U.S. 101 South County Corridor Transportation Study

Final Report

Prepared for:

San Luis Obispo County

Prepared by:

omni · means
ENGINEERS · PLANNERS

U.S. 101 SOUTH COUNTY CORRIDOR TRANSPORTATION STUDY

PREPARED FOR:
SAN LUIS OBISPO COUNTY
976 OSOS STREET
SAN LUIS OBISPO, CA 93401

PREPARED BY:
OMNI-MEANS, LTD.
ENGINEERS & PLANNERS
943 RESERVE DRIVE, SUITE 100
ROSEVILLE, CA 95678
916.782.8688

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INTRODUCTION

THE U.S. 101 SOUTH COUNTY CORRIDOR TRANSPORTATION STUDY

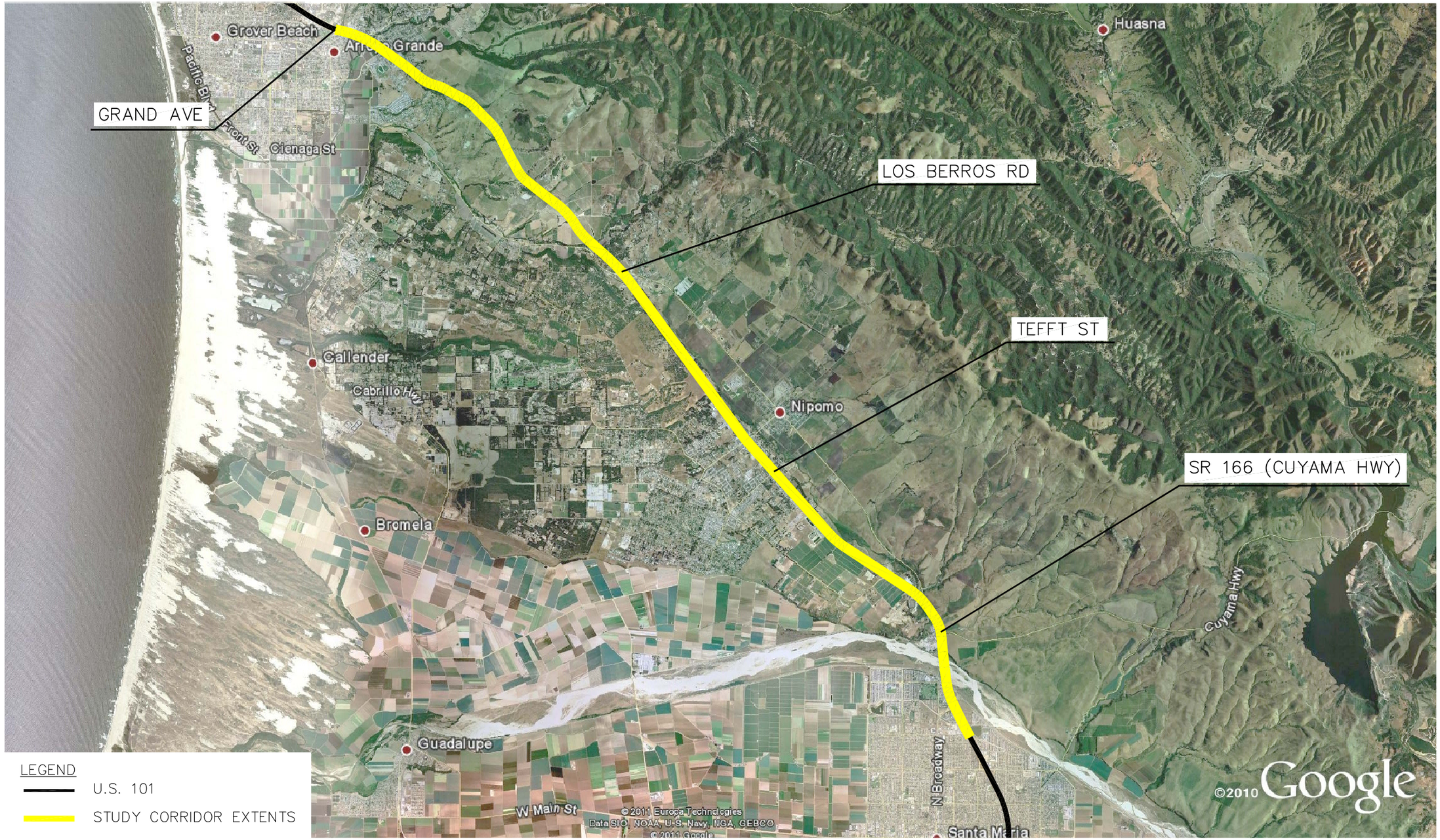
The primary purpose of this Corridor Transportation Study is to identify current and future deficiencies on the U.S. 101 corridor through the South County area, and provide a program of potential improvements to mitigate identified corridor deficiencies. This corridor study will also serve as a secondary resource to support the traffic operations analysis in the forthcoming U.S. 101 South County Corridor System Management Plan (CSMP).

U.S. 101 is an important north–south U.S. highway that runs through the states of California, Oregon, and Washington, on the West Coast of the United States. It is also known as El Camino Real (The Royal Road) where its route along the southern and central California coast approximates the old trail which linked the Spanish missions, pueblos, and presidios. It merges at some points with California Highway 1. Through the years, U.S. 101 has consistently been upgraded to become a major freeway between Los Angeles and San Francisco. In San Luis Obispo County, U.S. 101 alternates between a freeway and expressway classification where there are some at-grade intersections.

Demand on U.S. 101 is driven by interregional trips between cities and communities within San Luis Obispo County, longer trips to and from neighboring counties such as Santa Barbara and Monterey, recreational and seasonal trips to and from beach destinations, agricultural uses, and other special destinations such as wineries. Local trips within communities are less likely to use U.S. 101 than parallel and alternate routes such as State Route 1 and local arterials. Travel demand is expected to continue increasing on U.S. 101 in the South County area due to growth within the immediately adjacent communities, growth within nearby communities in the County and in Santa Maria (Santa Barbara County), and increases in seasonal and recreational work and leisure activities.

According to the 2005-2009 American Communities Survey (*U.S. Census Bureau)* about 90% of commutes in the Nipomo area were reported to be made via car, truck, or van. 4.2% worked from home, 3.2% walked, 1.7% used public transportation, and roughly 1% use taxicab, motorcycle, or other means. Given the mode split for the area, this study focuses on the passenger car travel mode for commuting and recreation. Any incremental increase in modal choice towards alternative modes such as bicycle, pedestrian, and/or public transportation would not significantly affect the future facility improvement requirements to meet projected travel demand.

Figure 1 presents a map of the study area, including the extents of the U.S. 101 South County corridor.



U.S. 101 South County Corridor Transportation Study

Figure 1

PROJECT STUDY AREA AND CORRIDOR EXTENTS

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PROJECT SETTING

PERMANENT ACCESS OPPORTUNITIES

Current access to U.S. 101 within the study area is provided primarily by the following full-access interchanges:

- Grand Avenue Interchange;
- Los Berros Road Interchange;
- Tefft Street Interchange;
- State Route 166 (Cuyama) Interchange; and,
- North Broadway Interchange.

There is also directional ramp access provided at Brisco Road (northbound on and off), Halcyon Road (southbound on and off), Fair Oaks Avenue (southbound off, via auxiliary lane from Grand Avenue interchange), and Traffic Way (southbound on and northbound off). Lastly, there are also at-grade intersections with U.S. 101 between Traffic Way and Los Berros Road at El Campo Road (full access), Tower Grove Drive (full access), Hemi Road (full access), and five unnamed agricultural access roads (two full access, three northbound on and off). Full access intersections provide egress and ingress movement to and from U.S. 101 from all directions, including left turns, where partial access locations may only grant right turn access.

Since initialization of this corridor study, a new full-access interchange has been constructed at Willow Road along with a Willow Road extension on both sides of U.S. 101. San Luis Opispo County was the implementing agency on this project funded for construction with ARRA, STIP, local, and Proposition 1B funding. This facility will be assumed to be in place in future conditions analysis, and will be part of the Year 2035 Baseline scenario. Upon build-out conditions, if further access needs are required beyond the new interchange at Willow Road, a new interchange south of Tefft Street, potentially at or around Southland Street, will be evaluated.

EXISTING TRANSPORTATION FACILITIES

The following section describes the roadways that provide primary circulation within the South San Luis Obispo County study area:

> ***US 101*** is a major north-south highway facility that traverses along coastal California. For this study, the US 101 corridor limits are from and including the Los Berros Road interchange south to and including the SR 135/Broadway interchange in the City of Santa Maria in Santa Barbara County. US 101 serves as the principal inter-regional auto and truck travel route that connects San Luis Obispo County (and other portions of the Central Coast) with the San Francisco Bay Area to the north and the Los Angeles urban basin to the south.
>
> Within San Luis Obispo County, US 101 provides major connection between and through several cities. Through the South County Nipomo area of San Luis Obispo County, US 101 represents a major recreational as well as commuter travel route. Sections of US 101 within the South County Nipomo area alternate between a general four-lane divided freeway cross-section and an at-grade access four-lane divided highway cross-section, with 65 mph posted speed limits throughout. Within the South County Nipomo planning area, US 101 forms full-access interchanges with Los Berros Road/North Thompson Road, Tefft Street, and Cuyama Lane/SR 166 (Cuyama).

State Route 1 (SR 1) is a state highway route that runs predominantly in a north-south direction. Within the South County area, SR 1 connects the City of Arroyo Grande with the Community of Guadalupe and south into Santa Barbara County. SR 1 has a general two-lane highway type cross-section through most segments.

State Route 166 (SR 166) is a state highway route that runs predominantly in an east-west direction. SR 166 extends easterly across San Luis Obispo County into Kern County and connects to Interstate 5 (I-5) and State Highway 99 (SR 99). SR 166 has a general two-lane highway type cross-section through most segments and represents an interregional commuter travel route between the Central Valley and the Pacific coast.

Tefft Street is a major east-west arterial through and within the Community of Nipomo and has a general two and four-lane arterial cross-section through the community. Tefft Street forms a full access interchange with US 101 and serves as the primary access route for the Community of Nipomo to the freeway.

Pomeroy Road serves as an arterial connection in the southeast-northwest direction between the Nipomo urban areas and the residential and recreational areas on the Nipomo Mesa and has a typical two-lane roadway cross-section. The segment of Pomeroy Road between Willow Road and Los Berros Road is not a standard arterial cross section due to narrow shoulder widths. Significant changes in grade and horizontal alignment also limit the capacity of the northern Pomeroy Road segment to function as an arterial facility.

Orchard Avenue/Joshua Street/Hutton Road form a major north-south arterial connecting the Nipomo urban area west of US 101 with the SR 166 (Cuyama) interchange. The road has a general two-lane cross-section.

Los Berros Road is a two-lane north-south arterial that travels through Los Berros Valley. With the closure of the Halcyon grade to truck traffic, Los Berros Road has become the primary truck route along the Nipomo Mesa.

Halcyon Road is a two-lane north-south arterial that connects the Nipomo Mesa with US 101, the City of Arroyo Grande and the Five Cities area. At its crossing with SR 1, Halcyon Road is constrained by a channel crossing, resulting in an offset intersection. A significant grade up to the Mesa on Halcyon Road south of SR 1 required the need on this segment of roadway to prohibit truck traffic. Improvements to Halcyon Road in the vicinity of SR 1 are in the planning stage to improve the connection, safety, and capacity of the corridor.

El Campo Road is a two-lane arterial that extends southerly from an at-grade intersection with US 101 to Los Berros Road, Halcyon Road, and Woodland Hills Road. El Campo Road primarily serves residential traffic in the Nipomo Mesa area.

Juniper Street is a two-lane collector located in a residential area within Nipomo. With future area development, this roadway is projected to provide parallel access to the north of Tefft Street.

Division Street is a general northeast-southwest collector and has a typical two-lane roadway cross-section. Extending southwesterly from the Community of Nipomo, Division Street serves as the southwest gateway to/from US 101 and the Oceano Dune

State Vehicular Recreation Area. The roadway currently serves local residential, truck traffic, and agriculture traffic.

Thompson Avenue is a north-south arterial and collector that extends along the eastern border of the Community of Nipomo and has a general two-lane cross-section. In conjunction with Tefft Street, Thompson Avenue serves as the major traffic route for neighborhoods east of US 101 within the Community of Nipomo. Thompson Road also functions as the east frontage road to US 101.

South Frontage Road runs along the west side of US 101 from Tefft Street to Southland Street. *South Frontage Road* serves both residential and local commercial traffic.

Bonita School Road runs north/south and has a bridge crossing of the Santa Maria River. The roadway is generally unimproved and primarily used for agricultural purposes.

Willow Road, Oso Flaco Lake Road, Eucalyptus Road, Mesa Road, and ***Camino Caballo*** are other important roadways serving the South County area that have general two-lane cross-sections.

PARALLEL ALTERNATIVE NORTH-SOUTH ROUTES

This section describes north-south roadways that are used as alternatives to U.S. 101 through the study area, including to and from Santa Barbara County across the Santa Maria River.

Thompson Avenue

Locally, Thompson Avenue provides an alternate parallel route to U.S. 101 on the east side of the freeway. Thompson Avenue directly connects the SR 166 (Cuyama) interchange to the Los Berros Road interchange. Thompson Avenue provides access throughout the developed east side of Nipomo, and intersects Tefft Street, providing access to and from the Tefft Street interchange and the west side of Nipomo.

Orchard Road/Hutton Road

Orchard Road, via Hutton Road, is a significantly used parallel alternative to U.S. 101 between central Nipomo on the west side of U.S. 101 and the SR 166 (Cuyama) interchange. It is used heavily in the southbound direction during the AM peak hour and in the northbound direction during the PM peak hour, concurrent to the morning and evening commutes to and from Santa Maria from Nipomo. This route is chosen by many commuters in an effort to avoid other conflicting traffic at the Tefft Street interchange. Orchard Road starts at Tefft Street just south of Pomeroy Road and connects to the SR 166 (Cuyama) interchange via Joshua Road and Hutton Road.

Pomeroy Road/Hetrick Road/Summit Station Road

Pomeroy Road also serves as somewhat of a parallel north-south alternative route west of U.S. 101. Pomeroy Road connects Los Berros Road to Tefft Street just north of Orchard Road. However, Pomeroy Road connects to Tefft Street about 8,500 west of U.S. 101. For this reason, a commonly used parallel route to U.S. 101 on the west side of the freeway involves the use of Hetrick Avenue and Summit Station Road, which are located between Pomeroy Road and the freeway. Summit Station Road in turn connects to the Frontage Road south of Los Berros Road directly adjacent to the freeway ramp terminals. This route is used by commuters and travelers heading northbound on U.S. 101 that seek to avoid conflicting traffic at the Tefft Street interchange, in a similar way to Orchard Road to the south. This route is not as heavily used, however, as Orchard Road.

State Route 1 (SR 1)
They interregional alternative north-south route to U.S. 101 in the study area is SR 1 (also commonly referred to as Highway 1 or Cabrillo Highway). SR 1's alignment varies as it progresses north from the Santa Barbara County line into Oceano and Grover Beach. SR 1 crosses the Santa Maria River roughly 8 miles west of the U.S. 101 river crossing (Santa Maria Bridge). The crossing is located at the northern edge of the Guadalupe community, following Guadalupe Road. About 5 miles north of the river, SR 1 shifts west at Willow Road and follows the Mesa View Drive alignment north about 4 miles. From this point, SR 1 again shifts alignments west at Valley Road, following Cienaga Street through Oceano and onto Pacific Boulevard on the western edge of Grover Beach. SR 1 joins U.S. 101 north of Grover Beach in Pismo Beach.

SR 1 provides an alternative crossing over the Santa Maria River, and furthermore provides an alternative, albeit somewhat circuitous, north-south route between the coastal communities of southern San Luis Obispo County and northern Santa Barbara County.

Bonita School Road
Bonita School Road is located between U.S. 101 and SR 1, about 3 ½ miles east of Guadalupe and about 4 ½ miles west of Santa Maria. Bonita School Road crosses the Santa Maria River, connecting West Main Street in Santa Barbara County to Division Street in San Luis Obispo County. On the Santa Barbara County side of the bridge, Bonita School Road is unpaved for about 2,000 feet. Despite these conditions, the roadway gets used fairly significantly for agriculture-related activities as it is one of only three crossings over the Santa Maria River between Nipomo and Santa Barbara County.

EXISTING CONDITIONS

CURRENT TRAFFIC DATA COLLECTION
Daily traffic volumes were aggregated from multiple sources. The San Luis Obispo Council of Governments (SLOCOG) provided OMNI-MEANS with traffic counts from July and October 2008. These daily traffic counts are used to calibrate the updated South County Travel Demand Model. Generally, the higher of the July or October count was selected.

These traffic counts were not sufficient, however, to calibrate the model. Therefore, the counts were supplemented by data culled from San Luis Obispo County Department of Public Works's *Traffic Volumes – December 2009* report. Data in this book included data from many years, but only data from 2007 or later was considered relevant (except in some specific locations where newer data was not available).

Lastly, annual average daily traffic on State Route 1, State Route 135, State Route 166, and U.S. Route 101 was collected from Caltrans's *2009 AADT* available online from the Traffic Data Branch. U.S. Route 101 ramp volumes were also collected online from Caltrans's *2009 Ramp Volumes On the California State Freeway System District 5* published in November 2010.

EXISTING ROADWAY SEGMENT LEVELS OF SERVICE
The daily capacities for roadways have been established by OMNI-MEANS through a combination of using Highway Capacity Manual (HCM) guidelines for highways, knowledge of local roadway characteristics, and by observing peaking characteristics of major routes in the study area (U.S. 101 and State Route 1). Also, daily capacities from the Sacramento County Department of Transportation were reviewed for comparable facilities. These daily capacities are attached in the Appendix of this report and are consistent with the following table.

Daily Capacity Determination For Tefft Street Corridor

For the U.S. 101 Corridor evaluation process, facilities have been analyzed on a daily volume basis, based on daily volume capacities by roadway facility type. These capacities have been determined based on historical peak hour capacities of similar facilities in many different communities and are not refined to represent the unique conditions of specific roadways. These capacities are used to aid in the identification of facilities that may need further improvement without analyzing specific peak hour intersection operations.

Therefore, in locations where typical conditions are not present, such as where there are closely spaced intersections, irregular intersection configurations, or particularly heavy turning movements in certain directions, it is sometimes necessary to revise daily capacities for individual facilities in order to better represent the need for improvement. Such determinations usually require peak hour intersection analysis, from which a peak hour to daily volume conversion can be made in order to assign a daily capacity estimate. From previous modeling efforts in the Nipomo area, peak hour counts were available on the Tefft Street corridor between Mary Avenue and Oakglen Street. These peak hour volumes were adjusted based on changes in daily volume on Tefft Street between the date of the peak hour counts and today.

The results of the peak hour analysis indicate that the Tefft Street corridor, as currently configured, has a lower daily capacity than the typically four-lane arterial facility due to poor traffic operations at the Tefft Street/U.S. 101 SB Ramps/Frontage Road intersection. The peak hour analysis indicated that the main problem in the poor service levels is the heavy turning movements to and from Frontage Street from Tefft Street, particularly the westbound left turn. Table 2 presents the daily capacities by facility type including a “Tefft Street” capacity. This capacity will be used in the identification of existing and future LOS conditions on Tefft Street so long as the intersection configurations remain as they are today.

TABLE 1
DAILY ROADWAY CAPACITIES BY FACILITY TYPE

	LOS "A"	LOS "B"	LOS "C"	LOS "D"	LOS "E"
Freeway Facilities[1] (Maximum Volume-to-Capacity Ratio)	N/A	N/A	0.7	0.9	1.0
All Other Facilities (Maximum Volume-to-Capacity Ratio)	0.6	0.7	0.8	0.9	1.0
	Average Daily Traffic (ADT) – Total of Both Directions				
Roadway Type	**A**	**B**	**C**	**D**	**E**
Six-Lane Freeway	N/A	N/A	84,000	108,000	120,000
Four-Lane Freeway	N/A	N/A	56,000	72,000	80,000
Six-Lane Divided Expressway	36,000	42,000	48,000	54,000	60,000
Four-Lane Divided Expressway	24,000	28,000	32,000	36,000	40,000
Four-Lane Divided Arterial	22,000	26,000	29,000	33,000	36,000
Tefft Street (Mary to Oakglen)[2]	15,000	17,000	20,000	22,000	24,000
Two-Lane Divided Arterial	11,000	13,000	15,000	17,000	18,000
Four-Lane Undivided Arterial	18,000	21,000	24,000	27,000	30,000
Two-Lane Undivided Arterial	9,000	11,000	12,000	14,000	15,000
Four-Lane Collector	15,000	17,000	20,000	22,000	24,000
Two-Lane Collector	8,000	9,000	10,000	11,000	12,000

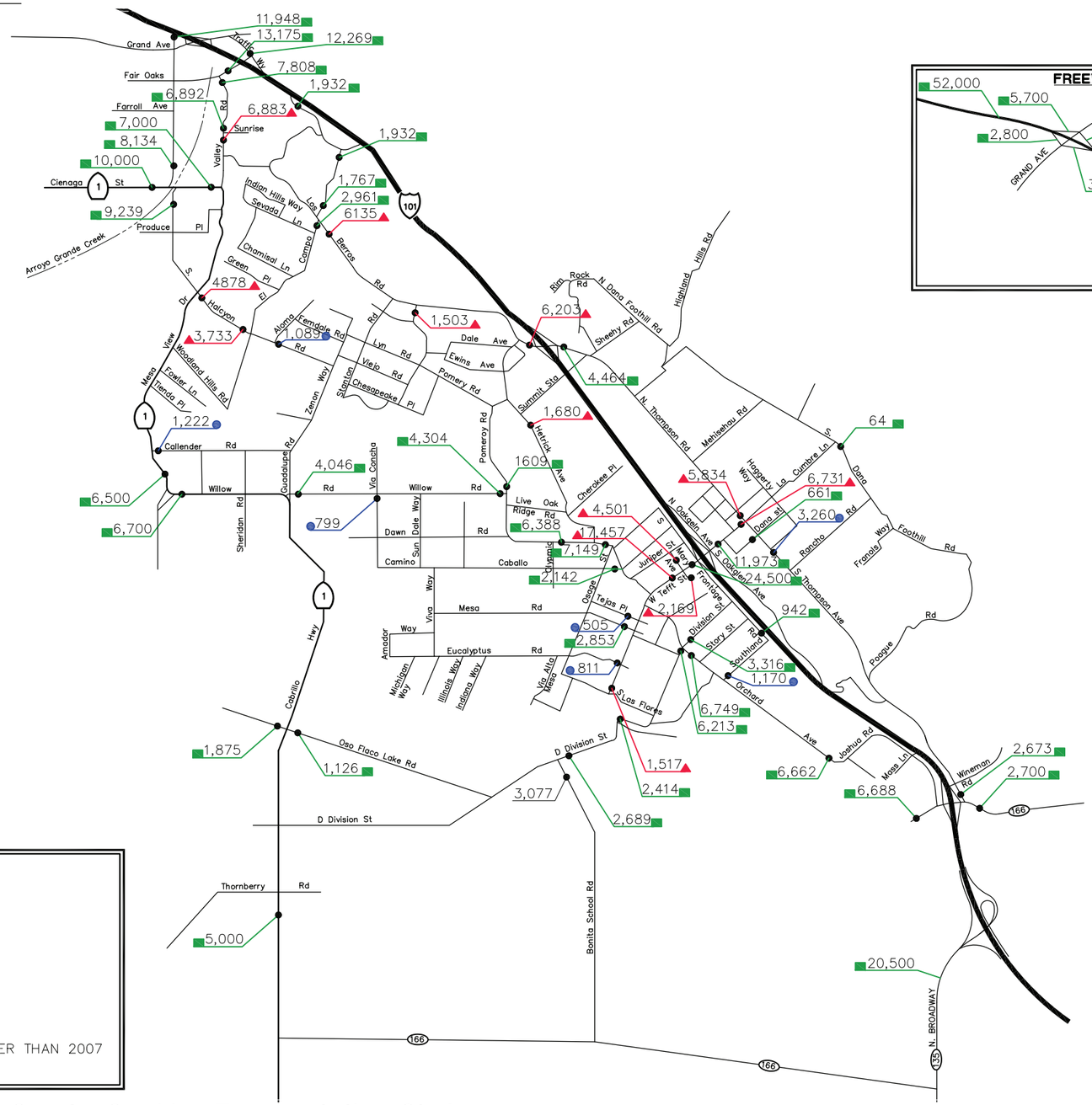
Notes:

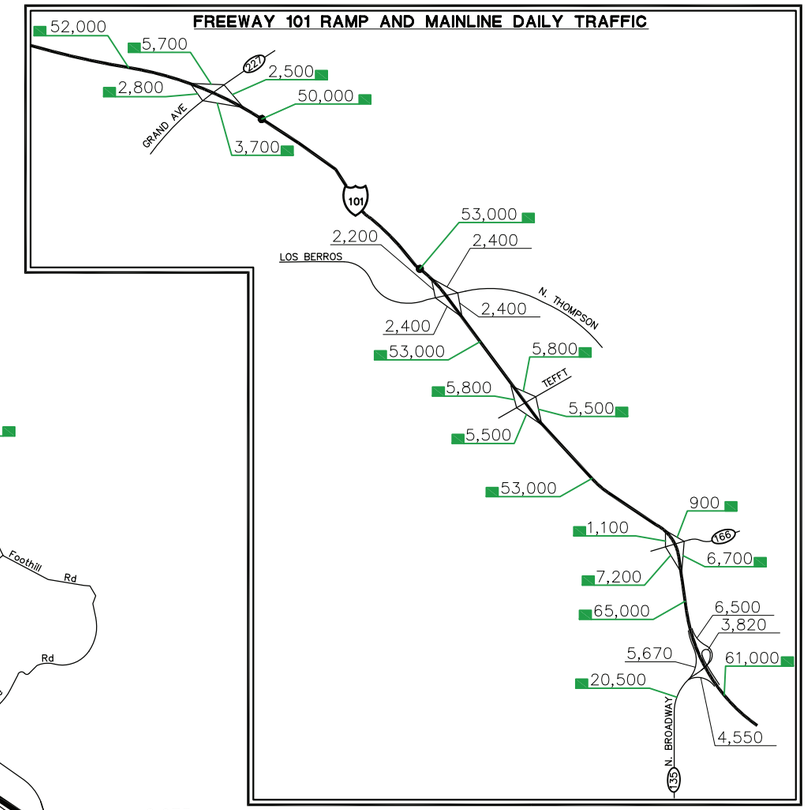
1. LOS C or better will be calculated for freeway segments. LOS A or B will not be identified for these facilities. Daily volume to capacity on freeways does not supplant the need to perform peak-hour HCM-based analysis.

2. Tefft Street capacity from Mary Avenue to Oakglen Avenue was determined by Synchro PM peak hour operations. LOS E was achieved using existing volumes from 2005. Based on the 2005 daily traffic count, approximately 22,000 daily trips occurred on this segment. Therefore, the LOS D/E threshold was determined to be 22,000.

As presented in Table 1, following the peak hour analysis methodology, the resulting daily capacity for the Tefft Street corridor between Mary Avenue and Oakglen Avenue is akin to that of a four-lane collector, rather than a four-lane arterial, due to the intersection configurations and specific turning movements at the intersections in question.

Figure 2 presents the daily traffic volumes collected for the study on a map of the study area. Table 2 presents the traffic counts collected for model calibration with the year the count was collected, as well as estimated existing level of service based on the daily capacities presented in Table 1.





LEGEND:

- 5,000 ▲ 2009 ADT
- 5,000 ■ 2008 ADT
- 5,000 ● 2007 ADT
- 5,000 ADT EARLIER THAN 2007

U.S. 101 South County Corridor Transportation Study

Figure 2

EXISTING AVERAGE DAILY TRAFFIC

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TABLE 2
EXISTING DAILY ROADWAY VOLUMES AND LOS

Roadway	Location	Facility Type	Count Year	Existing Traffic Count	LOS
U.S. 101	North of Brisco Road	Four-Lane Freeway	2008	55000	A
U.S. 101	South of Grand Avenue	Four-Lane Freeway	2008	50000	A
U.S. 101	North of Los Berros Road	Four-Lane Freeway	2008	53000	A
U.S. 101	North of Tefft Street	Four-Lane Freeway	2008	53000	A
U.S. 101	North of State Route 166	Four-Lane Freeway	2008	53000	A
U.S. 101	North of State Route 135	Four-Lane Freeway	2008	65000	A
U.S. 101	South of State Route 135	Four-Lane Freeway	2008	61000	A
State Route 1	West of Halcyon Road (North)	Two-Lane Divided Arterial	2004	11500	B
State Route 1	West of Valley Road	Two-Lane Divided Arterial	2008	7000	A
State Route 1	West of Halcyon Road (South)	Two-Lane Divided Arterial	2008	10100	A
State Route 1	North of Callender Road	Two-Lane Divided Arterial	2005	10100	A
State Route 1	South of Willow Road	Two-Lane Divided Arterial	2004	4600	A
State Route 1	South of Thornberry Road	Two-Lane Divided Arterial	2008	5000	A
State Route 135	South of U.S. 101	Four-Lane Divided Arterial	2008	20500	A
State Route 166	East of U.S. 101	Two-Lane Undivided Arterial	2008	2700	A
Branch Street	East of U.S. 101	Four-Lane Divided Arterial	2004	24100	B
Branch Street	**East of Traffic Way**	**Two-Lane Divided Arterial**	**2004**	**18500**	**F**
Bonita School Road	South of Division Street	Two-Lane Collector	2006	3100	A
Camino Caballo	West of Pomeroy Road	Two-Lane Collector	2007	2100	A
Division Street	East of Orchard Road	Two-Lane Collector	2008	3300	A
Division Street	West of Orchard Road	Two-Lane Collector	2008	6200	A
Division Street	North of Riverside Road	Two-Lane Collector	2006	4200	A
Division Street	East of Bonita School Road	Two-Lane Collector	2008	2700	A
El Campo Road	South of U.S. 101	Two-Lane Collector	2008	1900	A
El Campo Road	North of Los Berros Road	Two-Lane Collector	2008	1800	A
El Campo Road	South of Los Berros Road	Two-Lane Collector	2008	3000	A
Fair Oaks Avenue	West of U.S. 101	Four-Lane Collector	2008	13200	A
Fair Oaks Avenue	**East of Halcyon Road**	**Two-Lane Collector**	**2004**	**11200**	**E**
Frontage Road	South of Los Berros Road	Two-Lane Collector	2004*	2000	A
Frontage Road	South of Tefft Street	Two-Lane Collector	2005	7300	A
Grand Avenue	West of Halcyon Road	Four-Lane Divided Arterial	2004	18600	A
Grand Avenue	West of U.S. 101	Four-Lane Divided Arterial	2005	19600	A
Halcyon Road	**South of U.S. 101**	**Two-Lane Collector**	**2008**	**11900**	**E**
Halcyon Road	**South of Grand Avenue**	**Two-Lane Collector**	**2004**	**17300**	**F**
Halcyon Road	North of Cienaga Street	Two-Lane Collector	2008	8200	B
Halcyon Road	**South of Cienaga Street**	**Two-Lane Collector**	**2004**	**10100**	**D**
Halcyon Road	South of Mesa View Drive	Two-Lane Collector	2006	6200	A
Halcyon Road	West of El Campo Road	Two-Lane Collector	2009	3700	A
Hetrick Avenue	South of Summit Station Road	Two-Lane Collector	2009	1700	A
Hutton Road	North of State Route 166	Two-Lane Collector	2008	6700	A

Roadway	Location	Facility Type	Count Year	Existing Traffic Count	LOS
Juniper Street	East of Mary Avenue	Two-Lane Collector	2006	1700	A
Los Berros Road	East of Valley Road	Two-Lane Collector	2004	5500	A
Los Berros Road	East of El Campo Road	Two-Lane Collector	2009	6100	A
Los Berros Road	East of Stanton Road	Two-Lane Collector	2004	5700	A
Los Berros Road	West of U.S. 101	Two-Lane Collector	2009	6200	A
Mary Avenue	North of Tefft Street	Two-Lane Collector	2009	4500	A
Mary Avenue	South of Tefft Street	Two-Lane Collector	2009	2200	A
Mesa Road	West of Tefft Street	Two-Lane Collector	2008	2900	A
Orchard Road	East of Tefft Street	Two-Lane Divided Arterial	2004	7700	A
Orchard Road	South of Division Street	Two-Lane Divided Arterial	2008	6700	A
Orchard Road	North of Joshua Road	Two-Lane Collector	2008	6700	A
Pomeroy Road	South of Los Berros Road	Two-Lane Collector	2009	1500	A
Pomeroy Road	North of Willow Road	Two-Lane Collector	2006	2200	A
Pomeroy Road	East of Olympic Way	Two-Lane Collector	2008	6400	A
Pomeroy Road	North of Sandydale Road	Two-Lane Collector	2008	7000	A
Pomeroy Road	North of Tefft Street	Two-Lane Collector	2006	9200	C
Southland Street	East of Orchard Road	Two-Lane Collector	2007	1100	A
Stanton Road	South of Los Berros Road	Two-Lane Collector	2006	1100	A
Tefft Street	North of Las Flores Drive	Two-Lane Collector	2009	1500	A
Tefft Street	North of Mesa Road	Two-Lane Collector	2004	6500	A
Tefft Street	South of Orchard Road	Four-Lane Collector	2006	9800	A
Tefft Street	West of Mary Avenue	Four-Lane Divided Arterial	2009	17500	A
Tefft Street	**West of U.S. 101**	**Four-Lane Divided Arterial**	**2008**	**24500**	**F**
Tefft Street	East of U.S. 101	Four-Lane Divided Arterial	2008	10300	A
Tefft Street	East of Oakglen Avenue	Two-Lane Divided Arterial	2006	9300	A
Tefft Street	West of Thompson Avenue	Two-Lane Divided Arterial	2009	6700	A
Thompson Avenue	South of U.S. 101	Two-Lane Collector	2008	4400	A
Thompson Avenue	North of Tefft Street	Two-Lane Collector	2009	5800	A
Thompson Avenue	North of Rancho Road	Two-Lane Collector	2007	3300	A
Thompson Avenue	North of State Route 166	Two-Lane Collector	2008	2700	A
Traffic Way	North of Fair Oaks Avenue	Four-Lane Collector	2008	12300	A
Valley Road	North of Cienaga Street	Two-Lane Collector	2004	6500	A
Valley Road	North of Los Berros Road	Two-Lane Collector	2009	6900	A
Valley Road	South of Fair Oaks Avenue	Two-Lane Collector	2008	7800	A
Willow Road	West of Pomeroy Road	Two-Lane Collector	2008	4300	A
Willow Road	East of State Route 1	Two-Lane Collector	2008	3700	A

As presented in Table 2, two roadway segments are currently operating at LOS E and three roadway segments are currently operating at LOS F. Branch Street, east of Traffic Way, Halcyon Road, south of Grand Avenue, and Tefft Street, west of U.S. 101 are currently over capacity at LOS F. Fair Oaks Avenue, east of Halcyon Road, and Halcyon Road, south of U.S. 101, are both currently at LOS E. Halcyon Road, south of Cienaga Street (Highway 1) is approaching capacity at LOS D.

EXISTING FREEWAY RAMP AND MAINLINE LEVELS OF SERVICE

Table 3 presents the PM peak hour U.S. 101 ramp operations, as calculated using the HCS2000 software. The PM peak hour was chosen as the most critical period for operations because it was the period that consistently had the higher volumes as compared to the AM peak hour.

TABLE 3
EXISTING U.S. 101 INTERCHANGE RAMP OPERATIONS

Interchange Location	Target LOS	Junction Type	PM Peak Hour Density (pc/mi/ln)	PM Peak Hour LOS
Los Berros Road Interchange				
State Route 101 Northbound On-Ramp	D	Merge	25.3	C
State Route 101 Northbound Off-Ramp	D	Diverge	29.8	D
State Route 101 Southbound On-Ramp	D	Merge	24.7	C
State Route 101 Southbound Off-Ramp	D	Diverge	28.6	D
Tefft Street Interchange				
State Route 101 Northbound On-Ramp	D	Merge	26.6	C
State Route 101 Northbound Off-Ramp	D	Diverge	29.0	D
State Route 101 Southbound On-Ramp	D	Merge	25.6	C
State Route 101 Southbound Off-Ramp	D	Diverge	29.0	D
Cuyama Lane/State Route 166 Interchange				
State Route 101 Northbound On-Ramp	D	Merge	27.3	C
State Route 101 Northbound Off-Ramp	D	Diverge	**35.2**	**E**
State Route 101 Southbound On-Ramp	D	Merge	32.0	D
State Route 101 Southbound Off-Ramp	D	Diverge	28.6	D
North Broadway/State Route 135 Interchange				
State Route 101 Northbound On-Ramp	D	Merge	33.5	D
State Route 101 Northbound Off-Ramp	D	Diverge	**35.9**	**E**
State Route 101 Southbound On-Ramp	D	Merge	27.0	C
State Route 101 Southbound Off-Ramp	D	Diverge	33.8	D

As presented in Table 3, all but two U.S. 101 ramps are currently operating at LOS D or better during the PM peak hour. The ramps currently operating at LOS E are the northbound off-ramps at State Route 166 (Cuyama Lane) and State Route 135 (North Broadway).

Table 4 presents the U.S. 101 mainline operations, also calculated using the HCS2000 software.

TABLE 4
EXISTING U.S. 101 MAINLINE SEGMENT OPERATIONS

Freeway Mainline Segment	Target LOS	# Lanes	PM Peak Hour Volume	PM Peak Hour Density, (pc/mi/ln)	PM Peak Hour LOS
Northbound					
North Broadway to S.R. 166	D	2	3,367	28.6	D
S.R. 166 to Tefft Street	D	2	2,729	22.1	C
Tefft Street to Los Berros Road	D	2	2,762	22.4	C
Southbound					
Los Berros Road to Tefft Street	D	2	2,684	21.7	C
Tefft Street to S.R. 166	D	2	2,651	21.5	C
S.R. 166 to North Broadway	D	2	3,322	28.1	D

As presented in Table 4, all U.S. 101 mainline segments are currently operating at LOS D or better during the PM peak hour.

EXISTING U.S. 101 COLLISION DATA

The primary source for collision data is Caltrans's Traffic Accident and Surveillance Analysis System (TASAS). The TASAS data used in this analysis was requested from Caltrans and supplied for a three year period beginning on July 7th, 2006 and wnding on June 30th, 2009. U.S. 101 was broken down into five segments within the study area. The segments are presented in Figure 3.

The collision rates are presented in number of accidents per million vehicle miles. Separate accident rates are provided for the northbound and southbound travel lanes for each segment. Accident data was obtained for mainline (U.S. 101) collisions as well as intersections and ramps. Table 5 presents the collision rates in the study area, compared to statewide averages on comparable facilities.

TABLE 5
MAINLINE COLLISION RATES BY SEGMENT AND TRAVEL DIRECTION

U.S. 101 Segment *(Postmile Range)*	**Direction of Travel**	**Actual Accident Rate** per million vehicle miles			**Average Accident Rate** per million vehicle miles		
		Fatality	**Fatality + Injury**	**Total**	**Fatality**	**Fatality + Injury**	**Total**
1: S.R. 135 to County Line *(SB 101 090.000 – 090.988)*	Northbound	.000	.29	.89	.009	.30	.93
2: County Line to South Nipomo *(SLO 101 000.000 – 002.700)*	Northbound	.012	.15	**.60**	.012	.20	.55
3 South Nipomo to North Nipomo *(SLO 101 002.700 – 006.433)*	Northbound	.000	.14	.39	.008	.23	.69
4: North Nipomo to El Campo Rd *(SLO 101 006.433 – 011.330)*	Northbound	.000	.14	.46	.016	.28	.74
5: El Campo Rd to Grand Ave *(SLO 101 011.330 – 013.397)*	Northbound	**.017**	.15	.52	.013	.31	.88
1: S.R. 135 to County Line *(SB 101 090.000 – 090.988)*	Southbound	**.032**	**.51**	**1.08**	.009	.30	.93
2: County Line to South Nipomo *(SLO 101 000.000 – 002.700)*	Southbound	.012	**.22**	**.60**	.012	.20	.55
3 South Nipomo to North Nipomo *(SLO 101 002.700 – 006.433)*	Southbound	.000	.05	.39	.008	.23	.69
4: North Nipomo to El Campo *(SLO 101 006.433 – 011.330)*	Southbound	.014	.11	.36	.016	.28	.74
5: El Campo to Grand Ave *(SLO 101 011.330 – 013.397)*	Southbound	.000	**.35**	**.90**	.013	.31	.88

Note: Bolded entries denote segments where actual rate exceeds average rate for statewide comparable facilities.

As presented in Table 5, there are two segments in the study area where the collisions with fatalities rate exceeds the average rates on comparable statewide facilities. These are northbound Segment 5 and southbound Segment 1. There are three segments that exceed the average rates for collisions with fatalities and/or injuries. These are southbound Segment 1, Segment 2, and Segment 5. Lastly, there are four locations where the total collision rates exceed the average rates. These are northbound Segment 2 and southbound Segment 1, Segment 2, and Segment 5.

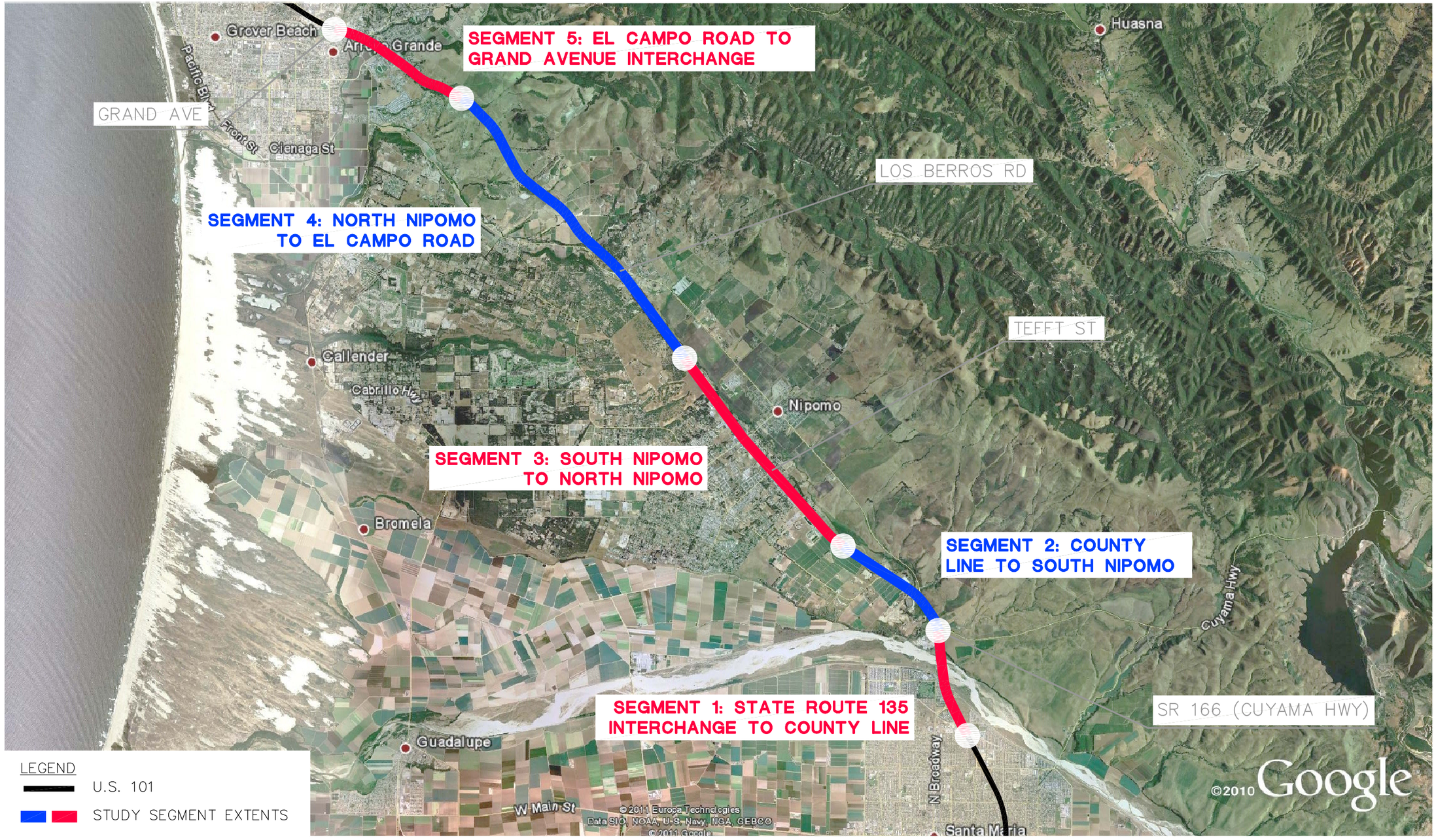
Collision rates were also obtained for at-grade intersections and interchange ramps in the study area. This data is also presented in collisions per million vehicle miles, and are compared to statewide averages on comparable facilities. Table 6 presents the obtained ramp collision data for each interchange in the area.

TABLE 6
INTERSECTION AND RAMP COLLISION RATES BY LOCATION

U.S. 101 Intersection or Ramp	Ramp Direction	Actual Accident Rate per million vehicle miles			Average Accident Rate per million vehicle miles		
		Fatality	Fatality + Injury	Total	Fatality	Fatality + Injury	Total
El Campo Road	N/A	.000	**.22**	**.38**	.006	.13	.30
S.R. 135 Interchange	SB On	.000	.00	**.80**	.001	.19	.60
S.R. 135 Interchange	NB Off	.000	.24	.48	.006	.34	1.20
S.R. 135 Interchange	SB Off	.000	.48	.97	.005	.15	.45
S.R. 135 Interchange	NB On	.000	**.28**	.42	.003	.20	.65
S.R. 166 Interchange	SB On	.000	.00	.14	.003	.10	.40
S.R. 166 Interchange	NB Off	.000	.14	.43	.006	.19	.75
S.R. 166 Interchange	SB Off	.000	**1.86**	**2.79**	.006	.19	.75
S.R. 166 Interchange	NB On	.000	.00	.00	.003	.10	.40
Tefft Street Interchange	SB On	.000	.16	**.82**	.002	.26	.75
Tefft Street Interchange	NB Off	.000	**.48**	1.12	.004	.42	1.20
Tefft Street Interchange	SB Off	.000	**.78**	**2.03**	.004	.42	1.20
Tefft Street Interchange	NB On	.000	.48	**1.11**	.002	.26	.75
Los Berros Road Interchange	SB On	.000	.00	.00	.004	.18	.60
Los Berros Road Interchange	NB Off	.000	**1.14**	1.14	.007	.37	1.20
Los Berros Road Interchange	SB Off	.000	**.41**	**2.07**	.007	.37	1.20
Los Berros Road Interchange	NB On	.000	**.38**	.38	.004	.18	.60
Traffic Way Ramps	SB On	.000	.00	.00	.004	.15	.45
Traffic Way Ramps	NB Off	.000	.00	.25	.002	.18	.60
Fair Oaks Boulevard Off-Ramp	SB Off	.000	**.61**	**1.52**	.004	.42	1.20
Grand Avenue Interchange	SB On	.000	.20	**.82**	.002	.26	.75
Grand Avenue Interchange	NB Off	.000	**.32**	.64	.002	.31	1.00
Grand Avenue Interchange	SB Off	.000	**1.16**	**2.33**	.004	.42	1.20
Grand Avenue Interchange	NB On	.000	.00	.30	.001	.19	.60

Note: Bolded entries denote segments where actual rate exceeds average rate for statewide comparable facilities.

As presented in Table 6, there are no collisions with fatalities on record in the last three years on any at-grade intersections, on-ramps, or off-ramps. There are eleven locations where the rates of collisions with fatality and/or injury exceed the statewide average for comparable facilities. There are ten locations where the overall collision rates exceed the statewide average for comparable facilities.



U.S. 101 South County Corridor Transportation Study

Figure 3

PROJECT STUDY SEGMENTS

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TRAVEL DEMAND MODEL DEVELOPMENT

This section presents the supporting technical documentation for the South County TDM development process. The procedure is outlined below:

1. Collect parcel data and aggregate areas into Traffic Analysis Zones (TAZ)
2. Model the traffic network
3. Create the four-step modeling process
4. Calibrate the base year model
5. Forecast build-out year travel demand (incomplete)

TRAVEL DEMAND MODEL STREET NETWORK

In 2006, OMNI-MEANS updated the South County/Nipomo Travel Demand Model. The base network assumed for that model forms the basis for the network used in this updated 2010 South County Travel Demand Model, with a few notable exceptions:

- Base network includes one additional U.S. 101 interchange. This is the North Broadway (SR 135) interchange, south of San Luis Obispo County, in the City of Santa Maria (Santa Barbara County); and,
- Includes an extension of Mary Avenue from West Tefft Street to Hill Street; and,
- Includes an extension of Willow Road from Pomeroy Road to Hetrick Avenue.

The interchange was added to increase the scope of the model in the context of modeling the U.S. 101 corridor to include the crossings of the Santa Maria River. The roadway extensions were added to incorporate street network improvements that have occurred since the last model update. Figure 4 presents the base network used in the 2010 travel demand model scenario.

The travel demand model simulates a road's ability to handle travel demand based on facility type (e.g. freeway, highway, arterial, and collector), number of lanes, speed, and alignment. Table 7 presents the road classification categories, the associated operating characteristics of each category, and examples of roads in each category.

TABLE 7
ROADWAY CLASSIFICATION

Classification	Capacity (Vehicles per Lane per Hour)	Free-Flow Speed (mph)	Example Roadway
Freeway	2000	65-70	US Highway 101
Highway	1000	45-55	Highway 1, State Route 166
Major Arterial	800	35-45	Tefft Street
Minor Arterial	700	35-45	Orchard Road, Los Berros Road
Collector	600	25-35	Osage Street, Division Street
Local	300	25-35	Mesa Road, Camino Caballo

Note: The roadway classifications used in the Travel Demand Model are not necessarily representative of the classifications used in the subsequent analyses. For example, the technical analysis uses "Divided Arterial" and "Undivided Arterial" classifications to differentiate facilities based on built geometry, rather than "Highway", "Major Arterial", and "Minor Arterial" classifications.

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Figure 4

Travel Demand Model Network Map

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TRAFFIC ANALYSIS ZONES

Traffic analysis zone (TAZ) boundaries have remained unchanged from the previous travel demand model update in 2006, although the parcel land use data assigned to each TAZ has been updated to reflect the most current assessor's data. Figure 5 presents the TAZ map used in the model. The US 101 freeway cordon to the south has been extended and expanded to include both the US 101 mainline in both directions and the northbound on-ramp and the southbound off-ramp connections at the Broadway (SR 135) interchange. However, no additional TAZs were created south of the Santa Maria River.

Land Use Data

Travel demand models simulate travel demand by first estimating trips generated in zones within the study area. The number and type of trips generated and attracted between areas depend on land use. The County Assessor's parcel database provides land use data in terms of zoning and development type (e.g. housing, commercial development, public uses). The land uses were further simplified into housing unit and employment estimates, which are consistent with the US Census. The existing land uses within the County are summarized in Table 8.

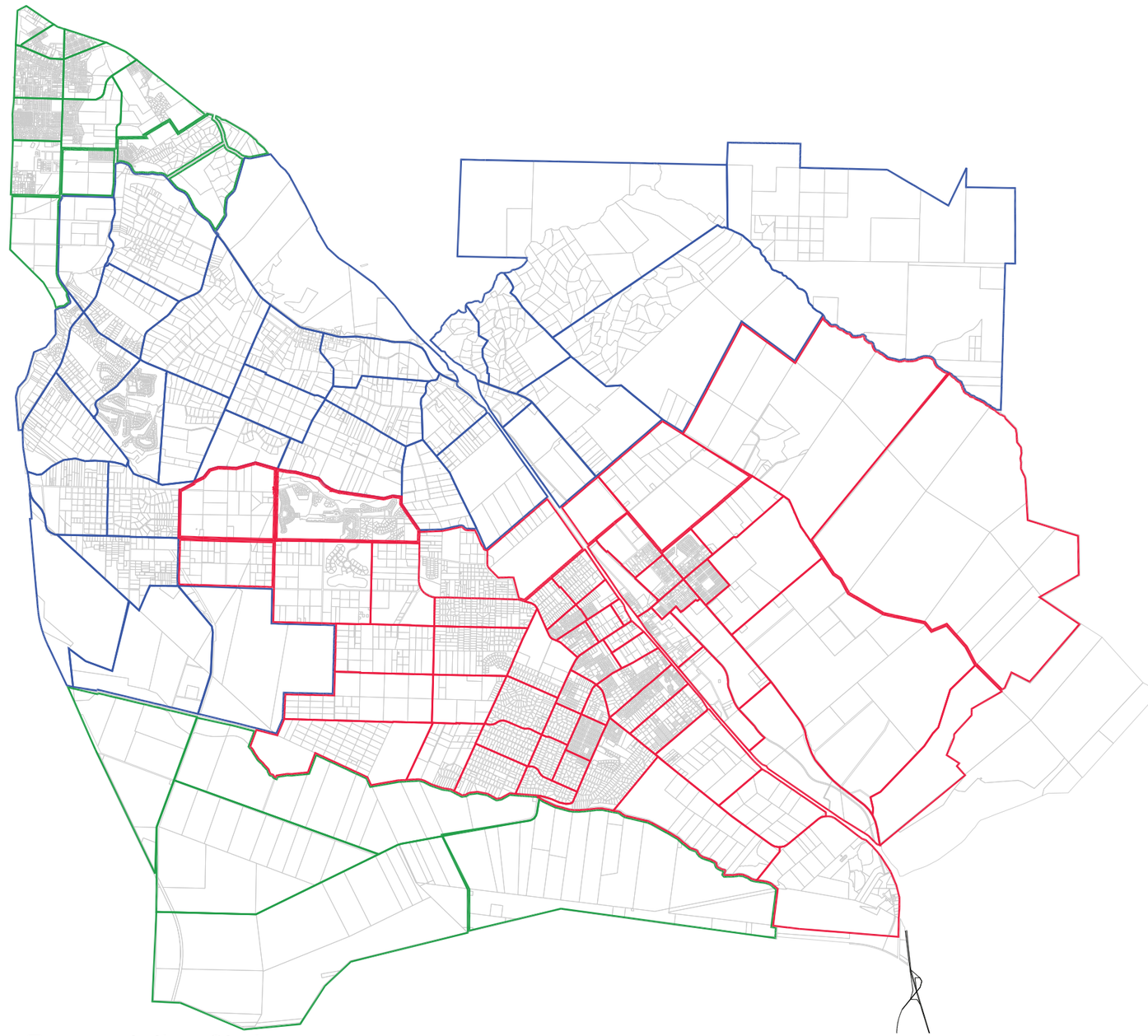
TABLE 8
EXISTING LAND USE

	2010 Conditions			
Land Use	**Area 1**	**Area 2**	**Area 3***	**Total**
Residential (dwelling units)				
Single Family	4,979	2,153	2,001	9,133
Multi Family	1,009	135	807	1,951
Mobile Home	140	300	378	818
Non-Residential (acres)				
Agriculture	1,010	1,341	5,355	7,706
Commercial + Motel	67	49	30	146
Golf	71	343	0	414
Industrial	57	172	9	239
Office	16	37	29	82
Storage + Warehouse	11	23	15	49
Estimated Employment				
Retail	207	64	125	396
Service	477	309	627	1,413
Other	403	572	803	1,778

**Area 3 consists of parcels outside Nipomo Areas 1 & 2, in unincorporated San Luis Obispo County and Arroyo Grande, that are included in the South County TDM*

South County land uses are simplified into areas referred to as "Traffic Analysis Zones" (TAZs) for travel demand modeling purposes. Aggregating minute areas like parcels into larger zones decreases the computation intensity of the model and simplifies data processing. The TAZs are defined using real-world traffic boundaries, such as natural geographic barriers (e.g. rivers and creeks) and "man-made" barriers (e.g. major street right-of-ways and railroads).

Figure 5 presents the South County TAZ boundary map. A total of 94 TAZs were defined for the South County area. Figure 5 also depicts the boundaries of "Area 1", "Area 2", and "Area 3".



AREA:

1

2

3

U.S. 101 South County Corridor Transportation Study

Figure 5

TAZ BOUNDARY MAP

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Four-Step Modeling Process
The CUBE/Voyager (Citilabs) software suite was used for the current update to the South County Travel Demand Model. The prior version of the South County model also used CUBE. The travel demand model follows an industry-standard four-step procedure for modeling travel demand. The steps are as follows:

1. Trip Generation – Estimate the trips generated and attracted by individual Traffic Analysis Zones (TAZs)
2. Trip Distribution – Match trips that are generated and attracted between zones for varying trip purposes.
3. Mode Choice – Select a travel mode for a particular trip.
4. Assignment – Select a path for the chosen travel mode and trip.

Trip Generation
Land uses generate a varying number of trips based on development type and development quantity. Trip producing land use groups include single-family and multi-family residential dwelling units. Trip attracting land use groups include retail, office, industrial and educational land uses. The land use quantities derived from the parcel database was converted into dwelling unit and employment estimates. These TAZ-level estimates were checked for consistency with the US Census and the regional model.

Each trip purpose has a different trip generation rate for each land use. Trip generation rates for individual land uses were checked against traffic studies contained in the Institute of Transportation Engineers *Trip Generation, 8th Edition* manual.

Trip Distribution
The trips generated and attracted between land uses depend on trip purpose and network impedance. Modeled trips were sorted into five trip purpose categories.

1. Home-Based Work (HBW)
2. Home-Based Education (HBE)
3. Home-Based Shop (HBS)
4. Home-Based Other (HBO)
5. Other-Based Other (OBO)

The ability for one land use to satisfy the trip purpose of another land use leads to the creation of an origin-destination pairing (e.g. a trip from a residential area to an area containing retail development). The likelihood of such a pairing also depends on the travel time for such a trip to occur. Long travel times between zones, which are affected by congested roadways, decrease the likelihood of an origin-destination pairing and results in the model seeking another closer trip pairing opportunity.

Mode Choice
According to the 2005-2009 American Communities Survey (*U.S. Census Bureau)* about 90% of commutes in the Nipomo area were reported to be made via car, truck, or van (including those in carpools). 4.2% worked from home, 3.2% walked, 1.7% used public transportation, and roughly 1% use taxicab, motorcycle, or other means. Given the purpose of the study is traffic operations analysis, this study focuses on the passenger car travel mode for commuting and recreation only. Issues such as access, mobility, complete streets, greenhouse gas emissions reduction, etc. are outside the scope of this study.

Trip Assignment

Trips between origin-destination pairs are assigned by the model using an equilibrium process. The multiple possible paths between zones are iteratively loaded until no one path provides an advantage over another. The volumes on each network link are then compared against real-world traffic counts to determine model correctness. The following section outlines the model calibration procedure.

MODEL CALIBRATION

The previous section described the creation of a complete but "un-validated" base year model, i.e. the model may not accurately reflect real-world travel demand. Calibrating the model so that it reasonably reflects real world travel demand requires matching the model estimate on a set of links against traffic counts. Table 9 presents the calibration for each selected facility used in the calibration process.

TABLE 9
SOUTH COUNTY TRAVEL DEMAND MODEL – CALIBRATION BY FACILITY

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	Model Forecast	Model Diff	% Error Model	% Error Target
U.S. 101	North of Brisco Road	Four-Lane	Freeway	2008	55,000	54,300	700	-1.3%	7.0%
U.S. 101	South of Grand Avenue	Four-Lane	Freeway	2008	50,000	50,500	-500	1.0%	7.0%
U.S. 101	North of Los Berros Road	Four-Lane	Freeway	2008	53,000	53,100	-100	0.2%	7.0%
U.S. 101	North of Tefft Street	Four-Lane	Freeway	2008	53,000	49,200	3,800	**-7.2%**	7.0%
U.S. 101	North of State Route 166	Four-Lane	Freeway	2008	53,000	52,900	100	-0.2%	7.0%
U.S. 101	North of State Route 135	Four-Lane	Freeway	2008	65,000	64,900	100	-0.2%	7.0%
U.S. 101	South of State Route 135	Four-Lane	Freeway	2008	61,000	60,900	100	-0.2%	7.0%
State Route 1	West of Halcyon Road (North)	Two-Lane	Arterial	2004	11,500	12,500	-1,000	8.7%	15.0%
State Route 1	West of Valley Road	Two-Lane	Arterial	2008	7,000	8,000	-1,000	14.3%	15.0%
State Route 1	West of Halcyon Road (South)	Two-Lane	Arterial	2008	10,100	11,300	-1,200	11.9%	15.0%
State Route 1	North of Callender Road	Two-Lane	Arterial	2005	10,100	9,800	300	-3.0%	15.0%
State Route 1	South of Willow Road	Two-Lane	Arterial	2004	4,600	4,800	-200	4.3%	15.0%
State Route 1	South of Thornberry Road	Two-Lane	Arterial	2008	5,000	5,400	-400	8.0%	15.0%
State Route 135	South of U.S. 101	Four-Lane	Arterial	2008	20,500	20,700	-200	1.0%	15.0%
State Route 166	East of U.S. 101	Two-Lane	Arterial	2008	2,700	2,700	0	0.0%	15.0%
Branch Street	East of U.S. 101	Four-Lane	Arterial	2004	24,100	20,400	3,700	**-15.4%**	15.0%
Branch Street	East of Traffic Way	Two-Lane	Arterial	2004	18,500	18,500	0	0.0%	15.0%
Bonita School Road	South of Division Street	Two-Lane	Collector	2006	3,100	3,100	0	0.0%	25.0%
Camino Caballo	West of Pomeroy Road	Two-Lane	Collector	2007	2,100	1,600	500	-23.8%	25.0%
Division Street	East of Orchard Road	Two-Lane	Collector	2008	3,300	3,000	300	-9.1%	25.0%
Division Street	West of Orchard Road	Two-Lane	Collector	2008	6,200	6,300	-100	1.6%	25.0%
Division Street	North of Riverside Road	Two-Lane	Collector	2006	4,200	4,200	0	0.0%	25.0%
Division Street	East of Bonita School Road	Two-Lane	Collector	2008	2,700	3,500	-800	**29.6%**	25.0%
El Campo Road	South of U.S. 101	Two-Lane	Collector	2008	1,900	2,000	-100	5.3%	25.0%

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	Model Forecast	Model Diff	% Error Model	% Error Target
El Campo Road	North of Los Berros Road	Two-Lane	Collector	2008	1,800	1,300	500	**-27.8%**	25.0%
El Campo Road	South of Los Berros Road	Two-Lane	Collector	2008	3,000	3,400	-400	13.3%	25.0%
Fair Oaks Avenue	West of U.S. 101	Four-Lane	Collector	2008	13,200	12,600	600	-4.5%	25.0%
Fair Oaks Avenue	East of Halcyon Road	Two-Lane	Collector	2004	11,200	10,600	600	-5.4%	25.0%
Frontage Road	South of Los Berros Road	Two-Lane	Collector	2004*	2,000	2,500	-500	25.0%	25.0%
Frontage Road	South of Tefft Street	Two-Lane	Collector	2005	7,300	9,100	-1,800	24.7%	25.0%
Grand Avenue	West of Halcyon Road	Four-Lane	Arterial	2004	18,600	20,300	-1,700	9.1%	15.0%
Grand Avenue	West of U.S. 101	Four-Lane	Arterial	2005	19,600	18,000	1,600	-8.2%	15.0%
Halcyon Road	South of U.S. 101	Two-Lane	Collector	2008	11,900	14,400	-2,500	21.0%	25.0%
Halcyon Road	South of Grand Avenue	Two-Lane	Collector	2004	17,300	18,600	-1,300	7.5%	25.0%
Halcyon Road	North of Cienaga Street	Two-Lane	Collector	2008	8,200	8,700	-500	6.1%	25.0%
Halcyon Road	South of Cienaga Street	Two-Lane	Collector	2004	10,100	11,600	-1,500	14.9%	25.0%
Halcyon Road	South of Mesa View Drive	Two-Lane	Collector	2006	6,200	7,400	-1,200	19.4%	25.0%
Halcyon Road	West of El Campo Road	Two-Lane	Collector	2009	3,700	3,500	200	-5.4%	25.0%
Hetrick Avenue	South of Summit Station Road	Two-Lane	Collector	2009	1,700	2,000	-300	17.6%	25.0%
Hutton Road	North of State Route 166	Two-Lane	Collector	2008	6,700	6,700	0	0.0%	25.0%
Juniper Street	East of Mary Avenue	Two-Lane	Collector	2006	1,700	1,600	100	-5.9%	25.0%
Los Berros Road	East of Valley Road	Two-Lane	Collector	2004	5,500	6,800	-1,300	23.6%	25.0%
Los Berros Road	East of El Campo Road	Two-Lane	Collector	2009	6,100	5,900	200	-3.3%	25.0%
Los Berros Road	East of Stanton Road	Two-Lane	Collector	2004	5,700	4,900	800	-14.0%	25.0%
Los Berros Road	West of U.S. 101	Two-Lane	Collector	2009	6,200	5,800	400	-6.5%	25.0%
Mary Avenue	North of Tefft Street	Two-Lane	Collector	2009	4,500	4,200	300	-6.7%	25.0%
Mary Avenue	South of Tefft Street	Two-Lane	Collector	2009	2,200	2,300	-100	4.5%	25.0%
Mesa Road	West of Tefft Street	Two-Lane	Collector	2008	2,900	2,800	100	-3.4%	25.0%
Orchard Road	East of Tefft Street	Two-Lane	Arterial	2004	7,700	7,200	500	-6.5%	15.0%
Orchard Road	South of Division Street	Two-Lane	Arterial	2008	6,700	5,800	900	-13.4%	15.0%
Orchard Road	North of Joshua Road	Two-Lane	Collector	2008	6,700	6,700	0	0.0%	25.0%
Pomeroy Road	South of Los Berros Road	Two-Lane	Collector	2009	1,500	2,400	-900	**60.0%**	25.0%
Pomeroy Road	North of Willow Road	Two-Lane	Collector	2006	2,200	2,300	-100	4.5%	25.0%
Pomeroy Road	East of Olympic Way	Two-Lane	Collector	2008	6,400	5,500	900	-14.1%	25.0%
Pomeroy Road	North of Sandydale Road	Two-Lane	Collector	2008	7,000	4,700	2,300	**-32.9%**	25.0%
Pomeroy Road	North of Tefft Street	Two-Lane	Collector	2006	9,200	7,200	2,000	-21.7%	25.0%

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	Model Forecast	Model Diff	% Error Model	% Error Target
Southland Street	East of Orchard Road	Two-Lane	Collector	2007	1,100	1,600	-500	**45.5%**	25.0%
Stanton Road	South of Los Berros Road	Two-Lane	Collector	2006	1,100	1,200	-100	9.1%	25.0%
Tefft Street	North of Las Flores Drive	Two-Lane	Collector	2009	1,500	1,400	100	-6.7%	25.0%
Tefft Street	North of Mesa Road	Two-Lane	Collector	2004	6,500	6,800	-300	4.6%	25.0%
Tefft Street	South of Orchard Road	Four-Lane	Collector	2006	9,800	9,700	100	-1.0%	25.0%
Tefft Street	West of Mary Avenue	Four-Lane	Arterial	2009	17,500	19,600	-2,100	12.0%	15.0%
Tefft Street	West of U.S. 101	Four-Lane	Arterial	2008	24,500	25,600	-1,100	4.5%	15.0%
Tefft Street	East of U.S. 101	Four-Lane	Arterial	2008	10,300	10,200	100	-1.0%	15.0%
Tefft Street	East of Oakglen Avenue	Two-Lane	Arterial	2006	9,300	10,200	-900	9.7%	15.0%
Tefft Street	West of Thompson Avenue	Two-Lane	Arterial	2009	6,700	5,700	1,000	-14.9%	15.0%
Thompson Avenue	South of U.S. 101	Two-Lane	Collector	2008	4,400	4,300	100	-2.3%	25.0%
Thompson Avenue	North of Tefft Street	Two-Lane	Collector	2009	5,800	4,900	900	-15.5%	25.0%
Thompson Avenue	North of Rancho Road	Two-Lane	Collector	2007	3,300	2,100	1,200	**-36.4%**	25.0%
Thompson Avenue	North of State Route 166	Two-Lane	Collector	2008	2,700	2,200	500	-18.5%	25.0%
Traffic Way	North of Fair Oaks Avenue	Four-Lane	Collector	2008	12,300	10,000	2,300	-18.7%	25.0%
Valley Road	North of Cienaga Street	Two-Lane	Collector	2004	6,500	6,400	100	-1.5%	25.0%
Valley Road	North of Los Berros Road	Two-Lane	Collector	2009	6,900	7,800	-900	13.0%	25.0%
Valley Road	South of Fair Oaks Avenue	Two-Lane	Collector	2008	7,800	11,000	-3,200	**41.0%**	25.0%
Willow Road	West of Pomeroy Road	Two-Lane	Collector	2008	4,300	4,300	0	0.0%	25.0%
Willow Road	East of State Route 1	Two-Lane	Collector	2008	3,700	3,500	200	-5.4%	25.0%

*Adjusted based on increase at Hetrick Road since 2004

Road Type

The travel demand model validation is based on criteria created by the Federal Highway Administration (*Federal Highway Administration, Calibration and Adjustment of System Planning Models, 1990.)* and Caltrans (*California Department of Transportation, Travel Forecasting Guidelines, 1992.)*. Table 10 presents the Federal Highway Administration (FHWA)-recommended absolute error targets for each facility type. The Root-Mean-Squared Error (RMSE) more heavily weights large errors.

TABLE 10
SOUTH COUNTY TRAVEL DEMAND MODEL – CALIBRATION SUMMARY

Roadway Classification	Daily Count	Model Volume	% Model	% Target	RMSE Model	RMSE Target
Freeway	390,000	385,800	1.1%	7.0%	2.8%	15.0%
Arterial	252,900	256,300	1.3%	15.0%	9.2%	40.0%
Collector / Local	273,300	276,400	1.1%	25.0%	18.9%	50.0%
Total	916,200	918,500	0.3%	5.0%	16.0%	35.0%

Table 10 shows that the model satisfies each facility-specific absolute percent-error target and the RMSE targets for all facilities.

Screenlines

Screenlines are imaginary boundaries that measure the total traffic across multiple parallel routes. Screenlines allow for calibration across areas rather than at specific sites. Traffic count locations were selected such that three screenlines were defined for the South County TDM.

The South County North screenline includes:

- U.S. 101, north of Los Berros Road;
- State Route 1, west of Valley Road;
- Valley Road, south of Sunrise Drive;
- El Campo Road, south of U.S. 101; and,
- Halcyon Road, south of Cienaga Road (Highway 1).

The Nipomo Central screenline includes:

- U.S. 101, north of Tefft Street;
- Thompson Street, north of Tefft Street;
- Pomeroy Road, north of Tefft Street;
- Mary Avenue, north of Tefft Street; and,
- Mesa Road, west of Tefft Street.

The South County South screenline includes:

- U.S. 101, north of State Route 166;
- Thompson Street, north of State Route 166; and,
- Hutton Road, north of State Route 166.

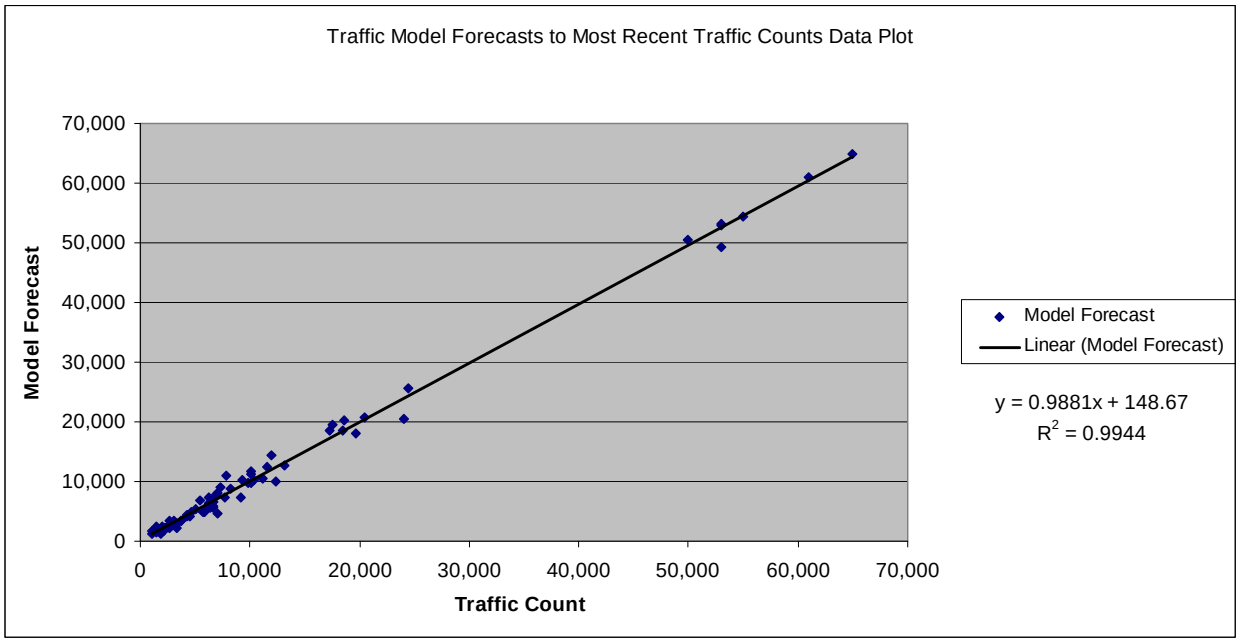
Table 11 shows the model screenline calibration results. All screenline results are within recommended percent error targets.

TABLE 11
SOUTH COUNTY TRAVEL DEMAND MODEL – SCREENLINE SUMMARY

Screenline	Traffic Count	Model Volume	% Error Model	% Error Target
South County, north	**78,900**	**82,500**	**4.6%**	**15.0%**
US 101, n/o Los Berros Road interchange	53,000	53,100		
Highway 1, w/o Valley Road	7,000	8,000		
Valley Road, s/o Sunrise	6,900	7,800		
El Campo Rd, s/o US 101	1,900	2,000		
Halcyon Rd, s/o Cienaga Rd	10,100	11,600		
Nipomo, north of Tefft St.	**75,400**	**68,300**	**9.4%**	**15.0%**
US 101, n/o Tefft Street interchange	53,000	49,200		
Thompson St, n/o Tefft St	5,800	4,900		
Pomeroy Rd, n/o Tefft St	9,200	7,200		
Mary Ave, n/o Tefft St	4,500	4,200		
Mesa Rd, w/o Tefft St	2,900	2,800		
South County, south	**62,400**	**61,800**	**1.0%**	**15.0%**
US 101, n/o SR 166 interchange	53,000	52,900		
Thompson St, n/o SR 166	2,700	2,200		
Hutton Rd, n/o SR 166	6,700	6,700		

Region-wide Correlation Coefficient

The region-wide model correlation was calculated by plotting the model forecasts against the roadway counts. An acceptable correlation coefficient is 0.88. As shown in the following chart, which plots model traffic forecasts to the most recent traffic counts, the model correlation coefficient is 0.9944, meaning the model explains slightly more than 99% of the variability in the traffic counts.



DEVELOPMENT OF YEAR 2035 BASELINE FORECAST MODEL

This section presents the methodology, processes, and supporting technical documentation for the South County Travel Demand Model (TDM) development process of the *2035 Baseline Conditions* TDM.

Land Use Data

As with existing land uses, future land uses were also determined based on assessor's parcel data indicating vacant commercial and vacant residential designations. Future land uses were verified, and adjusted as needed, against Nipomo / South County build-out projections. Tables 12 and 13 present build-out (2035) land uses within the modeling area, compared to existing land-uses, and the growth in percentages and units/acres.

The Traffic Analysis Zone (TAZ) boundaries for the future conditions model are the same as those for the existing conditions model (Figure 5).

TABLE 12
EXISTING AND FUTURE LAND USE

	2010 Conditions				2035 Conditions			
Land Use	**Area 1**	**Area 2**	**Area 3***	**Total**	**Area 1**	**Area 2**	**Area 3***	**Total**
Residential (dwelling units)								
Single Family	4,979	2,153	2,001	9,133	6,758	4,489	2,126	13,373
Multi Family	1,009	135	807	1,951	1,670	552	807	3,029
Mobile Home	140	300	378	818	140	300	378	818
Non-Residential (acres)								
Agriculture	1,010	1,341	5,355	7,706	1,010	1,341	5,355	7,706
Commercial + Motel	67	49	30	146	192	138	46	376
Golf	71	343	0	414	71	343	0	414
Industrial	57	172	9	239	57	299	9	365
Office	16	37	29	82	16	37	29	82
Storage + Warehouse	11	23	15	49	11	23	15	49
Estimated Employment								
Retail	207	64	125	396	683	310	314	1,307
Service	477	309	627	1,413	794	471	753	2,017
Other	403	572	803	1,778	403	604	1,473	2,480

**Area 3 consists of parcels outside Nipomo Areas 1 & 2, in unincorporated San Luis Obispo County and Arroyo Grande, that are included in the South County TDM*

TABLE 13
GROWTH IN DWELLING UNITS, ACRES AND JOBS

	2035 Added Land-Uses				Land-Use Percent Growth			
Land Use	**Area 1**	**Area 2**	**Area 3***	**Total**	**Area 1**	**Area 2**	**Area 3***	**Total**
Residential (dwelling units)								
Single Family	1,779	2,336	125	4,240	36%	108%	6%	46%
Multi Family	661	417	0	1,078	66%	309%	0%	55%
Mobile Home	0	0	0	0	0%	0%	0%	0%
Non-Residential (acres)								
Agriculture	0	0	0	0	0%	0%	0%	0%
Commercial + Motel	125	89	16	230	185%	182%	55%	157%
Golf	0	0	0	0	0%	0%	0%	0%
Industrial	0	126	0	126	0%	73%	0%	53%
Office	0	0	0	0	0%	0%	0%	0%
Storage + Warehouse	0	0	0	0	0%	0%	0%	0%
Estimated Employment								
Retail	476	246	189	911	230%	384%	151%	230%
Service	317	162	126	604	66%	52%	20%	43%
Other	0	32	670	702	0%	6%	83%	39%

**Area 3 consists of parcels outside Nipomo Areas 1 & 2, in unincorporated San Luis Obispo County and Arroyo Grande, that are included in the South County TDM*

2035 Baseline Model Street Network

In the *2035 Baseline Conditions* travel demand model, the street network is assumed to be similar to the *2010 Existing Conditions* model, with the addition of pending improvement projects. The improvements assumed in the model include widening of U.S. 101 from the Santa Barbara County border, across the Santa Maria Bridge, to the SR 166 (Cuyama) interchange at the southern end of the study area.

The *2035 Baseline Conditions* street network also assumes the construction of a new interchange at Willow Road, including an extension of Willow Road from its current terminus west of U.S. 101 to Thompson Road east of U.S. 101. Currently, Willow Road extends from Highway 1 (Guadalupe Road) to Pomeroy Road. A disconnected segment also existing from Hetrick Avenue to U.S. 101.

With this improvement, Willow Road will be extended easterly from its current terminus at Pomeroy Road to Hetrick Avenue where it will form a new connection with the existing segment and extend further east to U.S. 101 and form a new interchange. Willow Road will be extended from the new interchange further east to Thompson Avenue.

2035 BASELINE CONDITIONS MODEL FORECASTS

The year 2035 model scenario was created by inputting the 2035 South County land uses, projected 2035 regional productions and attractions, and projected 2035 interregional "through" trips into the Cube modeling software. Table 14 presents the forecasted *2035 Baseline Conditions* daily traffic forecasts on select facilities.

In the subsequent section of this report, the *2035 Baseline Conditions* traffic volumes will compared to other alternative "2035" street network model runs. Level of service calculations will also be presented in the subsequent section, comparing *2035 Baseline Conditions* operations with each alternative.

TABLE 14
2035 BASELINE CONDITIONS TRAFFIC FORECASTS

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	2010 Model Forecast	2035 Baseline	Added Model Trips	Percent Model Growth
U.S. 101	North of Brisco Road	Four-Lane	Freeway	2008	55,000	54,300	76,800	22,500	29%
U.S. 101	South of Grand Avenue	Four-Lane	Freeway	2008	50,000	50,500	72,400	21,900	31%
U.S. 101	North of Los Berros Road	Four-Lane	Freeway	2008	53,000	53,100	77,000	23,900	33%
U.S. 101	North of Tefft Street	Four-Lane	Freeway	2008	53,000	49,200	65,700	16,500	25%
U.S. 101	North of State Route 166	Four-Lane	Freeway	2008	53,000	52,900	70,900	18,000	26%
U.S. 101	North of State Route 135	Four-Lane	Freeway	2008	65,000	64,900	92,300	27,400	30%
U.S. 101	South of State Route 135	Four-Lane	Freeway	2008	61,000	60,900	83,000	22,100	27%
State Route 1	West of Halcyon Road (North)	Two-Lane	Arterial	2004	11,500	12,500	14,400	1,900	13%
State Route 1	West of Valley Road	Two-Lane	Arterial	2008	7,000	8,000	10,700	2,700	24%
State Route 1	West of Halcyon Road (South)	Two-Lane	Arterial	2008	10,100	11,300	15,300	4,000	29%
State Route 1	North of Callender Road	Two-Lane	Arterial	2005	10,100	9,800	9,700	-100	-1%
State Route 1	South of Willow Road	Two-Lane	Arterial	2004	4,600	4,800	6,800	2,000	30%
State Route 1	South of Thornberry Road	Two-Lane	Arterial	2008	5,000	5,400	7,600	2,200	29%
State Route 135	South of U.S. 101	Four-Lane	Arterial	2008	20,500	20,700	34,600	13,900	40%
State Route 166	East of U.S. 101	Two-Lane	Arterial	2008	2,700	2,700	4,100	1,400	34%
Branch Street	East of U.S. 101	Four-Lane	Arterial	2004	24,100	20,400	23,100	2,700	11%
Branch Street	East of Traffic Way	Two-Lane	Arterial	2004	18,500	18,500	21,300	2,800	13%
Bonita School Road	South of Division Street	Two-Lane	Collector	2006	3,100	3,100	4,300	1,200	28%
Camino Caballo	West of Pomeroy Road	Two-Lane	Collector	2007	2,100	1,600	2,000	400	17%
Division Street	East of Orchard Road	Two-Lane	Collector	2008	3,300	3,000	4,700	1,700	43%
Division Street	West of Orchard Road	Two-Lane	Collector	2008	6,200	6,300	8,700	2,400	26%
Division Street	North of Riverside Road	Two-Lane	Collector	2006	4,200	4,200	6,200	2,000	32%
Division Street	East of Bonita School Road	Two-Lane	Collector	2008	2,700	3,500	5,000	1,500	30%
El Campo Road	South of U.S. 101	Two-Lane	Collector	2008	1,900	2,000	2,900	900	20%

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	2010 Model Forecast	2035 Baseline	Added Model Trips	Percent Model Growth
El Campo Road	North of Los Berros Road	Two-Lane	Collector	2008	1,800	1,300	1,800	500	16%
El Campo Road	South of Los Berros Road	Two-Lane	Collector	2008	3,000	3,400	3,500	100	2%
Fair Oaks Avenue	West of U.S. 101	Four-Lane	Collector	2008	13,200	12,600	15,300	2,700	17%
Fair Oaks Avenue	East of Halcyon Road	Two-Lane	Collector	2004	11,200	10,600	15,200	4,600	30%
Frontage Road	South of Los Berros Road	Two-Lane	Collector	2004*	2,000	2,500	900	-1,600	-46%
Frontage Road	South of Tefft Street	Two-Lane	Collector	2005	7,300	9,100	11,500	2,400	20%
Grand Avenue	West of Halcyon Road	Four-Lane	Arterial	2004	18,600	20,300	27,500	7,200	27%
Grand Avenue	West of U.S. 101	Four-Lane	Arterial	2005	19,600	18,000	24,100	6,100	26%
Halcyon Road	South of U.S. 101	Two-Lane	Collector	2008	11,900	14,400	16,100	1,700	11%
Halcyon Road	South of Grand Avenue	Two-Lane	Collector	2004	17,300	18,600	20,900	2,300	10%
Halcyon Road	North of Cienaga Street	Two-Lane	Collector	2008	8,200	8,700	8,300	-400	-4%
Halcyon Road	South of Cienaga Street	Two-Lane	Collector	2004	10,100	11,600	10,700	-900	-8%
Halcyon Road	South of Mesa View Drive	Two-Lane	Collector	2006	6,200	7,400	6,300	-1,100	-12%
Halcyon Road	West of El Campo Road	Two-Lane	Collector	2009	3,700	3,500	4,500	1,000	22%
Hetrick Avenue	South of Summit Station Road	Two-Lane	Collector	2009	1,700	2,000	300	-1,700	-68%
Hutton Road	North of State Route 166	Two-Lane	Collector	2008	6,700	6,700	9,000	2,300	25%
Juniper Street	East of Mary Avenue	Two-Lane	Collector	2006	1,700	1,600	1,500	-100	-4%
Los Berros Road	East of Valley Road	Two-Lane	Collector	2004	5,500	6,800	6,200	-600	-7%
Los Berros Road	East of El Campo Road	Two-Lane	Collector	2009	6,100	5,900	6,200	300	4%
Los Berros Road	East of Stanton Road	Two-Lane	Collector	2004	5,700	4,900	4,500	-400	-6%
Los Berros Road	West of U.S. 101	Two-Lane	Collector	2009	6,200	5,800	6,000	200	2%
Mary Avenue	North of Tefft Street	Two-Lane	Collector	2009	4,500	4,200	4,000	-200	-3%
Mary Avenue	South of Tefft Street	Two-Lane	Collector	2009	2,200	2,300	5,700	3,400	52%
Mesa Road	West of Tefft Street	Two-Lane	Collector	2008	2,900	2,800	4,000	1,200	25%
Orchard Road	East of Tefft Street	Two-Lane	Arterial	2004	7,700	7,200	9,500	2,300	27%
Orchard Road	South of Division Street	Two-Lane	Arterial	2008	6,700	5,800	8,100	2,300	27%
Orchard Road	North of Joshua Road	Two-Lane	Collector	2008	6,700	6,700	9,100	2,400	26%
Pomeroy Road	South of Los Berros Road	Two-Lane	Collector	2009	1,500	2,400	1,000	-1,400	-50%
Pomeroy Road	North of Willow Road	Two-Lane	Collector	2006	2,200	2,300	1,000	-1,300	-48%
Pomeroy Road	East of Olympic Way	Two-Lane	Collector	2008	6,400	5,500	4,200	-1,300	-16%
Pomeroy Road	North of Sandydale Road	Two-Lane	Collector	2008	7,000	4,700	3,600	-1,100	-16%
Pomeroy Road	North of Tefft Street	Two-Lane	Collector	2006	9,200	7,200	6,000	-1,200	-14%

Roadway	Location	Facility	Type	Count Year	Existing Traffic Count	2010 Model Forecast	2035 Baseline	Added Model Trips	Percent Model Growth
Southland Street	East of Orchard Road	Two-Lane	Collector	2007	1,100	1,600	2,800	1,200	44%
Stanton Road	South of Los Berros Road	Two-Lane	Collector	2006	1,100	1,200	1,800	600	32%
Tefft Street	North of Las Flores Drive	Two-Lane	Collector	2009	1,500	1,400	2,000	600	30%
Tefft Street	North of Mesa Road	Two-Lane	Collector	2004	6,500	6,800	9,400	2,600	26%
Tefft Street	South of Orchard Road	Four-Lane	Collector	2006	9,800	9,700	12,800	3,100	24%
Tefft Street	West of Mary Avenue	Four-Lane	Arterial	2009	17,500	19,600	19,600	0	0%
Tefft Street	West of U.S. 101	Four-Lane	Arterial	2008	24,500	25,600	28,600	3,000	9%
Tefft Street	East of U.S. 101	Four-Lane	Arterial	2008	10,300	10,200	16,400	6,200	36%
Tefft Street	East of Oakglen Avenue	Two-Lane	Arterial	2006	9,300	10,200	16,400	6,200	36%
Tefft Street	West of Thompson Avenue	Two-Lane	Arterial	2009	6,700	5,700	6,200	500	7%
Thompson Avenue	South of U.S. 101	Two-Lane	Collector	2008	4,400	4,300	9,000	4,700	45%
Thompson Avenue	North of Tefft Street	Two-Lane	Collector	2009	5,800	4,900	6,800	1,900	25%
Thompson Avenue	North of Rancho Road	Two-Lane	Collector	2007	3,300	2,100	4,400	2,300	50%
Thompson Avenue	North of State Route 166	Two-Lane	Collector	2008	2,700	2,200	4,400	2,200	47%
Traffic Way	North of Fair Oaks Avenue	Four-Lane	Collector	2008	12,300	10,000	10,800	800	7%
Valley Road	North of Cienaga Street	Two-Lane	Collector	2004	6,500	6,400	9,600	3,200	34%
Valley Road	North of Los Berros Road	Two-Lane	Collector	2009	6,900	7,800	9,800	2,000	18%
Valley Road	South of Fair Oaks Avenue	Two-Lane	Collector	2008	7,800	11,000	13,200	2,200	15%
Willow Road	West of Pomeroy Road	Two-Lane	Collector	2008	4,300	4,300	8,100	3,800	75%
Willow Road	East of State Route 1	Two-Lane	Collector	2008	3,700	3,500	5,700	2,200	33%

YEAR 2035 CONDITIONS IMPROVEMENT ALTERNATIVES

OMNI-MEANS tested a number of alternative future networks addressing the needs for capacity improvements on the U.S. 101 corridor. During the course of consecutive project development team meetings, a final list of alternatives to test was established. In the end, 3 alternative concepts were selected for study. Within these three concepts, it was also determined that six-lane widening of U.S. 101 through the study area would be analyzed. This section of the report and the following analysis is intended to provide a starting point for discussing final corridor improvement alternatives, which will then be analyzed in greater detail in more localized subsequent studies.

2035 Baseline Conditions

In the *2035 Baseline Conditions* travel demand model, the street network assumes the widening of U.S. 101 from the Santa Barbara County border, across the Santa Maria Bridge, to the SR 166 (Cuyama) interchange at the southern end of the study area. The *2035 Baseline Conditions* street network also assumes the construction of the Willow Road interchange and an extension of Willow Road from its current terminus west of U.S. 101 to Thompson Road east of U.S. 101.

Concept 1: Baseline Plus Tefft Street Improvements

This concept builds upon the *2035 Baseline Conditions* street network by assuming improvements to circulation on Tefft Street around the U.S. 101 interchange. The closely-spaced intersection on Tefft Street in the immediate freeway interchange vicinity cause queuing issues of the freeway off-ramps and significantly decrease the effective capacity of the corridor. Feasible access control options have been presented and analyzed in prior studies, such as the *South County Traffic Model Update – 2006 Annual Report and Fifth Year Update* prepared by OMNI-MEANS in March 2006 and the *Supplemental To The South County Traffic Model and Road Improvement Fee Update* prepared by OMNI-MEANS in March 2008. For detailed analysis of Tefft Street corridor improvements, these studies should be referred to. Per the County's analysis, the more favorable access control solutions include converting the Frontage Road to a southbound-only one-way street or restricting turns to right-in or right-out movements. Full access for the restricted movements between Tefft Street and Frontage Road would be maintained via Mary Avenue and Hill Street. Similar access restrictions previously identified and analyzed in the previously mentioned reports by OMNI-MEANS, were shown to provide acceptable operations at the Tefft Street corridor intersection locations under long-term conditions.

Concept 2: Baseline Plus South Nipomo Interchange

This concept builds upon the *2035 Baseline Conditions* street network by including another new interchange south of Tefft Street in addition to the Willow Road extension and interchange. The location of this interchange for this concept is not determined, but it would be spaced at least 1 mile south of Tefft Street and north of the SR 166 (Cuyama) interchange. A four-lane arterial would connect the new interchange to Orchard Road. A two-lane arterial would likely connect the interchange to Thompson Road.

Concept 3: Baseline Plus South Nipomo Interchange & Tefft Street Improvements

This concept builds upon the *Concept 2* street network. As with *Concept 1*, access restrictions are assumed to be in place at the Frontage Road intersection with Tefft Street, thus improving the capacity of the roadway segment in the vicinity of the Tefft Street interchange and improving intersection operations at the southbound ramp terminals. Full access for the restricted movements between Tefft Street and Frontage Road would be maintained via Mary Avenue and Hill Street.

6-Lane U.S. 101 Alternatives

For each concept, in addition to the *2035 Baseline Conditions* analysis, an additional 6-lane U.S. 101 analysis has been performed. This analysis will assume the widening to take place, as much as is feasible,

on the inside of U.S. 101 (where there is currently a median). Thus, these alternative analyses will not include improvements to current off-ramp and on-ramp configurations.

YEAR 2035 ROADWAY SEGMENT LOS

As discussed in the previous section, daily roadway service levels were evaluated for each preliminary corridor improvement alternative based on facility type, and in the case of Tefft Street between Mary Avenue and Oakglen Avenue, based on thresholds determined by specific peak hour conditions. Table 15 presents the daily roadway LOS results for each interchange location under each alternative in addition to the *2035 Baseline Conditions*. Table 16 presents the remaining daily roadway LOS results by facility for the main concepts and *2035 Baseline Conditions*. Lastly, Table 17 presents the *6-Lane U.S. 101 Alternatives* daily volume and roadway LOS results for the U.S. 101 mainline.

TABLE 15
2035 DAILY ROADWAY LOS BY INTERCHANGE LOCATION

Roadway	Location	Facility Type	2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
			Forecast	LOS	Forecast	LOS	Forecast	LOS	Forecast	LOS
Los Berros Road	West of U.S. 101 SB Ramps	Two-Lane Undivided Arterial	6,000	A	6,000	A	5,700	A	5,700	A
	Between NB and SB Ramps	Two-Lane Undivided Arterial	7,600	A	7,500	A	7,400	A	7,400	A
	East of U.S. 101 NB Ramps	Two-Lane Undivided Arterial	9,000	B	9,000	B	9,100	B	9,200	B
Willow Road	West of U.S. 101 SB Ramps	Four-Lane Divided Arterial	13,500	A	13,800	A	13,200	A	13,200	A
	Between NB and SB Ramps	Four-Lane Divided Arterial	7,900	A	8,000	A	7,600	A	7,700	A
	East of U.S. 101 NB Ramps	Four-Lane Divided Arterial	2,700	A	2,700	A	2,400	A	2,400	A
Tefft Street*	West of U.S. 101 SB Ramps	Four-Lane Divided Arterial	**30,500**	**F**	**36,700**	**F**	**26,200**	**F**	**29,900**	**D**
	Between NB and SB Ramps	Four-Lane Divided Arterial	**29,200**	**F**	28,500	C	**25,100**	**F**	24,300	B
	East of U.S. 101 NB Ramps	Four-Lane Divided Arterial	16,400	B	16,600	A	15,900	B	15,500	A
South Nipomo Interchange	West of U.S. 101 SB Ramps	Four-Lane Divided Arterial					18,500	A	19,300	A
(between Tefft and 166)	Between NB and SB Ramps	Four-Lane Divided Arterial					10,000	A	10,500	A
	East of U.S. 101 NB Ramps	Two-Lane Divided Arterial					1,300	A	1,500	A
S.R. 166	West of U.S. 101 SB Ramps	Two-Lane Undivided Arterial	**18,300**	**F**	**19,600**	**F**	9,700	B	9,700	B
	Between NB and SB Ramps	Two-Lane Undivided Arterial	**13,700**	**D**	**14,000**	**E**	8,800	A	8,800	A
	East of U.S. 101 NB Ramps	Two-Lane Undivided Arterial	8,500	A	8,100	A	8,000	A	8,000	A

*Adjusted based on peak hour analysis and unique conditions on Tefft Street between Mary Avenu and Oakglen Avenue - see Daily Road Capacities by Facility Type table.

TABLE 16
2035 DAILY ROADWAY LOS BY FACILITY

Roadway	Location	Facility Type	2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
			Forecast	LOS	Forecast	LOS	Forecast	LOS	Forecast	LOS
U.S. 101	North of Brisco Road	Four-Lane Freeway	**76,800**	**E**	**76,800**	**E**	**77,100**	**E**	**77,100**	**E**
U.S. 101	South of Grand Avenue	Four-Lane Freeway	**72,400**	**E**	**72,300**	**E**	**73,000**	**E**	**73,000**	**E**
U.S. 101	North of Los Berros Road	Four-Lane Freeway	**77,000**	**E**	**77,000**	**E**	**77,100**	**E**	**77,100**	**E**

Roadway	Location	Facility Type	2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
			Forecast	LOS	Forecast	LOS	Forecast	LOS	Forecast	LOS
U.S. 101	North of Tefft Street	Four-Lane Freeway	**65,700**	**D**	**65,500**	**D**	**65,100**	**D**	**64,900**	**D**
U.S. 101	North of State Route 166	Four-Lane Freeway	**70,900**	**D**	**70,000**	**D**	**80,100**	**F**	**80,200**	**F**
U.S. 101	North of State Route 135	Four-Lane Freeway	**92,300**	**F**	**92,300**	**F**	**92,300**	**F**	**92,300**	**F**
U.S. 101	South of State Route 135	Four-Lane Freeway	**83,000**	**F**	**83,000**	**F**	**83,000**	**F**	**83,000**	**F**
State Route 1	West of Halcyon Road (North)	Two-Lane Divided Arterial	14,400	C	14,300	C	14,000	C	14,000	C
State Route 1	West of Valley Road	Two-Lane Divided Arterial	10,700	A	10,600	A	7,700	A	7,700	A
State Route 1	West of Halcyon Road (South)	Two-Lane Divided Arterial	**15,300**	**D**	**15,400**	**D**	14,900	C	14,900	C
State Route 1	North of Callender Road	Two-Lane Divided Arterial	9,700	A	9,800	A	9,200	A	9,200	A
State Route 1	South of Willow Road	Two-Lane Divided Arterial	6,800	A	6,800	A	6,800	A	6,800	A
State Route 1	South of Thornberry Road	Two-Lane Divided Arterial	7,600	A	7,600	A	7,600	A	7,600	A
State Route 135	South of U.S. 101	Four-Lane Divided Arterial	**34,600**	**E**	**34,600**	**E**	**34,600**	**E**	**34,600**	**E**
State Route 166	East of U.S. 101	Two-Lane Undivided Arterial	4,100	A	4,100	A	4,100	A	4,100	A
Branch Street	East of U.S. 101	Four-Lane Divided Arterial	23,100	B	23,100	B	23,200	B	23,200	B
Branch Street	East of Traffic Way	**Two-Lane Divided Arterial**	**21,300**	**F**	**21,300**	**F**	**21,300**	**F**	**21,300**	**F**
Bonita School Road	South of Division Street	Two-Lane Collector	4,300	A	4,300	A	4,300	A	4,300	A
Camino Caballo	West of Pomeroy Road	Two-Lane Collector	2,000	A	2,200	A	1,700	A	1,700	A
Division Street	East of Orchard Road	Two-Lane Collector	4,700	A	6,600	A	2,300	A	2,500	A
Division Street	West of Orchard Road	Two-Lane Collector	8,700	B	8,500	B	9,200	C	9,300	C
Division Street	North of Riverside Road	Two-Lane Collector	6,200	A	6,200	A	6,200	A	6,200	A
Division Street	East of Bonita School Road	Two-Lane Collector	5,000	A	5,000	A	4,900	A	4,900	A
El Campo Road	South of U.S. 101	Two-Lane Collector	2,900	A	2,900	A	3,200	A	3,200	A
El Campo Road	North of Los Berros Road	Two-Lane Collector	1,800	A	1,800	A	2,100	A	2,100	A
El Campo Road	South of Los Berros Road	Two-Lane Collector	3,500	A	3,500	A	3,400	A	3,400	A
Fair Oaks Avenue	West of U.S. 101	Four-Lane Collector	15,300	B	15,300	B	13,700	A	13,700	A
Fair Oaks Avenue	East of Halcyon Road	**Two-Lane Collector**	**15,200**	**F**	**15,300**	**F**	**15,500**	**F**	**15,500**	**F**

Roadway	Location	Facility Type	2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
			Forecast	LOS	Forecast	LOS	Forecast	LOS	Forecast	LOS
Frontage Road	South of Los Berros Road	Two-Lane Collector	900	A	900	A	1,000	A	1,000	A
Frontage Road	South of Tefft Street	Two-Lane Collector	**11,500**	**E**	1,800	A	7,600	A	1,700	A
Grand Avenue	West of Halcyon Road	Four-Lane Divided Arterial	27,500	C	27,500	C	27,500	C	27,500	C
Grand Avenue	West of U.S. 101	Four-Lane Divided Arterial	24,100	B	24,100	B	25,000	B	25,000	B
Halcyon Road	South of U.S. 101	**Two-Lane Collector**	**16,100**	**F**	**16,100**	**F**	**16,700**	**F**	**16,700**	**F**
Halcyon Road	South of Grand Avenue	**Two-Lane Collector**	**20,900**	**F**	**20,900**	**F**	**22,500**	**F**	**22,600**	**F**
Halcyon Road	North of Cienaga Street	Two-Lane Collector	8,300	B	8,400	B	9,400	C	9,500	C
Halcyon Road	South of Cienaga Street	**Two-Lane Collector**	**10,700**	**D**	**10,700**	**D**	**14,100**	**F**	**14,100**	**F**
Halcyon Road	South of Mesa View Drive	Two-Lane Collector	6,300	A	6,300	A	6,800	A	6,800	A
Halcyon Road	West of El Campo Road	Two-Lane Collector	4,500	A	4,500	A	5,000	A	5,000	A
Hetrick Avenue	South of Summit Station Road	Two-Lane Collector	300	A	300	A	300	A	300	A
Hutton Road	North of State Route 166	Two-Lane Collector	9,000	C	**10,300**	**D**	400	A	400	A
Juniper Street	East of Mary Avenue	Two-Lane Collector	1,500	A	1,500	A	1,600	A	1,500	A
Los Berros Road	East of Valley Road	Two-Lane Collector	6,200	A	6,200	A	5,700	A	5,700	A
Los Berros Road	East of El Campo Road	Two-Lane Collector	6,200	A	6,200	A	6,100	A	6,000	A
Los Berros Road	East of Stanton Road	Two-Lane Collector	4,500	A	4,500	A	4,200	A	4,200	A
Los Berros Road	West of U.S. 101	Two-Lane Collector	6,000	A	6,000	A	5,700	A	5,700	A
Mary Avenue	North of Tefft Street	Two-Lane Collector	4,000	A	3,900	A	4,000	A	3,900	A
Mary Avenue	South of Tefft Street	Two-Lane Collector	5,700	A	**11,700**	**E**	3,200	A	8,100	B
Mesa Road	West of Tefft Street	Two-Lane Collector	4,000	A	4,200	A	4,000	A	4,000	A
Orchard Road	East of Tefft Street	Two-Lane Divided Arterial	9,500	A	10,800	A	8,200	A	8,400	A
Orchard Road	South of Division Street	Two-Lane Divided Arterial	8,100	A	9,600	A	6,000	A	6,000	A
Orchard Road	North of Joshua Road	Two-Lane Collector	9,100	C	**10,400**	**D**	600	A	600	A
Pomeroy Road	South of Los Berros Road	Two-Lane Collector	1,000	A	1,000	A	1,100	A	1,100	A
Pomeroy Road	North of Willow Road	Two-Lane Collector	1,000	A	1,000	A	1,000	A	1,000	A
Pomeroy Road	East of Olympic Way	Two-Lane Collector	4,200	A	4,200	A	4,200	A	4,200	A
Pomeroy Road	North of Sandydale Road	Two-Lane Collector	3,600	A	3,800	A	3,300	A	3,300	A
Pomeroy Road	North of Tefft Street	Two-Lane Collector	6,000	A	6,100	A	5,800	A	5,800	A
Southland Street	East of Orchard Road	Two-Lane Collector	2,800	A	2,900	A	7,100	A	7,200	A
Stanton Road	South of Los Berros Road	Two-Lane Collector	1,800	A	1,800	A	1,800	A	1,800	A

Roadway	Location	Facility Type	2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
			Forecast	LOS	Forecast	LOS	Forecast	LOS	Forecast	LOS
Tefft Street	North of Las Flores Drive	Two-Lane Collector	2,000	A	2,000	A	1,900	A	1,900	A
Tefft Street	North of Mesa Road	Two-Lane Collector	9,400	C	9,500	C	8,800	B	8,700	B
Tefft Street	South of Orchard Road	Four-Lane Collector	12,800	A	13,000	A	12,100	A	12,000	A
Tefft Street	West of Mary Avenue	Four-Lane Divided Arterial	19,600	A	20,800	A	17,700	A	17,500	A
*Tefft Street***	*West of U.S. 101***	**Four-Lane Divided Arterial**	**28,600**	**F**	**35,000**	**E**	**24,700**	**F**	28,500	C
*Tefft Street***	*East of U.S. 101***	Four-Lane Divided Arterial	16,400	B	16,600	A	15,900	B	15,500	A
Tefft Street	East of Oakglen Avenue	Two-Lane Divided Arterial	**16,400**	**D**	**16,600**	**D**	**15,900**	**D**	**15,500**	**D**
Tefft Street	West of Thompson Avenue	Two-Lane Divided Arterial	6,200	A	6,100	A	6,100	A	5,800	A
Thompson Avenue	South of U.S. 101	Two-Lane Collector	9,000	C	9,000	C	9,100	C	9,100	C
Thompson Avenue	North of Tefft Street	Two-Lane Collector	6,800	A	6,700	A	6,500	A	6,400	A
Thompson Avenue	North of Rancho Road	Two-Lane Collector	4,400	A	4,000	A	4,300	A	4,500	A
Thompson Avenue	North of State Route 166	Two-Lane Collector	4,400	A	4,100	A	4,000	A	4,000	A
Traffic Way	North of Fair Oaks Avenue	Four-Lane Collector	10,800	A	10,800	A	10,400	A	10,400	A
Valley Road	North of Cienaga Street	Two-Lane Collector	9,600	C	9,500	C	8,400	B	8,400	B
Valley Road	North of Los Berros Road	Two-Lane Collector	9,800	C	9,900	C	9,000	C	9,000	C
Valley Road	South of Fair Oaks Avenue	Two-Lane Collector	**13,200**	**F**	**13,400**	**F**	**12,300**	**F**	**12,300**	**F**
Willow Road	West of Pomeroy Road	Two-Lane Collector	8,100	B	8,100	B	8,000	B	8,000	B
Willow Road	East of State Route 1	Two-Lane Collector	5,700	A	5,700	A	5,900	A	5,900	A

**Adjusted based on increase at Hetrick Road since 2004*

***Adjusted based on peak hour analysis and unique conditions on Tefft Street between Mary Avenue and Oakglen Avenue.*

As presented in Table 15, poor level of service (LOS F) is anticipated in the vicinity of the Tefft Street interchange and SR 166 (Cuyama) interchange during the *2035 Baseline Conditions* scenario. With the addition of a new South Nipomo interchange in *Concept 2*, significant trips are diverted from the SR 166 (Cuyama) interchange and the Tefft Street interchange. Despite the diversion, however, LOS F conditions persist at the Tefft Street interchange because of the closely spaced intersections and the intersection configurations, especially at the southbound ramps. *Concept 1*, which changes the configuration of the Tefft Street corridor, improves operations near the Tefft Street interchange, but redirects additional traffic to SR 166 (Cuyama) because of the changes to the Frontage Road configuration. Lastly, *Concept 3*, which combines the improvements on *Concept 2* (new South Nipomo interchange) and *Concept 1* (reconfiguration of Tefft Street corridor), provides acceptable LOS on roadway segments in the vicinity of all interchanges.

As presented in Table 16, level of service issues arise in every tested scenario on City streets. However, as the focus of this study is on the performance of the U.S. 101 corridor, it should be noted that most of these performance issues are separated from the vicinity of U.S. 101 interchanges. As with the results of Table 15, Concept *3* provides the most improvement to the Tefft Street and SR 166 (Cuyama) interchange vicinity roadways.

U.S. 101 itself, however, is projected to operate at LOS F north of SR 135 and SR 166 (Cuyama) in every tested scenario as a 4-lane freeway. North of Los Berros Road, south of Grand Avenue, and north of Brisco Road, U.S. 101 is projected to operate at LOS E in every scenario. North of Tefft Street, U.S. 101 is projected to operate at LOS D in every scenario. However, north of SR 166 (Cuyama), U.S. 101 is projected to operate at LOS F for *Concept 2* and *Concept 3* but LOS D for *2035 Baseline Conditions* and *Concept 1*. The reason for this is because in *Concept 2* and *Concept 3*, the addition of a new interchange between SR 166 (Cuyama) and Tefft Street redirects traffic that would otherwise use the SR 166 (Cuyama) interchange further north to the new South Nipomo interchange. Table 17 presents the U.S. 101 mainline operations as a 6-lane freeway.

TABLE 17
2035 U.S. 101 6-LANE FREEWAY DAILY ROADWAY LOS

		2035 Baseline Conditions		Concept 1 (Willow and Improved Tefft)		Concept 2 (Willow and South Nipomo Interchange)		Concept 3 (Willow, South Nipomo, and Improved Tefft)	
Location	**Facility Type**	**Forecast**	**LOS**	**Forecast**	**LOS**	**Forecast**	**LOS**	**Forecast**	**LOS**
North of Brisco Road	Six-Lane Freeway	76,800	≤C	76,800	≤C	77,100	≤C	77,100	≤C
South of Grand Avenue	Six-Lane Freeway	72,400	≤C	72,300	≤C	73,000	≤C	73,000	≤C
North of Los Berros Road	Six-Lane Freeway	77,000	≤C	77,000	≤C	77,100	≤C	77,100	≤C
North of Tefft Street	Six-Lane Freeway	65,700	≤C	65,500	≤C	65,100	≤C	64,900	≤C
North of State Route 166	Six-Lane Freeway	70,900	≤C	70,000	≤C	80,100	≤C	80,200	≤C
North of State Route 135	Six-Lane Freeway	**92,300**	**D**	**92,300**	**D**	**92,300**	**D**	**92,300**	**D**
South of State Route 135	Six-Lane Freeway	83,000	≤C	83,000	≤C	83,000	≤C	83,000	≤C

Note: Widening to a 6-lane freeway would inherently require upgrading existing "expressway" segments to "freeway" standards, which includes closure of existing at-grade intersections with U.S. 101. The U.S. 101 Corridor System Management Plan can be referenced for more discussion on this conversion from expressway to freeway standards.

As presented in Table 17, U.S. 101 would operate at LOS D or better on a daily basis for all mainline segments assuming it is widened to a 6-lane freeway. The following section of this report will evaluate

the PM peak hour mainline operations and ramp merge and diverge operations for U.S. 101 as a 4-lane freeway and as a 6-lane freeway.

YEAR 2035 FREEWAY RAMP AND MAINLINE LEVELS OF SERVICE

In order to enhance the traffic operational distinctions between alternatives, future PM peak hour ramp and mainline operations on U.S. 101 were evaluated using the HCS 2000 software, which implements HCM 2000 methodologies. In moving forward with the PM peak hour ramp and mainline operations analysis for future alternative conditions, the findings may not fully reveal the true traffic operational conditions as peak period intersection operations can also have a direct effect on ramp operations. These operations are not necessarily captured in the HCM merge, diverge, and mainline service level calculations. Therefore, the PM peak hour evaluation of ramp and mainline operations will provide further insight into the future conditions, but some caution in the use of its findings should still be exercised. Figure 6 presents the PM peak hour volumes for each future alternative, compared to the existing volumes.

2035 Baseline & Concept 1 Conditions

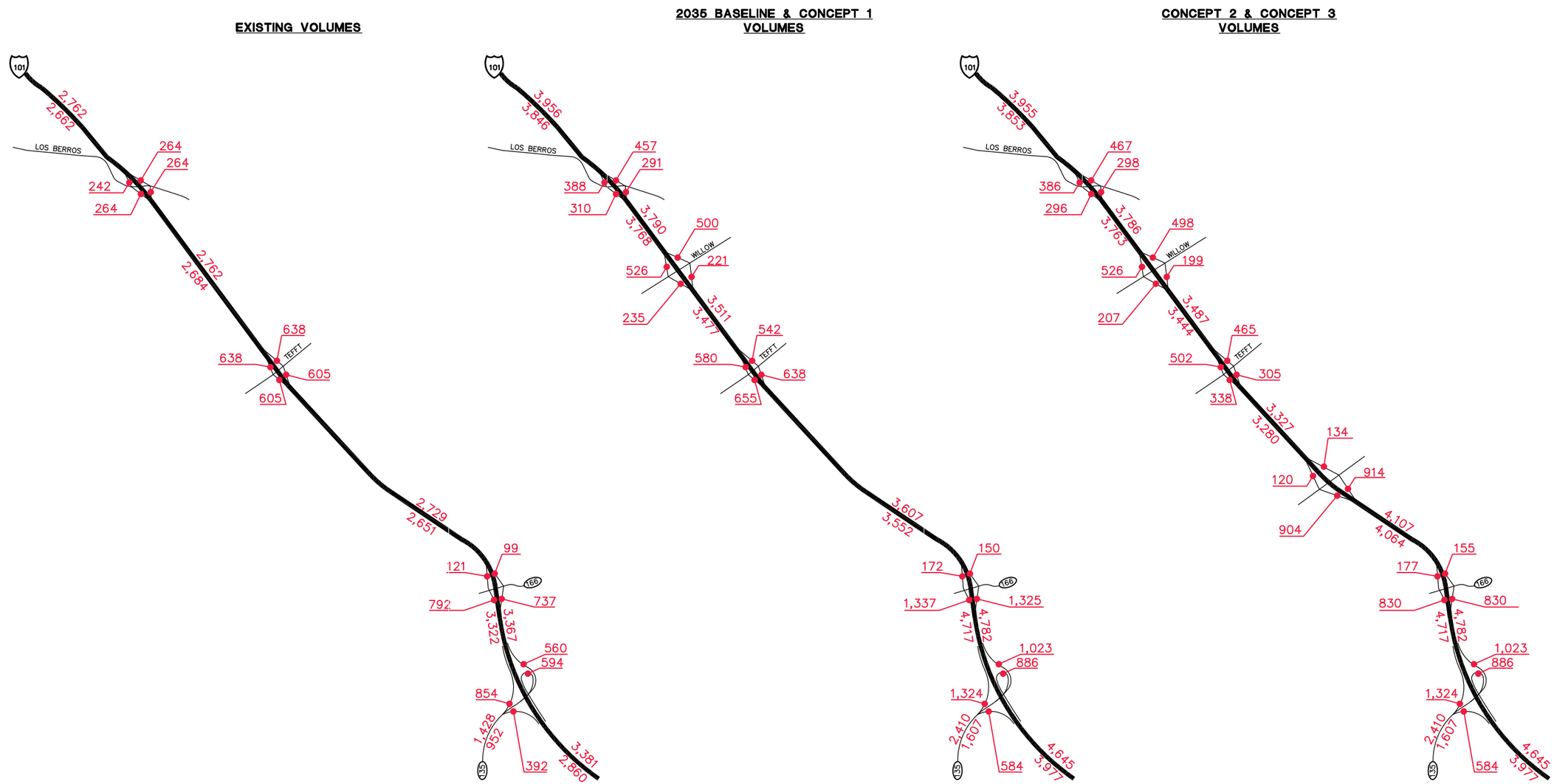
The *2035 Baseline Conditions* and *Concept 1* scenarios assume the construction of an interchange at Willow Road and the widening of U.S. 101 to 6 lanes south of SR 166 (Cuyama) across the Santa Barbara County line. The freeway ramp and mainline analyses for *2035 Baseline Conditions* and *Concept 1* have been consolidated because the difference between these alternatives lies in the Tefft Street corridor improvements which will not affect ramp merge and diverge or mainline operations.

The PM peak volumes for these alternatives are presented in Figure 6. Table 18 presents the freeway mainline level of service calculations for this scenario. Table 18 also presents the calculations for this scenario if U.S. 101 is widened to 6 lanes through the study area.

TABLE 18
YEAR 2035 BASELINE & CONCEPT 1 U.S. 101 PEAK HOUR MAINLINE OPERATIONS

			Baseline & Concept 1			6-Lane U.S. 101			
Freeway Mainline Segment	Target LOS	# Lanes	Volume	Density, (pc/mi/ln)	LOS	# Lanes	Volume	Density, (pc/mi/ln)	LOS
Northbound									
North Broadway to S.R. 166	D	3	4,782	26.6	D	3	4,782	26.6	D
S.R. 166 to Tefft Street	D	2	3,607	31.8	D	3	3,607	19.4	C
Tefft Street to Willow Road	D	2	3,511	30.5	D	3	3,511	18.9	C
Willow Road to Los Berros Road	D	2	3,790	34.7	D	3	3,790	20.4	C
Southbound									
S.R. 166 to North Broadway	D	3	4,717	26.1	D	3	4,717	26.1	D
Tefft Street to S.R. 166	D	2	3,552	31.0	D	3	3,552	19.1	C
Willow Road to Tefft Street	D	2	3,477	30.0	D	3	3,477	18.7	C
Los Berros Road to Willow Road	D	2	3,768	34.4	D	3	3,768	20.3	C

As presented in Table 18, all U.S. 101 mainline segments are projected to operate at LOS D under the *2035 Baseline Conditions* and *Concept 1* scenarios. The increase in mainline volumes between SR 166 (Cuyama) and North Broadway is accommodated with the widening to 6 lanes. When the U.S. 101 is widened to 6 lanes throughout the entire study area, the segments north of SR 166 (Cuyama) are all projected to operate at LOS C. Table 19 presents the *2035 Baseline Conditions* and *Concept 1* ramp operations analysis results.



U.S. 101 South County Corridor Transportation Study

Figure 6

PM PEAK HOUR RAMP AND MAINLINE VOLUMES

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TABLE 19
2035 BASELINE & CONCEPT 1 CONDITIONS U.S. 101 PEAK HOUR RAMP OPERATIONS

			Baseline & Concept 1			6-Lane U.S. 101		
Interchange Location	**Target LOS**	**Junction Type**	**Mainline Lanes**	**Density (pc/mi/ln)**	**LOS**	**Mainline Lanes**	**Density (pc/mi/ln)**	**LOS**
Los Berros Road Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	**35.7**	**E**	3	23.2	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	**39.8**	**E**	3	27.5	C
State Route 101 Southbound On-Ramp	D	Merge	2	34.4	D	3	22.1	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**40.1**	**E**	3	27.7	C
Willow Road Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	34.8	D	3	23.0	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	**37.1**	**E**	3	25.9	C
State Route 101 Southbound On-Ramp	D	Merge	2	32.2	D	3	20.6	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**39.6**	**E**	3	27.8	C
Tefft Street Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	33.2	D	3	22.5	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	**37.5**	**E**	3	26.7	C
State Route 101 Southbound On-Ramp	D	Merge	2	33.5	D	3	23.1	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**36.7**	**E**	3	26.3	C
Cuyama Lane/State Route 166 Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	35.0	D	3	22.4	C
State Route 101 Northbound Off-Ramp	D	Diverge	3	**40.0**	**E**	3	**40.0**	**E**
State Route 101 Southbound On-Ramp	D	Merge	3	33.4	D	3	33.4	D
State Route 101 Southbound Off-Ramp	D	Diverge	2	**37.3**	**E**	3	25.9	C
North Broadway/State Route 135 Interchange								
State Route 101 Northbound On-Ramp	D	Merge	3	34.1	D	3	34.1	D
State Route 101 Northbound Off-Ramp	D	Diverge	3	32.9	D	3	32.9	D
State Route 101 Southbound On-Ramp	D	Merge	3	24.5	C	3	24.5	C
State Route 101 Southbound Off-Ramp	D	Diverge	3	**38.5**	**E**	3	**38.5**	**E**

Notes: Bolded entries indicate freeway ramp merge diverge junctions operating at unacceptable LOS

As presented in Table 19, under *2035 Baseline Conditions* and *Concept 1*, numerous merging and diverging LOS deficiencies are projected. However, as presented in the second set of results, if U.S. 101 is widened to 6 lanes, the majority of merge and diverge operations would be improved to LOS C, and all but two locations operate at LOS D or better.

Additional peak hour intersection analysis at the ramps terminals may also reveal queuing issues and potentially spillbacks onto the U.S. 101 mainline. This is especially true at stop-controlled ramp terminals, such as those at SR 166 (Cuyama) and Los Berros Road.

2035 Concept 2 & Concept 3 Conditions (Includes South Nipomo Interchange)

The *Concept 2* and *Concept 3* scenarios assume the construction of a new interchange in South Nipomo in addition to an interchange at Willow Road and the widening of U.S. 101 to 6 lanes south of SR 166 (Cuyama) across the Santa Barbara County line. The freeway ramp and mainline analyses for *Concept 2* and *Concept 3* have been consolidated because the difference between these alternatives does not significantly affect these results. The difference between these concepts lies in the Tefft Street corridor improvements which will not affect ramp merge and diverge or mainline operations.

The PM peak volumes for these alternatives are presented in Figure 6. Table 20 presents the freeway mainline level of service calculations for this scenario.

TABLE 20
CONCEPT 2 & CONCEPT 3 U.S. 101 PEAK HOUR MAINLINE OPERATIONS

			Concepts 2 & 3				6-Lane U.S. 101		
Freeway Mainline Segment	**Target LOS**	**# Lanes**	**Volume**	**Density, (pc/mi/ln)**	**LOS**	**# Lanes**	**Volume**	**Density, (pc/mi/ln)**	**LOS**
Northbound									
North Broadway to S.R. 166	D	3	4,782	26.6	D	3	4,782	26.6	D
S.R. 166 to South Nipomo	D	2	4,107	41.2	**E**	3	4,107	22.2	C
South Nipomo to Tefft Street	D	2	3,327	28.1	D	3	3,327	17.9	B
Tefft Street to Willow Road	D	2	3,487	30.1	D	3	3,487	18.8	C
Willow Road to Los Berros Road	D	2	3,786	34.7	D	3	3,786	20.4	C
Southbound									
S.R. 166 to North Broadway	D	3	4,717	26.1	D	3	4,717	26.1	D
South Nipomo to S.R. 166	D	2	4,064	40.2	**E**	3	4,064	22.0	C
Tefft Street to South Nipomo	D	2	3,280	27.6	D	3	3,280	17.7	B
Willow Road to Tefft Street	D	2	3,444	29.6	D	3	3,444	18.5	C
Los Berros Road to Willow Road	D	2	3,763	34.3	D	3	3,763	20.3	C

As presented in Table 20, one U.S. 101 mainline segment is projected to operate over LOS D, at LOS E, under the *Concept 2* and *Concept 3* scenarios. Because fewer vehicles use the SR 166 (Cuyama) interchange when a new interchange in the South Nipomo area is introduced, the mainline volume north of SR 166 (Cuyama) increases. However, as also presented in Table 20, when U.S. 101 is widened to 6 lanes throughout the entire study area, the segments north of SR 166 (Cuyama) are all projected to operate at LOS C or better. Table 21 presents the results of *Concept 2* and *Concept 3* ramp merge and diverge operations analysis.

TABLE 21
CONCEPT 2 & CONCEPT 3 CONDITIONS U.S. 101 PEAK HOUR RAMP OPERATIONS

			Concepts 2 & 3			6-Lane U.S. 101		
Interchange Location	**Target LOS**	**Junction Type**	**Mainline Lanes**	**Density (pc/mi/ln)**	**LOS**	**Mainline Lanes**	**Density (pc/mi/ln)**	**LOS**
Los Berros Road Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	**35.6**	**E**	3	23.2	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	**39.8**	**E**	3	27.5	C
State Route 101 Southbound On-Ramp	D	Merge	2	34.4	D	3	22.0	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**40.2**	**E**	3	27.7	C
Willow Road Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	34.8	D	3	23.0	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	**36.9**	**E**	3	25.7	C
State Route 101 Southbound On-Ramp	D	Merge	2	31.9	D	3	20.4	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**39.6**	**E**	3	27.8	C
Tefft Street Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	33.1	D	3	22.2	C
State Route 101 Northbound Off-Ramp	D	Diverge	2	34.8	D	3	24.5	C
State Route 101 Southbound On-Ramp	D	Merge	2	31.3	D	3	20.7	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	**36.4**	**E**	3	26.0	C
South Nipomo Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	31.0	D	3	19.5	B
State Route 101 Northbound Off-Ramp	D	Diverge	2	**42.9**	**E**	3	30.3	D
State Route 101 Southbound On-Ramp	D	Merge	2	**36.9**	**E**	3	25.6	C
State Route 101 Southbound Off-Ramp	D	Diverge	2	34.9	D	3	24.5	C
Cuyama Lane/State Route 166 Interchange								
State Route 101 Northbound On-Ramp	D	Merge	2	**39.4**	**E**	3	25.0	C
State Route 101 Northbound Off-Ramp	D	Diverge	3	**38.7**	**E**	3	**38.7**	**E**
State Route 101 Southbound On-Ramp	D	Merge	3	32.1	D	3	32.1	D
State Route 101 Southbound Off-Ramp	D	Diverge	2	**42.3**	**E**	3	28.6	D
North Broadway/State Route 135 Interchange								
State Route 101 Northbound On-Ramp	D	Merge	3	32.7	D	3	32.7	D
State Route 101 Northbound Off-Ramp	D	Diverge	3	32.9	D	3	32.9	D
State Route 101 Southbound On-Ramp	D	Merge	3	24.5	C	3	24.5	C
State Route 101 Southbound Off-Ramp	D	Diverge	3	**35.7**	**E**	3	**35.7**	**E**

Notes: Bolded entries indicate freeway ramp merge diverge junctions operating at unacceptable LOS

As presented in Table 21, northbound off-ramp operations improve at the Tefft Street interchange with the installation of a new interchange in the South Nipomo area. However, even with a new interchange, operations are still similarly poor to the *2035 Baseline Conditions* and *Concept 1* scenarios due to the over-saturation of the mainline lanes. When U.S. 101 is widened to six lanes, most operations improve to LOS C or better and, at all but two locations, LOS D or better.

ALTERNATIVE CORRIDOR IMPROVEMENT SOLUTIONS

There are two principal concepts for improving the U.S. 101 corridor sufficiently to accommodate the projected increases in traffic by Year 2035. The concepts so far addressed in this report aim to improve the U.S. 101 freeway facility itself, and its interchanges, such that projected traffic increases on the freeway are accommodated without significantly changing travel patterns on surface parallel routes. The second concept involves improving and expanding parallel routes sufficiently to absorb traffic that otherwise would use U.S. 101. This approach would minimize improvements to the U.S. 101 freeway and freeway ramp facilities in favor of surface street expansions and improvements. This section will outline potential improvement concepts that would provide the additional capacity needed by Year 2035 focusing on alternative north-south routes.

PARALLEL ROUTE ALTERNATIVES

For this approach, the guiding principle is to minimize improvements to the U.S. 101 freeway facilities while diverting traffic to parallel routes in the study area. The following facilities would require improvements under this scenario:

Thompson Avenue

Thompson Avenue is the adjacent alternative parallel route on the east side of U.S. 101 in Nipomo. Today, daily traffic volumes on Thompson Avenue are about 3,000 south of Tefft Street and up to 6,000 north of Tefft. Although under capacity today, traffic volumes are not projected to increase significantly despite congestion on U.S. 101. The reason for this is largely due to the fact that little growth is planned on the east side of U.S. 101. Heading northbound on Thompson Avenue from the SR 166 (Cuyama) interchange, no development is encountered for over 3 ½ miles. Similarly, heading southbound from the Los Berros Road interchange, little development is encountered until about 2 ½ miles.

Without new attractions or productions, such as residential units or commercial properties, significant traffic is unlikely to divert to Thompson Avenue from U.S. 101. Under the current growth plan and circulation network, daily traffic volumes are projected to increase to 4,000 to 9,000 on Thompson Avenue by Year 2035.

On the southern end of Thompson Avenue, the alignment traverses directly adjacent to US 101 and acts a frontage road at its terminus at SR 166 (Cuyama). Consideration of this alignment for further extension southerly to serve as a parallel route across the Santa Maria River would not be reasonable. Topographic constraints and proximity to US 101 would not make such an alignment a feasible southerly extension alternative. Other extensions easterly of Thompson Avenue were considered that would tie into SR 166 (Cuyama) and then into the existing Bull Canyon Road bridge. However, upon review of the terrain, this project would involve significant costs to negotiate the terrain east of the existing Thompson Avenue alignment. Furthermore, this connection would be significantly out of direction for most users and the length of road between SR 166 (Cuyama) and Bull Canyon Road would likely preclude such a connection from being adopted as a major alternate route.

Orchard Road/Hutton Road

Orchard Road/Hutton Road is the southern adjacent alternative parallel route on the west side of U.S. 101 in Nipomo. Today, daily traffic volumes on Orchard Road are nearly 7,000. This is a significantly used parallel route to U.S. 101 between the Tefft Street and SR 166 (Cuyama) interchanges. During the morning and evening commutes, this traffic creates observable and significant queuing at the ramp terminals, due to closely spaced stop-controlled intersections directly east and west of the off- and on-ramps. Existing industrial and commercial uses on the west side of the SR 166 (Cuyama) interchange restrict the ability to relocate the Hutton Road/SR 166 (Cuyama) intersection westward and provide needed separation between it and the southbound ramp terminals.

This route could be reinforced and increased use could be expected if significant roadway realignment were considered. This would likely involve realigning Orchard Road to come southwest of the recently constructed subdivision on Moss Lane and feed into Cuyama Lane in line with SR 166 (Cuyama). The roadway would also need to be improved to an arterial standard. The minimal existing and planned development between Southland Street and SR 166 (Cuyama) will nonetheless restrict Orchard Road's ability to become a more significant alternate route. Daily traffic volumes are expected to increase on Orchard Road/Hutton Road to between 9,000 and 11,000 if no new interchange is constructed between Tefft Street and SR 166 (Cuyama). However, daily traffic volumes are expected to decrease if a new interchange in South Nipomo is constructed.

On the southern end of Orchard Road, either in conjunction with or as an alternative to realigning Orchard Road, a new connection across the Santa Maria River could possibly be provided that connects to the western developed edge of the City of Santa Maria at either Blosser Road or Railroad Avenue. In this alignment, Orchard Road could divert from where it bends into Joshua Road and turn south across the river. This facility could provide a useful alternate route between the urbanized areas of Nipomo and the City of Santa Maria. The cost of the bridge structure could be significant however, as the span would likely have to include not only the river width but the flood plain as well, extending up to half a mile in length.

Pomeroy Road/Hetrick Road/Summit Station Road

Pomeroy Road and Hetrick Road/Summit Station Road are the northern adjacent alternative parallel routes on the west side of U.S. 101 in Nipomo. Though Pomeroy Road is a better road with higher capacity, the Hetrick Road/Summit Station Road route is shorter and is equally used. Today, a little over 3,000 daily trips use these two routes combined. As an alternative route to U.S. 101 between the Tefft Street and Los Berros Road interchanges.

Connections between Hetrick Road and Pomeroy Road could be improved to promote this alternative route. There are currently dirt roads between the two roads. However, upon completion of the Willow Road interchange, traffic volumes on both these facilities is projected to decrease significantly.

State Route 1 (SR 1)

State Route 1 provides a regional alternative route to U.S. 101, connecting from its divergence from SR 135 in Orcutt, through Guadalupe, and on through western Nipomo in San Luis Obispo County and eventually merging back into U.S. 101 in Pismo Beach. Currently, daily traffic volumes on SR 1 range from around 10,000 near Oceano to 5,000 at the Santa Maria River crossing. This route is used significantly for agriculture-related activities and also for some regional travel between the coastal communities. Use as a north-south alternative is limited due to its distance from downtown Santa Maria, the relative undeveloped nature of the route until Oceano, and the indirect alignment of the route.

In order to promote SR 1 as a viable alternate route from Santa Barbara County, the route could be realigned in a less-circuitous fashion in order to remove the 90-degree turns near Willow Road and Halcyon Road. However, due to the spacing of SR 1 from developed regions surrounding U.S. 101 in San Luis Obispo and Santa Barbara counties, it is not projected that traffic volumes will increase significantly for inter-county regional travel. By Year 2035, traffic volumes are projected to increase to about 7,500 at the Santa Maria River crossing and about 15,000 near Halcyon Road.

Bonita School Road

Bonita School Road connects SR 166 (Cuyama) in Santa Barbara County to the east-west Division Street collector in southwest Nipomo. The road is unpaved south of the bridge over the Santa Maria River for about 2,000 feet in Santa Barbara County. Daily traffic volumes today are about 3,000, and consist largely of agricultural transportation between farmlands in each county. The underdeveloped nature of the river crossing, as well as its distance from central Santa Maria, prevent this route from being used as a major north-south alternative. Furthermore, access to central Nipomo via Division Street is discouraged due to the steep grade ascending and descending the mesa towards Orchard Road.

The route could be made more attractive for non-agricultural travel between Santa Barbara County and Nipomo by improving the roadway to County standards and realigning the segment in the vicinity of the mesa to smoothen the climb and descent by reducing the percent grade of the roadway. As with Highway 1, however, it is not projected that traffic volumes will increase significantly for inter-county regional travel. By Year 2035, daily traffic is expected to increase to slightly under 4,500.

Summary Analysis of Parallel Route Alternatives

Of the alternative parallel routes explored, the most promising potential for a new parallel route appears to be the extension of Orchard Road from Joshua Road across the river into the City of Santa Maria at Blosser Road or Railroad Avenue. Detailed traffic modeling of the expected traffic diversion provided by alternate routes was not completed in this study but will be required prior to making a final assessment as to the expected traffic diversion provided by a new facility, and to determine specific lane and intersection configurations for any new or expanded facilities. Further study will also be required to determine the most feasible alignment of any new connection across the Santa Maria River. A general location of the crossing location is provided in Figure 7.

FIGURE 7 – GENERAL LOCATION OF POSSIBLE PARALLEL ROUTE

POTENTIAL IMPROVEMENTS TO THE U.S. 101 CORRIDOR

Of the two principal improvements concepts (develop parallel routes or improve U.S. 101), improvement to the U.S. 101 interchanges and mainline appear to be the more efficient course of action. However, beyond considering improvements to existing interchanges, construction of additional changes, and widening of U.S. 101 to 6 lanes, concepts for developing new parallel routes between the urbanized areas of Nipomo and the City of Santa Maria will need to be developed.

Improvements to the U.S. 101 corridor have been suggested based on the analyses contained in this report. The development of these improvements is based not only on future projected conditions, but also on existing conditions.

TABLE 22
POTENTIAL IMPROVEMENTS TO U.S. 101 CORRIDOR

Improvement Location	Reasoning
Tefft Street Interchange	This improvement should be considered because conditions are already unacceptable at this intersection. Even with a new interchange at Willow Road, this interchange will experience significant congestion in the near-term.
SR 166 (Cuyama) Interchange	This improvement should be considered because conditions during the AM and PM peak hours are already congested and significant queues are observable. Specifically, the ramp terminal intersections and frontage road intersections should be reconfigured and operational improvements should be installed.
New Interchange in South Nipomo	Beyond improvements to the Tefft Street and SR 166 (Cuyama) interchanges that provide intermittent congestion relief in the corridor, traffic volumes are still projected to increase enough by Year 2035 that an additional interchange will need to be considered. The incremental improvements to the SR 166 (Cuyama) interchange are not intended to satisfy Year 2035 volumes. The logical placement for such an interchange is between Tefft Street and SR 166 (Cuyama).
Widen U.S. 101	By Year 2035, incremental improvements to Tefft Street and SR 166 (Cuyama) interchanges, and the construction of a new interchange south of Tefft Street, may no longer suffice in providing acceptable ramp and mainline operations on U.S. 101. Widening of the freeway to six lanes, and conversion of expressway segments to freeway standards, should be considered in conjunction with potential improvements to parallel routes.
Develop alternate north-south parallel routes	The construction of new, and/or reinforcement of existing, north-south parallel alternate routes should be considered. In particular, a new river crossing from Orchard Road to Blosser Road or Railroad Avenue should be explored to relieve existing rover crossings between Santa Barbara and San Luis Obispo counties.
Corridor Management Strategies	The recently completed U.S. 101 Corridor System Management Plan includes recommended corridor management strategies beyond the physical improvements described in this study. These include connecting land use & transportation planning, rail & transit expansion, transportation demand management, increasing modal options, intelligent transportation systems, and incident management. The U.S. 101 CSMP should be referenced for more discussion on these strategies.

NEED FOR FURTHER ANALYSIS

While the results of this report do provide some clear indications of what direction planning needs to occur in for the U.S. 101 corridor in the coming years, this analysis also reveals that further peak hour intersection operations analysis is needed for selected alternatives at the interchange ramp intersections and their respective surface street corridors. Such specific peak hour corridor analysis along Tefft Street and SR 166 (Cuyama) in the vicinity of their interchanges with US 101 will provide a clearer distinction in traffic operational conditions among the alternatives, particularly in weighing the ultimate need, location and type of new connection and interchange between Tefft Street and SR 166 (Cuyama) on US 101.

CONCLUSIONS

Several conclusions can be drawn from the results of this report. Despite some service level deficiencies in the *Existing Conditions* analysis, it is clear that significant increases in traffic will occur on the U.S. 101 corridor. The *Existing Conditions* analysis revealed deficiencies at the northbound off-ramps for the SR 166 (Cuyama) and SR 135 interchanges. The SR 135 off-ramp deficiency appears to be mitigated in the future condition with the widening of U.S. 101 to 6 lanes (*2025 Baseline Conditions)*. Also identified during the *Existing Conditions* analysis were deficiencies on Tefft Street in the immediate vicinity of the U.S. 101 interchange. Under Year 2035 traffic volumes, these deficiencies appear to be mitigated in the *Concept 3* scenario, which implements reconfigurations to the Tefft Street corridor and assumes a new interchange in the South Nipomo area in addition to the new interchange at Willow Road.

Under Year 2035 volumes, it is clear that significant increases are projected on U.S. 101 and to a lesser degree on surface streets. As presented in the concluding section of this report, *Concept 3* is the only alternative to mitigate daily roadway LOS in the vicinity of the study area interchanges to LOS D or better. Furthermore, it is readily apparent that in order to provide acceptable ramp merge and diverge operations on U.S. 101 interchanges in the study area, the facility should be widened to six lanes through the Los Berros Road interchange.

The results indicate that a new interchange between SR 166 (Cuyama) and Tefft Street would provide substantive improvements to U.S. 101 operations. This new South Nipomo interchange will significantly improve ramp intersection operations at the SR 166 (Cuyama) interchange and the Tefft Street interchange. Furthermore, based on travel demand model testing performed prior to the completion of this report, it is clear that a new interchange should be placed closer to Tefft Street than to SR 166 (Cuyama). Due to the over-saturation of the Tefft Street interchange and surface street corridor, significant demand is projected by Year 2035 on the SR 166 (Cuyama) interchange. The closer to Tefft Street a new interchange is constructed, the more demand will be absorbed by it.

These future level of service issues are not necessarily reflected in the mainline or ramp analysis, but the capacity of the existing SR 166 (Cuyama) stop-controlled ramp intersections will be exceeded by a significant margin and queuing spillback onto the mainline may be a serious concern for the off-ramps. Even with a new interchange between Tefft Street and SR 166 (Cuyama), in the short term it is likely that intermediate improvements to both the Tefft Street and SR 166 (Cuyama) ramp terminal intersections will be required to avoid poor service levels and possible queuing onto the freeway mainline.

As presented at the end of this report, a general prioritization schedule has been developed based on the conclusions of the analyses. After improvements to existing interchanges and the construction of new interchanges, the most efficient means to provide adequate capacity for Year 2035 volumes appears to be widening of U.S. 101. However, beyond widening U.S. 101 to six lanes, it will become less feasible to further widen the freeway, and alternate north-south routes should be considered at that stage. One such possible new route that would provide a connection between urbanized Nipomo and the City of Santa Maria is the extension of Orchard Road south from Joshua Road, across the river, into the western edge of the City of Santa Maria. This connection would likely be costly due to the significant bridge structure likely required over the river and flood plain, but would tie into Blosser Road or Railroad Avenue to provide an indirect connection into downtown Santa Maria. This connection would relieve the demand on U.S. 101, especially between the SR 135 interchange and the SR 166 (Cuyama) interchange.

While this report presents general improvement recommendations, further detailed peak hour intersection level of service analysis is recommended prior to adopting any prioritization schedule. Such further analysis, for example micro-simulation of the interchange terminals on U.S. 101, will further define the operational deficiencies of the corridor. Without such analysis the ability to determine specific improvement plans and improvement costs required to satisfy projected demands will be limited.

Through the analyses presented in this report, an overview of existing and future safety and operations on the U.S. 101 corridor in South County has been established. This report presents general concepts for realistic, feasible solutions to be further developed that will satisfy the short term and long term transportation needs for the corridor. The improvements presented in this report provide the incremental increases to corridor capacity to meet projected travel demand and can be phased according to available funds and prioritization of needs. This report presents a prioritization of likely improvement needs moving forward towards 2035. Continued monitoring of traffic conditions and collaborative planning between affected agencies will ensure that appropriate corridor capacity improvements are implemented to maintain and improve the safety and mobility of local and interregional travel within the U.S. 101 corridor.