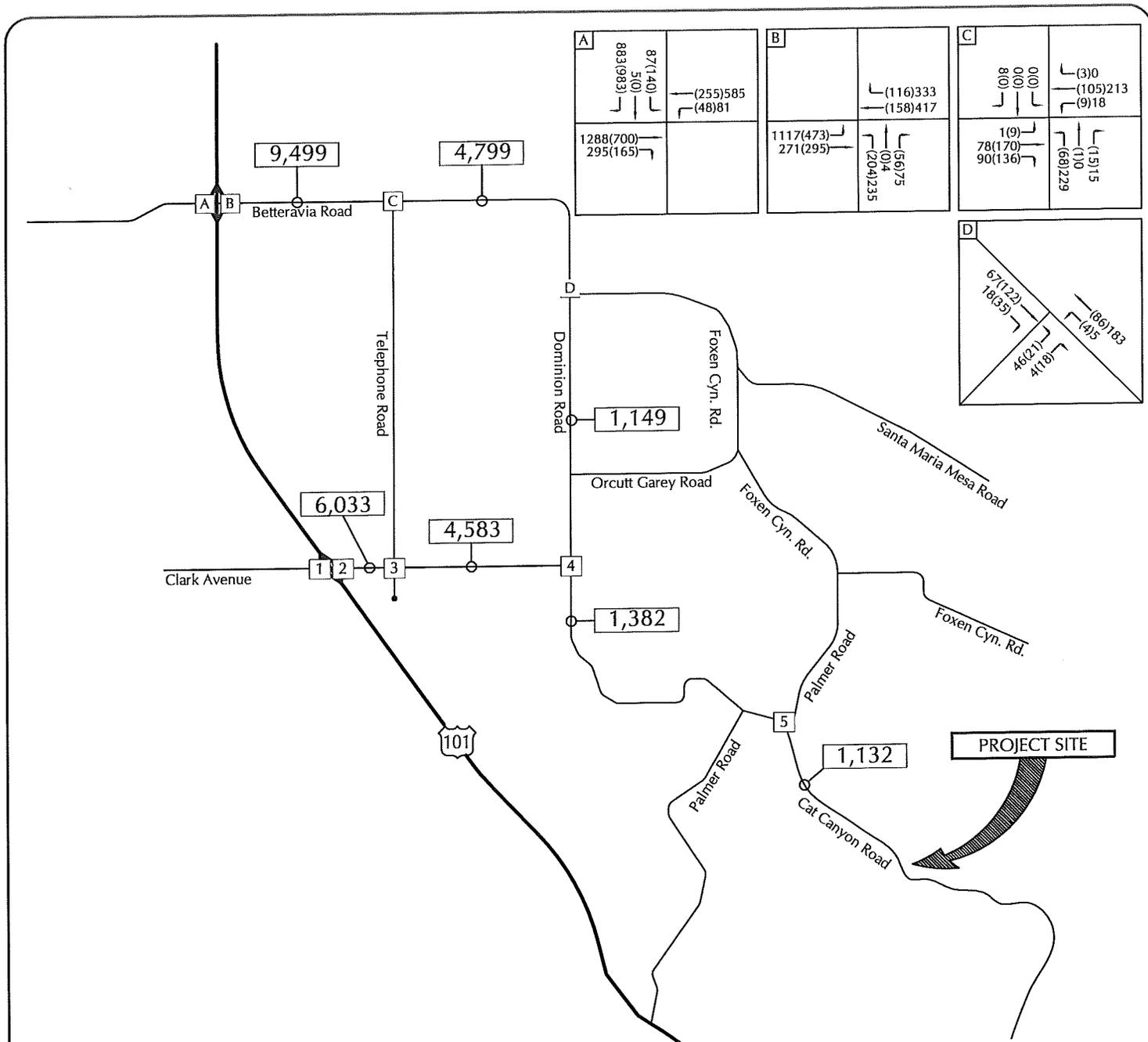


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PROJECT TRIP DISTRIBUTION AND ASSIGNMENT - OPTION 3

FIGURE 19

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<b>A</b>	87(140) 5(0) 883(983)	(255)585 (48)81	<b>B</b>	1117(473) 271(295)	(116)333 (158)417	<b>C</b>	0(0) 0(0) 8(0)	(3)0 (105)213 (9)18
	1288(700) 295(165)			(56)75 0(4) (20)4235			1(9) 78(170) 90(136)	(1)515 (1)0 (68)229
						<b>D</b>		
						67(122) 16(53)		
						(86)183 (9)5 46(21) 4(18)		

**LEGEND**

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume

N  
NOT TO SCALE

<b>1</b>	106(98) 0(0) 545(311)	(119)286 (23)11	<b>2</b>	359(594) 222(202)	(113)273 (102)140	<b>3</b>	14(16) 1(1) 78(94)	(14)30 (118)376 (2)2	<b>4</b>	10(13) 63(51)	(3)7 (3)2
	458(703) 57(137)			(12)21 (1)0 (44)157			65(46) 128(151) 4(3)	(3)1 (4)0 (4)4		32(70) 29(23)	4(24) 22(25)
									(7)15 (17)122		
									(3)3 (17)110		



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**EXISTING + PROJECT TRAFFIC VOLUMES - OPTION 3**

**FIGURE 20**

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As shown, the Project study-area roadways are forecast to continue to operate at LOS A with the addition of Project traffic under Option 3, which meets the County’s LOS C standard. Thus, the East Cat Canyon Oil Field Redevelopment Project would not generate project-specific roadway impacts under Option 3.

**Existing + Project Intersection Impacts – Option 3**

Tables 24 and 25 compare the Existing and Existing + Project intersection levels of service for Option 3 and identify project-specific impacts based on County thresholds.

As shown, the Project study-area intersections are forecast to operate at LOS C or better with Existing + Project traffic under Option 3, which meets the County's LOS C standard. The East Cat Canyon Oil Field Redevelopment Project would not generate project-specific intersection impacts under Option 3.

**Table 24  
Existing + Project A.M. Peak Hour Intersection Operations – Option 3**

Intersection	Existing		Existing + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	12.8 Sec.	LOS B	12.8 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue(1)	8.5 Sec.	LOS A	8.5 Sec.	LOS A	No
Telephone Road/Clark Avenue(1)	9.3 Sec.	LOS A	9.4 Sec.	LOS A	No
Dominion Road/Clark Avenue(1)	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.2 Sec.	LOS A	8.5 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.73	LOS C	0.73	LOS C	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.36	LOS A	0.37	LOS A	No
Telephone Road/Betteravia Road(1)	10.8 Sec.	LOS B	10.8 Sec.	LOS B	No
Dominion Road/Foxen Canyon Road(1)	8.2 Sec.	LOS A	8.2 Sec.	LOS A	No
NOTES: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.					
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.					
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.					

**Table 25**  
**Existing + Project P.M. Peak Hour Intersection Operations – Option 3**

Intersection	Existing		Existing + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	8.5 Sec.	LOS A	8.6 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue(1)	11.5 Sec.	LOS B	11.7 Sec.	LOS C	No
Telephone Road/Clark Avenue(1)	10.2 Sec.	LOS B	10.8 Sec.	LOS B	No
Dominion Road/Clark Avenue(1)	8.3 Sec.	LOS A	8.3 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.4 Sec.	LOS A	9.0 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.78	LOS C	0.78	LOS C	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.65	LOS B	0.65	LOS B	No
Telephone Road/Betteravia Road(1)	14.9 Sec.	LOS B	15.0 Sec.	LOS B	No
Dominion Road/Foxen Canyon Road(1)	8.1 Sec.	LOS A	8.1 Sec.	LOS A	No

NOTES: Existing + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

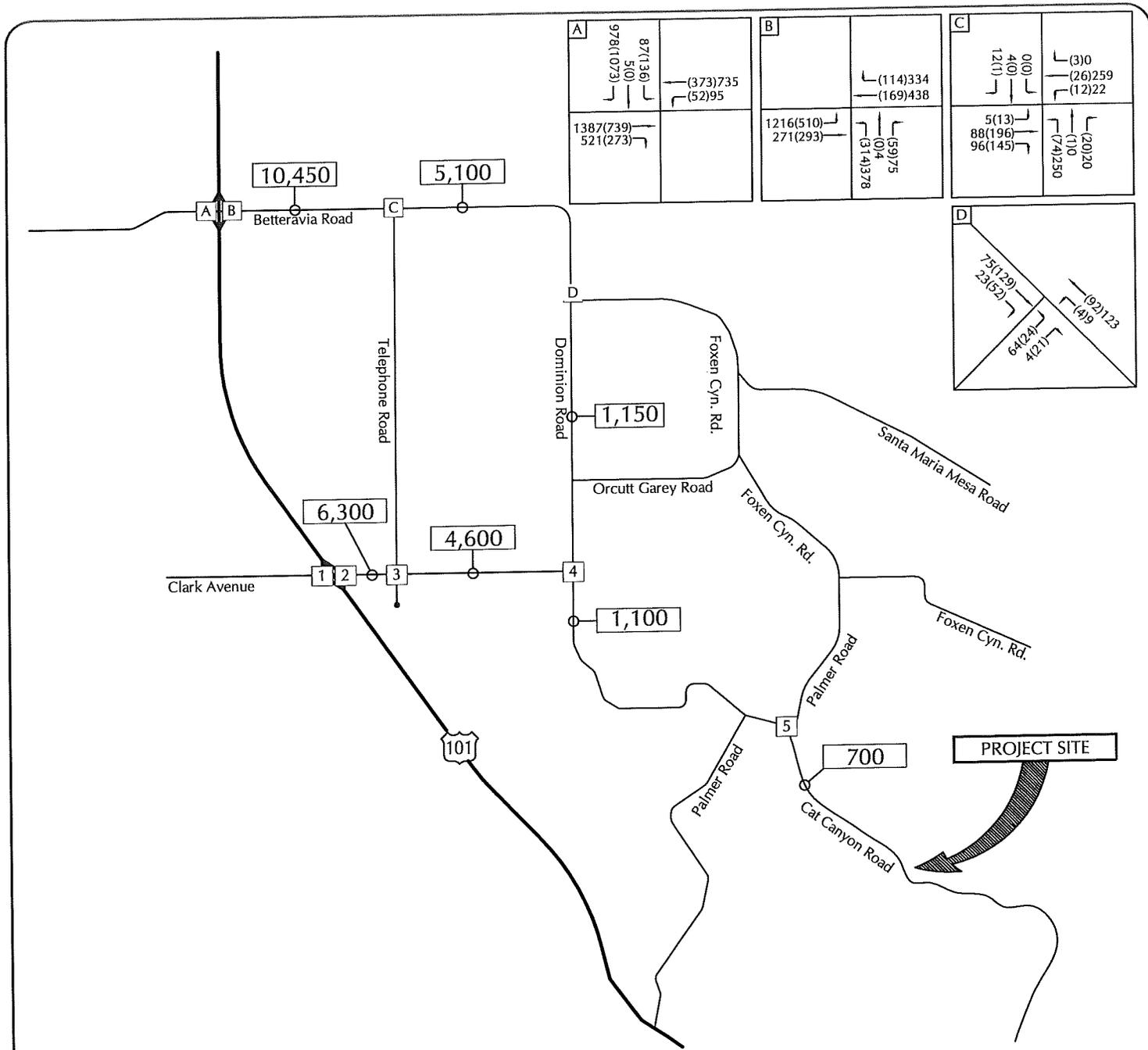
**Cumulative + Project Roadway Impacts – Option 3**

Cumulative and Cumulative + Project traffic volumes for Option 3 are shown on Figures 21 and 22. Table 26 compares the Cumulative and Cumulative + Project roadway levels of service for Option 3 and identifies cumulative impacts based on County thresholds.

**Table 26**  
**Cumulative + Project Roadway Operations – Option 3**

Roadway Segment	ADT Volume / LOS		Project Added	Impact?
	Cumulative	Cumulative + Project		
Clark Avenue e/o U.S. 101	6,300 / LOS A	6,633 / LOS A	333	No
Clark Avenue e/o Telephone Road	4,600 / LOS A	4,933 / LOS A	333	No
Dominion Road s/o Clark Avenue	1,100 / LOS A	1,632 / LOS A	532	No
Cat Canyon Road s/o Palmer Road	700 / LOS A	1,232 / LOS A	532	No
Betteravia Road e/o U.S. 101	10,450 / LOS A	10,649 / LOS A	199	No
Betteravia Road e/o Telephone Road	5,100 / LOS A	5,299 / LOS A	199	No
Dominion Road n/o Clark Avenue	1,150 / LOS A	1,349 / LOS A	199	No

NOTE: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.



<b>A</b>	87(136) 5(0) 978(1073)	(373)735 (52)95	<b>B</b>	(114)334 (169)438	<b>C</b>	(3)0 (26)259 (12)22
	1387(739) 521(273)			1216(510) 271(293)		5(13) 88(196) 96(145)
				(59)75 (10)4 (31)4378		(20)20 (1)0 (74)250

<b>D</b>	75(129) 23(52)	(93)123 (14)9
	64(24) 4(2)1	

**LEGEND**

**X** - Average Daily Traffic Volume

(XX)XX - (A.M.)P.M. Peak Hour Volume

**N**

NOT TO SCALE

<b>1</b>	110(115) 895(432)	(130)380 (29)16	<b>2</b>	(226)232 (115)183	<b>3</b>	15(20) 5(5) 89(101)	(19)33 (129)337 (6)2	<b>4</b>	12(19) 77(59)	(5)12 (5)5
	573(836) 76(159)			473(701) 237(223)		71(55) 142(172) 7(7)	(7)5 (8)4 (6)5		36(78) 33(34)	8(28) 20(26)
				(17)26 (47)198					(6)18 (2)160	(4)6 (15)36

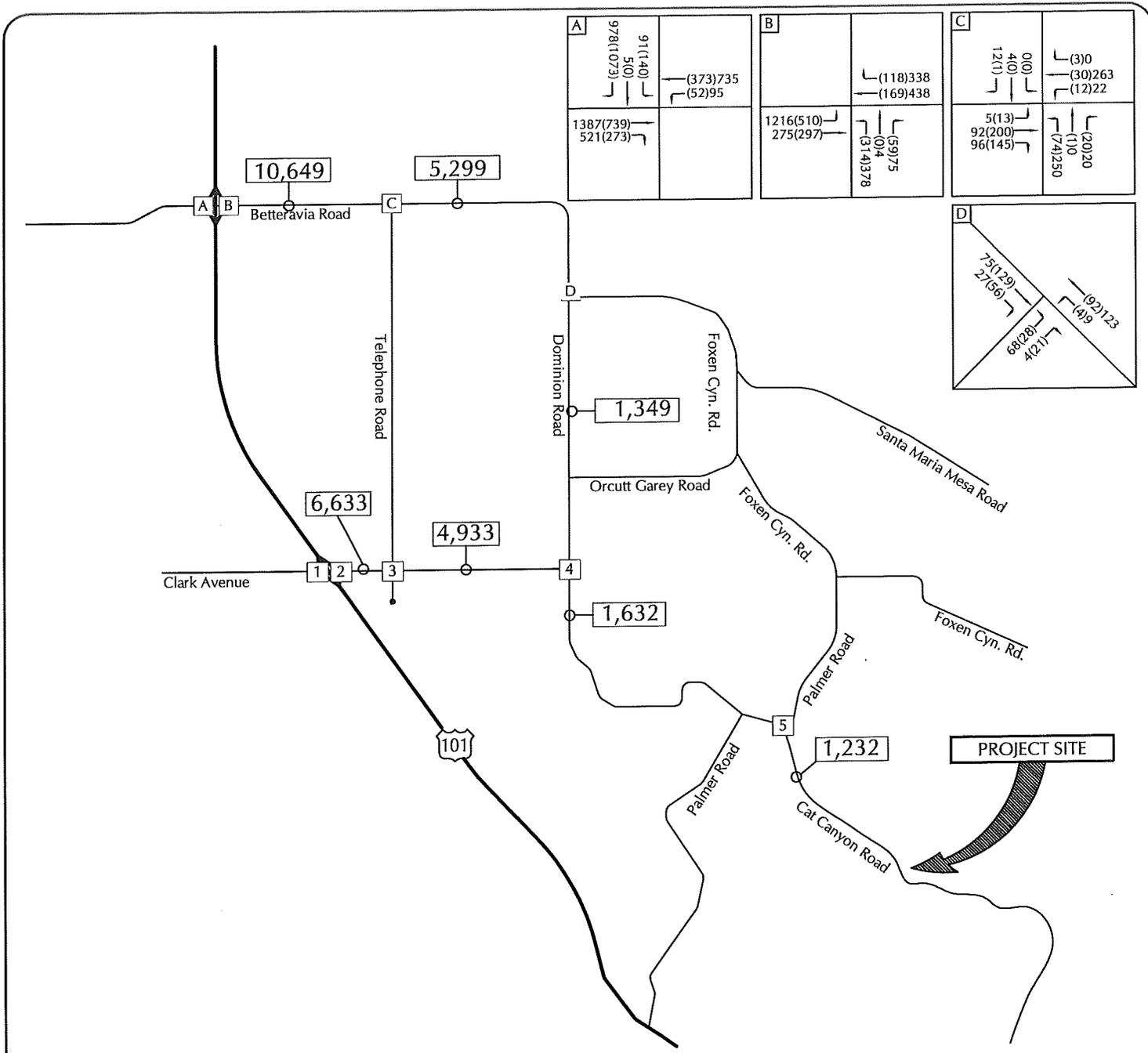


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CUMULATIVE TRAFFIC VOLUMES - OPTION 3

FIGURE 21

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<b>A</b>	91(140) 5(0) 978(1073)	(373)735 (52)95	<b>B</b>		(118)338 (169)438	<b>C</b>	12(1) 0(0) 4(0)	(3)0 (30)263 (12)22
	1387(739) 521(273)			1216(510) 275(297)	(59)75 (0)4 (31)4378		5(13) 92(200) 96(145)	(20)20 (1)0 (7)4250

<b>D</b>	75(129) 27(56)	(92)123 (4)9
	688(28) 42(1)	

**LEGEND**

**X** - Average Daily Traffic Volume

**(XX)XX** - (A.M.)P.M. Peak Hour Volume

NOT TO SCALE

<b>1</b>	112(115) 895(432)	(130)388 (29)20	<b>2</b>		(228)299 (115)195	<b>3</b>	15(20) 5(5) 89(101)	(19)33 (131)416 (6)2	<b>4</b>	16(23) 77(59)	(10)22 (23)139	<b>5</b>		(5)12 (5)5
	573(836) 76(159)			473(701) 239(223)	(17)26 (47)198		71(55) 144(172) 7(7)	(7)5 (8)4 (6)5		36(78) 35(34)			8(28) 26(30)	(4)6 (21)119



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**CUMULATIVE + PROJECT TRAFFIC VOLUMES - OPTION 3**

**FIGURE 22**

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As shown in Table 26, the Project study-area roadways are forecast to operate at LOS A under Cumulative and Cumulative + Project conditions for Option 3. Thus, the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative roadway impacts under Option 3.

### Cumulative + Project Intersection Impacts – Option 3

Tables 27 and 28 compare the Cumulative and Cumulative + Project intersection levels of service for the Project study-area intersections for Option 3 and identify cumulative impacts based on County thresholds.

As shown, most of the Project study-area intersections are forecast to operate at LOS C or better under Cumulative + Project conditions, which meets the County's LOS C standard. The U.S. 101 SB Ramps/Betteravia Road intersection is forecast to operate at LOS D during the A.M. and P.M. peak hour periods, which meets the City of Santa Maria LOS D standard. Thus, Option 3 for the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative intersection impacts based on adopted thresholds.

**Table 27  
Cumulative + Project A.M. Peak Hour Intersection Operations – Option 3**

Intersection	Cumulative		Cumulative + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	15.2 Sec.	LOS c	15.2 Sec.	LOS C	No
U.S. 101 NB Ramps/Clark Avenue(1)	8.9 Sec.	LOS A	8.9 Sec.	LOS A	No
Telephone Road/Clark Avenue(1)	9.8 Sec.	LOS A	9.8 Sec.	LOS A	No
Dominion Road/Clark Avenue(1)	9.0 Sec.	LOS A	9.0 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.3 Sec.	LOS A	8.4 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.81	LOS D	0.82	LOS D	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.41	LOS A	0.41	LOS A	No
Telephone Road/Betteravia Road(1)	11.7 Sec.	LOS B	11.8 Sec.	LOS B	No
Dominion Road/Foxen Canyon Road(1)	8.4 Sec.	LOS A	8.4 Sec.	LOS A	No

NOTES: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
 (1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
 (2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

**Table 28  
Cumulative + Project P.M. Peak Hour Intersection Operations – Option 3**

Intersection	Cumulative		Cumulative + Project		Impact?
	ICU or Delay	LOS	ICU or Delay	LOS	
U.S. 101 SB Ramps/Clark Avenue(1)	9.0 Sec.	LOS A	9.3 Sec.	LOS A	No
U.S. 101 NB Ramps/Clark Avenue(1)	21.3 Sec.	LOS C	22.3 Sec.	LOS C	No
Telephone Road/Clark Avenue(1)	11.5 Sec.	LOS B	11.7 Sec.	LOS B	No
Dominion Road/Clark Avenue(1)	8.5 Sec.	LOS A	8.4 Sec.	LOS A	No
Palmer Road/Cat Canyon Road(1)	8.5 Sec.	LOS A	9.0 Sec.	LOS A	No
U.S. 101 SB Ramps/Betteravia Road(2)	0.88	LOS D	0.89	LOS D	No
U.S. 101 NB Ramps/Betteravia Road(2)	0.74	LOS C	0.74	LOS C	No
Telephone Road/Betteravia Road(1)	18.5 Sec.	LOS C	18.8 Sec.	LOS C	No
Dominion Road/Foxen Canyon Road(1)	8.4 Sec.	LOS A	8.5 Sec.	LOS A	No

NOTES: Cumulative + Project forecasts include Project traffic for day-to-day operations + peak drilling phases.  
(1) LOS based on average delay per vehicle in seconds pursuant to HCM procedures.  
(2) LOS based on volume-to-capacity ratio pursuant to City of Santa Maria ICU procedures.

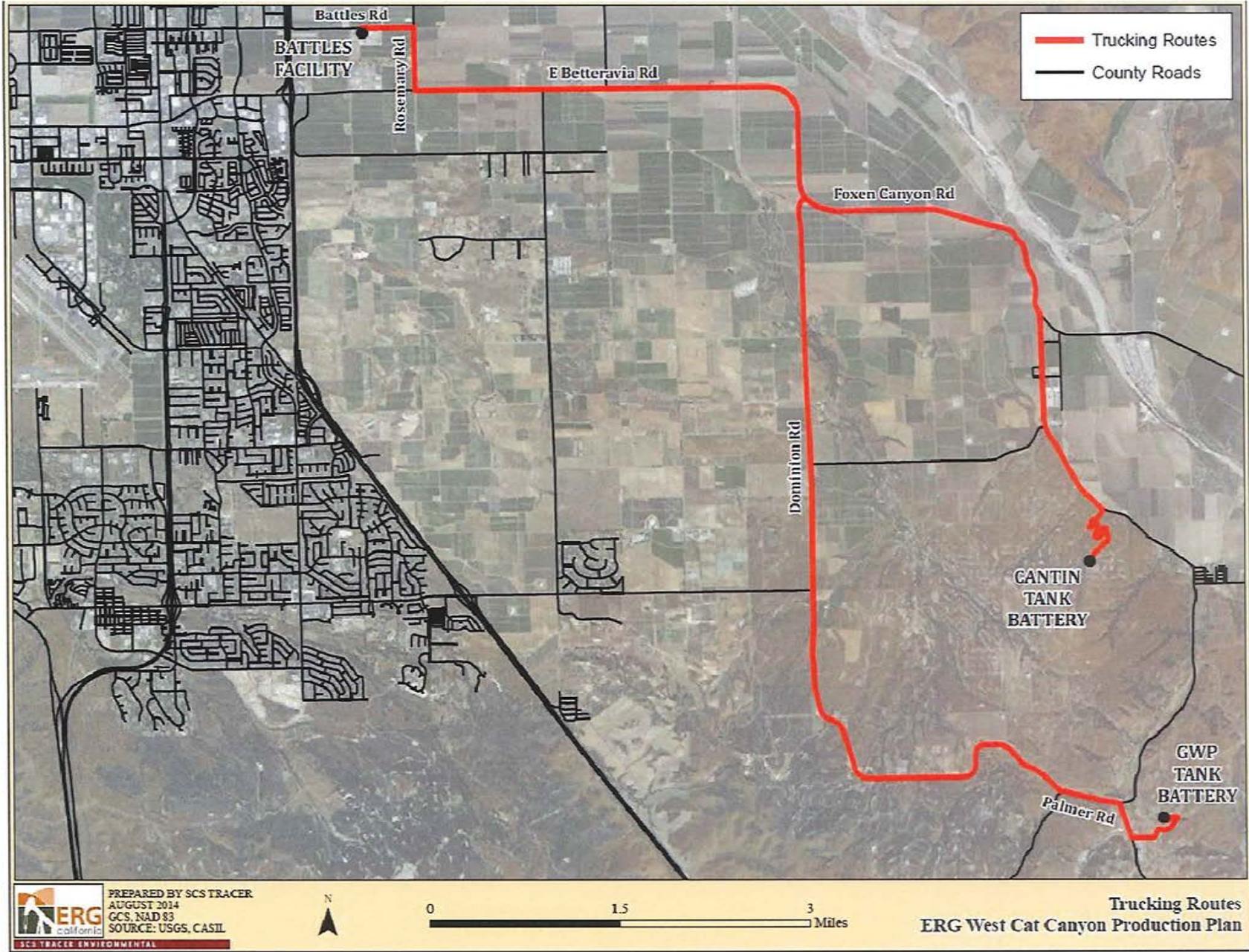
### ALTERNATIVE CUMULATIVE ANALYSIS

The preceding cumulative impact analyses (all Project options) assume that one of the cumulative projects - the ERG West Cat Canyon Oilfield Expansion Project - would transport products via the Foxen Petroleum Pipeline. County staff requested an alternative cumulative analysis assuming that the Foxen Petroleum Pipeline is not constructed and not used for material transport by the ERG West Cat Canyon Oilfield Expansion Project. The following analysis assesses potential cumulative impacts assuming that the ERG West Cat Canyon Oilfield Expansion Project products are transported by trucks instead of using the Foxen Petroleum Pipeline.

### Trip Generation & Distribution

Oil is currently produced and stored at two tank batteries on the ERG West Cat Canyon site: the Cantin Tank Battery on Foxen Canyon Road and the GWP Tank Battery on Cat Canyon Road. Oil is then trucked from each tank battery to the Phillips 66 tank farm on Battles Road. Figure 23 shows the locations of the ERG West Cat Canyon tank batteries and the truck routes used to transport oil to the Phillips 66 tank farm on Battles Road.

Current oil production is about 3,400 barrels of oil per day (BOPD) and requires approximately 22 truckloads per day. Approximately 7 truckloads per day of Light Crude Oil (LCO) are also imported to blend with the heavy crude oil produced in the ERG West Cat Canyon Oilfield to enable truck transport. Thus, the existing number of trucks for the current oil production is 29 trucks per day.



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ERG WEST CAT CANYON OIL FIELD EXPANSION PROJECT - TRUCK ROUTES

FIGURE 23

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Oil production is anticipated to increase to a production rate of 10,000 BOPD, which would require approximately 63 truckloads per day. Approximately 22 truckloads per day of LCO would also be required to blend with the heavy crude oil. In addition, up to 2 truckloads per day would be required for equipment and other deliveries. Thus, the number of trucks for the 10,000 BOPD production level is forecast at or the current oil production is 87 trucks per day.

Table 29 shows the additional truck traffic that would be generated by the ERG West Cat Canyon Oilfield Expansion Project assuming that trucks are used to transport materials and products instead of using the Foxen Petroleum Pipeline. Oil production and trucking are anticipated to occur over a 24-hour period. The table shows the number of trucks per day as well as the number of trucks per hour that are used to assess potential impacts.

**Table 29**  
**ERG West Cat Canyon Truck Trips – No Pipeline**

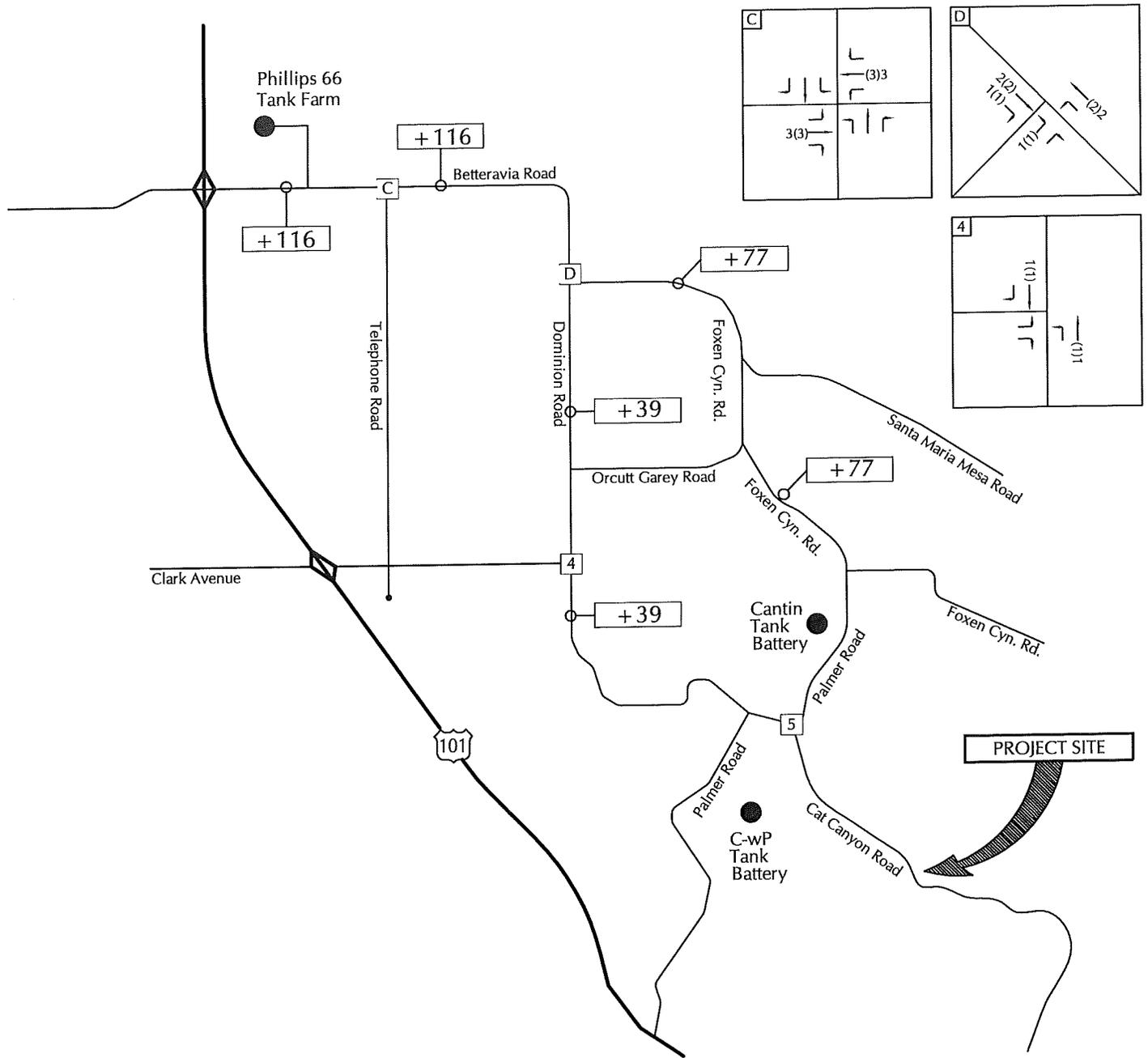
Scenario	Trucks Per Day	Truck Trips Per Day(1)	Truck Trips Per Hour(2)
Future Production 10,000 BOPD	87	174	7.3
Existing Production 3,400 BOPD	29	58	2.4
<b>Net New Trips</b>	<b>+58</b>	<b>+116</b>	<b>+4.9</b>
(1) Each truck represents 2 one-way trips (1 inbound + 1 outbound).			
(2) Truck trips per hour during the A.M. and P.M. peak hours assuming 24-hour operations.			

As shown in Table 29, assuming that the Foxen Petroleum Pipeline is not constructed and used for oil transport, the ERG West Cat Canyon Oilfield Expansion Project would generate 116 additional daily truck trips, with about 5 additional truck trips during the A.M. and P.M. peak hour periods.

The additional traffic that would be generated by this scenario was assigned to the roadway network in the Project study area for analyses of potential cumulative impacts. The assignment of the additional truck trips assumes the existing truck routes between the on-site tank batteries and the Phillips 66 tank farm on Battles Road (see Figure 23). As derived from the traffic study prepared for the ERG West Cat Canyon Oilfield Expansion Project,<sup>2</sup> the distribution analysis assumes that one-third of the truck trips would come from the GWP Tank Battery and two-thirds would come from the Cantin Tank Battery.

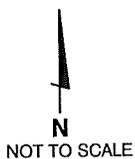
The additional truck trips on the study-area street network are illustrated on Figure 24. Those trips were then added to the Cumulative + Project traffic forecasts for Option 3 to assess potential cumulative impacts (Option 3 was selected for analyses since the street network affected by Option 3 would also be affected by the additional trucks generated by the ERG West Cat Canyon Oilfield Expansion Project).

<sup>2</sup> Traffic Analysis for the ERG West Cat Canyon Revitalization Plan, Associated Transportation Engineers, August 2014.



LEGEND

- X - Average Daily Traffic Volume
- (XX)XX - (A.M.)P.M. Peak Hour Volume



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ERG WEST CAT CANYON OIL FIELD EXPANSION PROJECT -  
TRUCK TRIPS WITHOUT FOXEN PETROLEUM PIPELINE

FIGURE 24

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## Potential Roadway Impacts

Cumulative + Project (Option 3) traffic forecasts are shown in Table 30. The table also lists the Cumulative + Project (Option 3) + ERG West Cat Canyon Oilfield Expansion Project traffic assuming that the Foxen Petroleum Pipeline is not constructed.

**Table 30**  
**Cumulative + Project (Option 3) + ERG West Cat Canyon Project Roadway Operations**

Roadway Segment	ADT Volume / LOS		Impact?
	Cumulative + Project(1)	Cumulative + Project + ERG West(2)	
Betteravia Road e/o U.S. 101	10,649 / LOS A	10,765 / LOS A	No
Betteravia Road e/o Telephone Road	5,299 / LOS A	5,415 / LOS A	No
Dominion Road n/o Clark Avenue	1,349 / LOS A	1,388 / LOS A	No
Dominion Road s/o Clark Avenue	1,632 / LOS A	1,671 / LOS A	No
(1) Cumulative + Project forecasts include Project Option 3 traffic for day-to-day operations + peak drilling phases.			
(2) Cumulative + Project (Option 3) forecasts + ERG West Cat Canyon Oilfield Expansion Project assuming that the Foxen Petroleum Pipeline is not constructed.			

As shown in Table 30, the common roadway segments in the Project study area that would be affected by the Project and the ERG West Cat Canyon Oilfield Expansion Project are forecast to operate at LOS A assuming the Cumulative + Project (Option 3) + ERG West Cat Canyon Oilfield Expansion Project traffic forecasts. Thus, the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative roadway impacts under this scenario.

## Potential Intersection Impacts

Cumulative + Project (Option 3) level of service forecasts for the A.M. and P.M. peak hour for the common intersections are shown in Table 31. The table also lists the level of service forecasts assuming Cumulative + Project (Option 3) + ERG West Cat Canyon Oilfield Expansion Project traffic assuming that the Foxen Petroleum Pipeline is not constructed. As shown in Table 29, the ERG West Cat Canyon Oilfield Expansion Project would add 5 truck trips to the Project study-area street network during the A.M. and P.M. peak hour periods.

**Table 31  
Cumulative + Project (Option 3) Peak Hour Intersection Operations**

Intersection	A.M. Peak Hour		P.M. Peak Hour		Impact?
	Cumulative + Project(1)	Cumulative + Project + ERG West(2)	Cumulative + Project(1)	Cumulative + Project + ERG West(2)	
Telephone Road/Betteravia Road	LOS C	LOS C	LOS C	LOS C	No
Dominion Road/Foxen Canyon Road	LOS A	LOS A	LOS A	LOS A	No
Dominion Road/Clark Avenue	LOS A	LOS A	LOS A	LOS A	No
(1) Cumulative + Project forecasts include Project Option 3 traffic for day-to-day operations + peak drilling phases. (2) Cumulative + Project (Option 3) forecasts + ERG West Cat Canyon Oilfield Expansion Project assuming that the Foxen Petroleum Pipeline is not constructed.					

As shown in Table 31, the common intersections in the Project study area that would be affected by the Project and the ERG West Cat Canyon Oilfield Expansion Project are forecast to operate at LOS C or better assuming the Cumulative + Project (Option 3) + ERG West Cat Canyon Oilfield Expansion Project traffic forecasts. Thus, the East Cat Canyon Oil Field Redevelopment Project would not contribute to significant cumulative intersection impacts under this scenario.

## REGIONAL TRUCKING IMPACTS

The preceding impact analyses focused on potential impacts of the Project within the study-area adjacent to the site in the Santa Maria-Orcutt area. The following analysis assesses potential impacts on the regional roadway network for Project trucks hauling light crude oil and produced crude oil between the Project site and the South Belridge Oil Field in Kern County.

### Truck Route

Figure 25 illustrates the truck route that would be used between the Project site in the Santa Maria-Orcutt area in Santa Barbara County and the South Belridge Oil Field in Kern County. As shown, trucks would use the following State Routes:

#### Regional Truck Route Roadway Segments

- U.S. 101 – Betteravia Road to Santa Maria River Bridge
- U.S. 101 – Santa Maria River Bridge to Arroyo Grande
- U.S. 101 – Arroyo Grande to San Luis Obispo
- U.S. 101 – San Luis Obispo to Paso Robles
- State Route 46 – Paso Robles to State Route 41 Junction
- State Route 46 – State Route 41 Junction to State Route 33
- State Route 33 – State Route 46 to South Belridge Oil Field



**FIGURE 2**  
**REGIONAL TRUCK ROUTE -  
 PROJECT SITE TO SOUTH BELRIDGE OIL FIELD**

FIGURE 25



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## Caltrans Impact Criteria

The truck route is comprised of Caltrans facilities. The following analyses was therefore conducted using Caltrans level of service methods and impact criteria, as outlined in the Caltrans *Guide for the Preparation of Traffic Impact Studies*.<sup>3</sup> According to the guide, Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D. Levels of service for State highway facilities are based upon measures of effectiveness (MOEs), which describe the measures best suited for analyzing State highway facilities (i.e., freeway segments, signalized intersections, on- or off-ramps, etc.). If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.

## Existing Operations

Figure 26 illustrates the Existing traffic volumes along the truck route between the Project site and the South Belridge Oil Field in Kern County. Existing traffic volumes were obtained from Caltrans.<sup>4</sup> Levels of service were calculated for each highway segment using the operations methods outlined in the Highway Capacity Manual. Table 32 lists the Existing traffic operations for each highway segment between the Project site and the South Belridge Oil Field.

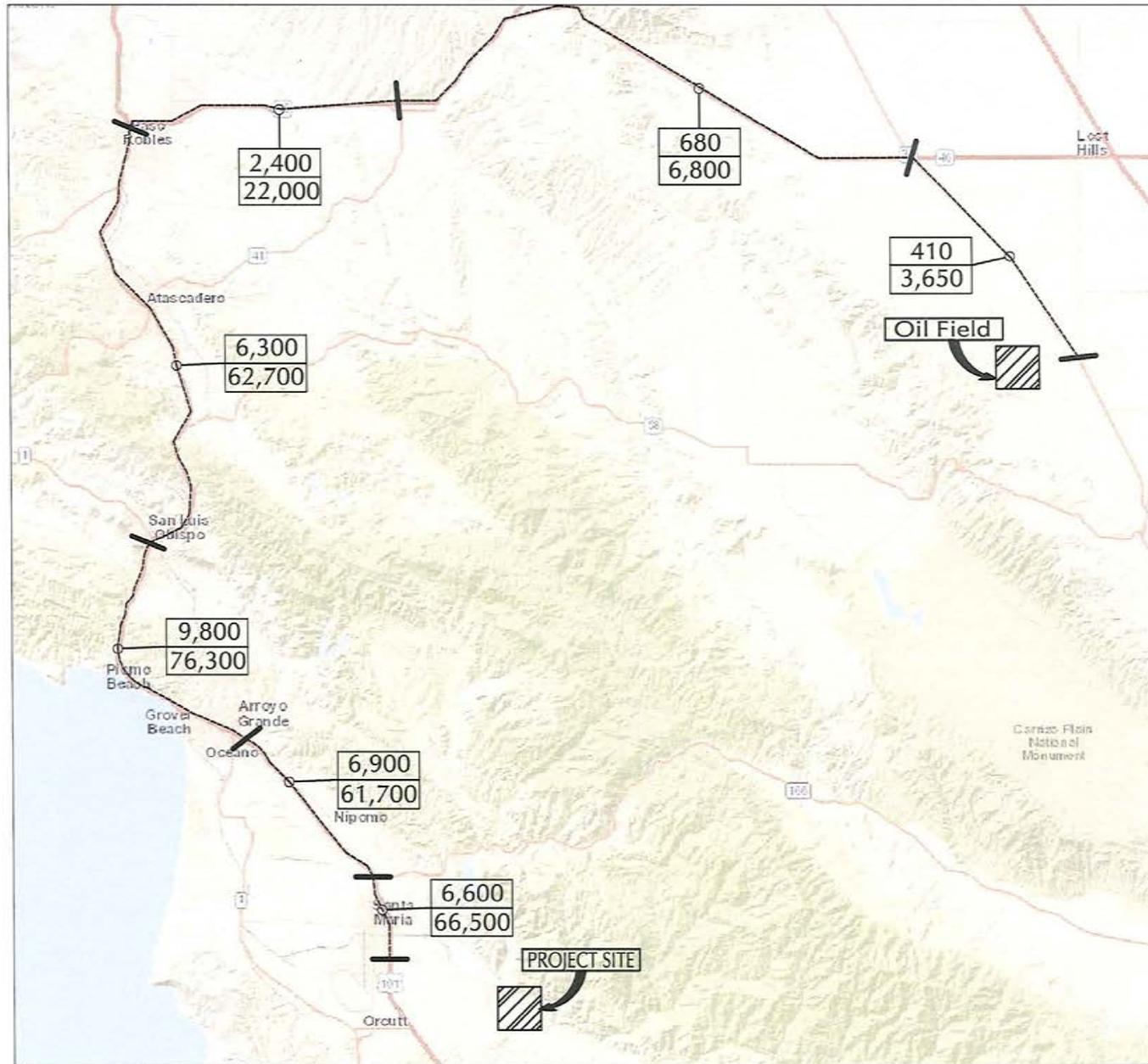
**Table 32**  
**Project Site to South Belridge Oil Field Truck Route - Existing Operations**

Facility	Segment	Facility Type	Existing Volume(1)	Existing LOS(2)
U.S. 101	Betteravia to Santa Maria River Bridge	6-Lane Freeway	6,600	LOS C
U.S. 101	Santa Maria River Bridge to Arroyo Grande	4-Lane Freeway	6,900	LOS E
U.S. 101	Arroyo Grande to San Luis Obispo	4-Lane Freeway	9,800	LOS F
U.S. 101	San Luis Obispo to Paso Robles	4-Lane Freeway	6,300	LOS D
SR 46	Paso Robles to SR 41(E) Junction(3)	4-Lane Highway	2,400	LOS B
SR 46	SR 41(E) Junction to SR 33	2-Lane Highway	680	LOS C
SR 33	SR 33 to South Belridge Oil Field	2-Lane Highway	410	LOS C
(1) Existing peak hour volume.				
(2) Existing LOS during peak hour using HCM operations procedures.				
(3) The 2-lane portions of this segment are being widened to a 4-lane highway.				

As shown, the segments of the U.S. 101 between the Santa Maria River Bridge and Paso Robles current operate at LOS D, E or F during the peak hour period. The other highway segments along the truck haul route operate at LOS C or better.

<sup>3</sup> *Guide for the Preparation of Traffic Impact Studies*, Caltrans, December 2002.

<sup>4</sup> <http://traffic-counts.dot.ca.gov/2014all>, 2014 Traffic Volumes Book, Caltrans, 2016.



LEGEND

- X - Peak Hour Volume
- XX - Average Annual Traffic Volume

EXISTING TRAFFIC VOLUMES -  
 REGIONAL TRUCK ROUTE



## **Trip Generation**

A total of about 100 trucks per day would transport crude oil between the Project site and the South Belridge Oil Field in Kern County (see Table 3 - Peak Project Trip Generation – All Options). The trucking activity would occur over a 24-hour basis, which equates to 4 inbound trucks and 4 outbound per hour along the regional haul route between the Project site and the South Belridge Oil Field in Kern County.

## **Potential Impacts**

The trucking activity would add a low number of new trips along the proposed truck haul route (4 trips in each direction during peak hour periods). This relatively minor amount of traffic would not change the levels of service or the measures of effectiveness along the route. Thus, the Project traffic additions would not significantly impact traffic operations along the regional haul route between the Project site and the South Belridge Oil Field in Kern County.

## **SITE ACCESS – ALL OPTIONS**

Site access is currently provided by a private portion of Long Canyon Road, which connects to Cat Canyon Road south of Palmer Road. Traffic volumes are relatively light on Cat Canyon Road in the vicinity of the connection (less than 500 ADT). Field observations found that the Cat Canyon Road/Long Canyon Road intersection operates at LOS A during the A.M. and P.M. peak periods. Given the traffic that would be generated by the Project (10 trips during the A.M. peak hour and 89 trips during the P.M. peak hour), the intersection is forecast to continue to operate at LOS A under Existing + Project conditions.

The sight distance looking to the south from Long Canyon Road is limited by a vertical curve on the roadway, a large oak tree, and several smaller scrub oak trees. A warning sign is located on Cat Canyon Road just south of the Long Canyon Road connection to inform drivers of trucks entering Cat Canyon Road from Long Canyon Road. The applicant is pursuing a new connection to Cat Canyon Road about 300 feet north of the existing Long Canyon Road connection to serve the Project site. The new connection is located in an area where Cat Canyon Road is relatively flat and straight. The sight distances at the new connection are an improvement when compared to the existing Cat Canyon Road/Long Canyon Road intersection that currently serves the Project site. Given the relatively low volumes on Cat Canyon Road in the vicinity of the new connection, the new intersection is forecast to operate at LOS A during the A.M. and P.M. peak periods under Existing + Project conditions.

## POTENTIAL CONSTRUCTION IMPACTS

### Project Construction

The project-specific and cumulative impact analyses presented above include the traffic that would be generated by peak levels of construction on the Project site as well as traffic generated by day-to-day operations throughout the life of the Project. The analysis found that the Project would not significantly impact the Project study-area roadways and intersections. Thus, traffic generated during the Project's peak construction phases would not result in significant traffic impacts on the Project study-area street network.

### Electrical Transmission Line

Project Description. This component of the Project includes construction of a new electrical transmission line and associated staging/laydown areas. This construction project would be completed by PG&E. Figure 27 illustrates the location of the electrical transmission line and staging and laydown areas. The electrical transmission line would require up to 3 new poles on the Sisquoc-Santa Ynez 115 kilovolt power line near the point of interconnection and up to 8 new poles along the new transmission line. Pending final design of the electrical transmission line, improvements may be required at 2 PG&E company-owned substations (at Sisquoc or Palmer). Work at both substations is expected to occur within the existing substation properties. The electrical transmission line construction project is estimated to take a total of 5 weeks. Work hours are anticipated to be 7:00 A.M. to 5:00 P.M. on Monday-Saturday. The maximum number of workers is 8 per day.

Impact Analysis. It is estimated that the construction activities would generate a maximum of 26 trips per day, with 8 trips during the A.M. peak hour and 8 trips during the P.M. peak hour (trip generation assumes peak of 8 workers per day during Weeks 4 and 5, plus material deliveries). Most of the work would occur on the Project site and would not affect traffic flows on public roads. Access to the offsite portion of the electrical transmission line route are existing dirt roads currently used for oil field and ranching operations and maintenance. Construction of the electrical transmission line would not require any lane closures on the public roads in the Project vicinity. Some traffic control would be required for the 1-2 days while rope and conductor is installed over Cat Canyon Road. Given the short duration of the construction project (5 weeks), the minor amount of traffic that would be generated on a day-to-day basis during the construction period (maximum of 26 trips per day on public roads for worker commute trips and material deliveries), and the fact that construction would not require lane closures on public roads, the short-term traffic impacts of this construction project would be insignificant.



-  Aera Energy LLC Property
-  Proposed 115kV Service Line
-  Project Footprint
-  Proposed Laydown Area - 100'x100'
-  Approximate Route of Existing 115kV Line
-  Proposed Staging Area within Existing Palmer Substation

Source: County of Santa Barbara, NAD 2012 Image, PGE, Aera Energy LLC, TJCross 8/20/14, DPSI 2013 Survey  
 Notes: This map was created for informational and display purposes only



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ELECTRICAL TRANSMISSION INSTALLATION STAGING AND LAYDOWN AREAS

FIGURE 27

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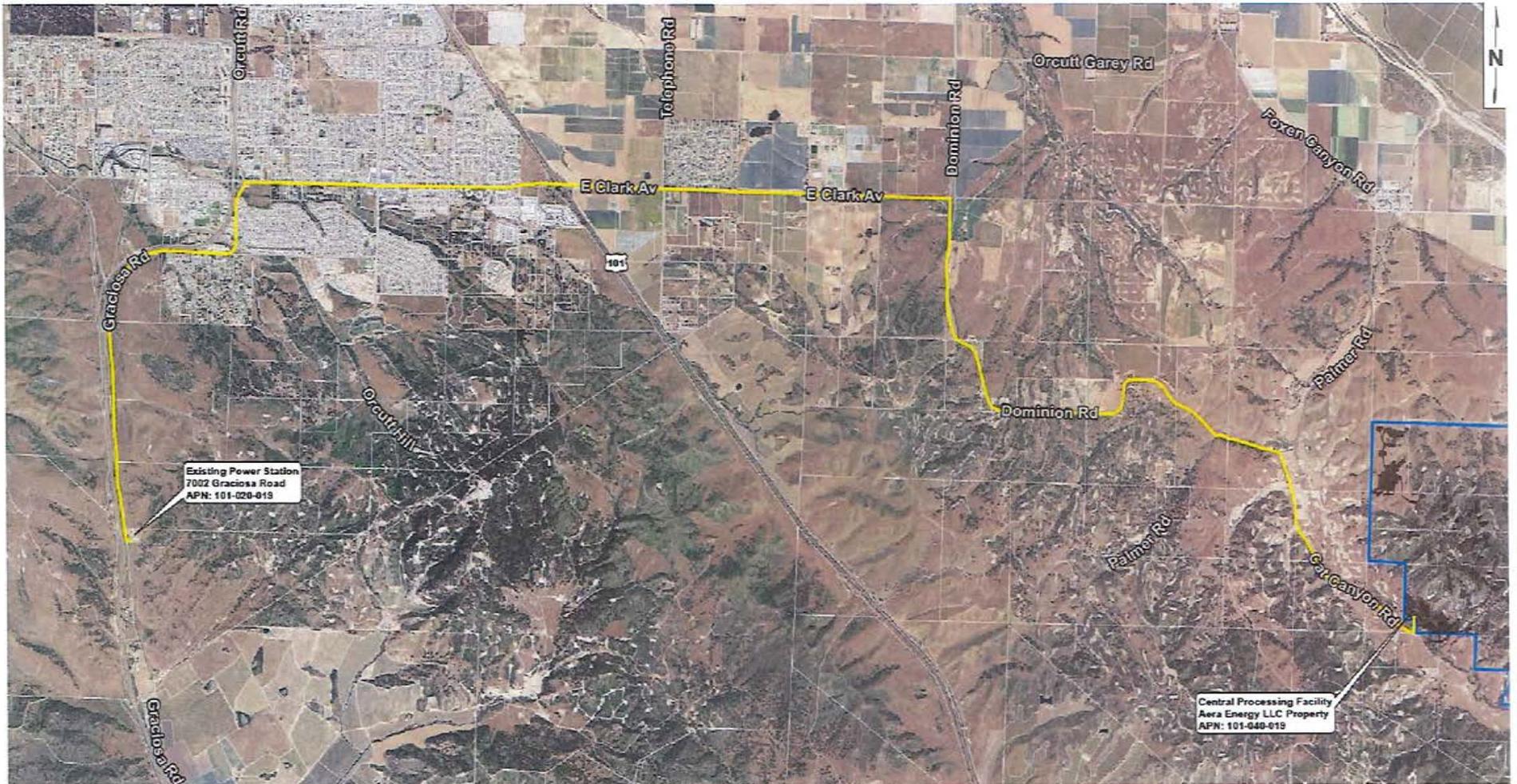
## Natural Gas Pipeline

Project Description. This component of the Project includes construction of a 14-mile long, 8-inch diameter natural gas pipeline between the existing Southern California Gas (SoCalGas) station located south of the Orcutt community (Divide Station) and the Cat Canyon Crude Oil Processing Plant. This construction project would be completed by SoCalGas. Figure 28 illustrates the pipeline route. In addition to the pipeline, SoCalGas would construct and maintain appurtenant facilities, including two aboveground valves, four underground valves, and a metering station at the terminus of the pipeline. The pipeline would be installed using conventional trenching, as well as horizontal directional drill (HDD), slick bore, and jack-and-bore techniques.

The pipeline construction project is estimated to take 5-6 months. At this time, it is anticipated that a 1,500-foot moving construction zone would be used for the pipeline installation process. The workforce would depend on the contractor and how many crews are assigned during construction at any given time. It is expected that approximately 70 to 80 construction personnel would work daily, with a peak number of approximately 100. Depending on the construction sequencing, the workforce could increase to approximately 80 to 90 construction personnel, with a peak number of approximately 120. In general, at least one crew would focus on installation of the pipeline at major road and drainage crossings; one crew would work on the horizontal directional drill (HDD); and a main crew would focus on conventional trenching and pipe installation. Construction crews would work approximately 10 hours per day, 6 days per week, typically from 6:00 A.M. to 5:00 P.M. and in accordance with the local noise ordinance.

The new pipeline would be constructed primarily within existing roadways and road shoulders. The pipeline would be designed, constructed, operated, and maintained in accordance with all applicable requirements included in the U.S. Department of Transportation regulations in Title 49 of the Code of Federal Regulations Section 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. Further, the pipeline construction project would be subject to California Public Utilities Commission (CPUC) standards as embodied under General Order 112-E. Traffic control, temporary road closures, and detours would be in accordance with the local encroachment permit requirements.

Trip Generation. Assuming the peak number of workers (120 workers) it is estimated that the pipeline construction project would generate 400 daily trips, with 4 trips during the A.M. peak hour and 122 trips during the P.M. peak hour (includes trips associated with workers arriving and departing work sites as well as delivery of materials and equipment during the A.M. and P.M. peak commuter periods). Table 33 shows the trip generation estimates for the pipeline construction project assuming the peak number of workers.



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### PROPOSED NATURAL GAS PIPELINE ROUTE

FIGURE 28

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**Table 33**  
**SoCalGas Pipeline – Peak Trip Generation Forecasts**

Component	Number Per Day	Shift	Trip Generation				
			ADT	A.M. Peak		P.M. Peak	
				In	Out	In	Out
Workers(1)	120	6:00 AM-5:00 PM	360	0	0	0	120
Deliveries & Miscellaneous Trips(2)	20	NA	40	2	2	2	2
<b>Totals</b>			<b>400</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>122</b>

(1) Worker shift starts at 6:00 A.M. and ends at 5:00 P.M. ADT assumes 50% of employee leave site for lunch break.  
(2) Deliveries & Miscellaneous Trips assumes one inbound + one outbound trip per delivery. A.M. and P.M. peak hour trip generation assumes 10% of trips during each peak hour.

As shown in Table 33, the peak trip generation forecasts for the pipeline construction is 400 ADT, with 4 trips during the A.M. peak hour and 122 trips during the P.M. peak hour. It is noted that most of the traffic generated during the P.M. peak hour period would be the 120 workers leaving the job site at 5:00 P.M. at the end of the work day. The construction project would require fewer workers during most phases and therefore generate less traffic, including during the P.M. peak hour.

Impact Analysis – Construction Traffic. Traffic generated by the pipeline construction project has the potential to impact traffic operations along the pipeline route. As shown in Table 1, traffic volumes are relatively low along the two-lane segments of Clark Avenue, Dominion Road, Palmer Road, and Cat Canyon Road east of U.S. 101. Those roadway segments currently operate at LOS A and would continue to operate at LOS A with the additional 400 daily trips that would be added by the construction project. Similarly, traffic volumes are relatively low along the two-lane segments of Orcutt Road and Graciosa Road south of the community of Orcutt. Orcutt Road carries less than 3,000 ADT south of Clark Avenue and Graciosa Road carries less than 1,000 ADT south of Rice Ranch Road. These two roadway segments currently operate at LOS A and would continue to operate at LOS A with the additional 400 daily trips that would be added by the pipeline construction project.

The segment of Clark Avenue between U.S. 101 and Orcutt Road traverses a populated area and is heavily traveled by commuter, school, and commercial traffic. This segment is a four-lane arterial with signalized intersections at major cross streets. Existing average daily traffic volumes for Clark Avenue between U.S. 101 and Orcutt Road were obtained from counts contained in recent traffic studies, including counts conducted in August 2015 for the Rice Ranch Specific Plan.<sup>5</sup> The operational characteristics of the roadway segments were analyzed based on the County's engineering roadway design capacities (roadway capacities are summarized in the Technical Appendix). Table 34 shows the County's "Acceptable Capacity" ratings and the Existing ADT volumes for the Clark Avenue roadway segments.

<sup>5</sup> Rice Ranch Specific Plan – Revised Traffic and Circulation Study, Stantec, June 2015.

**Table 34**  
**Existing Roadway Operations – Clark Avenue Corridor in Orcutt**

Roadway Segment	Roadway Classification	Number of Lanes	Acceptable Capacity	Existing ADT
Clark Avenue e/o Sunny Hills Road	Primary 2	3 Lanes	25,500	14,700
Clark Avenue w/o Stillwell Road	Primary 2	4 Lanes	34,000	16,900
Clark Avenue e/o Bradley Road	Primary 2	4 Lanes	34,000	18,000
Clark Avenue w/o Bradley Road	Primary 2	4 Lanes	34,000	18,000
Note: Acceptable Capacity ratings from Orcutt Community Plan.				

The data presented in Table 34 show that the Clark Avenue roadway segments currently carry traffic volumes within their Acceptable Capacity ratings. The 400 ADT that would be generated by the pipeline construction project would not impact Clark Avenue roadway operations.

More detailed traffic flow analyses for urban arterial roads such as Clark Avenue focus on operation at critical intersections during peak travel periods since traffic is most constrained at intersections. Table 35 lists the Existing levels of service for the key intersections along Clark Avenue between U.S. 101 and Orcutt Road for the P.M. peak commuter period. Since traffic volumes are lower during the A.M. peak commuter period, the Existing levels of service are better during the A.M. peak hour when compared to the P.M. peak hour.

**Table 35**  
**Existing Intersection Operations – Clark Avenue Corridor in Orcutt**

Intersection	Control	P.M. Peak Hour
Clark Avenue/U.S. 101 NB Ramps	STOP Sign	LOS B
Clark Avenue/U.S. 101 SB Ramps	STOP Sign	LOS A
Clark Avenue/Stillwell Road	Signal	LOS A
Clark Avenue/Bradley Road	Signal	LOS B
Clark Avenue/Orcutt Road	Signal	LOS A

The data presented in Table 35 show that the major intersections along Clark Avenue between U.S. 101 and Orcutt Road currently operate at LOS A or LOS B during the P.M. peak hour period, which indicates relatively good operations and meet the County’s LOS C standard. The Clark Avenue would continue to operate at LOS A and LOS B with the 4 A.M. peak hour trips and 122 P.M. peak hour trips that would be generated by the pipeline construction project.

Impact Analysis – Construction Work Zone. The 1,500-foot construction work zone has the potential to impact traffic flows along the route. Most of the pipeline construction would occur in shoulder areas adjacent to two-lane roads that are not heavily traveled. Traffic volumes are relatively light on the roadway segments east of U.S. 101. As shown in Table 1, traffic volumes are low along the two-lane segments of Clark Avenue, Dominion Road, Palmer Road, and Cat Canyon Road east of U.S. 101. Those roadway segments currently operate at LOS A. It is anticipated that the pipeline would be installed within the shoulder areas along these roadway segments and not require lane closures. Thus, the pipeline construction project is anticipated to not significantly impact traffic operations along these two-lane roadway segments.

Similarly, traffic volumes are relatively low along the two-lane segments of Orcutt Road and Graciosa Road south of the community of Orcutt. Orcutt Road carries less than 3,000 ADT south of Clark Avenue and Graciosa Road carries less than 1,000 ADT south of Rice Ranch Road. These two roadway segments currently operate at LOS A. It is anticipated that the pipeline would be installed within the shoulder areas along these roadway segments and not require lane closures. Thus, the pipeline construction project is anticipated to not significantly impact traffic operations along these two-lane roadway segments.

The 1,500-foot construction work zone has the potential to impact traffic flows along the Clark Avenue route between U.S. 101 and Orcutt Road within the Orcutt community. Lane closures may be required intermittently along the pipeline route, which could constrain traffic flows during the A.M. and P.M. peak commuter periods – particularly at major intersections where traffic is most restricted.

Mitigation Measures. The following measures should be considered in order to minimize potential traffic impacts associated with the SoCalGas pipeline construction project.

1. Adhere to applicable Federal, State, and County regulations (i.e. U.S. Department of Transportation regulations, CPUC standards, Caltrans standards, and Santa Barbara County standards). Most notably, the traffic control procedures and measures that should be adhered to are outlined in the *California Manual on Uniform Traffic Control Devices* (Caltrans 2014); *Standard Plans* (Caltrans 2015); and *Standard Specifications* (Caltrans 2015).
2. Where possible, avoid lane closures during the A.M. and P.M. peak commuter periods at major intersections along Clark Avenue between U.S. 101 and Orcutt Road.

## **CONGESTION MANAGEMENT PROGRAM ANALYSIS**

The Santa Barbara County Association of Governments (SBCAG) has developed a set of traffic impact thresholds to assess the impacts of land use decisions made by local jurisdictions on regional transportation facilities located within the Congestion Management Plan (CMP) roadway system. The following guidelines were developed by SBCAG to determine the significance of project-generated traffic impacts on the regional CMP system.

## Impact Thresholds

1. For any roadway or intersection operating at "Level of Service" (LOS) A or B, a decrease of two levels of service resulting from the addition of project-generated traffic.
2. For any roadway or intersection operating at LOS C, project-added traffic that results in LOS D or worse.
3. For intersections within the Congestion Management Program system with existing congestion, the following table defines significant impacts.

Level of Service	Project-Added Peak Hour Trips
LOS D	20
LOS E	10
LOS F	10

4. For freeway or highway segments with existing congestion, the following table defines significant impacts.

Level of Service	Project-Added Peak Hour Trips
LOS D	100
LOS E	50
LOS F	50

## Potential Impacts

Intersections. The U.S. 101 Northbound Ramps/Betteravia Road intersection and U.S. 101 Southbound Ramps/Betteravia Road intersection are part of the Congestion Management Program network. The traffic analysis found that these 2 intersections operate at LOS B or better during the A.M. and P.M. peak hour period under Existing and Existing + Project conditions. The Project would therefore not generate project-specific impacts to the CMP intersections. The U.S. 101 Southbound Ramps/Betteravia Road intersection is forecast to degrade to LOS D under Cumulative and Cumulative + Project conditions. Project Options 2 and 3 would add 4 trips to the intersection during the A.M. and P.M. peak hour periods, which is considered an insignificant impact according to CMP impact criteria.

U.S. 101. According to CMP monitoring, the segment of U.S. 101 north of the Clark Avenue interchange operates at LOS B in the northbound direction and LOS A in the southbound direction during the peak hour period. The Project is forecast to add a maximum of 71 peak hour trips to northbound U.S. 101 and 6 peak hour trips to southbound U.S. 101. This segment of U.S. 101 would continue to operate at LOS B in the northbound direction and LOS A in the southbound direction with the addition of Project traffic. Thus, the Project would not significantly impact U.S. 101 north of the Clark Avenue interchange based on Congestion Management Program impact criteria.

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## STUDY PARTICIPANTS AND REFERENCES

### Associated Transportation Engineers

Scott A. Schell, AICP, PTP, Principal Transportation Planner

Richard L. Pool, PE, Principal Engineer

Dan Dawson, PTP, Supervising Transportation Planner

Matthew Farrington, Transportation Planner I

### References

California Manual on Uniform Traffic Control Devices, Caltrans, 2014.

Guide for the Preparation of Traffic Impact Studies, Caltrans, December 2002.

Highway Capacity Manual, Transportation Research Board, National Research Council, 2010.

Highway Design Manual, California Department of Transportation, 6th Edition, 2006.

<http://traffic-counts.dot.ca.gov/2014all>, 2014 Traffic Volumes Book, Caltrans, 2016.

Orcutt Community Plan Update EIR, Volume II, Key Sites, County of Santa Barbara, 1995.

Rice Ranch Specific Plan – Revised Traffic and Circulation Study, Stantec, June 2015.

Trip Generation, Institute of Transportation Engineers, 9<sup>th</sup> Edition, 2012.

Santa Barbara County 2003-2008 Housing Element Focused Rezone Program EIR - Traffic and Circulation Study, Associated Transportation Engineers, July, 2008.

Standard Plans, Caltrans, 2015.

Standard Specifications, Caltrans, 2015.



# ASSOCIATED TRANSPORTATION ENGINEERS

100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805) 687-4418 • FAX (805) 682-8509

Since 1978

Richard L. Pool, P.E.  
Scott A. Schell, AICP, PTP

May 14, 2018

13079L09

Crystahl Taylor  
Padre Associates  
369 Pacific Street  
San Luis Obispo, CA 93401

## **SUPPLEMENTAL ANALYSIS FOR THE EAST CAT CANYON PRODUCTION PLAN PROJECT, COUNTY OF SANTA BARBARA**

Associated Transportation Engineers (ATE) prepared a traffic and circulation study for the East Cat Canyon Oil Field Redevelopment Project located southeast of the Orcutt area of Santa Barbara County.<sup>1</sup> Since that time, updates have been made to the trucking plan as part of the Applicant's review of the Air Quality Impact Assessment (AQIA) and the Truck Transportation Quantitative Risk Assessment (TQRA). The following supplemental analysis addresses the changes to the Project's trip generation and potential impacts.

### **PROJECT TRIP GENERATION**

#### **November 2017 Traffic Study**

The trip generation estimates in the November 2017 study assumed 99.5 trucks per day (peak day) for transport of light crude oil imports and produced crude oil exports. Table 3 from the November 2017 study is reproduced below for reference. As shown, the Project's trip generation totaled 532 average daily trips (ADT), with 10 trips occurring during the A.M. peak hour and 89 trips occurring during the P.M. peak hour.

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<sup>1</sup> Revised Traffic and Circulation Study for the East Cat Canyon Oil Field Redevelopment Project, Associated Transportation Engineers, November 2017.

**Table 3  
Peak Project Trip Generation – All Options**

Component	Number Per Day	Shift	Trip Generation				
			ADT	A.M. Peak		P.M. Peak	
				In	Out	In	Out
<b>Employees – Operations</b>							
Aera 9/80 Employees(1)	48	6:30 AM-4:15 PM	144	0	0	0	48
Aera 12H Employees(2)	5	6:00 AM/PM-6:00 PM/AM	15	0	0	0	0
Contract 9/80 Employees(1)	25	6:30 AM-4:15 PM	75	0	0	0	25
Contract 12H Employees(2)	14	6:00 AM/PM-6:00 PM/AM	<u>42</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal			276	0	0	0	73
<b>Employees – Drilling</b>							
Aera 9/80 Employees(1)	6	6:30 AM-4:15 PM	18	0	0	0	6
Contract 12H Employees(2)	7	6:00 AM/PM-6:00 PM/AM	<u>21</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal			39	0	0	0	6
Bulk Material & Waste Deliveries(3)	4	NA	8	0	1	1	0
Miscellaneous Material Deliveries(3)	5	NA	10	0	1	1	0
Light Crude Oil Import/Produced Crude Oil Export(4)	99.5	NA	199	4	4	4	4
<b>Totals</b>			<b>532</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>83</b>
(1) 9/80 workers. Shift starts at 6:30 A.M. and ends at 4:15 P.M. ADT assumes 50% of employee leave site for lunch break. (2) 12-hour shift workers. Shifts = 6:00 A.M. to 6:00 P.M.; and 6:00 P.M. to 6:00 A.M. ADT assumes 50% of employees leave site for lunch break. (3) Deliveries assumes one inbound + one outbound trip per delivery. A.M. and P.M. peak hour trip generation assumes 10% of trips during each peak hour. (4) Light Crude Oil Import/Produced Crude Oil Export assumes one inbound + one outbound trip per truck. A.M. and P.M. peak hour trip generation assumes 4 trucks inbound and outbound per hour.							

**Revised Trip Generation**

The number of trucks per day (peak day) for transport of light crude oil imports and produced crude oil exports has been modified to 95 trucks per day (reduced from 99.5 trucks per day). The Project’s trip generation estimates were recalculated based on the reduced number of trucks. As shown in the revised Table 3 below, this modification results in 523 ADT (reduction of 9 ADT), with 10 trips occurring during the A.M. peak hour (no change) and 89 trips occurring during the P.M. peak hour (no change).

**Table 3 - REVISED  
REVISED Peak Project Trip Generation – All Options**

Component	Number Per Day	Shift	Trip Generation				
			ADT	A.M. Peak		P.M. Peak	
				In	Out	In	Out
<b>Employees – Operations</b>							
Aera 9/80 Employees(1)	48	6:30 AM-4:15 PM	144	0	0	0	48
Aera 12H Employees(2)	5	6:00 AM/PM-6:00 PM/AM	15	0	0	0	0
Contract 9/80 Employees(1)	25	6:30 AM-4:15 PM	75	0	0	0	25
Contract 12H Employees(2)	14	6:00 AM/PM-6:00 PM/AM	42	0	0	0	0
Subtotal			276	0	0	0	73
<b>Employees – Drilling</b>							
Aera 9/80 Employees(1)	6	6:30 AM-4:15 PM	18	0	0	0	6
Contract 12H Employees(2)	7	6:00 AM/PM-6:00 PM/AM	21	0	0	0	0
Subtotal			39	0	0	0	6
Bulk Material & Waste Deliveries(3)	4	NA	8	0	1	1	0
Miscellaneous Material Deliveries(3)	5	NA	10	0	1	1	0
Light Crude Oil Import/Produced Crude Oil Export(4)	95	NA	190	4	4	4	4
<b>Totals</b>			<b>523</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>83</b>
(1) 9/80 workers. Shift starts at 6:30 A.M. and ends at 4:15 P.M. ADT assumes 50% of employee leave site for lunch break. (2) 12-hour shift workers. Shifts = 6:00 A.M. to 6:00 P.M.; and 6:00 P.M. to 6:00 A.M. ADT assumes 50% of employees leave site for lunch break. (3) Deliveries assumes one inbound + one outbound trip per delivery. A.M. and P.M. peak hour trip generation assumes 10% of trips during each peak hour. (4) Light Crude Oil Import/Produced Crude Oil Export assumes one inbound + one outbound trip per truck. A.M. and P.M. peak hour trip generation assumes 4 trucks inbound and outbound per hour.							

**POTENTIAL IMPACTS**

The November 2017 traffic study found that the Project would not generate significant traffic impacts to the study-area roadways and intersections (no project-specific and no cumulative impacts). The revised Project, with the reduction of 9 ADT, also would not generate any traffic impacts to the study-area roadways and intersections (no project-specific and no cumulative impacts). Thus, the traffic impact analysis in the November 2017 traffic study remains valid.

This concludes our supplemental analysis for the East Cat Canyon Oil Field Redevelopment Project.

Associated Transportation Engineers

A handwritten signature in black ink, appearing to read 'Dan Dawson', with a long horizontal flourish extending to the right.

Dan Dawson  
Supervising Transportation Planner

DLD/EKM