4.2 TRAFFIC AND TRANSPORTATION

4.2.1 INTRODUCTION

This section of the EIR describes transportation and traffic impacts attributable to implementation of the 2030 General Plan. The information is based on research and analysis conducted by KDAnderson & Associates, Inc. Transportation Engineers in 2008 and 2009.

DRAFT CIRCULATION DIAGRAM

The 2030 General Plan Circulation Element identifies a hierarchy of streets and highways that will provide access to new and existing development, while linking the community with the balance of the Sutter County – Butte County area. Planned vehicular improvements are depicted in Exhibit 4.2-1.

Street Classification

The Live Oak circulation system is comprised of State Route 99 (SR 99) as well as Arterial, Major Collector, Minor Collector, and Local streets.

State Highways / Arterials. The Circulation Diagram identifies SR 99 as the primary element of the City's circulation system. This street is expected to be widened to provide two through lanes in each direction, with auxiliary turning lanes at major intersections.

The Circulation Diagram identifies other Arterial streets that will serve as alternatives to SR 99. Most Arterials are expected to be two lanes, although some would have four lanes. The design of access and alignment of Arterial streets will accommodate travel speeds that are higher than those expected on lesser streets. Parking will be prohibited. The Circulation Diagram identifies the Arterial streets (Table 4.2-1).

Table 4.2-1
State Highway and Arterials

Arterial	From	To	Lanes
State Route 99	Paseo Avenue	Ash Street	4*
State Route 99	Ash Street	Kola Street	4
State Route 99	Kola Street	Riviera Road	4
Township Road	Planning Area limits	Riviera Road	2
Paseo Avenue	Township Road	State Route 99	2
Sinnard Avenue	99 Access Point	Road C	2
Apricot Street – Broadway connection	Broadway	State Route 99	2
Broadway	Apricot Street – Broadway connection	Apricot Street	2
Larkin Road	Road 5	Road 3	2

* access to be limited to achieve Caltrans' expressway standards

Major Collectors. Major Collectors provide greater amenities for non-automobile traffic than Arterials, permit more local access, and may include on-street parking. However, Major Collectors are intended to promote city-wide circulation to a greater degree than Minor Collectors and may be two or four lanes. The Circulation Diagram designates the Major Collector streets (Table 4.2-2).

Table 4.2-2 Major Collectors			
Major Collector Street	From	To	Lanes
Sinnard Avenue	Township Road	Orchard Way	2
Sinnard Avenue	Orchard Way	Pennington Road	2
Pennington Road	Township Road	N Street	2
Pennington Road	N Street	State Route 99	4
Pennington Road	State Route 99	Sheldon Avenue	2
Larkin Road	Riviera Road	Road 5	2
Larkin Road	Road 3	Paseo Avenue	2

Minor Collectors. Minor Collectors provide both local access and community circulation and are two-lane facilities. The Circulation Diagram identifies the Minor Collector streets (Table 4.2-3).

Railroad Crossings. The Circulation Diagram perpetuates existing railroad crossings and identifies a new grade separation over the Union Pacific Railroad (UPRR). In addition to the public crossings listed in Table 4.2-4, there is an existing private railroad crossing located approximately 200 feet north of Bishop Avenue that provides access to SR 99.

GENERAL PLAN POLICIES

The 2030 General Plan addresses evaluation of traffic conditions with implementation of the Plan. The General Plan Circulation Diagram is designed to provide acceptable traffic operations within the Planning Area with complete buildout of the General Plan.

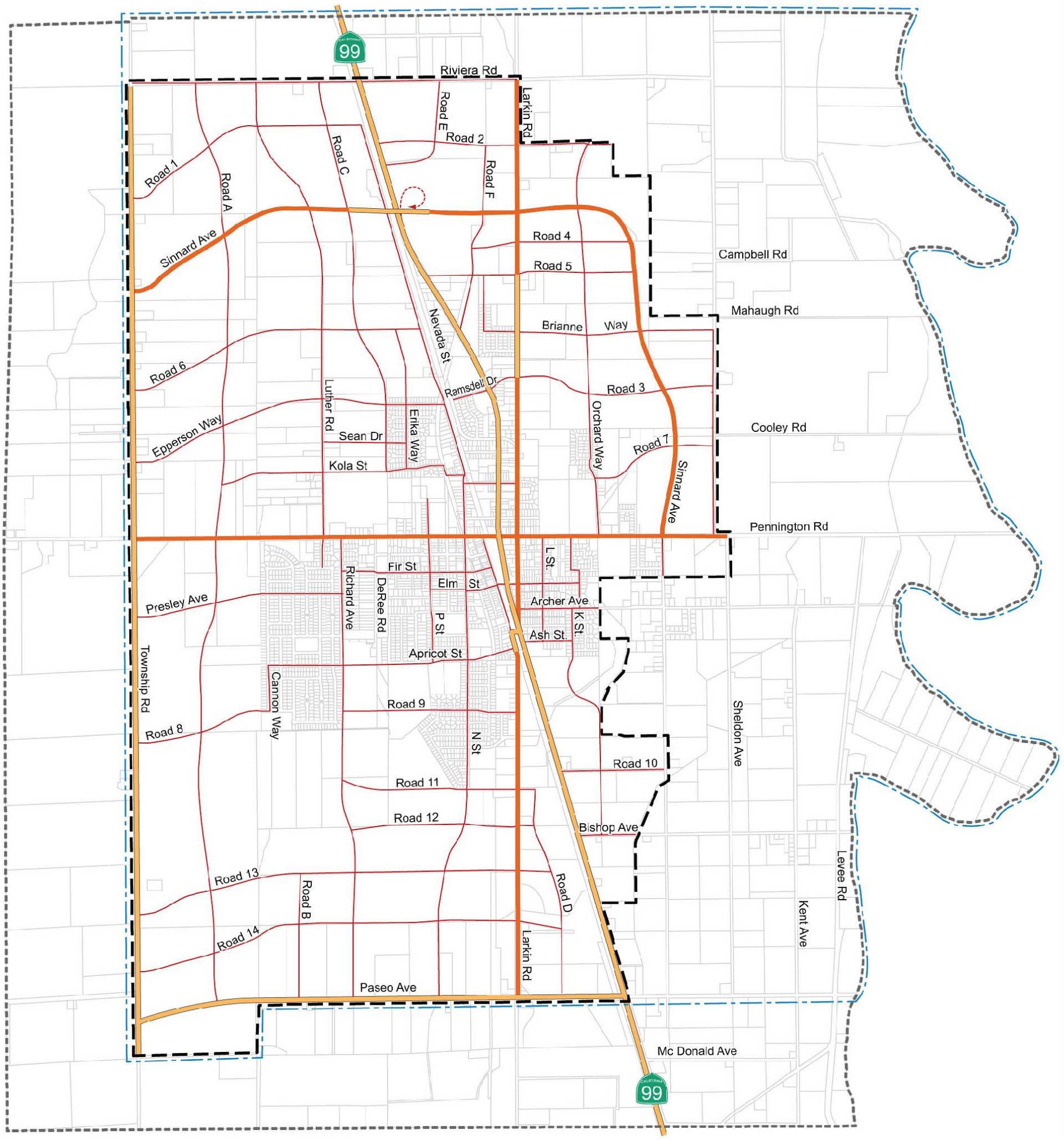
The City's proposed Level of Service (LOS) standard is "D" for City streets and intersections with these roadways, although the Circulation Element also identifies locations where a more congested LOS is acceptable due to physical constraints or lack of local control over the improvements necessary to achieve LOS standards.

The LOS D standard will apply to both average daily trip (ADT) and peak-hour traffic estimates for City streets. For projects where the City is the lead agency, a LOS E standard will be applied for segments of SR 99 and intersections with SR 99 (consistent with the current Caltrans Transportation Concept Report for this segment).

4.2.2 REGULATORY FRAMEWORK

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

The U.S. government participates in transportation through the regulation of airspace and water space, funding and oversight of transit service, and funding and oversight of the roadway system. Oversight of roadways includes regulation of allowable vehicles on public roadways based on type, fuel emission targets, and air quality performance. The most recent authorization was in July 2005, when the U.S. Congress passed the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU represents the most recent in a long-established system of transportation oversight efforts involving funding and authorization by Congress. Federal requirements are also relevant when applying for funds to construct projects. Planning, forecasting, and project funding have been governed by planning requirements assigned to the regional metropolitan planning organizations (MPOs), which are discussed below.



LEGEND

Boundaries
- Study Area
- Planning Area
- Sphere of Influence
- Parcels

Roadways
- Arterial/Highway 99
- Major Collector
- Minor Collector

0 875 1,750
FEET

N

G 08110072.01 004 11/09

Source: Sutter County Assessor's Office, Live Oak GIS, Adapted by EDAW 2008

Imagine the future...
City Of Live Oak
General Plan

Exhibit 4.2-1
Vehicular Circulation Diagram

Table 4.2-3
Minor Collector Streets

Minor Collector Street	From	To	Lanes
East-West Streets			
Riviera Road	Township Road	Larkin Road	2
Road 1	Township Road	N Street	2
Road 2	State Route 99	Orchard Way	2
Road 4	Road F	Sinnard Avenue	2
Road 5	State Route 99	Sinnard Avenue	2
Road 6	Township Road	N Street	2
Brianne Way	Stephanie Drive	Metteer Road	2
Jennifer Drive	Stephanie Drive	Larkin Road	2
Epperson Way	Township Road	N Street	2
Ramsdell Drive	Nevada Street	State Route 99	2
Road 3	State Route 99	Metteer Road	2
Sean Drive	Luther Road	Erika Way	2
Kola Street	A Street	State Route 99	2
Road 7	Orchard Way	Metteer Road	2
Fir Street	Richard Avenue	Broadway	2
Presley Avenue	Township Road	Richard Avenue	2
Elm Street	P Street	State Route 99	2
Elm Street	State Route 99	K Street	2
Archer Avenue	State Route 99	Planning Area boundary	2
Ash Street	State Route 99	K Street	2
Apricot Street	Cannon Way	Broadway	2
Road 8	Township Road	Cannon Way	2
Road 9 (Allen Street)	Richard Avenue	Larkin Road	2
Coleman Avenue – Road 10	State Route 99	Planning Area boundary	2
Road 11	Richard Avenue	Road D	2
Road 12	Richard Avenue	Road D	2
Bishop Avenue	State Route 99	Planning Area boundary	2
Road 13	Township Road	Road D	2
Road 14	Township Road	Road D	2
Minor Collector Street	From	To	Lanes
North-South Streets			
Road A	Riviera Road	Paseo Avenue	2
Cannon Way	Apricot Street	Road 8	2
Luther Road	Riviera Road	Arbor Way	2
Road B	Road 13	Paseo Avenue	2
Richard Avenue	Pennington Road	Paseo Avenue	2
Road C	Riviera Road	Kola Street	2
Erika Way	Road 6	Kola Street	2
P Street	Park Street	Apricot Street	2
N Street	Road 1	Pennington Road	2
N Street	Pennington Road	Paseo Avenue	2
Broadway	Pennington Road	Apricot Street	2
Road E	Riviera Road	State Route 99	2
Road F	Road 2	State Route 99	2
Road D	Road 11	Paseo Avenue	2
L Street	Pennington Road	Ash Street	2
K Street	Pennington Road	Bishop Avenue	2
Orchard Way	Road 2	Pennington Road	2
Sinnard Avenue	Pennington Road	Planning Area limits	2
Metteer Road	Mahaugh Road	Pennington Road	2
Stephanie Drive	Road 5	Jennifer Drive	2

Table 4.2-4 Public UPRR Crossings under 2030 General Plan	
Street	Condition
Riviera Road	Existing at-grade
Sinnard Avenue	Proposed grade separation
Kola Street	Existing at-grade
Pennington Road	Existing at-grade
Elm Street	Existing at-grade
Apricot – Broadway	Existing at-grade
Paseo Avenue	Existing at-grade

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Department of Transportation. The California Department of Transportation (Caltrans) prepares various planning documents for facilities throughout the state. The goals established for specific highways are documented in Transportation Concept Reports (TCR). The TCR is a system planning document and tool which also includes an analysis of a transportation corridor. The TCR establishes a 20-year transportation planning concept that is consistent with Caltrans' goals as set forth in the District System Management Plan (DSMP). The TCR also establishes the future concept of LOS for segments along the route and broadly indentifies the nature and extent of the improvements needed to attain a LOS. Operating conditions for each corridor are projected for 10- and 20-year horizons. Beyond the 20-year planning period, the TCR identifies the Ultimate Transportation Corridor (UTC) to ensure that adequate right-of-way is preserved for future ultimate facility projects.

The 2004 TCR for SR 99 provides information for the segment of SR 99 serving the Live Oak area. The concept LOS for the 20-year planning horizon for SR 99 in the Live Oak area is LOS E. In addition, the Concept Facility for SR 99 is a four-lane facility. South of Live Oak Blvd, the four-lane facility is to be developed an expressway, while a four-lane conventional highway is ultimately planned through Live Oak. Table 4.2-5 summarizes the concept for SR 99 in the Live Oak Planning Area (segment 8).

Table 4.2-5 Concept for State Route 99 Live Oak							
Segment	Post Mile	Location	2000 LOS	Current Facility	2025 LOS	2025 Concept LOS	2025 Concept Facility
8	35.0–42.4	1 mile north of Eager Road to Butte Co line	E	2-Lane C	F	E	4-Lane Expressway to Live Oak Blvd then 4-lane conventional w/ passing lanes
Notes: 2 lane C is two-lane conventional highway							

California Public Utilities Commission

The California Public Utilities Commission (PUC) is the state agency that governs railroad, rail transit and passenger transportation companies in California.

REGIONAL PLANS, POLICIES, REGULATIONS, AND LAWS

Sacramento Area Council of Governments. The Sacramento Area Council of Governments' (SACOG) 2008 Metropolitan Transportation Plan (MTP) specifies the policies, projects, and programs necessary to maintain, manage, and improve the region's transportation system over a 28 year period. The MTP identifies a comprehensive, long-range view of transportation needs and opportunities for the six counties that comprise SACOG. In addition, the MTP establishes goals and objectives for the future system and identifies the actions necessary to achieve these goals. Finally, the MTP describes a funding strategy and options for implementing the actions. Appendix B includes a tabular summary of numerous goals, objectives, and policies contained in the MTP related to automobile, circulation models, transit, and alternative transportation.

Sutter County

Sutter County is directly responsible for the construction and maintenance of all roads in the county, other than those within the incorporated cities and state routes (e.g., SR 99). The County established roadway classifications and minimum LOS policies for County roads, of which, LOS D is the minimum operating LOS on County roads.

EXISTING CONDITIONS

The quality of current traffic conditions in the Live Oak Planning Area has been identified and summarized herein, based on information originally assembled for the General Plan Background Report. The description of existing conditions make use of information regarding daily traffic volumes on key roadways, peak-hour traffic volumes at major intersections, and the number of trains traveling through Live Oak on the UPRR.

ANALYSIS METHODOLOGIES

The analysis presented in this section describes the quality of traffic movement on roadways in the Planning Area under current conditions and under full buildout of the 2030 General Plan. The analysis uses buildout estimates from the 2030 General Plan, as well as information on the roadway network that is planned to serve development anticipated under the Plan.

Individual roadway segments and intersections are analyzed differently, and intersections are divided further into two main categories: un-signalized and signalized. For this study, the following methodologies were used.

- Intersections – Transportation Research Board, 2000 Highway Capacity Manual, for un-signalized and signalized Intersections.

- Roadways – Comparison of daily traffic volumes to maximum thresholds associated with LOS.

Definitions. The above methodologies were used to calculate levels of service at all study locations. Level of Service (LOS), along with a detailed description of the analysis methodologies is described below. LOS is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Typically, LOS is measured by a system of letters (A thru F) designating various levels of operating conditions for different types of roadway facilities (i.e., roadways, signalized intersections, un-signalized intersections.) Table 4.2-6 identifies the characteristics of different LOS grades at intersections and on roadway segments.

Level of Service Thresholds based on Daily Traffic Volume. General "planning level" LOS can be identified based on the daily traffic volume occurring on roadways of different types. These values can be used to suggest whether major intersections on a roadway segment are likely to be operating at or above a particular LOS during peak traffic hours.

Table 4.2-6
Level of Service Definitions

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach (es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Sources: 2000 Highway Capacity Manual.

To identify applicable thresholds, information regarding LOS thresholds that was available from other local jurisdictions was reviewed. Sutter County has identified daily volume thresholds in its General Plan Update Technical Background Report and in the recently certified Sutter Point EIR. The Gridley General Plan Update EIR also includes LOS threshold for roads that are similar to those planned in Live Oak. These criteria were reviewed with City staff, and the resulting LOS thresholds judged to be applicable to the City of Live Oak are noted in Table 4.2-7.

Table 4.2-7
Level of Service Thresholds Based on Daily Traffic Volume

Classification	Lanes	Maximum Daily Volume				
		LOS A	LOS B	LOS C	LOS D	LOS E
State Highway	2E	15,000	17,500	19,500	23,500	26,000
	4E	31,000	35,000	39,000	47,000	52,000
	6E	46,000	52,000	58,000	71,000	77,000
Arterial	2+	12,000	14,000	16,000	18,000	20,000
	4+	24,000	28,000	32,000	36,000	40,000
	6+	36,000	42,000	48,000	54,000	60,000
Major Collector	2	9,000	10,500	12,000	13,500	15,000
	4	18,000	21,000	24,000	27,000	30,000
Minor Collector	2	6,000	7,200	8,400	10,800	12,000
Rural Road	2	-	-	6,000	12,000	15,000

Notes: (E) indicates limited access and expressway standards for intersection spacing
(+) indicates presence of median or two-way left turn lane

The general capacity and LOS thresholds on SR 99 will vary depending on the level of access permitted to the highway and on the presence of major signalized intersections. There could be different LOS thresholds for locations on SR 99 in Live Oak depending on expected intersection spacing and access control. The portion of SR 99 through downtown Live Oak is likely to behave like an Arterial due to the close proximity of signals at Pennington Road and Elm Street. However, south of Archer Avenue, the road could potentially have limited access and greater distance between signals, and this portion could behave like an Expressway.

Levels of Service at Intersections. Table 4.2-6 (previously cited) shows the relationship between service levels for intersections controlled by two-way and four-way stop signs and presents the characteristics of signalized intersections as well. Intersection LOS is based on control delay and is presented in terms of seconds of delay per vehicle. At intersections controlled by side street stop signs, two values are typically given: the "worst case" scenario and the "average per vehicle" in the intersection. The "worst case" condition typically describes the delays experienced by motorists waiting to turn left onto the uncontrolled major street. For this study, the "worst case" scenario control delay was used to determine the reported intersection LOS.

Existing Traffic Conditions

Level of Service Based on Daily Traffic Volumes. Table 4.2-8 identifies current daily traffic volumes on streets in Live Oak, along with the LOS that occurs on those streets during peak traffic hours.

Existing Levels of Service. Table 4.2-9 identifies current operating LOS occurring at intersections in Live Oak during A.M. and P.M. peak hours.

Acceptable Levels of Service. The 2030 General Plan Circulation Element identifies that LOS D as the minimum acceptable LOS on City Streets, with LOS E accepted on SR 99 and intersections with SR 99. The Circulation Element also identifies certain roadway segments where physical constraints or the lack of local control over needed improvements would prevent the City from achieving LOS D.

Existing Levels of Service. As noted previously in Table 4.2-8, with one exception, all roadway segments carry daily traffic volumes indicative of LOS C or better. That exception is the segment of SR 99 south of Pennington Road, which operates at LOS E.

As noted previously in Table 4.2-9, the "overall" average delays at Live Oak intersections do not exceed LOS C. At un-signalized intersections the "worst case" delays are indicative of conditions in excess of LOS C at eight (8) locations, with LOS D exceeded at six (6) locations.

Railroad Operations

A heavy rail line exists within the Planning Area that parallels SR 99. Union Pacific Railroad Company operates several runs per day ranging from small, 10- to 20-car trains, up to 30- and 40-car trains. Observations showed that the effect on traffic operations is significant when a train is present. As gates drop on Pennington Road, traffic may become trapped between SR 99 and the railroad gate, and halted west of the railroad gate. Observations during the A.M. and P.M. peak hour at this location indicate a significant queuing problem on Pennington Road when trains are present. On one occasion, westbound traffic on Pennington Road, anticipating the raising of the gates, was observed to block southbound traffic on SR 99.

Any future improvements involving railroad facilities will require advance coordination with both the Union Pacific Railroad Company and the California Public Utilities Commission.

Table 4.2-8
Existing Roadway Classification, Daily Volume and Level of Service

Roadway	From	To	Classification	Lanes	Daily Traffic Volume (ADT)	LOS
Riviera Road	Township Road	State Route 99	Minor Collector	2	1,600	A
Riviera Road	State Route 99	Larkin Road	Minor Collector	2	3,100	A
Township Road	Riviera Road	Pennington Road	Arterial	2	1,900	A
Township Road	Pennington Road	Paseo Avenue	Arterial	2	2,000	A
Pennington Road	Township Road	Luther Road	Major Collector	2	1,800	A
Pennington Road	Luther Road	N Street	Major Collector	2/3	3,300	A
Pennington Road	N Street	State Route 99	Major Collector	3	9,100	B
Pennington Road	State Route 99	Sheldon Road	Major Collector	2	7,900	A
Luther Road	Pennington Road	North of Pennington Road	Minor Collector	2	230	A
Metteer Road	Riviera Road	Pennington Road	Minor Collector	2	3,600	A
Metteer Road	Pennington Road	Cooley Road	Minor Collector	2	370	A
Richards Road	Pennington Road	South of Pennington Road	Minor Collector	2	1,700	A
Larkin Road	Riviera Road	Pennington Road	Major Collector	2	2,990	A
Larkin Road	Pennington Road	State Route 99	Minor Collector	2	700	A
Larkin Road	Apricot Street	Paseo Avenue	Minor Collector	2	2,100	A
N Street	Pennington Road	Dean Street	Minor Collector	2	1,400	A
N Street	Hampton Road	Pennington Road	Minor Collector	2	2,900	A
State Route 99	Riviera Road	Pennington Road	Arterial	2	15,200	C
State Route 99	Pennington Road	Paseo Avenue	Arterial	2	18,900	E
Sinnard Avenue	Pennington Road	Archer Avenue	Arterial	2	2,400	A
Sinnard Avenue	Archer Avenue	Bishop Avenue	Arterial	2	240	A
Bishop Avenue	State Route 99	Sinnard Avenue	Minor Collector	2	180	A
Sheldon Road	Pennington Road	Archer Avenue	County Rural Road	2	400	A
Sheldon Road	Archer Avenue	Bishop Avenue	County Rural Road	2	115	A
Archer Avenue	State Route 99	Sinnard Avenue	Minor Collector	2	790	A
Paseo Avenue	Township Road	State Route 99	Arterial	2	1,100	A
Paseo Avenue	State Route 99	Sinnard Avenue	County Rural Road	2	900	A
Paseo Avenue	Sinnard Avenue	Sheldon Avenue	County Rural Road	2	110	A
Kent Avenue	Bishop Avenue	Paseo Avenue	County Rural Road	2	370	A

KDAnderson & Associates, Inc. Transportation Engineers, 2008 and 2009.

Table 4.2-9
Study Intersections and Existing Levels of Service

Intersection	Traffic Control	Am Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Average Delay		LOS		Average Delay		LOS		
		Overall	Worst Case	Overall	Worst Case	Overall	Worst Case	Overall	Worst Case	
1. Riviera Road / Township Road	2-way stop sign	1	9	A	A	1	9	A	A	No
2. State Route 99 / Riviera Road	2-way stop sign	1	17	A	C	1	41	A	E	No
3. Riviera Road / Larkin Road	2-way stop sign	2	10	A	B	1	11	A	B	No
4. State Route 99 / Old Live Oak Highway	2-way stop sign	1	22	A	C	1	21	A	C	No
5. State Route 99 / Ramsdell Drive	2-way stop sign	1	14	A	B	1	42	A	E	No
6. State Route 99 / Kola Street	2-way stop sign	1	25	A	D	3	54	A	F	Yes
7. Pennington / Township Road	4-way stop sign	8	-	A	-	8	-	A	-	No
8. Pennington Road / Luther Road	2-way stop sign	4	10	A	A	3	10	A	B	No
9. Pennington Road / Richards Road	2-way stop sign	1	10	A	A	1	9	A	A	No
10. Pennington Road / N Street	2-way stop sign	3	19	A	C	4	18	A	C	No
11. Pennington Road / Broadway	2-way stop sign	2	16	A	C	3	14	A	B	No
12. State Route 99 / Pennington Road	Signal	32	-	C	-	28	-	C	-	n/a
13. Pennington Road / Larkin Road	2-way stop	15	93	C	F	6	16	A	C	Yes
14. Pennington Road / Orchard Way	2-way stop	2	14	A	B	2	9	A	A	No
15. Pennington Road / Sinnard Avenue	2-way stop sign	4	9	A	A	2	9	A	A	No
16. Pennington Road / Metteer Road	2-way stop sign	5	9	A	A	5	9	A	A	No
17. N Street / Elm Street	4-way stop sign	7	-	A	-	7	-	A	-	No
18. State Route 99 / Elm Street	2-way stop sign	8	99	A	F	8	181	A	F	Yes
19. State Route 99 / Archer Avenue	2-way stop sign	1	23	A	C	2	49	A	F	No
20. State Route 99 / Coleman Avenue	2-way stop sign	1	34	A	D	1	27	A	D	No
21. State Route 99 / Bishop Avenue	2-way stop sign	1	28	A	D	1	32	A	D	No
22. Paseo Avenue / Township Road	2-way stop sign	1	9	A	A	1	9	A	A	No
23. Paseo Avenue / Larkin Road	4-way stop sign	8	-	A	-	8	-	A	-	No
24. State Route 99 / Paseo Avenue	2-way stop sign	1	64	A	F	1	73	A	F	No

KDAnderson & Associates, Inc. Transportation Engineers, 2008 and 2009.

Pedestrian Facilities

Pedestrian facilities are located along roadways that have been recently constructed as a part of local residential developments, and older, more established roadways. Some critical locations lacking pedestrian facilities include portions of SR 99 through downtown Live Oak, Luther Road, portions of Pennington Road, portions of Larkin Road, and other various locations. These areas are considered critical since they are near schools and the community's core, where there is a higher degree of pedestrian activity. There are school crossings available for children walking to school on most roadways linking the Luther Elementary School to Pennington Road, as well as on Pennington Road east of SR 99 linking Live Oak High School with the Middle School further to the east.

Bicycle Facilities

Currently, there are few exclusive bicycle facilities for travel throughout Live Oak. Most school and recreational locations provide for bicycle storage on site. There are some on-street bike lanes on Pennington Road, from Larkin Road to Connecticut Avenue and on P Street, from Pennington Road to Apricot Street.

The City has finished plans and specifications for the "Live Oak Community Trail," and is currently in the process of identifying funding to construct this one-mile, multi-use trail from Apricot Street on the south to Epperson Drive on the north.

Transit Facilities

Currently, there is little transit service for the Live Oak Planning Area. Yuba Sutter Transit operates a single run between the Marysville/Yuba City area to Live Oak three times a week with a stop located near Live Oak Memorial Park (at Pennington Road and O Street).

School Access and Circulation

There are three main schools in Live Oak. They are:

- Live Oak High School,
- Live Oak Middle School, and
- Luther Elementary School.

These schools attract both vehicle trips and non-motorized student and staff trips. The following describes typical activity observed around the schools, and summarizes discussions and information provided by all schools.

Live Oak High School. Live Oak High School is located on the east side of SR 99, north of Pennington Road between Larkin Road and Orchard Way. Primary access to the school is provided by a loop driveway from Pennington Road leading to staff parking and the main school complex. Student parking is located east of the main access road adjacent to the tennis courts.

Live Oak Middle School. East of the High School is the Live Oak Middle School. As there are no student drivers at this school, student drop-offs (parents, etc.), staff, and visitors were assumed to be the only vehicle trip generating sources at this site. As with high school non-motorized trips, students traveling to the school site were observed to use Pennington Road — mostly on the south side of this street.

Luther Elementary School. Luther Elementary is located on Connecticut Avenue, west of SR 99. Off-street parking is available for teachers and staff and sidewalks are available where drop-off locations are provided.

Airports

The Sutter County airport is located at 100 Airport Road in Yuba City. This general aviation airport is roughly 12 miles from Live Oak. The Oroville Municipal Airport is about 22 miles from Live Oak and the Chico Municipal Airport is approximately 37 miles north. The Sacramento International Airport is located along Interstate 5 in Sacramento County and is roughly 50 miles south of Live Oak.

4.4.3 IMPACTS AND MITIGATION MEASURES

METHOD OF ANALYSIS

Technical Approach. To evaluate the impacts of implementing the City of Live Oak's 2030 General Plan, the traffic study used estimates of land use and total buildout of the entire Planning Area. The traffic study identified the amount of vehicular traffic accompanying total buildout of the General Plan, assigned traffic to the planned circulation system, and determined resulting LOS. The traffic study included estimates of development outside of the Live Oak SOI that could directly affect traffic on Live Oak's streets. Impacts are characterized relative to existing conditions. Trip generation associated with new development was estimated using the residential (per dwelling unit) and non-residential (per employee) trip generation rates that are included in the regional traffic model, as well as the employee densities assumed for each land use category (Table 4.2-10).

Table 4.2-10
New Land Use / Trip Generation Under Buildout of the 2030 General Plan

Land Use	Unit	2030 General Plan	
		Quantity	Daily Trips
Residential			
Single Family Residential	Dwelling	13,897	126,463
Multiple Family Residential	Dwelling	1,869	12,990
Subtotal Residential		**15,766**	**139,453**
Non-Residential			
Commercial Mixed Use	Ksf	2,543.3	45,779
Community Commercial	Ksf	647.2	38,741
Employment / Industrial	Ksf	1,969.6	37,324
Subtotal Non-Residential		**5,160.1**	**121,845**
Total Trips			**261,298**

KDAnderson & Associates, Inc. Transportation Engineers, 2009.

The 2030 General Plan could accommodate approximately 15,000–18,000 new residences at full buildout. The 2030 General Plan could potentially accommodate an additional 4,500,000–6,000,000 square feet of commercial and employment uses. As shown, the new uses that could be accommodated under the 2030 General Plan would produce approximately 261,298 trip ends.

The 2030 General Plan is relatively "balanced" in terms of the relationship between residential and non-residential trips, while the 1994 General Plan is weighted heavily towards non-residential uses. A "balanced" General Plan would account for the range of residential and nonresidential land uses and activities to decrease the need to travel outside the planning area for employment, services, or housing. The relationships between residential land uses and destination land uses are not only important for the amount of trips, but also the average trip length and trip mode.

Travel Demand Forecasting Model. The City of Live Oak is included in the Tri-County Regional Travel Demand Forecasting Model. This travel demand forecasting tool was originally developed for Caltrans. While it is generally applicable to Sutter, Yuba, and Butte counties, this model also incorporates information from the other four counties included in the Sacramento Area Council of Governments (SACOG) area.

Regional models are intended to provide information for major facilities and typically lack the detail need to provide accurate forecasts at the collector street level. To provide forecasts for the 2030 General Plan, the traffic model was refined for the Live Oak Planning Area. Collector and arterial streets anticipated to be constructed under the 2030 General Plan Circulation Diagram were added to the model as new links and the original system of traffic analysis zones (TAZs) was disaggregated to provide greater detail and to estimate volumes along the planned street system in a more accurate manner. These model changes and estimates of future land use were added to the traffic model and daily traffic volume projections were made for the 2030 General Plan.

Projected Daily Traffic Volumes

Table 4.2-11 identifies daily traffic volumes on Minor Collectors, Major Collectors, and Arterials within the Planning Area and on Sutter County roads immediately outside of the Planning Area. Resulting LOS assuming implementation of the roadway improvements identified in the Circulation Diagram are also presented.

Intersection Levels of Service

Peak-hour intersection traffic volumes were identified for key intersections in Live Oak assuming implementation of the 2030 General Plan. Table 4.2-12 identifies resulting peak-hour LOS forecast for key Planning Area intersections.

Forecasts for these intersections were developed using the procedures outlined in Transportation Research Board (TRB) National Cooperative Highway Research Program (NCHRP) 255, Highway Traffic Data for Urbanized Project Planning and Design, based on local growth rates derived from existing and projected future daily traffic volumes. No improvements to existing intersection geometry were assumed.

THRESHOLDS OF SIGNIFICANCE

The 2030 General Plan includes policies that identify LOS standards for Live Oak, with LOS D being the minimum standard on City streets and LOS E as acceptable on SR 99 and intersections with SR 99. Sutter County's current minimum standard is LOS D for County roads. The City has made certain exceptions to its LOS standard where physical constraints or the lack of local authority would the implementation of improvements necessary to deliver acceptable LOS. These exceptions are presented in more detail in the Circulation Element (under separate cover) and below, as appropriate.

Based on this guidance and on Appendix G of the State CEQA Guidelines, an impact on transportation and circulation is considered significant if the proposed project would:

- cause City streets or intersections that presently operate at LOS D or better to degrade to LOS E or F, or cause a decrease in LOS for those roadways that presently operate at LOS E or F;
- cause SR 99 segments or intersections operating at LOS E or better to degrade to LOS F;
- result in inadequate emergency access;
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or

Table 4.2-11
Year 2030 Roadway Segment Daily Volumes and Levels of Service with 2030 General Plan

Street	Class	From	To	Current Volume	Lanes	2030 GP Volume	LOS
Riviera Road	Minor	Township Road	State Route 99	1,600	2	5,625	A
	Minor	State Route 99	Larkin Road	3,100	2	1,825	A
Road 1	Minor	Township Road	Luther Road	n/a	2	1,625	A
	Minor	Luther Road	N Street	n/a	2	5,550	A
Road 2	Minor	State Route 99	Larkin Road	n/a	2	4,850	A
West Sinnard Avenue	Major	Township Road	Luther Road	n/a	2	7,225	A
	Major	Luther Road	N Street	n/a	2	8,650	A
	Arterial	N Street	State Route 99 connection	n/a	2	13,800	B
	Major	State Route 99 connection	Larkin Road	n/a	2	7,950	A
	Major	Larkin Road	Orchard Way	n/a	2	5,100	A
Road 4	Minor	Road F	Larkin Road	n/a	2	5,650	A
	Minor	Larkin Road	Sinnard Avenue	n/a	2	8,450	D
Road 5	Minor	State Route 99	Larkin Road	n/a	2	6,275	B
	Minor	Larkin Road	Sinnard Avenue	n/a	2	10,650	D
Road 6	Minor	Township Road	Luther Road	n/a	2	1,375	A
	Minor	Luther Road	N Street	n/a	2	250	A
Brianne Way	Minor	Larkin Road	Sinnard Avenue	n/a	2	7,600	C
Epperson Drive	Minor	Township Road	Luther Road	n/a	2	3,025	A
	Minor	Luther Road	N Street	n/a	2	3,550	A
Ramsdell Drive	Minor	Nevada Street	State Route 99	n/a	2	3,975	A
Road 3	Minor	State Route 99	Larkin Road	n/a	2	9,475	D
	Minor	Larkin Road	Sinnard Avenue	n/a	2	3,050	A
Kola Street	Minor	Road A	Luther Road	n/a	2	4,725	A
	Minor	Luther Road	N Street	n/a	2	6,750	B
	Minor	**N Street**	**State Route 99**	**n/a**	**2**	**11,925**	**E**
	Minor	State Route 99	Larkin Road	n/a	2	6,425	B
Road 7	Minor	Orchard Way	Larkin Road		2	1,550	A

Table 4.2-11
Year 2030 Roadway Segment Daily Volumes and Levels of Service with 2030 General Plan

Street	Class	From	To	Current Volume	Lanes	2030 GP Volume	LOS
Pennington Road	Major	Township Road	Luther Road	1,800	2	3,350	A
	Major	Luther Road	N Street	3,300	2	5,850	A
	Major	N Street	State Route 99	9,100	4	12,950	A
	Major	State Route 99	Larkin Road	7,900	2	5,950	A
	Major	Larkin Road	Sinnard Avenue	7,900	2	5,825	A
Presley Avenue	Minor	Township Road	Richard Avenue		2	3,550	A
Fir Street	Minor	Richard Avenue	Broadway		2	4,325	A
Elm Street	Minor	Broadway	State Route 99		2	3,950	A
	Minor	State Route 99	Larkin Road		2	4,800	A
Archer Avenue	Minor	State Route 99	K Street	790	2	3375	A
Broadway – Apricot 99 Connection	Arterial	Broadway	State Route 99		2	13,950	B
Apricot Street	Minor	Richard Avenue	Broadway		2	7,175	B
Ash Street	Minor	State Route 99	K Street		2	2750	A
Road 8	Minor	Township Road	Cannon Way	n/a	2	2,275	A
Road 9 (Allen Street)	Minor	Richard Avenue	Larkin Road	n/a	2	1,150	A
Road 10 (Coleman Avenue)	Minor	State Route 99	Sinnard Avenue	n/a	2	10,425	D
Road 11	Minor	Richard Avenue	Larkin Road	n/a	2	1,850	A
Road 12	Minor	Richard Avenue	Larkin Road	n/a	2	1,850	A
Bishop Avenue	Minor	State Route 99	Sinnard Avenue	180	2	5,450	A
Road 13	Minor	Township Road	Richard Avenue	n/a	2	2,525	A
	Minor	Richard Avenue	Larkin Road	n/a	2	5,500	A
Road 14	Minor	Township Road	Richard Avenue	n/a	2	3,275	A
	Minor	Richard Avenue	Larkin Road	n/a	2	8,900	D

Table 4.2-11
Year 2030 Roadway Segment Daily Volumes and Levels of Service with 2030 General Plan

Street	Class	From	To	Current Volume	Lanes	2030 GP Volume	LOS
Paseo Avenue	Arterial	Township Road	Richard Avenue	1,100	2	3,825	A
	Arterial	Richard Avenue	Larkin Road	1,100	2	4,975	A
	Arterial	Larkin Road	Road D	1,100	2	6,775	A
	Arterial	Road D	State Route 99	1,100	2	10,450	A
	County Rural Road	State Route 99	Sinnard Avenue	900	2	3,875	A
Clark Road	County Rural Highway	Township Road	Broadway	n/a	2	8,300	D
Township Road	County Rural Road	Butte Co line	Riviera Road	n/a	2	7,775	D
	Arterial	Riviera Road	Sinnar Avenue	1,900	2	6,700	A
	Arterial	Sinnard Avenue	Pennington Road	1,900	2	8,450	A
	Arterial	Pennington Road	Road 8	2,000	2	8,600	A
	Arterial	Road 8	Paseo Avenue	2,000	2	7,525	A
	County Rural Road	Paseo Avenue	Clark Road	n/a	2	8,300	D
Road A	Minor	Riviera Road	Sinnard Avenue	n/a	2	3,450	A
	Minor	Sinnard Avenue	Kola Street	n/a	2	4,925	A
	Minor	Kola Street	Pennington Road	n/a	2	7,675	C
	Minor	Pennington Road	Road 8	n/a	2	5,550	A
	Minor	Road 8	Paseo Avenue	n/a	2	6,050	B
Luther Road	Minor	Riviera Road	Sinnard Avenue		2	3,350	A
	Minor	Sinnard Avenue	Pennington Road		2	4,050	A
Richard Avenue	Minor	Pennington Road	Apricot Street	1,700	2	4,475	A
	Minor	Apricot Street	Road 13	n/a	2	5,325	A
	Minor	Road 13	Paseo Avenue	n/a	2	7,125	B
Road C	Minor	Riviera Road	Sinnard Avenue	n/a	2	1,875	A
	Minor	Sinnard Avenue	Epperson Drive	n/a	2	1,825	A

Table 4.2-11
Year 2030 Roadway Segment Daily Volumes and Levels of Service with 2030 General Plan

Street	Class	From	To	Current Volume	Lanes	2030 GP Volume	LOS
N Street	Minor	Road 1	Sinnard Avenue	n/a	2	4,125	A
	Minor	Sinnard Avenue	Epperson Drive	n/a	2	2,450	A
	Minor	Epperson Drive	Kola Street	2,900	2	2,250	A
	Minor	Kola Street	Pennington Road	2,900	2	7,650	C
	Minor	Pennington Road	Fir Street	1,400	2	10,950	D
	Minor	Fir Street	Apricot Street	1,400	2	8,400	C
	Minor	Apricot Street	Road 13	n/a	2	9,500	D
	Minor	Road 13	Paseo Avenue	n/a	2	3,200	A
Broadway	Minor	Pennington Road	Elm Street	n/a	2	4,400	A
	Minor	Elm Street	Apricot – Broadway connection across RR to State Route 99	n/a	2	950	A
	Arterial	Apricot – Broadway connection across RR to State Route 99	Apricot Street	n/a	2	14,750	C
West Larkin Road	Major	Apricot Street	Road 13	2,100	2	8,750	A
	Major	Road 13	Paseo Avenue	2,100	2	9,225	B
Road D	Minor	Road 11	Paseo Avenue	n/a	2	8,550	D
Road E	Minor	Riviera Road	Road 2	n/a	2	5,750	B
Road F	Minor	Road 2	Sinnard Avenue	n/a	2	2,100	A
	Minor	Sinnard Avenue	State Route 99	n/a	2	4,525	A
East Larkin Road	TBD**	Butte Co line	Riviera Road	2,990	2	13,200	D
	Major	Riviera Road	Sinnard Avenue	2,990	2	13,000	D
	Major	Sinnard Avenue	Road 5	2,990	2	9,275	B
	Arterial	Road 5	Road 3	2,990	2	16,225	C
	Major	Road 3	Pennington Road	2,900	2	12,050	D
	Major	Pennington Road	Ash Street	700	2	6,650	A
K Street	Minor	Pennington Road	Ash Street	n/a	2	5,650	A
	Minor	Ash Street	Bishop Avenue	n/a	2	1,775	A
Orchard Way	Minor	Sinnard Avenue	Road 3	n/a	2	7,450	C
	Minor	Road 3	Pennington Road	n/a	2	5,925	A

Table 4.2-11
Year 2030 Roadway Segment Daily Volumes and Levels of Service with 2030 General Plan

Street	Class	From	To	Current Volume	Lanes	2030 GP Volume	LOS
Sinnard Avenue	Major	Road 4	Road 3	n/a	2	3,275	A
	Major	Road 3	Pennington Road	n/a	2	3,350	A
	County Rural Road	Pennington Road	Bishop Avenue	2,400	2	3,125	A
	County Rural Road	Bishop Avenue	Paseo Avenue	240	2	3,875	A
Metteer Road	Minor	Riviera Road	Brianne Way	n/a	2	2,000	A
	Minor	Brianne Way	Pennington Road	3,600	2	4,000	A
Sheldon Road	County Rural Road	Pennington Road	Bishop Road	400	2	500	A
SR 99	Arterial	Butte Co line	Riviera Road	15,200	4	23,350	A
	Arterial	Riviera Road	Sinnard Avenue	15,200	4	30,800	C
	Arterial	Sinnard Avenue	Road F	15,200	4	33,125	D
	Arterial	Road F	Road 3	15,200	4	33,325	D
	Arterial	**Road 3**	**Kola Street**	**15,200**	**4**	**43,550**	**F**
	Arterial	Kola Street	Pennington Road	15,200	4	36,500	E
	Arterial	Pennington Road	Elm Street	18,900	4	36,400	E
	Arterial	**Elm Street**	**Archer Avenue**	**18,900**	**4**	**44,200**	**F**
	Arterial	**Archer Avenue**	**Apricot Street**	**18,900**	**4**	**47,550**	**F**
	Arterial	**Apricot Street**	**Ash Street**	**18,900**	**4**	**44,025**	**F**
	Expressway	Ash Street	Coleman Avenue	18,900	4	46,800	D
	Expressway	Coleman Avenue	Bishop Avenue	18,900	4	39,700	D
	Expressway	Bishop Avenue	Paseo Avenue	18,900	4	40,525	D
	Expressway	Paseo Avenue	Clark Road		4	51,775	E

Notes: **Bold** indicates conditions in excess of LOS D for City streets and LOS E for SR 99 segments.
*The 2030 General Plan Circulation Element includes policy or implementation that would achieve acceptable LOS, but the City cannot itself guarantee that specified improvements would be made. The LOS with Circulation Element improvements is shown in this table.
** The Circulation Element identifies needed improvements to East Larkin Road, which could include Arterial standards or other improvements.
Source: KDAnderson & Associates, Inc. Transportation Engineers, 2009.

Table 4.2-12
Year 2030 Intersection Levels of Service under 2030 General Plan

Intersection	Traffic Control	AM Peak Hour				PM Peak Hour				Traffic Signal warranted?
		Average Delay		LOS		Average Delay		LOS		
		Overall	Worst Case	Overall	Worst Case	Overall	Worst Case	Overall	Worst Case	
Pennington Road / Township Road	4-way stop sign	13	-	B	-	17	-	C	-	No
Pennington Road / Luther Road	2-way stop sign	8	17	A	C	6	14	A	B	No
Pennington Road / Richards Road	2-way stop sign	6	12	A	B	6	13	A	B	No
N Street / Elm Street	4-way stop sign	12	-	B	-	12	-	B	-	No
Paseo Avenue / Township Road	2-way stop sign	4	15	A	B	4	19	A	C	No

Intersection	Existing Control	Proposed Circulation Plan Mitigation	LOS	Close Apricot/Broadway Crossing, Install New At-Grade Crossing	LOS
Township Road / Riviera Road	stop sign	LT lanes on Township	D	Same	
SR 99 / Riviera Road	stop sign	Signal, LT lanes on Riviera	B		
Riviera Road/ Larkin Road	stop sign	Signal, LT lanes on all approaches	B		
SR 99 / Ramsdell Drive	stop sign	Signal, LT lanes on Ramsdell and NB right turn lane	D		
SR 99 / Kola Street	stop sign	Signal, LT lanes on Kola	E		
Pennington Road / N Street	stop sign	Signal, 4 lane Pennington	D		
Pennington Road / Broadway	stop sign	Prohibit Left Turns	B		
SR 99 / Pennington Road	Signal	4 lane Pennington	D	4 lane Pennington and southbound RT lane	E
Pennington Road / Larkin Road	stop sign	Signal	C	Same	
Pennington Road / Orchard Way	stop	Signal	C		
Pennington Road / Sinnard Avenue	stop sign	All-Way Stop	C		
SR 99 / Elm Street	stop sign	Signal and 4 lane SR 99	D	Signal, 4 lane SR 99, RT lanes on Elm	E
SR 99 / Archer Avenue	stop sign	-		Right turn only	C
SR 99 / Apricot Street	stop sign	-		close	-
SR 99 / Ash Street	stop sign	-		Right turn only	D
SR 99 / Coleman Avenue	stop sign	-		Signal, 4 lane SR 99, 4 lane Coleman Ave. with LT lanes and southbound RT lane on SR 99	E
SR 99 / Bishop Avenue	stop sign	Signal, LT lane on Bishop	B	Same	
Paseo Ave/Larkin Road	stop sign	Signal, LT lanes on all approaches	C	Same	
SR 99 / Paseo Avenue	stop sign	Signal, dual NB LT lanes, LT on Paseo, eastbound RT lane	E	Same	

Note: Mitigation for all intersections on SR 99 assumes 4-lane SR 99 with left turn lanes.
Source: KDAnderson & Associates, Inc. Transportation Engineers, 2008 and 2009.

- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Because the closest airport to the Planning Area, Sutter County Airport, is located approximately 10 miles southeast of Live Oak, implementation of the 2030 General Plan would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. This issue will not be discussed further in this EIR.

The 2030 General Plan identifies an extensive range of policies and programs designed to ensure the safety and convenience of pedestrian and bicycle travel, which was not substantively addressed in the 1994 General Plan. Therefore, conflicts with policies intended to promote alternatives to vehicular travel are not analyzed in this EIR. Please refer to the 2030 General Plan Land Use, Community Character, Circulation, and Parks and Recreation elements, under separate cover, for more information.

IMPACT ANALYSIS

IMPACT 4.2-1 Degradation of City Roadway Levels of Service. *With implementation of the 2030 General Plan, operation of City roadways currently operating at LOS D or better would degrade to LOS E or LOS F. This impact would be less than significant.*

Development envisioned under the 2030 General Plan, along with other regional growth, and implementation of the Circulation Diagram would create daily traffic volumes that would contribute to one street segment operating at LOS E or F, as shown in Table 4.2-13.

Table 4.2-13
Roadway Segments Impacted Under 2030 General Plan

Street	From	To	Class	Daily Volume	LOS
Kola Street	N Street	State Route 99	Minor Collector	11,925	E

The 2030 General Plan Circulation Element incorporates transportation analysis of General Plan buildout and plans for improvements designed to serve the community's overall circulation needs. New development will contribute to needed improvements and the City will coordinate public investments consistent with General Plan policy. Excerpts from the Circulation Element describe the City's approach to transportation improvements (see the Circulation Element of the 2030 General Plan, under separate cover, for more detail):

- **Policy CIRC-1.6.** New development shall contribute on a fair-share basis toward construction of an overcrossing of the railroad and SR 99.

- **Policy CIRC-3.1.** New development shall construct and dedicate streets that accommodate the full range of locally available travel modes.

- **Policy CIRC-3.2.** New development shall construct and dedicate and/or contribute to a connected bicycle/pedestrian network that is designed to promote travel to all schools, parks, and other major destinations.

- **Policy CIRC-3.3.** New development shall contribute on a fair-share basis to construct streets and bicycle/pedestrian paths in new growth areas that serve areawide or citywide travel needs.

- **Policy CIRC-3.4.** New development shall contribute on a fair-share basis to improve streets in existing developed areas affected by new development traffic.

- **Policy CIRC-8.2.** The City will integrate local transportation planning with regional transportation planning and provide direction to the state and SACOG regarding community preferences for the design of regional transportation routes within Live Oak.

- **Implementation Program CIRC-1.** The City will assess transportation impact fees and plan transportation improvements based, in part, on LOS analysis and standards described in this Circulation Element. The City will also explicitly consider the impact of traffic improvements on pedestrian, bicycle, and public transit safety and convenience. The City will allow exceedance of vehicular LOS for future development projects, if necessary. Transportation investments will be implemented according to the following guidance:

    - Roadway or intersection widening is a less desirable type of mitigation for traffic impacts and generally should be considered after other options are exhausted.

    - The City will seek to improve roadway capacity by timing lights to optimize LOS at congested intersections.

    - The City will seek opportunities to decrease congested routes by providing more connectivity and route choice options.

- In areas where proposed development would result in exceeding the local LOS standards, the developer(s) shall redesign the project to increase connectivity, enhance bicycle/pedestrian/transit access, or through other means to meet LOS standards. After all feasible site planning approaches are exhausted, if LOS is still exceeded, projects will contribute on a fair-share basis for street improvements required to bring the areas roadways to within the City's LOS standards. Improvements needed to accommodate new growth shall not be funded by existing city residents or businesses…

- **Implementation Program CIRC-3.** Following adoption of the 2030 General Plan, the City will revise its development impact fees based on a Nexus Study, including areawide serving transportation facilities, such as a railroad and Highway 99 overcrossing in the northern portion of the City.

- **Implementation Program-CIRC-9.** On an ongoing basis, the City will identify priority transportation improvements in the existing City consistent with the Circulation Element and include such improvements in grant applications, capital improvements planning, and through other funding mechanisms, as appropriate.

Improvement Strategies

Measures to improve the Level of Service on streets operating at LOS E or LOS F have been identified and evaluated. Many roads in the Planning Area that are expected to experience high traffic volumes are affected by the limited connectivity in and around the railroad and SR 99. There are a relatively small number of crossings of the railroad and connections across SR 99, which leads to LOS issues on the crossings and connections that do exist. To address this issue, the City considered several alternative solutions. The Circulation Element identifies a new grade separated crossing in the northern portion of the Planning Area in order to improve connectivity. The City also considered closing the existing Kola Street crossing and replace it with a new crossing that would roughly align with Ramsdell Drive and Epperson Way. This alternative would result in LOS F for Ramsdell Drive, however, and would not be appropriate along this street, which has direct residential frontage (Table 4.2-14).

Table 4.2-14
Daily Traffic Volumes on Impacted Roadway Segments with Alternative UPRR Crossing

Street	From	To	Classification	2030 General Plan with Existing UPRR Crossings		with Ramsdell Drive Crossing instead of Kola Street Crossing		without Apricot Street Crossing and with New Crossing at Coleman Avenue	
				Daily Volume	LOS	Daily Volume	LOS	Daily Volume	LOS
West Sinnard Avenue	N Street	State Route 99 connection	Arterial	13,800	B	10,525	A	13,775	B
Ramsdell Drive	N Street	Nevada Street	Minor Collector	-	-	15,375	F	-	-
Kola Street	N Street	State Route 99	Minor Collector	11,925	E	-	-	11,725	E
Pennington Road	N Street	State Route 99	Major Collector (4 lanes)	12,950	A	14,125	A	14,050	A
Elm Street	Broadway	State Route 99	Minor Collector	3,950	A	3,575	A	7,125	B
Apricot Street – Broadway crossing	Broadway	State Route 99	Minor Collector	13,950	F	12,225	E	-	-
Broadway	Apricot Street Crossing	Apricot Street	Minor Collector	14,750	F	13,500	F	3,975	A
Road 11	West Larkin Road	State Route 99	Minor Collector	-	-	-	-	11,025	E
Paseo Avenue	Road D	State Route 99	Arterial	10,450	A	10,725	A	9,200	A

KDAnderson & Associates, Inc. Transportation Engineers, 2008 and 2009.

Another alternative would maintain the Kola Street railroad crossing, but would change the configuration of the street system south of Elm Street. The existing Apricot Street-Broadway railroad crossing would be closed and replaced with a new at-grade crossing. The locations of the new crossing could be along the Road 11/Road 10/ Coleman Avenue alignment, or at another location south of Apricot Street. The Ash Street and Archer Avenue connections to SR 99 would, under this scenario, be limited to right turns only. This alternative would not change conditions north of Pennington Road, but would eliminate the LOS exceedance forecast at the Apricot Street-Broadway railroad crossing. This alternative is to be pursued by the City in coordination with Caltrans, Union Pacific Railroad, and the Public Utilities Commission, as described in the Circulation Element:

- *(Under "Circulation Framework, Railroad Crossings"):* In order to improve intersection spacing along SR 99 and improve future connectivity across the railroad, the City will collaborate with the California Public Utilities Commission, Union Pacific Railroad, and Caltrans to install a new railroad crossing in tandem with the removal of the existing crossing north of Apricot Street. This action would allow development of a new crossing with greater separation between the railroad and the UPRR at a location that can be controlled by a signalized intersection. It this alternative is implemented, all public at-grade crossings would eventually be linked to SR 99 intersections that are controlled by traffic signals. Under this scenario, the existing Apricot Street–Broadway railroad crossing would be closed and replaced with a new at-grade crossing. The location of the new crossing could be along the Road 11/Road 10/Coleman Avenue alignment, or at another location south of Apricot Street. The Ash Street and Archer Avenue connections to SR 99 would, under this scenario,

be limited to right turns only. This alternative would eliminate the need for the Arterial standard at the Apricot Street/Broadway connection across the railroad and the segment of Broadway between this crossing and Apricot Street.

- **Implementation Program-CIRC-11.** Following General Plan adoption, the City will collaborate with Caltrans, the Public Utilities Commission, Union Pacific Railroad, local property owners and businesses, and other relevant agencies to develop and implement an Access Management Plan for SR 99 and railroad crossings in the Planning Area. This Plan will address forecast level of service issues along SR 99 and City streets with forecast LOS issues. The Access Management Plan will consider the location and design of a new railroad crossing south of Apricot Street to be constructed in tandem with the closing of the Broadway/ Apricot Street crossing. The Access Management Plan will identify a phased and logical approach to improving operations of SR 99 while ensuring ongoing local access, including the area between Ash Street and Ramsdell Drive. To the extent that this Access Management Plan includes removal or construction of crossings of the Union Pacific Railroad line, the City will consult with the Public Utilities Commission.

It is important to note that any decisions to be made regarding UPRR crossings fall under the jurisdiction of the California Public Utilities Commission (PUC) and would require input from the railroad and, due to proximity of the state highway, Caltrans. Thus, there is no guarantee that the actions taken by the City with regard to the crossings can be implemented. Additional investigation of design options will be required.

With no changes to railroad crossings, individual street design treatments would be needed to improve the forecast Level of Service. The changes are discussed below and in the Circulation Element and listed in Table 4.2-15.

- The portion of **Kola Street west of SR 99 to N Street** would need to be improved Major Collector standard to provide adequate Level of Service. This would involve elimination of on-street parking and widening Kola Street in the developed area adjoining SR 99. As noted in the Circulation Element, the City does not currently consider this level of improvement to be feasible due to the level of existing development along this roadway segment.

- The **Apricot Street – Broadway connection from Broadway to SR 99 across the UPRR** would need to be widened to Arterial standards to deliver adequate LOS. This change would involve widening the existing railroad crossing and creating separate eastbound left turn and right turn lanes on the approach to SR 99. Improvements to this railroad crossing will be subject to PUC approval. The Circulation Element identifies the Arterial classification for this roadway segment. If the Apricot/Broadway crossing of the railroad is closed, Arterial standards would not be required in this location.

- The segment of **Broadway between Apricot Street and the connection to SR 99** would need to be widened to Arterial standards to improve the LOS. This would likely involve creating a northbound right turn lane on Broadway to provide storage for traffic that is waiting to turn onto the connection to SR 99.

- The portion of **N Street from Pennington Road south to Fir Street** would need to be addressed through improvements at N Street and California Street, which come together in the area just south of Pennington Road. As noted in the Circulation Element, the City has plans for the Live Oak Community Trail to be improved in the vicinity of California and N Street. The trail would be located along the westerly side of California Street in this vicinity. With implementation of the Community Trail, there would be no direct access to California or Gum Street from N Street or Pennington. This will address impacts to N Street from Pennington Road to Fir Street. With the anticipated improvements, a Minor Collector classification (rather than Major Collector classification) would be anticipated to deliver acceptable LOS.

Table 4.2-15
Potential Classifications on Impacted Roadway Segments

Street	From	To	Classification – Option 1	Daily Volume	LOS	Classification – Option 2	LOS
West Sinnard Ave	N Street	State Route 99 connection	Major Collector	13,800	E	Arterial	B
Kola Street	N Street	State Route 99	Minor Collector	11,925	E	Major Collector	C
Apricot Street – Broadway	Broadway	State Route 99	Minor Collector	13,950	F	Arterial	C
N Street	Fir Street	Pennington Road	Minor Collector	10,950	E	Major Collector	C
Broadway	Apricot Street/ Broadway crossing	Apricot Street	Minor Collector	14,750	F	Arterial	C

KDAnderson & Associates, Inc. Transportation Engineers, 2008 and 2009.

With the improvement strategies included in the Circulation Element, acceptable LOS can be generally provided for City roadway segments. As noted, the City has identified that LOS E is acceptable for the portion of Kola Street between N Street and SR 99. However, because the City cannot guarantee that the PUC would approve improvements to the Apricot Street-Broadway railroad crossing or construction of a new crossing in the Road 11/Road 10/Coleman Avenue alignment (with closing of the Apricot Street-Broadway crossing), the City cannot guarantee that the specified improvements in the Circulation Element would be implemented. The forecast LOS F for Broadway from Apricot Street to the railroad crossing and for the crossing segment itself are identified as acceptable in the Circulation Element. The impact **is less than significant**.

IMPACT 4.2-2 Degradation of Highway Levels of Service. *With implementation of the 2030 General Plan, four SR 99 segments would operate at LOS F. This impact is considered* ***significant****.*

Development envisioned under the 2030 General Plan, along with other regional growth, and implementation of the Circulation Diagram would contribute to daily traffic volumes that would result in LOS F at four segments (Table 4.4-16).

The 2030 General Plan establishes LOS E as the minimum LOS for SR 99 in locations within the City's Planning Area. This LOS standard is consistent with the "Concept Level of Service" identified in Caltrans' 2004 Transportation Concept Report. It should be noted, however, that Caltrans traffic study guidelines (December 2002) require mitigation if the Level of Service drops below the LOS C/D.

While conditions on most of the SR 99 segments within Live Oak will perform within the LOS E standard, four segments between Ramsdell Drive and Ash Street are projected to operate at LOS F and exceed this standard. This is considered a **significant impact**.

Improvement Strategies

As discussed under impact 4.2-1, different railroad crossing strategies would shift traffic volumes on City streets. The same is true for segments of SR 99. Changes to crossings could help reduce operational issues associated with close intersection spacing along SR 99 (Table 4.2-16).The overall volume on SR 99 with the development of alternative railroad crossings does not vary substantially. None of the viable options would fully resolve the future estimated capacity issues associated with SR 99.

Table 4.2-16
State Highway 99 Segments with Buildout of 2030 General Plan

Street	From	To	Class	Existing Crossings		Close Kola Street Crossing and Install New Ramsdell Drive Crossing		Close Apricot-Broadway Crossing and Install New Crossing south of Apricot Street	
				Daily Volume	LOS	Daily Volume	LOS	Daily Volume	LOS
State Route 99	Sinnard Avenue	Road F	Arterial	33,125	D	33,450	D	33,050	D
	F Street	Ramsdell Drive	Arterial	33,325	D	35,500	D	33,500	D
	Ramsdell Drive	**Kola Street**	**Arterial**	**43,550**	**F**	**38,150**	**E**	**45,375**	**F**
	Kola Street	Pennington Road	Arterial	36,500	E	38,725	E	37,475	F
	Pennington Road	Elm Street	Arterial	36,400	E*	36,000	E*	36,475	E*
	Elm Street	**Archer Avenue**	**Arterial**	**44,200**	**F***	**44,000**	**F***	**44,100**	**F***
	Archer Avenue	**Apricot Street – Broadway**	**Arterial**	**47,550**	**F***	**46,200**	**F**	**44,175**	**F***
	Apricot Street – Broadway Connection	**Ash Street**	**Arterial**	**44,025**	**F***	**44,000**	**F***	**44,175**	**F**
	Ash Street	Road 10/ Coleman Avenue	Expressway	46,800	D*	46,050	D*	46,175	D*
	Coleman Avenue	Bishop Avenue	Expressway	39,700	D*	40,000	D*	40,325	D*
	Bishop Avenue	Paseo Avenue	Expressway	40,525	D*	40,900	D*	40,575	D*
	Paseo Avenue	Live Oak Blvd	Expressway	51,775	E*	51,350	E*	51,975	E*

* Current LOS is E

Source: KDAnderson & Associates, Inc. Transportation Engineers, 2009.

However, the alternative that creates a new crossing south of Apricot Street, closes the existing Broadway-Apricot Street crossing, and restricts the Ash Street and Archer Avenue intersections to right turns only would increase the distance between signalized intersections and potentially allow this segment to operate more like a high-capacity Expressway. The final crossing location and the nature of local access controls would need to be determined with public input and collaboration between the City and Caltrans. The City envisions that this collaborative process would result in the development and implementation of an Access Management Plan for SR 99. This Plan is described in the 2030 General Plan Circulation Element under the heading "Railroad Crossings" and in Implementation Program-CIRC-11.

Development of alternatives to SR 99 could be considered. The 2030 General Plan includes several policies and programs related to regional transportation issues, as well as those designed to ensure implementation of the City's Circulation Diagram (see discussion under Impact 4.2-1 for more details). The City has provided for improvements to Larkin Road to Major Collector and Arterial standards in part to provide a viable north-south alternative route through central Live Oak. In addition, the Circulation Element identifies the need for ongoing collaboration between the City, Sutter County, and other involved agencies to consider alternative north-south routes in northern Sutter County, with a focus on Larkin Road north of the Live Oak Planning Area. This could address existing and anticipated future congestion along SR 99. Excerpts from the Circulation Element that could help to address operations along SR 99 follow:

- **Policy CIRC-5.1:** The City will work cooperatively with the California Department of Transportation (Caltrans), the Sacramento Area Council of Governments (SACOG), and property owners to plan and fund improved access to and from SR 99 for existing and future businesses, including:

  - Examine alternatives for improvements to Highway 99 (capacity and bicycle/pedestrian safety improvements) and identify preferred conceptual plans to provide certainty for existing and future property owners along Highway 99;

  - Enhance and add cross-town circulation connections that make crossings of SR 99 and the railroad easier and more convenient for Live Oak residents and commerce; and,

  - Work cooperatively with Caltrans, SACOG, and Sutter County to examine opportunities for a bypass around Live Oak in the Paseo Avenue/Township Road corridor.

- **Policy CIRC-7.1:** The City will consult with Caltrans, SACOG, and other relevant agencies to plan, fund, and implement context-sensitive design solutions along SR 99 that calm traffic, enhance aesthetics, and improve pedestrian safety and convenience, consistent with this General Plan.

- **Policy CIRC-7.2:** The City will encourage and support narrower lanes for SR 99 between Kola Street and Archer Avenue, as one way to increase safety and encourage slower traffic.

- **Policy CIRC-7.3:** As development occurs along SR 99, this should include construction of separated sidewalks with street trees along property frontages.

- **Policy CIRC-7.4:** The City will limit new direct access points to SR 99 and will encourage new development along SR 99 to provide driveway access from local streets instead of the highway.

- **Policy CIRC-7.5:** The City will improve the safety and convenience of pedestrian activity along SR 99 and crossings of SR 99 in and around the downtown core area, as funding is available.

- **Policy CIRC-8.1:** The City will consult with other local and regional transportation planning agencies, including Sutter County, Butte County, Caltrans, and the Sacramento Area Council of Governments, to ensure consistency among agencies' transportation systems and plans.

- **Policy CIRC-8.2:** The City will integrate local transportation planning with regional transportation planning and provide direction to the state and SACOG regarding community preferences for the design of regional transportation routes within Live Oak.

The City anticipates communicating with Sutter County to address increased traffic volume on State Route 99 and other roads resulting from development in the City and region. The City also anticipates coordination relative to traffic impact fees for improvements to SR 99 and needed arterial or feeder roads that lead from SR 99 to developing areas to the west and east of Live Oak. Under the City-County master tax exchange agreement, Sutter County and the City are to coordinate in identifying the impact and to impose the traffic impact fees developed to mitigate those impacts on development that occurs within the Sphere of Influence of the City. In addition, the County and City are to coordinate to identify and acquire the routes for the identified Arterial and feeder roads to SR 99 and to collaborate in the construction of those roads. Sutter County and the City of Live Oak are to work together, along with Caltrans, to identify the appropriate route and needed improvements for SR 99 and to identify a method for funding the construction of those improvements.

While the City's commitments in General Plan policy and the implementation program to develop and implement an Access Management Plan can help reduce congestion on SR 99, achieving acceptable LOS on SR 99 through the central portion of Live Oak would theoretically require a 6-lane arterial, reconstructing the road to Expressway standards for access and intersection spacing, or developing regional alternatives to SR 99 for north-south travel that effectively draw traffic away from SR 99.

Widening or limiting access in the developed portion of SR 99 would present substantial challenges given the level of existing local access, close intersection spacing, and proximity to the railroad. If the City were able to construct a new railroad crossing in the Road 11/Road 10/Coleman Avenue alignment and close the existing Apricot Street crossing, while restricting the Ash Street and Archer Avenue intersections (and other appropriate intersections) to right turns only, this would increase the distance between signalized intersections and potentially allow this segment of SR 99 to operate more like an Expressway. While this can help reduce congestion on SR 99, development of an Expressway through Live Oak would not necessarily be consistent with the City's objectives for this corridor. The City would not support measures that would divide the community or create substantial barriers to safe and convenient bicycle and pedestrian movements.

As indicated in this Circulation Element, however, the City intends to collaborate with Caltrans and an Access Management Plan intended to identify improvements that would be acceptable to the community and that would improve operations. There is no guarantee that a high enough level of access control on SR 99 will actually be implemented under the Access Management Plan to achieve peak period congestion that satisfies LOS standards. The City cannot guarantee that sufficient alternative north-south routes can be developed to serve regional needs outside the SR 99 corridor such that SR 99 would operate within acceptable LOS. The City has considered and included as General Plan Circulation Element improvements, General Plan policy, and implementation programs all available feasible mitigation to address forecast LOS issues along SR 99.

Without improvements described in the Circulation Element, SR 99 between Ramsdell Drive/Road 3 and Kola Street, between Elm Street and Archer Avenue, between Archer Avenue and Apricot Street, and between Apricot Street and Ash Street would operate at LOS F. Although the City has identified solutions for forecast LOS conditions in the 2030 General Plan, since the City cannot guarantee the needed improvements would be made to provide acceptable LOS, the impact to SR 99 is considered **significant and unavoidable**.

IMPACT 4.2-3 Degradation of Regional Roadway Levels of Service. *Implementation of the 2030 General Plan would contribute traffic to regional roadways (i.e., located outside the City of Live Oak sphere of influence) currently operating at LOS C or better. This impact would be* ***significant****.*

Development envisioned under the 2030 General Plan and implementation of the Circulation Diagram, along with other regional growth, would increase daily traffic volumes on portions of regional roadways and highways

located outside the Planning Area. Traffic volumes on Township Road north of Riviera Road, Township Road south of Paseo Avenue and Clark Road from Township Road to SR 99 would result in LOS D conditions. As LOS D is the minimum LOS for Sutter County, the impact to these roads is considered **less than significant**.

However, the volumes forecast for Larkin Road north of Riviera Road is indicative of LOS E conditions, which exceeds the County's minimum standard. To achieve LOS D on this rural road, it would be necessary to widen the road to a four-lane highway, improve the road to an Arterial standard, or develop alternative north-south routes that draw traffic from Larkin Road.

Historically, individual cities in Sutter County have been primarily responsible for implementing roadway improvements within each city's sphere of influence. As an example, there has been no expectation that development in the city of Yuba City will contribute to the cost of improving streets located in Live Oak's sphere of influence, nor has there been an expectation that development in Live Oak fund roadway improvements in Yuba City or in rural Sutter County.

As countywide development proceeds, traffic volumes on regional roadways can be reasonably anticipated to increase, as well. The current arrangement (i.e., individual cities in Sutter County implement roadway improvements within its sphere of influence) may not be able to keep up with regional growth and deliver LOS consistent with each agency's standards.

As noted in the discussion of impacts to SR 99, the City of Live Oak and Sutter County are working together to create a solution for the increased traffic volume on County roads resulting from development. Sutter County and the City will collaborate to identify and acquire the routes for the identified Arterial and feeder roads to SR 99 and to collaborate in the construction of those roads. Larkin Road can be one of the roads considered through this process. Under the City-County master tax exchange agreement, the Live Oak and Sutter County are to jointly define a Zone of Benefit for the above-mentioned road and highway improvements and to establish an appropriate development impact fee to fund the improvements. All new development within the Zone of Benefit would be required to pay the development impact fees. The City's Circulation Element policies also discuss roles and responsibilities for planning, funding, and implementing needed circulation improvements during buildout of the 2030 General Plan (see discussion under Impact 4.2-1 for more details). As noted in the Circulation Element:

- *(Under the heading "Regional Roads")* Traffic volumes forecast for Larkin Road north of Riviera Road are indicative of LOS E conditions, which exceed the County's minimum standard. To achieve LOS D on this rural road, it would be necessary to widen the road to a four-lane highway, improve the road to arterial standards, or develop alternative north-south routes that draw traffic from Larkin Road. …As noted in this Element, the City will collaborate with the County to identify regional routes and improvement strategies for these routes. Larkin Road will be considered as a part of this overall process. To achieve LOS D on this rural road, it would be necessary to widen the road to a four-lane highway, improve the road to an Arterial standard, or develop alternative north-south routes that draw traffic from Larkin Road.

- **Implementation Program-CIRC-13.** Following General Plan adoption, the City will collaborate with Sutter County to identify regional routes that would serve traffic generated under the 2030 General Plan. The City will collaborate with Sutter County and other relevant agencies on funding, planning, and improvement strategies for these routes. Larkin Road will be considered as a part of this overall process. To achieve LOS D on this rural road, it would be necessary to widen the road to a four-lane highway, improve the road to an Arterial standard, or develop alternative north-south routes that draw traffic from Larkin Road.

Implementation of a regional approach to funding improvements to County roads would reduce identified impacts. If this regional approach was consistent with the approach for Larkin Road included in the Circulation Element (Arterial standard, alternative north-south routes, or expanding to four lanes), the impact could be mitigated to a less-than-significant level. However, because the exact nature of the improvements is not knowable

at this time, there is no guarantee that LOS on Larkin Road will not exceed LOS D. LOS without improvements to this roadway segment would be F. This impact is considered **significant and unavoidable**.

IMPACT 4.2-4 Level of Service at Intersections. *Implementation of the 2030 General Plan would contribute traffic to intersections that would operate in excess of acceptable LOS. This impact is considered* ***significant****.*

Development under the 2030 General Plan would increase A.M. and P.M. peak-hour traffic volumes at key intersections.

Improvement Strategies

Meeting the City's LOS standards at Planning Area intersections will require a combination of improvements and changes to intersection traffic controls.

The Circulation Element identifies intersections where traffic signals or roundabouts would be required to maintain acceptable LOS. The Element also notes that the specific type and timing of improvement will need to be analyzed for effects on nearby roadways and intersections. As noted in the Circulation Element under the heading "Intersections":

- Several intersections could require traffic signals or roundabouts to maintain acceptable LOS. The specific type and timing of improvement will need to be analyzed for effects on nearby roadways and intersections. Intersections that may need improvement include:

  - Riviera Road / Larkin Road
  - Pennington Road / N Street
  - Pennington Road / Larkin Road
  - Pennington Road / Orchard Way
  - Paseo Avenue / Larkin Road
  - State Route 99 / Road 2
  - Larkin Road / Sinnard Avenue
  - Larkin Road / Road 4
  - State Route 99 / Road 5
  - Larkin Road / Road 5
  - State Route 99 / Road F
  - Larkin Road / Road 3
  - N Street / Kola Street
  - Larkin Road / Kola Street
  - Larkin Road / Road 11
  - Richard Avenue / Road 13
  - N Street / Road 13
  - Larkin Road / Road 13
  - State Route 99 / Riviera Road
  - State Route 99 / Ramsdell Drive
  - State Route 99 / Kola Street
  - State Route 99 / Bishop Avenue
  - State Route 99 / Paseo Avenue

- While traffic signals may not prove to be warranted, at some intersections, it may eventually be necessary to install all-way stops, roundabouts, or to add separate left turn lanes in order to deliver minimum LOS, including:

  - Township Road / Riviera Road

- Pennington Road / Sinnard Avenue

The signal timing at Larkin Road and Pennington Road will need to be tied to the signal at SR 99 and Pennington to ensure adequate operations of these intersections. Prohibiting some movements may be needed, as noted in the Circulation Element under the heading "Intersections." It may be necessary to restrict left turns from westbound Pennington Road onto southbound Broadway to ensure adequate operations at this intersection. Specific requirements for intersection improvements based on traffic modeling conducted to support the 2030 General Plan is listed in Table 4.2-17. In the case that the Broadway-Apricot railroad crossing is closed and a new crossing is installed south of Apricot Street, specific recommended improvements have also been analyzed to support this scenario.

Delays at intersections on SR 99 would be reduced by widening the highway to four lanes and installing traffic signals. However, the feasibility of signalizing the closely spaced intersections immediately south of Elm Street is questionable, and the need to limit access in order to improve operations on SR 99 is an important issue. The option of closing / relocating the Apricot Street-Broadway railroad crossing to instead create a new intersection and railroad crossing south of Apricot Street will be considered, as noted earlier.

Because of the need to coordinate the requirements of the City, Caltrans, and the PUC over the long term based on the timing and location of actual development, the City has included an Access Management Plan as General Plan implementation (see Implementation Program-CIRC-11). As part of the Access Management Plan, a workable long-term concept that creates a new railroad crossing at a location that can facilitate a signalized access to SR 99 is to be identified. Two alternatives have been identified through the 2030 General Plan EIR process.

- Move railroad crossing to an alignment at approximately Road 11/Road 10/Coleman Avenue and limit Archer Avenue, Birch Street, and Ash Street connections on SR 99 to right turns only.

- Move the railroad crossing to a location south of Apricot Street and construct a new link from Larkin Road to SR 99 to L Street.

With implementation of the various measures for Planning Area intersections involving only City streets (and not SR 99), traffic conditions could be maintained at the minimum level established by the 2030 General Plan. Impacts to City street intersections would be considered **less than significant**.

The City has committed to identifying the range of specific improvements required to achieve the desired LOS at intersections with SR 99, recognizing that the implementation of these improvements requires other parties to participate. The Access Management Plan would involve participation by other agencies and there is no guarantee that all of the prescribed improvements to achieve acceptable LOS would be incorporated. Since the City cannot guarantee improvements to achieve acceptable LOS, impacts to the intersections of SR 99 with Archer Avenue, Ash Street, and Apricot Street are considered **significant and unavoidable**.

Improvements to other intersections with SR 99 will also require coordination with Caltrans since these improvements would involve the Caltrans right of way. In areas with less in the way of existing developed uses, such as intersections with Riviera Road and Bishop Avenue, meeting Caltrans engineering standards may be relatively easier compared to areas with developed uses surrounding the subject intersection. However, while the General Plan and this EIR have identified workable strategies to improve intersections to achieve acceptable LOS, there is no guarantee that the City would be able to implement the identified improvements while meeting Caltrans requirements. The improvements at SR 99 and Paseo Avenue could potentially involve review and approval by the PUC, as well. For this reason, although the City has identified all potentially feasible mitigation, the City cannot guarantee the implementation of required improvements to achieve acceptable LOS at identified intersections with SR 99. Therefore, the impact is considered **significant and unavoidable**.

Table 4.2-17
Year 2030 Impacted Intersections and Recommended Improvements

Intersection	Existing Control	LOS Worst Case (w/o GP improvements)	Proposed Circulation Plan	LOS	With Broadway-Apricot RR Crossing Closed and New Crossing south of Apricot	LOS
Riviera Road / Township Road	stop sign	F	Left turn lanes on Township Road	D	same	
State Route 99 / Riviera Road	stop sign	F	Signal with left turn lanes on Riviera Road	B		
Riviera Road / Larkin Road	stop sign	F	Signal and left turn lane, all approaches	B		
State Route 99 / Ramsdell Drive	stop sign	F	Signal, left turn lanes on Ramsdell Drive and NB right turn lane	D		
State Route 99 / Kola Street	stop sign	F	Signal and left turn lanes on Kola Street	E		
Pennington Road / N Street	stop sign	F	Signal and 4 lane Pennington Road	D		
Pennington Road / Broadway	stop sign	F	Prohibit Left turns from Pennington to southbound Broadway	B		
State Route 99 / Pennington Road	Signal	F	4 lane Pennington	D	4 lane Pennington and SB right turn lane	E
Pennington Road / Larkin Road	stop sign	F	Signal	C	same	
Pennington Road / Orchard Way	stop	E	Signal	C		
Pennington Road / Sinnard Avenue	stop sign	F	All-Way Stop	C		
State Route 99 / Elm Street	stop sign	F	Signal and 4 lane State Route 99	D	Signal, 4 lane SR 99, RT lanes on Elm Street	E
State Route 99 / Archer Avenue	stop sign	F	-		Right turn only	C
State Route 99 / Apricot Street	stop sign	F	-		close	-
State Route 99 / Ash Street	stop sign	F	-		Right turn only	D
State Route 99 / Coleman Avenue	stop sign	F	-		Signal, 4 lanes on SR 99, 4 lanes on Coleman Avenue with left run lanes and southbound right turn lane on SR 99	E
State Route 99 / Bishop Avenue	stop sign	F	Signal, left turn lane on Bishop	B	same	
Paseo Avenue / Larkin Road	stop sign	-	Signal with left turn lanes on all approaches	C	same	
State Route 99 / Paseo Avenue	stop sign	F	Signal, dual NB left turn, left turns on Paseo Avenue, EB right turn lane	E	same	

Note: Mitigation for all intersections on SR 99 assumes 4 lane SR 99 with left turn lanes
Source: KDAnderson & Associates, Inc. Transportation Engineers, 2009.

IMPACT 4.2-5 Introducing Traffic Hazards. *Implementation of the 2030 General Plan would add multi-modal trips to the existing and planned transportation network. If not properly designed, certain aspects of the General Plan could introduce traffic hazards. However, policies of the General Plan and the City's standards would ensure adequate emergency access and avoid introducing substantial traffic hazards. This impact is considered* ***less than significant****.*

With development in western Live Oak, the amount of vehicular and pedestrian traffic across the UPRR will increase substantially. The 2030 General Plan Circulation Element identifies a new grade separation (West Sinnard Avenue) that would serve the northern Live Oak Planning Area, to be funded on a fair-share basis by new development. Table 4.2-18 identifies projected daily traffic volumes across existing, proposed, and alternative crossing locations.

Table 4.2-18
Daily Traffic Volumes Across UPRR with Alternative UPRR Crossings

Street	Status	Type	Proposed GP with Existing UPRR Crossings		With Ramsdell Drive Crossing instead of Kola Street		Without Apricot Street Crossing and with Coleman Avenue	
			Daily Volume	LOS	Daily Volume	LOS	Daily Volume	LOS
Riviera Road	Existing	At Grade	5,625	A	5,000	A	5,600	A
West Sinnard Avenue	Planned	Grade Separation	13,800	E (D)	10,525	C	13,775	E (D)
Ramsdell Drive	Alternative	Grade Separation	-	-	15,375	F	-	-
Kola Street	Existing	At-grade	11,925	E (D)	-	-	11,725	E (D)
Pennington Road	Widen (4 lanes)	At-grade	12,950	A	14,125	A	14,050	A
Elm Street	Existing	At-grade	3,950	A	3,575	A	7,125	B
Apricot Street – Broadway connection	Alternative-Closure	At-grade	13,950	F (E)	12,225	E (D)	-	-
Road 11/Road 10/ Coleman Avenue	Alternative	At-grade	-	-	-	-	11,025	E (D)
Paseo Avenue	D Street	State Route 99	10,450	A	10,725	A	9,200	A

Note: Parentheses indicate mitigated LOS.

The Circulation Element includes an implementation program designed to ensure against hazards at railroad crossings:

- **Implementation Program-CIRC-12.** Following General Plan adoption, the City will monitor the number of pedestrians crossing the railroad at Kola Street, Pennington Road, and Elm Street, Riviera Road, the new Road 11/Road 10/Coleman Avenue crossing (if constructed), and Paseo Avenue. As necessary, the City will pursue improvements and maintenance of adequate traffic and pedestrian controls at each location, including installation of fencing to limit access to the railroad, in order to ensure safety. The City will seek funding for safe pedestrian and bicycle crossings of the railroad and/or SR 99 at approximately Epperson Way, Road F, and Road 10/Bishop Avenue/Coleman Avenue, among other appropriate locations.

The General Plan provides the overall long-term framework for transportation improvements, and does not identify any specific traffic design features. Review of design features, including intersections, curves in roadways, and other components would occur during buildout of the General Plan, in accordance with City standards. The City's Public Works Construction Standards specify maximum grades, required sight distances, adequate stopping distances, and other components that directly or indirectly related to public safety. The 2030 General Plan also includes policies to ensure adequate emergency access, improve safety, and prevent traffic conflicts:

- **Policy CIRC-1.3.** Where cul-de-sacs are allowed, they must allow emergency and bicycle/pedestrian through access, where appropriate.

- **Policy CIRC-1.4.** The maximum allowable length of a cul-de-sac is 500 feet unless an exception is granted by emergency service providers and approved by the Community Development Director.

- **Policy CIRC-2.1.** The City will seek funding for, and include pedestrian and bicycle improvements in Capital Improvements Planning, as feasible. Such improvements will include, but are not limited to:

    - construction of sidewalks where they do not currently exist,
    - widening of sidewalks in high pedestrian traffic areas,
    - installation of bike paths and lanes, and
    - improved crossings of roads and the railroad for bicycles and pedestrians.

- **Policy CIRC-2.2.** The City and Redevelopment Agency will prioritize transportation investments that better connect neighborhoods to major destinations, with safer and more convenient pedestrian, bicycle, and transit stops and routes.

- **Policy CIRC-2.4.** The City will seek funding for and, as feasible, install traffic-calming measures, such as planted medians, landscaped planter strips, landscaped traffic circles, and other designs in areas with excessive traffic, as appropriate.

- **Policy CIRC-2.5.** The City and Redevelopment Agency will explore opportunities to construct new, or improve the safety of existing east-west crossings, or may require such improvements as a condition of new development, as appropriate.

- **Policy CIRC-3.1.** New development shall construct and dedicate streets that accommodate the full range of locally available travel modes.

- **Policy CIRC-3.5.** In areas with high pedestrian activity, streets should be relatively narrow and curb radii should be designed to promote pedestrian safety and convenience, while also ensuring adequate emergency access.

- **Policy CIRC-7.1.** The City will consult with Caltrans, SACOG, and other relevant agencies to plan, fund, and implement context-sensitive design solutions along SR 99 that calm traffic, enhance aesthetics, and improve pedestrian safety and convenience, consistent with this General Plan.

- **Policy CIRC-7.2.** The City will encourage and support narrower lanes for SR 99 between Kola Street and Archer Avenue, as one way to increase safety and encourage slower traffic.

- **Policy CIRC-7.5.** The City will improve the safety and convenience of pedestrian activity along SR 99 and crossings of SR 99 in and around the downtown core area, as funding is available.

- **Policy PS-3.4.** The City will coordinate with the County Office of Emergency Services to identify and establish evacuation routes and operational plans to be used in case of dam failure, flood disaster, and fire.

The City will provide relevant outreach to residents and businesses regarding evacuation routes for each hazard type.

- **Policy PS-3.5.** The City will require development and maintenance of a road system that provides adequate access for emergency equipment.

With the implementation of 2030 General Plan policies and implementation programs and the City's Public Works Construction Standards, the impact is considered **less than significant**.