LAKE COUNTY/CITY AREA PLANNING COUNCIL

TEN YEAR TRANSPORTATION NEEDS AND CAPITAL IMPROVEMENT PROGRAM IN LAKE COUNTY

FINAL REPORT

Prepared By

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ENGINEERS · PLANNERS

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The *Ten Year Transportation Needs and Capital Improvement Program In Lake County* report is a comprehensive ten year multi-model transportation improvement program that includes Caltrans, Lake County, and the Cities of Clearlake and Lakeport. This program is intended to provide for the transportation needs of motorists, good movement, public transit, pedestrians and bicyclists over the next ten year period of time.

Unconstrained Year 2020 Improvement Needs

Year 2020 transportation system improvement needs were initially developed based upon the following criteria:

- Roadway Structural Conditions
- Roadway and Intersection Capacity
- Pedestrian Usage and Access
- Bicycle Usage and Access
- Safety Conditions
- Transit System

A detailed summary of the unconstrained ten year needs is contained in the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County - Table 7*.

Year 2020 Improvement Needs Planning Level Cost Estimates

Planning level cost estimates were prepared for the ten year unconstrained needs. Total costs associated with these improvements were approximately $650 million. Initial review indicated that ten year funding estimates would be significantly lower than $650 million. The APC Technical Advisory Committee (TAC) decided to create a constrained list of ten year improvement needs to more closely match funding estimates.

The detailed cost estimate worksheets associated with each preliminary planning level cost estimate are presented in the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County – Appendix B.*

Constrained Ten Year Improvement Needs

After considerable input from the Lake APC Technical Advisory Committee (TAC) additional refinements were made to the unconstrained ten year improvement needs to create a financially constrained set of transportation improvements. The following metrics were used:

1. Roadway Structural Improvement Needs
2. Roadway Vehicular Capacity Needs
3. Transit Needs
4. Safe Route to School Needs

Constrained Ten Year Improvement Needs Cost Estimation Methodology

Cost estimates completed for the unconstrained improvement projects assumed that roadways with a PCI of less than 25 would be fully reconstructed. While reconstruction of roadways with failing pavement conditions will provide long-term cost-savings, the initial cost associated with full reconstruction is very significant. Therefore, construction methods assumed for the constrained set of improvements assume that roadways with PCI values of less than 25 will be rehabilitated by cold planning the first four inches of AC and installing a new AC section. Roadways with PCI values greater than 25 were assumed to receive a slurry seal overlay, or similar treatment.

Constrained Improvement Needs Prioritization Methodology

The unconstrained ten year improvement needs projects were prioritized using a multi step decision matrix methodology. This first step ranked all agency projects from most important to least important based upon various criteria. Appendix A provided a summary of this methodology.

The second step in this process involved obtaining each agencies priority from 1 through 4 for each of the projects, partially based upon the quantified matrix ranking. The agency priority ranking was then used to categorize all of the ten year unconstrained improvement needs projects into four distinct priority groups.

Based upon the priority ranking the constrained improvement needs were separated into four funding Tiers (1 through 4).

Constrained Ten Year Improvement Needs Cost Estimates

Table ES1 summarizes the constrained ten year improvement project costs by agency and project

funding tier. As identified in this Table, the County faces very significant costs over the next ten years to provide the necessary multi-model transportation improvement necessary to maintain acceptable operating conditions.

Ten Year Funding Estimates

Table ES2 summarizes the anticipated ten year transportation funding estimates by funding source. Approximately $81 million in transportation funding is anticipated over the next ten years. This estimate would fund 75% of the Tier 1 projects estimated at $108 million.

Ten year funding estimates fall significantly short of funding all Tier 1 through Tier 4 project costs, funding only 42% of the total ten year constrained needs estimated at $193 million. Additional funding sources will be required to provide the necessary transportation improvements on a countywide basis.

Ten Year Capital Improvement Program

After review of the constrained ten years needs and funding tiers, the APC TAC decided that the Ten Year Capital Improvement Program would be comprised primarily of Tier 1 projects. Projects would be selected for design and construction based upon the availability and type of funding sources. Projects outside the Tier 1 list may be included in the CIP if specific funding monies preclude design/construction of projects in the Tier 1 list.

TABLE ES1
TEN YEAR CONSTRAINED TRANSPORTATION IMPROVEMENT NEEDS
SUMMARY OF COSTS BY AGENCY AND PROJECT PRIORITY ($1,000)

	Project Funding Tier				
Agency	**1**	**2**	**3**	**4**	**Totals**
Auto and Bicyle					
Caltrans	$78,098	$4,570	$21,525	$0	$104,193
County of Lake	$7,868	$9,548	$13,533	$1,350	$32,298
City of Lakeport	$2,132	$6,219	$2,763	$0	$11,114
City of Clearlake	$6,945	$7,263	$2,659	$1,832	$18,698
Totals	**$95,042**	**$27,600**	**$40,479**	**$3,182**	**$166,303**
Pedestrian					
Caltrans	$0	$0	$0	$0	$0
County of Lake	$1,704	$1,899	$453	$0	$4,056
City of Lakeport	$324	$177	$240	$0	$741
City of Clearlake	$998	$751	$0	$0	$1,749
Totals	**$3,026**	**$2,827**	**$693**	**$0**	**$6,546**
Transit					
Lake Transit Authority	$10,083	$9,600	$0	$0	**$19,683**
TOTALS	**$108,151**	**$40,027**	**$41,172**	**$3,182**	**$192,532**
GRAND TOTAL			**$192,532**		

TABLE ES2
TEN YEAR TRANSPORTATION FUNDING ESTIMATES

Funding Source	Ten Year Funding Estimate ($1,000)
State Transportation Improvement Program (STIP)	$12,000
Gas Tax	$31,200
Region Surface Transportation Program	$4,500
LTF (Bicycle and Pedestrian Portion)	$300
TDA (Transportation Development Act)	$450
SHOPP	$32,700
Total	**$81,150**

Source: Lake County APC. Caltrans SHOPP estimates.

The *Ten Year Transportation Needs and Capital Improvement Program In Lake County* report is a comprehensive ten year multi-model transportation improvement program that includes Caltrans, Lake County, and the Cities of Clearlake and Lakeport. This program is intended to provide for the transportation needs of motorists, good movement, public transit, pedestrians and bicyclists over the next ten year period of time. The report is divided into the following chapters:

- **Chapter I – Introduction**
- **Chapter II – Transportation Improvement Needs Methodologies**
- **Chapter III – Year 2020 Travel Demand Model**
- **Chapter IV – Existing Transportation Conditions**
- **Chapter V – Ten Year Transportation Improvement Needs**
- **Chapter VI – Ten Year Transportation Capital Improvement Program**

This report was preceded by the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County* that provides a summary of the technical analysis and data tables used to reach the conclusions contained in this report. Reference will be made to specific tables in *the Preliminary Report* to avoid duplication.

MULTI-MODAL "COMPLETE STREETS" APPROACH

Each of the agencies involved in this study, Caltrans, Lake County, City of Clearlake, and City of Lakeport are committed to providing transportation facilities that meet the needs of all users. The term "complete streets" refers to a policy whereby all public streets are designed and operated to enable safe access for all users. This includes the following transportation modes of travel, and users:

- **Motorists**
- **Pedestrians**
- **Bicyclists**
- **Transit**
- **Children**
- **Elderly**
- **Disabled**

The National Complete Streets Coalition has provides the following policy statements that are intended to facilitate a functional "complete streets" approach to transportation improvement needs.

- Includes a vision for how and why the community wants to complete its streets
- Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is adoptable by all agencies to cover all roads.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Directs the use of the latest and best design standards while recognizing the need for flexibility in balancing user needs.
- Directs that complete streets solutions will complement the context of the community.
- Establishes performance standards with measurable outcomes.

By instituting a complete streets policy this transportation improvement program will insure that all users have the ability to safely move along and across public streets.

Overview of Study Methodologies

Roadway needs are directly linked to both existing conditions and anticipated future development patterns. As presented in the following chapters, this transportation improvement needs study has reviewed the following aspects of the existing State, County and City transportation system in order to determine future needs:

- **Roadway Structural Conditions**
- **Roadway and Intersection Capacity**
- **Pedestrian Usage and Access**
- **Bicycle Usage and Access**
- **Safety Conditions**
- **Transit System**

Existing transportation facilities included within this study consist of all roadways classified as state highways, arterials and collectors. For each of these aspects of the existing transportation system a study methodology has been determined and analysis conducted to determine future improvement needs. The following existing Lake County roadway network statistics were obtained from the pavement management program reports (January 2009):

City of Clearlake - The roadway network is comprised of approximately 111.6 centerline miles, of which 29.9 are arterials, 11.8 are collectors, and 69.9 are residential/local streets.

City of Lakeport - The roadway network is comprised of approximately 29.0 centerline miles, of which 7.4 are arterials, 9.7 are collectors, and 11.9 are residential/local streets.

Lake County - The roadway network is comprised of approximately 510.1 centerline miles, of which 13.1 are arterials, 180.5 are collectors, 314.8 are residential/local streets, and 1.7 are other streets.

In addition to existing conditions, anticipated development patterns and expected growth in both residential and commercial land uses has been reviewed and incorporated into the determination of transportation system improvement needs. A Year 2020 travel demand model was developed to provide daily and peak hour vehicular demand projections for all study roadways.

Consistency with Current Planning and Engineering Studies

To ensure conformance with previously prepared studies, the following planning and engineering documents are considered as support documents to this study:

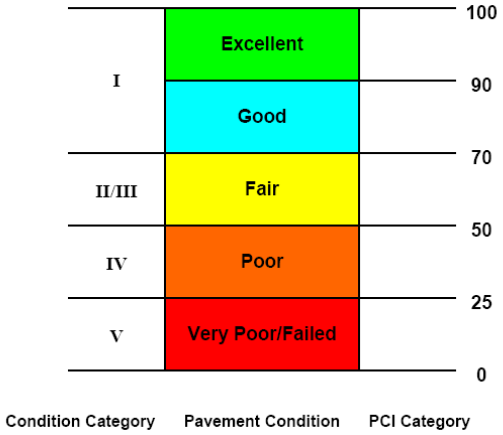
- Pavement Management Program Reports (June 2008)
- Transit Development Plan Study (September 2008)
- Countywide Regional Transportation Impact Fee Program (May 2008)
- Lake County General Plan Update (September 2008)
- Lake County Regional Transportation Plan (October 2005)
- Lake 20/29/53 Comprehensive Corridor Study (November 8, 2005)
- Highway 20 Traffic Calming and Beautification Plan (August 2006)
- Lake County Regional Bikeway Plan (August 9, 2006)
- Wine County IRP Origin Destination Study (December 29, 2006)
- Wine County IRP Final Report (June 30, 2004)

The methodologies use for determination of transportation improvement needs are presented below. These methodologies have been employed for both *Existing* and *Year 2020* conditions. Consistent with the "complete street" philosophy these improvement needs methodologies address all transportation modes and include structural and safety improvement considerations.

Roadway Structural Conditions

Existing roadway structural conditions were determined using the *Pavement Management Program Update for Lake County* completed in June 2008. The purpose of the report was to examine the overall condition of the road network and identify options for improving the network level pavement condition index (PCI). The pavement condition index, or PCI, is a measurement of pavement grade or condition and ranges from 0 to 100. A newly constructed road would have a PCI of 100, while a failed road would have a PCI of 10 or less. Figure 2 illustrates the definitions of the pavement condition categories.

Figure 1 - Pavement Condition Categories by PCI



PCI data for all study roadways was obtained from this report. Roadway structural improvement needs have been identified for all facilities with a PCI of less than 25.

Vehicular Roadway and Intersection Capacity

Vehicular capacity for all study roadway segments and intersection has been determined based upon appropriate local, State and national standards, as follows: Existing volumes and existing geometrics have been collected by Omni Means at key study locations, as follows:

Level Of Service Methodologies

Vehicular traffic operations for all roadways and intersections have been quantified through the determination of "Level of Service" (LOS). Level of service is a qualitative measure of traffic operating conditions, whereby, a letter grade A through F is assigned to an intersection or roadway segment representing progressively worsening traffic conditions. Roadway segment LOS is based upon daily traffic flows, with intersection LOS based upon AM and PM peak hour traffic flows.

Acceptable Level of Service Thresholds - Based upon currently adopted standard for the Lake County, the City of Clearlake, and the City of Lakeport, LOS C has been used as the minimum acceptable threshold for intersection and roadway segment operations.

Intersection Level of Service - Levels of Service has be calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fourth Edition, 2000* (HCM-2000). For two-way-stop-controlled (TWSC) intersections, the "worst-case" movement delays and LOS will be reported, computed based on HCM-2000. For signalized intersections and all-way-stop-controlled (AWSC) intersections, the intersection delays and LOS reported are the average values for the whole intersection, computed based on HCM-2000. The delay-based LOS criteria for different types of intersection control are identified in Table 1 (following page).

To determine whether "significance" should be associated with unsignalized intersection operations, a supplemental traffic signal "warrant" analysis has also been completed. The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an otherwise unsignalized intersection. This study has employed the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD),* as amended by the *MUTCD 2003 California Supplement,* for all study intersections.

TABLE 1
LEVEL OF SERVICE (LOS) CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized	Un signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 10.0	< 10.0	< 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel some what restricted within groups of vehicles.	>10.0 and < 20.0	>10.0 and < 15.0	>10.0 and < 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and < 35.0	>15.0 and < 25.0	>15.0 and < 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and < 55.0	>25.0 and < 35.0	>25.0 and < 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and < 80.0	>35.0 and < 50.0	>35.0 and < 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0	> 50.0

The signal warrant criteria are based upon several factors including volume of vehicular and pedestrian traffic, frequency of accidents, location of school areas etc. Both the FHWA's MUTCD and the *MUTCD 2003 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. Specifically, this study will utilize the Peak-Hour-Volume based Warrant 3 as one representative type of traffic signal warrant analysis. Warrant 3 criteria are basically identical for both the FHWA's MUTCD and the *MUTCD 2003 California Supplement*. Since Warrant 3 provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating at above 40 mph), study intersections which use this specialized criteria will be clearly identified.

Roadway Segment Level of Service - Roadway segment LOS is based upon daily volume to capacity thresholds contained in the Transportation Research Board Publication *High Capacity Manual, Fourth Edition, 2000*. Table 2 presents these thresholds for various roadway classifications.

Pedestrian Usage and Access

Determination of pedestrian facility needs is based upon the proximity of pedestrian generating land uses in the proximity of the study location. Close

proximity of pedestrian generating land uses, especially schools, along with connectivity needs were taken into consideration in the identification of pedestrian facility improvements. Typically pedestrian sidewalks are part of the overall roadway cross-section for facilities having a functional classification of Residential Collector and above facility types. Where possible pedestrian facilities are also included in all roadway structural or capacity improvement needs recommendations, on facilities that include pedestrian sidewalks in their ultimate cross-section.

Bicycle Usage and Access

Determination of bicycle facility needs is based on information contained in the *Lake County Regional Bikeway Plan* (August 2006). Similar to pedestrian sidewalks, bike lanes are typically part of the overall roadway cross-section for all facilities having a functional classification of Major Collector and above. Where possible bicycle facilities are also included in all roadway structural or capacity improvement needs recommendations, on facilities that include pedestrian sidewalks in their ultimate cross-section.

Safety Conditions

Roadway and intersection safety conditions have been determined by review of three year accident data. Accident data was obtained from Lake County, the City of Clearlake and City of Lakeport. Accident rates at the intersections have been calculated using the following formula:

$$= \frac{1{,}000{,}000 \times A}{365 \times T \times V}$$ per Million Entering Vehicle (MEV)

A = number of reported accidents
T = time frame of the analysis, years
V = AADT

Accident rates along the section have been calculated using the following formula:

$$= \frac{100{,}000{,}000 \times A}{365 \times T \times V \times L}$$ per 100 Million Vehicle Miles (MVM)

A = number of reported accidents
T = time frame of the analysis, years
L = Length of section in miles
V = AADT

Accident rates at each location have been compared with average accident rates published by Caltrans in the *2007 Collision Data on California State Highways*. Average accident rate data specific to Lake County has been used for this analysis.

Transit System

Determination of transit facility needs is based information contained in the *Transit Development Plan* (September 2008). Additional transit improvement needs as identified by Lake Regional Transit have also been incorporated into this study.

TABLE 2
LEVEL OF SERVICE (LOS) CRITERIA FOR ROADWAYS

Roadway Type	Functional Classification	Average Daily Traffic (ADT) – Total of Both Directions				
		LOS A	LOS B	LOS C	LOS D	LOS E
4-Lane Freeway	State Highway	50,000	60,000	70,000	80,000	90,000
4-Lane Expressway	State Highway	24,000	28,000	32,000	36,000	40,000
4-Lane Arterial	A - Arterial	22,000	25,000	29,000	32,500	36,000
4-Lane Arterial (No Median)	A - Arterial	18,000	21,000	24,000	27,000	30,000
2-Lane Arterial (With Median)	A - Arterial	11,000	12,500	14,500	16,000	18,000
2-Lane Arterial (No Median)	A - Arterial	9,000	10,500	12,000	13,500	15,000
2-Lane Arterial (Substandard)	A - Arterial	6,750	7,875	9,000	10,125	11,250
2-Lane Collector	C - Collector	1,800	3,600	5,900	10,100	17,000
2-Lane Collector (Substandard)	RMiC - Rural Minor Collector	1,350	2,700	4,425	7,575	12,750

Notes:

1. Based on Highway Capacity Manual, Fourth Edition, Transportation Research Board, 2000.
2. All volume thresholds represent average conditions and assume ideal roadway characteristics (unless otherwise noted). Actual thresholds for each LOS listed above may vary depending on a variety of factors.

Year 2020 development assumptions were prepared in close coordination with the affected agencies within the study area. Based upon the Lake County, City of Clearlake, and City of Lakeport General Plans development activity expected within the next ten years has been developed. Growth areas are consistent with those identified in the Lake County General Plan Update and are primarily located adjacent to existing developed communities, consistent with smart-growth principles.

Comparison of Year 2020 and Year 2030 Development Assumptions

Summary tables of Year 2030 and Year 2020 development assumptions by County Planning Area and City have been developed to present the development assumptions. Year 2030 data was obtained from the Lake County Travel Demand model as created for the *Countywide Regional Transportation Impact Fee Program (2008)*. Year 2020 data was obtained directly from the County and both Cities.

While estimating Year 2020 land uses, an anomaly was discovered in the dwelling unit totals contained in the *Countywide Regional Transportation Impact Fee Study* (2008). The study includes second (vacant) homes for dwelling unit totals under existing (Year 2007) land uses, but not for Year 2030 land uses. Total Year 2030 dwelling units as identified in the report, are correct, but represent only occupied homes. Since average weekday conditions are modeled, second (vacation) homes are not included in trip generation data. These anomalies have been corrected and summarized in Table 3.

The remainder of this chapter presents a relationship of population estimates (both current and General Plan estimates) against estimated growth in residential land uses. Based on the Year 2020 dwelling unit data obtained from the Cities and the County, relationships for two different land use alternatives have been established.

Land Use Alternative 1: This alternative assumes that the Year 2020 data provided does not include any second (2) homes.

Table 3 provides a summary of the population and dwelling unit estimates for years 2007, 2020 and 2030. Year 2020 dwelling unit estimates were obtained from the Cities of Lakeport and Clearlake and Lake County, and are assumed to exclude any second or vacant homes.

Based upon data contained in the Lake County General Plan growth in population by Year 2020 is approximately 51% of the growth in population between Year 2007 and Year 2030. In comparison, based upon the development assumption data obtained from the County and Cities, the estimated growth in occupied dwelling units (d.u.) by Year 2020 represents a 34% growth in population. Under Alternative 1, it is computed that occupied dwelling units grow at the following rates per year:

- From Year 2007 to Year 2020, dwelling units grow at 5,568/13 i.e 429 d.u./year
- From Year 2020 to Year 2030, dwelling units grow at 10677/10 i.e 1068 d.u./year
- From Year 2007 to Year 2030, dwelling units grow at 16245/23 i.e 707 d.u./year.

TABLE 3
YEAR 2020 AND YEAR 2030 POPULATION AND DWELLING UNIT SUMMARY

Year	Population [1]	Growth in Population	Estimated Dwelling Units (occupied)	Growth in Dwelling Units (occupied)	Growth in population	Growth in occupied Dwelling Units
2007	68,332	0	26,718	0	-	-
2020	85,346	17,014	32,286	5,568	51%	34%
2030	101,557	33,225	42,963	16,245	100%	100%
Notes						
1 - 2020 & 2030 population as obtained from Lake County General Plan (Sep 2008)						
2 - 2030 occupied d.u assumes 2.39 persons/household as obtained from Dept of Finance (2000 census data)						

Land Use Alternative 2: This land use alternative assumes that the relationship between vacation (or second) homes and occupied homes is representative of existing trends, and the Year 2020 data provided by the County and Cities includes both occupied and second (vacant) homes. Based upon Year 2007 land uses the dwelling unit estimates for Lake County as follows:

- Year 2007 total d.u: 35,910 homes
- Year 2007 occupied d.u: 26,718 homes
- Year 2007 second(vacant) du.: 9,192 homes

Based on these 2007 land use estimates, second homes constitute approximately 26% of the total homes. Applying the same percentage of second homes to the 2020 growth estimates provided by the Cities and the County, produces the following:

- 2020 total growth in d.u: 5,569 homes
- 2020 growth in occupied d.u: 4,121 homes
- 2020 second(vacant) du.: 1,448 homes

Adding this growth to the 2007 land uses, it is projected that in Year 2020, there would be:

- Year 2020 total d.u: 41,479 homes
- Year 2020 occupied d.u: 30,839 homes
- 2007 second(vacant) du.: 1,0640 homes

Table 4 summarizes the population and dwelling unit estimates for Year 2020.

As indicated earlier, the Lake County General Plan identifies that the growth in population by Year 2020 is approximately 51% of the growth in population between Year 2007 and Year 2030. However the growth in occupied dwelling units by Year 2020 as estimated under this alternative represents 25% of the total growth in occupied dwelling units between 2007 and 2030.

Under Alternative 2, the occupied dwelling units grow at the following rates per year:

- From Year 2007 to Year 2020, dwelling units grow at 4,121/13 i.e 317 d.u./year
- From Year 2020 to Year 2030, dwelling units grow at 12124/10 i.e 1213 d.u./year
- From Year 2007 to Year 2030, dwelling units grow at 16245/23 i.e 707 d.u./year.

Conclusions

Based upon review of these two alternative land use assumptions by the TAC, given the downturn in the economy Alternative 2 was selected to represent occupied dwelling units under Year 2020 conditions. Table 5 provides a summary of existing, anticipated growth and Year 2020 land use quantities for residential, commercial and industrial uses. Figure 3 illustrates this data by planning area and agency. Appendix A contains graphics illustrating the anticipated growth in occupied homes for all travel demand model TAZ areas.

Year 2020 Travel Demand Model

Using the land use data summarized in Table 5, the Year 2030 Lake County travel demand was modified to create a Year 2020 model. Land use assumptions by planning area and agency were divided into the model TAZ areas. Daily and peak hour vehicular travel demand were obtained from the model for use in determining roadway capacity improvement needs.

TABLE 4
ALTERNATIVE 2 - YEAR 2020 AND YEAR 2030 POPULATION AND DWELLING UNIT SUMMARY

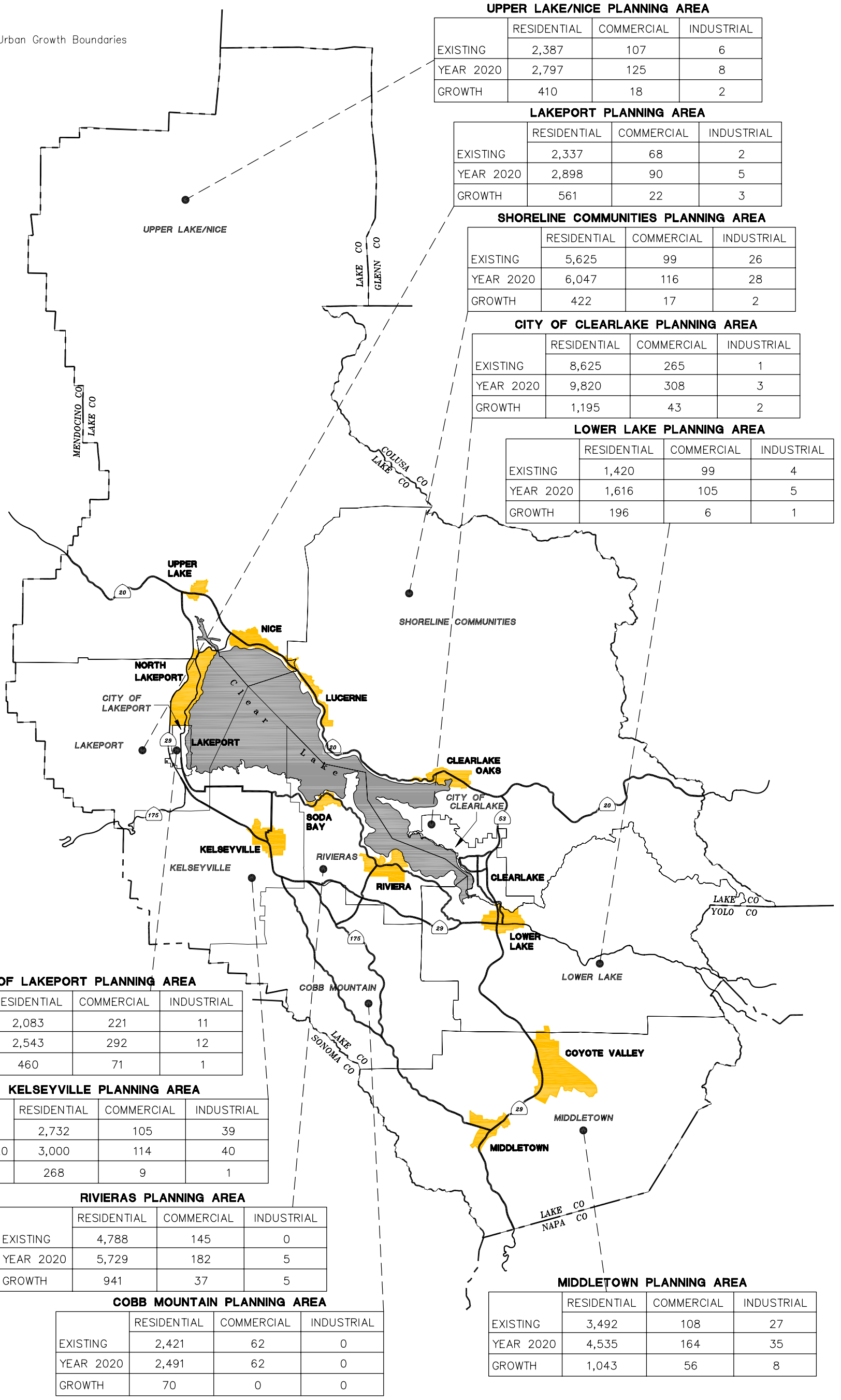
Year	Population [1]	Growth in Population	Estimated Dwelling Units [2] (occupied)	Growth in Dwelling Units (occupied)	Growth in population	Growth in occupied Dwelling Units
2007	68,332	-	26,718	-	0%	0%
2020	85,346	17,014	30,839	4,121	51%	25%
2030	101,557	33,225	42,963	16,245	100%	100%
Notes						
1 - 2020 & 2030 population as obtained from Lake County General Plan (Sep 2008)						
2 - 2030 occupied d.u assumes 2.39 persons/household as obtained from Dept of Finance (2000 census data)						

TABLE 5
YEAR 2020 LAND USE ASSUMPTIONS

EXISTING LAND USES						
Planning Area	**TAZ_#**	**Residential (du's) occupied**	**2nd homes**	**Commercial (acres)**	**Industrial (acres)**	**Other (acres)**
Upper Lake/Nice	100-133	2,387	0	107	6	290,239.06
Lakeport excl. City of Lakeport	200-230	1,586	751	68	2	39,671.03
Kelseyville	300-338	1,800	932	105	39	35,196.48
Cobb Mtn	400-436	2,399	22	62	0	43,101.44
Middletown	500-544	3,492	0	108	27	99,390.11
Lowerlake	600-645	1,420	0	99	4	69,851.56
Rivieras	700-733	3,059	1,729	145	0	14,620.82
Shoreline Communities excl. City of Clearlake	800-845	3,569	2,056	99	26	174,404.84
City of Clearlake	900-940	5,612	3,013	265	1	3,254.90
City of Lakeport	950-987	1,394	689	221	11	546.34
TOTAL		**26,718**	**9,193**	**1,279**	**116**	**770,277**
GROWTH IN LAND USES by Year 2020						
Planning Area	**TAZ_#**	**Residential (du's) occupied**	**2nd homes**	**Commercial (acres)**	**Industrial (acres)**	**Other (acres)**
Upper Lake/Nice	100-133	290	120	18	2	0
Lakeport excl. City of Lakeport	200-230	417	144	22	3	0
Kelseyville	300-338	210	58	9	1	0
Cobb Mtn	400-436	70	0	0	0	0
Middletown	500-544	751	292	56	8	0
Lowerlake	600-645	160	36	6	1	0
Rivieras	700-733	700	241	37	5	0
Shoreline Communities excl. City of Clearlake	800-845	314	108	17	2	0
City of Clearlake	900-940	888	307	43	2	0
City of Lakeport	950-987	342	118	71	1	0
TOTAL		**4,142**	**1,424**	**279**	**25**	**0**
Year 2020 Land Uses						
Planning Area	**TAZ_#**	**Residential (du's) occupied**	**2nd homes**	**Commercial (acres)**	**Industrial (acres)**	**Other (acres)**
Upper Lake/Nice	100-133	2,677	120	125	8	290,239
Lakeport excl. City of Lakeport	200-230	2,003	895	90	5	39,671
Kelseyville	300-338	2,010	990	114	40	35,196
Cobb Mtn	400-436	2,469	22	62	0	43,101
Middletown	500-544	4,243	292	164	35	99,390
Lowerlake	600-645	1,580	36	105	5	69,852
Rivieras	700-733	3,759	1,970	182	5	14,621
Shoreline Communities excl. City of Clearlake	800-845	3,883	2,164	116	28	174,405
City of Clearlake	900-940	6,500	3,320	308	3	3,255
City of Lakeport	950-987	1,736	807	292	12	546
TOTAL		**30,860**	**10,617**	**1,558**	**141**	**770,277**
% GROWTH IN LAND USES						
Planning Area	**TAZ_#**	**Residential (du's) occupied**	**2nd homes**	**Commercial (acres)**	**Industrial (acres)**	**Other (acres)**
Upper Lake/Nice	100-133	12%	-	17%	33%	0%
Lakeport excl. City of Lakeport	200-230	26%	19%	32%	195%	0%
Kelseyville	300-338	12%	6%	9%	3%	0%
Cobb Mtn	400-436	3%	0%	0%	-	0%
Middletown	500-544	22%	-	52%	29%	0%
Lowerlake	600-645	11%	-	6%	25%	0%
Rivieras	700-733	23%	14%	26%	-	0%
Shoreline Communities excl. City of Clearlake	800-845	9%	5%	17%	8%	0%
City of Clearlake	900-940	16%	10%	16%	156%	0%
City of Lakeport	950-987	25%	17%	32%	11%	0%
TOTAL		**16%**	**15%**	**22%**	**22%**	**0%**

LEGEND

Urban Growth Boundaries



UPPER LAKE/NICE PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	2,387	107	6
YEAR 2020	2,797	125	8
GROWTH	410	18	2

LAKEPORT PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	2,337	68	2
YEAR 2020	2,898	90	5
GROWTH	561	22	3

SHORELINE COMMUNITIES PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	5,625	99	26
YEAR 2020	6,047	116	28
GROWTH	422	17	2

CITY OF CLEARLAKE PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	8,625	265	1
YEAR 2020	9,820	308	3
GROWTH	1,195	43	2

LOWER LAKE PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	1,420	99	4
YEAR 2020	1,616	105	5
GROWTH	196	6	1

CITY OF LAKEPORT PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	2,083	221	11
YEAR 2020	2,543	292	12
GROWTH	460	71	1

KELSEYVILLE PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	2,732	105	39
YEAR 2020	3,000	114	40
GROWTH	268	9	1

RIVIERAS PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	4,788	145	0
YEAR 2020	5,729	182	5
GROWTH	941	37	5

COBB MOUNTAIN PLANNING AREA

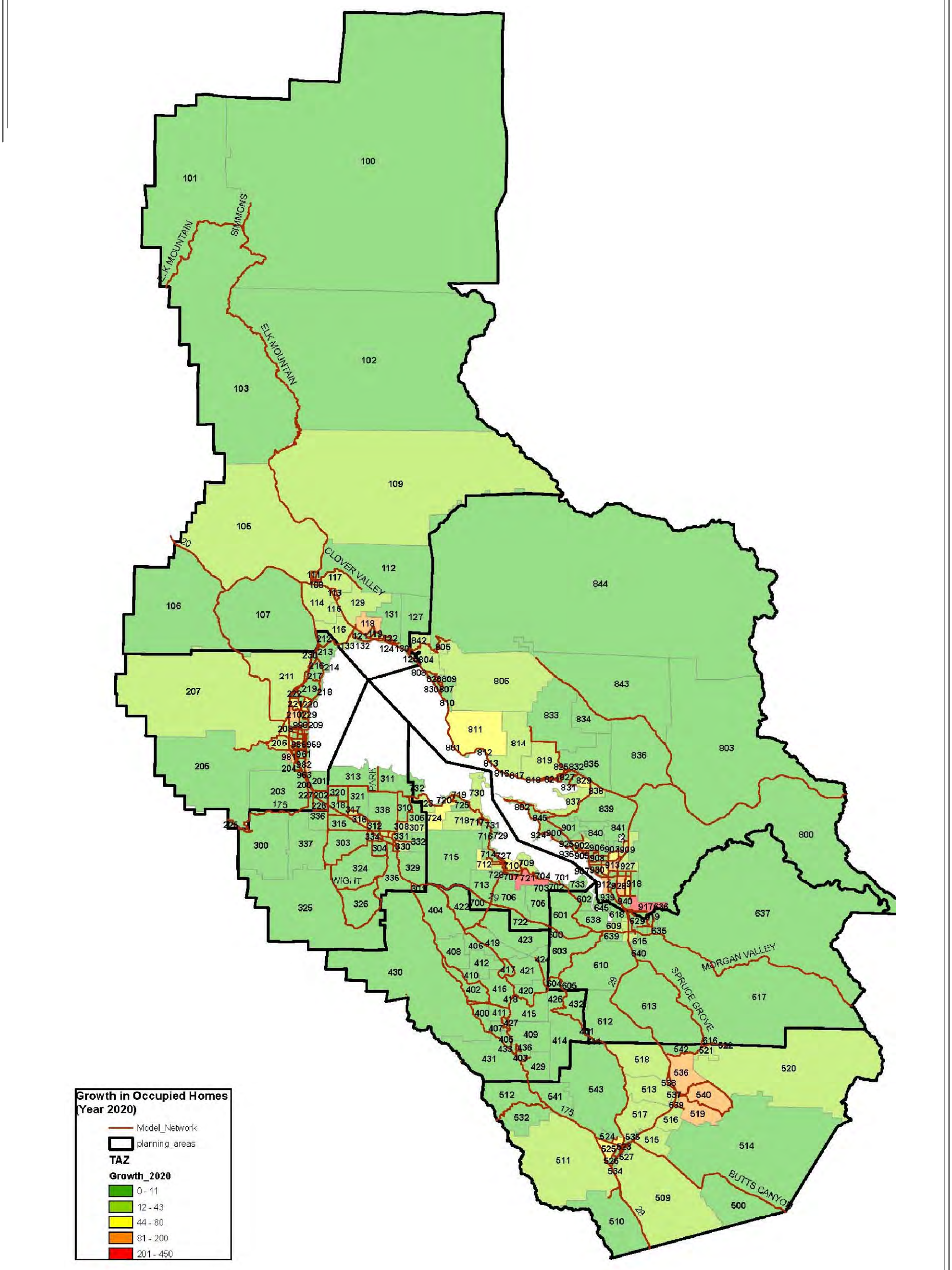
	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	2,421	62	0
YEAR 2020	2,491	62	0
GROWTH	70	0	0

MIDDLETOWN PLANNING AREA

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
EXISTING	3,492	108	27
YEAR 2020	4,535	164	35
GROWTH	1,043	56	8

Ten Year Transportation Needs and Capital Improvement Program in Lake County Figure 2

Existing and Year 2020 Land Use Assumptions



Ten Year Transportation Needs and Capital Improvement Program in Lake County Figure 3

Ten Year Growth in Occupied Homes

Existing Roadway Network

The following roadways form the primary roadway system within Lake County.

State Route 20 (SR 20) is a state facility that provides and east-west connection through northern California between Highway 1 on the coast and Interstate 80 in the Sierras. Regionally, SR 20 serves as an inter-regional auto and truck travel route that connects the Central Valley with the Cities of Williams, Marysville, Grass Valley, and Nevada City. Within Lake County, SR 20 provides for inter-regional through travel as well as locally based travel between the communities of Clear Lake, Clear Lake Oaks, Glenhaven, Lucerne, Nice, Upper Lake, and Lakeport.

Within the study area SR 20 is a two-lane undivided arterial with some passing lanes. The *1998 California Interregional Transportation Strategic Plan* added SR 20 as a "Principal Arterial Corridor" since it provides critical accessibility for the interregional movement of people, goods, agriculture, and recreational travel across the northern part of the state. It is one of ten corridors in the state to receive the highest priority for completion to minimum four-lane expressway facility standards over the next 20 years.

State Route 29 (SR 29) is a state facility that provides a north-south connection through central and northwestern California. Within the project area, SR 29 connects the Middletown area with the Lowerlake, Kelseyville, Rivieras, Lakeport, and Upper Lake/Nice planning areas. SR 29 is predominantly a two-lane arterial with short segments of passing lanes. In the Lakeport area, there is a 7.5 mile of full four-lane freeway with interchanges at Lakeport Blvd., 11th Street/Scotts Valley Road, Park Way, and the Nice Lucerne Cut-off.

State Route 53 (SR 53) is a rural principal arterial that provides north south circulation within Lake County, connecting SR 20 in the Shoreline Communities planning area with SR 29 in the Lowerlake Planning Area.

Bottle Rock Road and Nice Lucerne Cut-off are minor arterials providing circulation within the Lakeport and Cobb Mountain planning areas respectively.

State Route 175 (SR 175) provides east west connectivity within Lake County, and is functionally classified as a major collector between Bottle Rock Road.

The following study intersections are chosen for analysis during the PM peak hour, and were included for existing and Year 2030 traffic impact analysis.

1) State Route 20/Scotts Valley Road
2) State Route 20/State Route 29
3) State Route 20/Nice Lucerne Cut-off/Pyle Road
4) State Route 29/Lakeshore Blvd.
5) Country Club Drive/State Route 20
6) Foothill Drive (southern location)/State Route 20
7) State Route 20/State Route 53
8) Lakeshore Drive/Olympic Drive
9) State Route 53/Olympic Drive
10) State Route 29/State Route 53/Morgan Valley Road
11) State Route 29/Seigler Canyon Road
12) State Route 29/Point Lakeview Road
13) State Route 29/Butts Canyon Road
14) State Route 29/State Route 175 (in Middletown)
15) State Route 29/Dry Creek Cut-off
16) State Route 29/Red Hills Road/State Route 281(Soda Bay Road)
17) Soda Bay Road (State Route 281)/Pt. Lakeview Road
18) State Route 29/Main Street
19) State Route 29/Merrit Road
20) State Route 29/Argonaut Road
21) State Route 29/State Route 175 (in Kelseyville)
22) Lakeport Blvd./State Route 29 NB ramps
23) Lakeport Blvd./State Route 29 SB ramps
24) (Scotts Valley Road) 11th Street/State Route 29 NB ramps
25) (Scotts Valley Road) 11th Street/State Route 29 SB ramps
26) Nice Lucerne Cut-off/State Route 29 NB ramps
27) Nice Lucerne Cut-off/State Route 29 SB ramps
28) Nice Lucerne Cut-off/Lakeshore Blvd./Westlake Drive

Existing PM peak hour traffic counts were conducted by OMNI-MEANS on a weekday between March 14, and March 20, 2007. The PM peak hour is defined as one continuous hour of peak traffic

flow counted between 4:00 p.m. and 6:00 p.m. under typical weekday conditions. Existing roadway counts at different locations were conducted by Dow & Associates.

Lane geometrics and control at all study intersections are illustrated on Figure 2. Existing AM and PM peak hour traffic volumes at the study intersections are illustrated on Figure 3.

Principal Arterial Corridor (PAC)

The Principal Arterial Corridor (PAC) starts at the Route 101/20 junction north of the community of Calpella and continues on Route 20 southeast across the remainder of Mendocino County into Lake County. The PAC then follows Route 29 southeast to Route 53, then Route 53 north back to Route 20, then follows Route 20 east into Colusa County to Route I-5.

The PAC consists of the following segments of Routes 20, 29, 53:

- MEN-20-33.2/44.1 (State Route 101 to Lake County Line)
- LAK-20-0.0/8.3 (Lake County Line to Route 20/29 intersection)
- LAK-29-20.3/52.5 (South-Shore Lake 29 to State Route 53)
- LAK-53-0.0/7.45 (All of State Route 53)
- LAK-20-31.6/46.5 (Route 20/53 intersection to Colusa County Line)
- COL-20-0.0/R22.1 (Colusa County Line to Interstate 5)

Corridor Purpose

A Rural Principal Arterial (functional classification) serves corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel. This Principal Arterial was selected since major development along the North Shore of Clear Lake (Route 20) is not feasible due to environmental constraints. As the intervening Minor Arterial portion of Route 20 along the North Shore of Clear Lake becomes more congested, and improvements are made to Routes 29 and 53, it is anticipated that the PAC will be utilized by the majority of interregional traffic.

The PAC links Lake County with the Route 101 corridor near Ukiah on the west, and the Sacramento Valley on the east. Access to both of these areas is essential to Lake County's agricultural (fruit and nut orchards, vineyards) and tourist industries. In addition, the PAC provides access to communities along the Route.

The Route 53 segments of the PAC serve moderate to high volumes of local traffic in the community of Lower Lake, and through the City of Clear Lake, the largest City in Lake County. The Route also serves Anderson Marsh State Park, which is located about one mile north of the Community of Lower Lake along Route 53.

The PAC generally experiences light to moderate volumes of non-motorized traffic, with concentrations around the populated areas adjacent to the Route.

Roadway Classification

Lake County contains many different types of transportation facilities. Each facility within the study area will be covered in this section, with a description of each facility and how these facilities interrelate to one another. This section provides an overview of the existing roadway classification system based on the existing Lake County General Plan Circulation plan element, the existing transportation setting and the performance methodologies used to analyze the County's existing and future transportation system. Any deficient roadway segments and intersections are identified and alternative roadway configurations are recommended.

The term "Roadway Classification" refers to the hierarchy by which streets and highways are grouped according to the type of service they are intended to provide. The following section discusses the roadway classification systems as defined in the Lake County General Plan Transportation and Circulation Element. This document currently is used by the County as a policy document for the County's roadway system.

Arterial Systems generally consist of a road network connecting regions, towns, and other major traffic generators to serve commercial, economic development and employment centers. It is intended to move people and goods into, through and out of the valley and generally be continuous from

the point of entry into the Valley to the point of exit. The following classes of roadways fall under this category of road system.

- ***Freeways*** - Federally designated highway with two or more lanes in each direction separated by a barrier or median.

- ***Arterials*** - Facilities that link towns and major traffic generators. They are often heavily traveled and serve as a main street within a community. Their main function is to provide for the movement of traffic, with direct land access clearly a minor function

Collectors are facilities similar in nature to arterials where predominant travel distances are shorter when compared to the arterial route. These facilities generally originate and terminate at arterials, collectors, or neighborhood entrance with the primary purpose of moving the traffic between arterials and residential neighborhoods, or commercial/employment areas. These are again subdivided into major and minor collectors and facilitate both through movement of traffic as well as provide for direct land access.

- ***Major Collectors*** are facilities that may be upgraded to an arterial in the future and usually limit on-street parking to maintain smooth flow. They provide travel within the County to communities not directly served by the State Highway System. Major collectors within Lake County include Lakeport Blvd, 11th Street, Nice Lucerne Cut-off, Old Highway 53, Olympic Drive, West 40th Avenue.

- ***Minor Collectors*** are facilities that collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road. This type of road accounts for less than 10% of the County road system.

- ***Local Roads*** are facilities consisting of rural and residential roads not otherwise classified, primarily serving travel over relatively short distances with a primary function of providing access to adjacent lands.

Existing Facility Configuration and Vehicular Traffic Operations

The transportation facilities included in this study have been surveyed to determine existing configurations.

The following existing roadway configuration information is summarized in the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County – Table 6*:

- Facility Name
- Jurisdiction
- County Planning Area
- From/To Locations
- Functional Classification
- Length (feet)
- Existing Cross Section
- Developed Width
- Average Right-of-Way
- Pavement Conditions Index (PCI)
- Average Daily Traffic (ADT)
- Capacity Classification
- Existing Level of Service (LOS)
- Bike Route Designation
- Pedestrian Route Designation

Based upon methodologies presented in the preceding chapters, transportation improvements required to provide acceptable levels of mobility with Lake County have been identified. These improvement needs will form the basis for the fiscally constrained Ten Year Transportation Capital Improvement Program presented in the next chapter.

Planning Level Cost Estimate Methodology

Planning level cost estimates have been prepared for all transportation improvements required by Year 2020. These estimates represent very rough planning level costs based primarily upon additional roadway widening widths and overall roadway segment lengths to be improved. Based upon this data approximate square footage of additional surface improvements were calculated. Surface improvement areas were then multiplied by a square footage unit cost.

Square footage unit costs were divided into three categories as follows; level, rolling and steep terrain. Unit cost estimates were determined for each of these segment types by development of typical cross section costs for a typical roadway construction project. Unit cost data has been updated to current unit cost information. Steep slope improvement costs were derived from representative project bid data.

Unconstrained Year 2020 Improvement Needs

Year 2020 transportation system improvement needs were developed based upon the following criteria:

- Roadway Structural Conditions
- Roadway and Intersection Capacity
- Pedestrian Usage and Access
- Bicycle Usage and Access
- Safety Conditions
- Transit System

Based upon an analysis of each multi-model transportation need improvements to the existing transportation system necessary to accommodate Year 2020 mobility needs have been determined. A detailed summary of these needs is contained in the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County – Table 7*.

Year 2020 Improvement Needs Planning Level Cost Estimates

The detailed cost estimate worksheets associated with each preliminary planning level cost estimate are presented in the *Preliminary Report - Ten Year Transportation Needs and CIP in Lake County – Appendix B*.

Unconstrained Improvement Needs Prioritization Methodology

Considerable time was spent prioritizing the ten year improvement needs projects. A two step approach was used, with the first step involving a decision matrix methodology. This first step ranked all agency projects from most important to least important based upon various criteria. Appendix A provided a summary of this methodology.

The second step in this process involved obtaining each agencies priority from 1 through 4 for each of the projects, partially based upon the quantified matrix ranking. The agency priority ranking was then used to categorize all of the ten year improvement needs projects into four distinct priority groups. Tables 7 through 15 contain a summary of all agency projects by priority group.

Constrained Ten Year Improvement Needs

After considerable input from the Lake APC Technical Advisory Committee (TAC) additional refinements were made the list of unconstrained ten year improvement needs to create a financially constrained set of transportation improvements. The following metrics were used:

1. Structural Improvement Needs
2. Roadway Vehicular Capacity Needs
3. Roadway Bicycle Route Improvements

The following Tables 6 through 16 provide a summary of these improvement needs.

Constrained Ten Year Improvement Cost Estimation Methodology

Cost estimates completed for the unconstrained improvement projects assumed that roadways with a PCI of less than 25 would be fully reconstructed. While reconstruction of roadways with failing pavement conditions will provide long-term cost-saving the initial cost associated with full recon-

struction is very significant. Construction methods assumed for the constrained set of improvements assume that roadways with PCI values of less than 25 will be rehabilitated by cold planning the first four inches of AC and installing a new AC section. Roadways with PCI values greater than 25 were assumed to receive a slurry seal overlay or similar treatment.

TABLE 6
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
CALTRANS

Jurisdiction	Facility	From/At	To	Post Miles	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)
Caltrans	SR 20	Nice-Lucerne Cutoff	-	12.0 to 12.4	Roundabout at Rte 20/Nice-Lucerne Cutoff	**1**	$5,198
Caltrans	SR 20	SR 29	-	8.2 to 8.5	Safety and Operational Improvements	**1**	$3,840
Caltrans	SR 29	0.5 Mile East of SR 29/175	Deiner Drive/SR 29	23.8 to 31.6	Safety and Operational Improvements	**1**	$50,000
Caltrans	SR 29	SR 281	-	27.6 to 28.1	Intersection Widening	**1**	$1,560
Caltrans	SR 53	North of 40th Avenue/SR 53	Rte 20/53 intersection	3.1 to 7.4	Roadway Rehabilitation	**1**	$17,500
Caltrans	SR 29	Lakeport Blvd. SB Ramps		41.6	Construct Right-Turn Lane	**2**	$220
Caltrans	SR 29	-	-	9.9	Install Flashing Beacons	**2**	$140
Caltrans	SR 29	-	-	20.4 to 20.6	Widen Shoulder	**2**	$140
Caltrans	Various	-	-	Various	Reconstruct Metal Beam Guard Rail – Various Locations	**2**	$4,000
Caltrans	SR 20 & SR 175	-	-	2.4 and 13.7	Drainage Facility Improvements (2) SR 20 and SR 175	**2**	$70
Caltrans	SR 20	-	-	1.0 to 46.3	Culvert Rehab	**3**	$3,145
Caltrans	SR 29	-	-	20.1 to 20.8	Roadway Rehabilitation	**3**	$6,000
Caltrans	SR 175	-	-	4.9 to 28.0	Roadway Rehabilitation	**3**	$12,380

TABLE 7
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES TYPICAL ROADWAY SECTIONS
COUNTY OF LAKE

					Existing Cross Section (Ft.)										*New Cross Section (Ft.)*										
Jurisdiction	**Facility**	**From**	**To**	**Description of CIP Project**	**Existing Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**New Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**Comments**
Auto and Bicycle Facilities																									
Lake County	Bottle Rock Road	Sulphur Creek Road	SR 175	Structural Improvements	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Rehab Existing Pavement (Standard Plan 200-B)
Lake County	Lakeshore Boulevard	Nice Lucerne Cutoff	Park Way	Bike Lanes	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement (Standard Plan 200-B)
Lake County	Nice Lucerne Cut-off	Lakeshore Road	SR 20	Roadway Widening and Bike Lanes	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement (Standard Plan 200-B)(No-Bridge Widening)
Lake County	Soda Bay Road	Rancheria Road	Gaddy Lane	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Reconstruct Existing Pavement (Standard Plan 200-B)
Lake County	Soda Bay Road	SR 175	Big Valley Road	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Reconstruct Existing Pavement (Standard Plan 200-B)
Lake County	Harrington Flat Road	Bottle Rock Road	Sulphur Creek Road	Structural Improvements	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Rehab Existing Pavement (Standard Plan 200-B)
Lake County	Highland Springs	SR 29	Bell Hill Road	Structural Improvements	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Rehab Existing Pavement (Standard Plan 200-B)
Lake County	South Main Street	Lakeport City Limit	SR 175	Roadway Improvements	**62**		**5**		**20**	**12**	**20**		**5**		**62**	**4**	**5**	**4**	**12**	**12**	**12**	**4**	**5**	**4**	Overlay Existing Pavement

TABLE 8
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES
COUNTY OF LAKE

Jurisdiction	Facility	From/At	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)	Average Existing Developed Roadway Width (Ft.)	Average Proposed Developed Roadway Width (Ft.)	Type of Construction	Length of Roadway Section (Linear Ft.)	New Construction Area Width (Ft.)	Terrain Type	Roadway Construction Cost ($1,000)	Cost of Intersection or Interchange Improvements ($1,000)	New Right-of-Way Area (Sq. Ft.)	Right-of-Way Aquisition Cost ($1,000)	Engineering and Construction Support ($1,000)
Auto and Bicycle Facilities																	
Lake County	Bottle Rock Road	Sulphur Creek Road	SR 175	Structural Improvements	**1**	$2,872	24	32	Rehab Existing	8,000	8	Level	$1,748	$0	64,000	$512	$612
Lake County	Lakeshore Boulevard	Nice Lucerne Cutoff	Park Way	Bike Lanes	**1**	$3,554	24	32	Overlay Existing	16,000	8	Level	$874	$1,000	128,000	$1,024	$656
Lake County	Nice Lucerne Cut-off	Lakeshore Road	SR 20	Roadway Widening and Bike Lanes	**1**	$592	24	32	Overlay Existing	4,300	8	Level	$235	$0	34,400	$275	$82
Lake County	Nice Lucerne Cut-off	Lakeshore Road	-	Construct Roundabout	**1**	$850	-	-	Overlay Existing	-	-	-	$0	$850	0	$0	$298
Lake County	Soda Bay Road	Rancheria Road	Gaddy Lane	Roadway Widening	**2**	$7,179	24	32	Reconstruct Existing	20,000	8	Level	$4,370	$0	160,000	$1,280	$1,529
Lake County	Soda Bay Road	SR 175	Big Valley Road	Roadway Widening	**2**	$2,369	24	32	Reconstruct Existing	6,600	8	Level	$1,442	$0	52,800	$422	$505
Lake County	Harrington Flat Road	Bottle Rock Road	Sulphur Creek Road	Structural Improvements	**3**	$7,897	24	32	Rehab Existing	22,000	8	Level	$4,807	$0	176,000	$1,408	$1,682
Lake County	Highland Springs	SR 29	Bell Hill Road	Structural Improvements	**3**	$5,636	24	32	Rehab Existing	15,700	8	Level	$3,430	$0	125,600	$1,005	$1,201
Lake County	South Main Street	Lakeport City Limit	SR 175	Roadway Improvements	**4**	$1,350	62	62	Overlay Existing	7,300	0	Level	$0	$1,000	0	$0	$350

TABLE 9
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
PEDESTRIAN FACILITIES
COUNTY OF LAKE

Jurisdiction	Facility	From	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)
Pedestrian Facilities						
Lake County	17th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**1**	$56
Lake County	Bridge Arbor Bike Trail	Upper Lake	Bridge Arbor	Construct Class I Bikeway/Trail	**1**	$750
Lake County	Fairway Drive	Olympia	Sunset Ridge	Install Safe Route to School Plan Improvements - Riveriera School	**1**	$178
Lake County	Konocti Road	Main Street	Oak Ridge	Install Safe Route to School Plan Improvements - Kelseyville Schools	**1**	$156
Lake County	Lake Street	Main Street	Jessie	Install Safe Route to School Plan Improvements - Lower Lake Schools	**1**	$205
Lake County	Second Street	Main Street	Old Lucerne	Install Safe Route to School Plan Improvements - Upper Lake Schools	**1**	$239
Lake County	SR 20	Butler	Shaul	Install Safe Route to School Plan Improvements - Eastlake School	**1**	$119
Lake County	14th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**2**	$100
Lake County	15th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**2**	$88
Lake County	16th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**2**	$69
Lake County	Country Club Dr.	3rd Street	10th Street	Install Safe Route to School Plan Improvements - Lucerne School	**2**	$158
Lake County	Del Monte	Monte Cristo	Bel Air	Install Safe Route to School Plan Improvements - Riveriera School	**2**	$117
Lake County	First Street (Upper Lake)	Main Street (Upper Lake)	Old Lucerne	Install Safe Route to School Plan Improvements - Upper Lake Schools	**2**	$212
Lake County	Live Oak Drive	SR 29	Cruickshank Road	Roadway Structural and Pedestrian Improvements	**2**	$1,154
Lake County	10th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**3**	$53
Lake County	13th Street	-	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**3**	$50
Lake County	9th Street	SR 20	Country Club Road	Install Safe Route to School Plan Improvements - Lucerne School	**3**	$53
Lake County	Monte Cristo	Montezuma	Del Monte	Install Safe Route to School Plan Improvements - Riveriera School	**3**	$136
Lake County	Monterey	Monte Cristo	Del Monte	Install Safe Route to School Plan Improvements - Riveriera School	**3**	$53
Lake County	Sierra	Monte Cristo	Fairway Drive	Install Safe Route to School Plan Improvements - Riveriera School	**3**	$108

TABLE 10
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES
TYPICAL ROADWAY SECTIONS
CITY OF LAKEPORT

					Existing Cross Section (Ft.)										*New Cross Section (Ft.)*										
Jurisdiction	**Facility**	**From**	**To**	**Description of CIP Project**	**Existing Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**New Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**Comments**
Auto and Bicycle Facilities																									
City of Lakeport	Main Street	11th Street	6th Street	Roadway Improvements	62		5		20	12	20		5		64	5	5	4	12	12	12	4	5	5	Overlay Existing Pavement
City of Lakeport	Main Street	2nd Street	Martin Street	Roadway Improvements	62		5		20	12	20		5		64	5	5	4	12	12	12	4	5	5	Overlay Existing Pavement
City of Lakeport	Main Street	6th Street	2nd Street	Roadway Improvements	62		5		20	12	20		5		64	5	5	4	12	12	12	4	5	5	Overlay Existing Pavement
City of Lakeport	Hartley Road	16th Street	Clearlake Avenue	Structural Improvements	32		5		11		11		5		32		5		11		11		5		Rehab Existing Pavement
City of Lakeport	Hartley Road	20th Street	16th Street	Structural Improvements	27				11		11		5		32		5		11		11		5		Rehab Existing Pavement
City of Lakeport	Hartley Road	Crystal Lake Way	20th Street	Structural Improvements	22				11		11				32		5		11		11		5		Rehab Existing Pavement
City of Lakeport	Lakeport Boulevard	South Larrecou Lane	South Main Street	Roadway Improvements	54		5		16	12	16		5		56		5	4	14	12	12	4	5		Overlay Existing Pavement
City of Lakeport	Main Street	Martin Street	Lakeport Boulevard	Roadway Improvements	62		5		20	12	20		5		64	5	5	4	12	12	12	4	5	5	Overlay Existing Pavement
City of Lakeport	16th Street	Hartley Street	Forbes Street	Structural Improvements	50		5		20		20		5		54		5	4	12	12	12	4	5		Rehab Existing Pavement
City of Lakeport	16th Street	Mellor Drive	Hartley Street	Structural Improvements	50		5		20		20		5		54		5	4	12	12	12	4	5		Rehab Existing Pavement
City of Lakeport	Forbes Street	16th Street	Martin Street	Structural Improvements	42		5		16		16		5		42		5	4	12		12	4	5		Rehab Existing Pavement

TABLE 11
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES
CITY OF LAKEPORT

Jurisdiction	Facility	From	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)	Average Existing Developed Roadway Width (Ft.)	Average Proposed Developed Roadway Width (Ft.)	Type of Construction	Length of Roadway Section (Linear Ft.)	New Construction Area Width (Ft.)	Terrain Type	Roadway Construction Cost ($1,000)	Cost of Intersection or Interchange Improvements ($1,000)	New Right-of-Way Area (Sq. Ft.)	Right-of-Way Aquisition Cost ($1,000)	Engineering and Construction Support ($1,000)
Auto and Bicycle Facilities																	
City of Lakeport	Main Street	11th Street	6th Street	Roadway Improvements	**1**	$713	62	64	Overlay Existing	1,100	2	Level	$15	$500	2,200	$18	$180
City of Lakeport	Main Street	2nd Street	Martin Street	Roadway Improvements	**1**	$709	62	64	Overlay Existing	1,000	2	Level	$14	$500	2,000	$16	$180
City of Lakeport	Main Street	6th Street	2nd Street	Roadway Improvements	**1**	$709	62	64	Overlay Existing	1,000	2	Level	$14	$500	2,000	$16	$180
City of Lakeport	Hartley Road	16th Street	Clearlake Avenue	Structural Improvements	**2**	$295	32	32	Rehab Existing	1,000	0	Level	$218	$0	0	$0	$76
City of Lakeport	Hartley Road	20th Street	16th Street	Structural Improvements	**2**	$670	27	32	Rehab Existing	2,000	5	Level	$437	$0	10,000	$80	$153
City of Lakeport	Hartley Road	Crystal Lake Way	20th Street	Structural Improvements	**2**	$1,762	22	32	Rehab Existing	4,700	10	Level	$1,027	$0	47,000	$376	$359
City of Lakeport	Lakeport Boulevard	South Larrecou Lane	South Main Street	Roadway Improvements	**2**	$2,745	54	56	Overlay Existing	1,300	2	Level	$18	$2,000	2,600	$21	$706
City of Lakeport	Main Street	Martin Street	Lakeport Boulevard	Roadway Improvements	**2**	$747	62	64	Overlay Existing	2,100	2	Level	$29	$500	4,200	$34	$185
City of Lakeport	16th Street	Hartley Street	Forbes Street	Structural Improvements	**3**	$530	50	54	Rehab Existing	1,000	4	Level	$369	$0	4,000	$32	$129
City of Lakeport	16th Street	Mellor Drive	Hartley Street	Structural Improvements	**3**	$530	50	54	Rehab Existing	1,000	4	Level	$369	$0	4,000	$32	$129
City of Lakeport	Forbes Street	16th Street	Martin Street	Structural Improvements	**3**	$1,703	42	42	Rehab Existing	4,400	0	Level	$1,262	$0	0	$0	$442

TABLE 12
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
PEDESTRIAN FACILITIES
CITY OF LAKEPORT

Jurisdiction	Facility	From	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)
Pedestrian Facilities						
City of Lakeport	Fairview Way	Terrace Drive	Green Street	Install Safe Route to School Plan Improvements - Lakeport Schools	**1**	$69
City of Lakeport	Forest Drive	Terrace Drive	Giselman Street	Install Safe Route to School Plan Improvements - Lakeport Schools	**1**	$121
City of Lakeport	Hillcrest Drive	Forest Drive	Green Street	Install Safe Route to School Plan Improvements - Lakeport Schools	**1**	$86
City of Lakeport	Sayre Street	Green Street	Giselman Street	Install Safe Route to School Plan Improvements - Lakeport Schools	**1**	$48
City of Lakeport	Forbes Street	Martin Street	3rd Street	Install Safe Route to School Plan Improvements - Konocti Christian	**2**	$80
City of Lakeport	High Street	Martin Street	2nd Street	Install Safe Route to School Plan Improvements - Konocti Christian	**2**	$97
City of Lakeport	Martin Street	Russell	Main Street	Install Safe Route to School Plan Improvements - Konocti Christian	**3**	$240

TABLE 13
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES
TYPICAL ROADWAY SECTIONS
CITY OF CLEARLAKE

Jurisdiction	Facility	From	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)	Average Existing Developed Roadway Width (Ft.)	Average Proposed Developed Roadway Width (Ft.)	Type of Construction	Length of Roadway Section (Linear Ft.)	New Construction Area Width (Ft.)	Terrain Type	Roadway Construction Cost ($1,000)	Cost of Intersection or Interchange Improvements ($1,000)	New Right-of-Way Area (Sq. Ft.)	Right-of-Way Aquisition Cost ($1,000)	Engineering and Construction Support ($1,000)
Auto and Bicycle Facilities																	
City of Clearlake	Lakeshore Drive	Division Avenue	Olympic Drive	Roadway Widening	**1**	$864	35	50	Widen and Overlay	730	15	Level	$75	$500	10,950	$88	$201
City of Clearlake	Lakeshore Drive	Mullen Avenue	Divison Avenue	Roadway Widening	**1**	$1,579	35	50	Widen and Overlay	3,500	15	Level	$358	$500	52,500	$420	$300
City of Clearlake	Lakeshore Drive	Old Highway 53	Mullen Avenue	Roadway Widening	**1**	$1,398	35	50	Widen and Overlay	2,800	15	Level	$287	$500	42,000	$336	$275
City of Clearlake	Lakeshore Drive	SR 53	Old Highway 53	Roadway Widening	**1**	$1,346	45	60	Widen and Overlay	2,600	15	Level	$266	$500	39,000	$312	$268
City of Clearlake	Airport Road Ext.	Old Highway 53	SR 53	Construct New Roadway	**1**	$1,096	0	32	New Road	1,500	32	Level	$328	$200	48,000	$384	$185
City of Clearlake	18th Avenue	SR 53	Boyles	Roadway Widening	**1**	$661	20	32	Overlay Existing	3,200	12	Level	$262	$0	38,400	$307	$92
City of Clearlake	Dam Road Extension	Dam Road	18th Avenue	Construct New Roadway	**1**	$2,243	0	32	New Road	2,000	32	Rolling	$782	$500	64,000	$512	$449
City of Clearlake	Dam Road	SR 53	Dam Rd. Ext.	Roadway Widening	**1**	$529	72	96	Overlay Existing	300	24	Level	$49	$300	7,200	$58	$122
City of Clearlake	Old Highway 53	Olympic Drive	Austin Drive	Roadway Widening	**2**	$854	24	32	Overlay Existing	1,300	8	Level	$71	$500	10,400	$83	$200
City of Clearlake	Old Highway 53	Austin Drive	Davis Avenue	Roadway Widening	**2**	$882	24	32	Overlay Existing	1,500	8	Level	$82	$500	12,000	$96	$204
City of Clearlake	Old Highway 53	Davis Avenue	Lakeshore Drive	Roadway Widening	**2**	$923	24	32	Overlay Existing	1,800	8	Level	$98	$500	14,400	$115	$209
City of Clearlake	Old Highway 53	Lakeview Street	Airport Road	Roadway Widening	**3**	$882	24	32	Overlay Existing	1,500	8	Level	$82	$500	12,000	$96	$204
City of Clearlake	Old Highway 53	Airport Road	SR 53	Roadway Widening	**3**	$950	24	32	Overlay Existing	2,000	8	Level	$109	$500	16,000	$128	$213

TABLE 14
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
AUTO AND BICYCLE FACILITIES
CITY OF CLEARLAKE

					Existing Cross Section (Ft.)										*New Cross Section (Ft.)*										
Jurisdiction	**Facility**	**From**	**To**	**Description of CIP Project**	**Existing Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**New Roadway Width (Ft.)**	**Landscape Area**	**Sidewalk**	**Shoulder/Bike Lane**	**Travel Lanes**	**Median**	**Travel Lanes**	**Shoulder/Bike Lane**	**Sidewalk**	**Landscape Area**	**Comments**
Auto and Bicycle Facilities																									
City of Clearlake	Lakeshore Drive	Division Avenue	Olympic Drive	Roadway Widening	**35**				**15**		**15**		**5**		**50**		**5**		**14**	**12**	**14**		**5**		Widen and Overlay Pavement
City of Clearlake	Lakeshore Drive	Mullen Avenue	Divison Avenue	Roadway Widening	**35**				**15**		**15**		**5**		**50**		**5**		**14**	**12**	**14**		**5**		Widen and Overlay Pavement
City of Clearlake	Lakeshore Drive	Old Highway 53	Mullen Avenue	Roadway Widening	**35**				**15**		**15**		**5**		**50**		**5**		**14**	**12**	**14**		**5**		Widen and Overlay Pavement
City of Clearlake	Lakeshore Drive	SR 53	Old Highway 53	Roadway Widening	**45**				**14**	**12**	**14**		**5**		**60**	**3**	**5**	**4**	**12**	**12**	**12**	**4**	**5**	**3**	Widen and Overlay Pavement
City of Clearlake	Airport Road Ext.	Old Highway 53	SR 53	Construct New Roadway											**32**			**4**	**12**		**12**	**4**			New Road Construction
City of Clearlake	18th Avenue	SR 53	Boyles	Roadway Widening	**20**				**10**		**10**				**32**			**4**	**12**		**12**	**4**			Traveled Way Only
City of Clearlake	Dam Road Extension	Dam Road	18th Avenue	Construct New Roadway											**32**			**4**	**12**		**12**	**4**			New Road Construction
City of Clearlake	Dam Road	SR 53	Dam Rd. Ext.	Roadway Widening	**72**				**36**		**36**				**96**				**48**		**48**				Overlay Existing Pavement
City of Clearlake	Old Highway 53	Olympic Drive	Austin Drive	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement
City of Clearlake	Old Highway 53	Austin Drive	Davis Avenue	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement
City of Clearlake	Old Highway 53	Davis Avenue	Lakeshore Drive	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement
City of Clearlake	Old Highway 53	Lakeview Street	Airport Road	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement
City of Clearlake	Old Highway 53	Airport Road	SR 53	Roadway Widening	**24**				**12**		**12**				**32**			**4**	**12**		**12**	**4**			Overlay Existing Pavement

TABLE 15
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
PEDESTRIAN FACILITIES
CITY OF CLEARLAKE

Jurisdiction	Facility	From	To	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)
City of Clearlake	18th Avenue	SR 53	Boyles Avenue	Install Safe Route to School Plan Improvements - Oak Hill Middle School	1	$432
City of Clearlake	Arrowhead Road	Park	Kakul	Install Safe Route to School Plan Improvements - Pomo Elementary	1	$239
City of Clearlake	Austin Ave.	Pine Street	Redwood	Install Safe Route to School Plan Improvements - Burns Valley Elementary School	1	$234
City of Clearlake	Olive	Austin Drive	Walnut	Install Safe Route to School Plan Improvements - Burns Valley Elementary School	1	$93
City of Clearlake	Boyles Avenue	18th Avenue	29th Avenue	Install Safe Route to School Plan Improvements - Oak Hill Middle School	2	$264
City of Clearlake	Division	Lakeshore	Pine Street	Install Safe Route to School Plan Improvements - Burns Valley Elementary School	2	$104
City of Clearlake	Huntington	Lakeshore	Arrowhead Road	Install Safe Route to School Plan Improvements - Pomo Elementary	2	$147
City of Clearlake	Walnut	Pine Street	Madrone	Install Safe Route to School Plan Improvements - Burns Valley Elementary School	2	$155
City of Clearlake	Yuba College Road	Dam Road	-	Install Safe Route to School Plan Improvements - Oak Hill Middle School	2	$82

TABLE 16
CONSTRAINED TEN YEAR IMPROVEMENT NEEDS
TRANSIT FACILITIES
LAKE TRANSIT AUTHORITY

Jurisdiction	Description of CIP Project	Project Funding Tier	Project Cost ($1,000)
Auto and Bicycle Facilities			
Lake Transit Authority	Purchase Transit Vehicles	**1**	$718
Lake Transit Authority	Purchase Transit Vehicles	**1**	$1,810
Lake Transit Authority	Purchase Transit Vehicles	**1**	$1,600
Lake Transit Authority	Bus Security and Communications Equipment	**1**	$165
Lake Transit Authority	Facility Security Improvements	**1**	$55
Lake Transit Authority	Automatic Bus Wash	**1**	$100
Lake Transit Authority	Bus stop amenities, including wheelchair access, benches, shelters, signage, bus turnouts at existing bus stops.	**1**	$245
Lake Transit Authority	Bus stop amenities, including wheelchair access, benches, shelters, signage, bus turnouts at existing bus stops.	**1**	$120
Lake Transit Authority	Bus stop amenities, including wheelchair access, benches, shelters, signage, bus turnouts at existing bus stops.	**1**	$1,370
Lake Transit Authority	Bus stop amenities for new routes, new development	**1**	$300
Lake Transit Authority	Clearlake Transit Center planning and land acquisition	**1**	$600
Lake Transit Authority	Clearlake Transit Center - construction	**1**	$2,000
Lake Transit Authority	Lakeport Transit Center	**1**	$1,000
Lake Transit Authority	Purchase Transit Vehicles	**2**	$5,000
Lake Transit Authority	Bus Security and Communications Equipment	**2**	$200
Lake Transit Authority	Electronic fare management system	**2**	$500
Lake Transit Authority	Facility Security Improvements	**2**	$100
Lake Transit Authority	Operations Facility Expansion	**2**	$1,000
Lake Transit Authority	Solar Bus Ports	**2**	$2,500
Lake Transit Authority	Bus stop amenities for new routes, new development	**2**	$300

The preceding chapter provided a summary of ten year constrained transportation improvement needs within Lake County. This chapter will identify the funding constraints associated with a ten year transportation capital improvement program.

Constrained Ten Year Improvement Needs Cost Estimates

Table 17 summarizes the constrained ten year improvement project costs by agency and project funding tier. As identified in this Table, the County faces very significant costs over the next ten years to provide the necessary multi-model transportation improvement necessary to maintain acceptable operating conditions.

Ten Year Funding Estimates

Table 18 summarizes the anticipated ten year transportation funding estimates by funding source. Approximately $81 million in transportation funding is anticipated over the next ten years. This estimate would fund 75% of the Tier 1 projects estimated at $108 million.

Ten year funding estimates fall significantly short of funding all Tier 1 through Tier 4 project costs, funding only 42% of the total ten year constrained needs estimated at $193 million. Additional funding sources will be required to provide the necessary transportation improvements on a countywide basis.

Ten Year Capital Improvement Program

After review of the constrained ten years needs and funding tiers, the APC TAC decided that the Ten Year Capital Improvement Program would be comprised primarily of Tier 1 projects. Projects would be selected for design and construction based upon the availability and type of funding sources. Projects outside the Tier 1 list may be included in the CIP if specific funding monies preclude design/construction of projects in the Tier 1 list.

TABLE 17
TEN YEAR TRANSPORTATION IMPROVEMENT NEEDS
SUMMARY OF COSTS BY AGENCY AND FUNDING TIER ($1,000)

	Project Funding Tier				
Agency	**1**	**2**	**3**	**4**	**Totals**
Auto and Bicyle					
Caltrans	$78,098	$4,570	$21,525	$0	$104,193
County of Lake	$7,868	$9,548	$13,533	$1,350	$32,298
City of Lakeport	$2,132	$6,219	$2,763	$0	$11,114
City of Clearlake	$6,945	$7,263	$2,659	$1,832	$18,698
Totals	**$95,042**	**$27,600**	**$40,479**	**$3,182**	**$166,303**
Pedestrian					
Caltrans	$0	$0	$0	$0	$0
County of Lake	$1,704	$1,899	$453	$0	$4,056
City of Lakeport	$324	$177	$240	$0	$741
City of Clearlake	$998	$751	$0	$0	$1,749
Totals	**$3,026**	**$2,827**	**$693**	**$0**	**$6,546**
Transit					
Lake Transit Authority	$10,083	$9,600	$0	$0	**$19,683**
TOTALS	**$108,151**	**$40,027**	**$41,172**	**$3,182**	**$192,532**
GRAND TOTAL			**$192,532**		

TABLE 18
TEN YEAR TRANSPORTATION FUNDING ESTIMATES

Funding Source	Ten Year Funding Estimate ($1,000)
State Transportation Improvement Program (STIP)	$12,000
Gas Tax	$31,200
Region Surface Transportation Program	$4,500
LTF (Bicycle and Pedestrian Portion)	$300
TDA (Transportation Development Act)	$450
SHOPP	$32,700
Total	**$81,150**

Source: Lake County APC. Caltrans SHOPP estimates.

APPENDIX – PROJECT PRIORITY EVALUATION PROCESS

1.0 - INTRODUCTION

The matrix evaluation is a screening process designed to provide an objective method to prioritize the ten year capital improvement needs. Omni-Means has developed the *Project Priority Decision Matrix* (PPDM) that provides a numerical scoring methodology to formalize and simplify this procedure. The PPDM provides a means to identify and either quantitatively or qualitatively evaluate the advantages and disadvantages of each project, based upon selected criteria. The PPDM also provides a means to "weigh" the importance of each criterion, so that the advantages and disadvantages of each project can be compared and ranked in relation to each other, with highest PPDM scores ranking first. These rankings (PPDM scores) allow the determination of project priority, which directly relates to project funding priorities.

The overall PPDM procedure involves a six-step process:

1) Develop Need and Purpose criteria.
2) Prepare Need and Purpose initial screening check.
3) Develop a list of "evaluation criteria".
4) Determine "relative weighing" for each evaluation criteria.
5) Score each evaluation criteria for each project passing the initial Need and Purpose screen check.
6) Calculate the final weighted scores for each project.

The following discussion provides a more detailed description of the process.

1.1 - NEED AND PURPOSE

The first step in the PPDM process is to develop a list of Need and Purpose criteria that will be used to screen the projects for further matrix evaluation. Each Need and Purpose criteria have been formulated to relate specifically to the goals and objectives of the overall study, along with being consistent with existing General Plan policies. As set forth by Lake County/City Area Planning Council, the specific goals and objectives of this study are as follows:

> *The purpose of the project is to identify current needs and establish funding priorities for the region's transportation system. The existing program, Lake Countywide Road Needs Study (W-Trans, 2000) is now out-of-date. There has been an unforeseen spike in new development since 2000 that will impacted the transportation system. Transportation funding has also changed dramatically in the past several years.*

The Need and Purpose criteria presented in this working paper have been determined through joint consensus of the TAC and agency staff. The second step, is to review each transportation project to determine if each Need and Purpose criteria are met. This initial screening process uses a simple yes “Y” or no “N” scoring of each Need and Purpose criteria. Those projects that score fifty percent or greater “yes” scores for all of the criteria will pass to the full evaluation, as described below. Those projects that score less than fifty percent “yes” score will be eliminated from further consideration.

NEED AND PURPOSE CRITERIA	
Criteria	**Yes/No Scoring**
Traffic Operations	Improves Traffic Operations
Safety Impacts	Improves Overall Traffic Safety
Project Costs	Same Order of Magnitude Cost Compared with Projects of Similar Size
Environmental Impacts	Same Order of Magnitude Environmental Impacts Compared with Projects of Similar Size
Community Impacts	Same Order of Magnitude Community Impacts Compared with Project of Similar Size
Design Standards	Meets Most State and Local Design Standards
Constructability	Considered Ultimately Constructible

1.2 - EVALUATION CRITERIA

The third step in the PPDM procedure is to develop a list of evaluation criterion for use in scoring each project under consideration. The evaluation criteria were derived from the initial list of Need and Purpose criteria as determined through joint consensus of the TAC and agency staff. Following is a brief description of the seven (7) evaluation criterion categories:

- ***Traffic Operations:*** The Traffic Operations criterion refers to the level of vehicular traffic operations that are associated with a project.

Vehicular operation levels are determined through use of the LOS grading system. This system provides the ability to score each project based upon anticipated vehicular speeds, density and delay times (i.e., congestion).

- ***Safety Impacts:*** The Safety criterion provides a measure of potential safety enhancements within the study area traffic circulation system due to the proposed improvement project. This criteria will specifically assess the projects impact on known existing high traffic accident locations.

- ***Project Cost:*** The Cost criteria provides a measure of project costs relative to the other CIP projects. Projects are scored in relationship to percentage variance from the median CIP project costs.

- ***Environmental Impact:*** The Environmental Impact criterion will provide a subjective indication of the possible environmental effects resulting from each of the project.

- ***Community Impact:*** The Community Impact criteria provides both a subjective scoring of the overall community acceptance, along with quantified impacts for each project. The quantified impact will be scored based upon how each project will impact existing residential and commercial properties within the study area. These impacts will be scored based upon right-of-way requirements, along with the number of potential housing units and commercial property relocations required as a result the project.

- ***Design Standards:*** The Design criteria will score each project in relationship to variances required from Local, State and Federal design standards. The level of deviation from a mandatory or advisory standard will be scored based upon the number and severity of the deviation.

- ***Constructability:*** The Constructability criteria measures the relative impacts associated with constructing a project, and is based upon the ability to efficiently construct the project in a timely manner. Projects that require extensive phasing and traffic handling resulting in longer construction periods and greater impacts to the traveling public will receive a lower score compared to projects with shorter construction periods.

1.3 - WEIGHING EVALUATION CRITERIA

The fourth step in the PPDM evaluation procedure is to determine the "relative importance" of each evaluation criteria by assigning a weighing value to each. Certain criterion will be considered by the TAC to be more important than others, therefore, each evaluated criterion will be assigned a relative weighted value to indicate its relative importance in relation to the other criteria.

Each of the evaluation criterions will be weighted on a scale of one to ten. Ten is the upper end of the scale and indicates that the evaluated criterion is of critical importance. One is the low end of the scale and indicates that the evaluation criterion is least important. Each criterion is weighted independently.

Relative Importance Weighing Scale	
1	Least Important
3	Lower Importance
5	Important
7	More Important
10	Critically Important

Based upon input from the TAC the following relative importance weighing scores were used in this evaluation process. *{Note: Individual TAC member scoring worksheets are contained in the appendix.}*

RELATIVE IMPORTANCE WEIGHING	
Evaluation Criteria	**Relative Weighing**
Traffic Operations	**?**
Safety Impacts	**?**
Project Cost	**?**
Environmental Impact	**?**
Community Impact	**?**
Design Standards	**?**
Constructability	**?**

1.4 - EVALUATION CRITERIA SCORING

The fifth step in the PPDM procedure is to evaluate and score each project that has passed the initial Need and Purpose screening procedure, within each evaluation category. For each of the various evaluation criteria categories a system of scoring

each project has been created. There are various criteria that are not easily quantifiable but nonetheless represent an important consideration in the project priority determination process. For these criteria, a qualitative scale of one (1) to ten (10) was utilized, where; one (1) represents a significant impact (bad) and therefore does not provide a high score, and ten (10) represents little or no impact (good), and scores high.

The PPDM also accounts for multiple impacts associated with a specific aspect of a project. An example of this is a project that impacts a commercial building would be scored low under Community Impact, then receive another low score in the Cost category resulting from the cost increase for the property acquisition. In this way, major impacts are given relatively greater importance and negatively affecting the projects final scoring totals.

Following is a description of each recommended evaluation criteria.

Traffic Operations

This criterion refers to the level of traffic congestion, traffic volumes and travel times that may be associated with each of the projects. Vehicular congestion levels are determined through use of the LOS grading system. This system provides the ability to score each project based upon anticipated vehicular speeds, density and delay times (i.e., congestion).

To score the projects based on Levels of Service, a point system is applied to quantify LOS operations for the facilities analyzed. Points are assigned for expected changes in LOS in relationship to the base "No Project" conditions. Improvements to LOS conditions score higher and LOS deterioration score lower. A total of five (5) letter grade changes (both positive and negative) from LOS "A" through "F" have been used for this category. For example, if the "No Project" condition is expected to have a LOS C value and the project is expected to result in LOS E conditions, then the it would score a "-2" LOS grade change. Conversely, if the project is expected to result in LOS A conditions then a +2 LOS grade change would be scored. The scoring of each of the eleven grade changes possible are listed below:

Traffic Operations Criteria Scoring

LOS Value Grade Change	Point Value
+5	10
+4	9
+3	8
+2	7
+1	6
0	5
-1	4
-2	3
-3	2
-4	1
-5	0

Safety Impacts

Safety impacts will be determined by percentage improvements (subjective determination) to existing high accident locations. Scoring for each project is based upon percentage improvement of traffic safety (again subjective) as follows:

Safety Impacts Criteria Scoring

Rating Scale
10 …….. 100% Improvement
9 …….. ..90% Improvement
8 …….. ..80% Improvement
7 …….. ..70% Improvement
6 …….. ..60% Improvement
5 …….. ..50% Improvement
4 …….. ..40% Improvement
3 …….. ..30% Improvement
2 …….. ..20% Improvement
1 …….. ..10% Improvement
0 …….. …0% Improvement

Project Costs

Project cost scoring will be based upon the project's cost relative to the median CIP project cost. The rating scale for this criteria is based upon the relative cost differential between each project and the CIP median cost. The median cost of all alternatives will be determined and used as the benchmark score of "5". Projects with costs higher than the median would score low, and those with lower costs compared to the median would score high. For example, projects that cost 50% or more less than the median would score the highest score of "10", while project's that cost 50% or more higher than the median would score the lowest score of "0".

Project Costs Criteria Scoring

Rating Scale
10 – 50% (or more) less than median
9 – 40% less than median
8 – 30% less than median
7 – 20% less than median
6 – 10% less than median
5 - Equal to median cost
4 – 10% greater than median
3 – 20% greater than median
2 – 30% greater than median
1 – 40% greater than median
0 - 50% (or more) greater than median

Environmental Sensitivity

Environmental sensitivity subjectively considers the potential impacts of each project on various environmental criteria such as biological, wetlands, historical, neighborhood, etc. *{Note: These conditions are based upon available literature search and general field observations only.}* The following rating scale and criteria will be used to score each project for environmental impacts:

Environmental Sensitivity Criteria Scoring

Rating Scale
10 - No Impacts
9 -
8 -
7 - Less Than Significant Impact
6 -
5 -
4 -
3 - Significant Unless Mitigation Incorporated
2 -
1 -
0 - Significant and Unavoidable Impacts

Community Impacts

The Community Impact criteria provides both a subjective scoring of the overall community acceptance and community economic impact, along with a quantified scoring of community property take impacts for each project. The quantified impact will be scored based upon how each project will impact existing residential and commercial properties within the study area. These impacts will be scored based upon right-of-way requirements, along with the number of potential housing units and commercial property relocations required as a result the project.

Scoring for the Community Property Impacts is based upon percentage difference from median for all CIP project. The criteria for right-of-way will be acres, residential units taken will be number of units, commercial square footage taken will be thousand square feet (KSF), and loss of access will be total daily trips affected.

Community Acceptance Criteria Scoring

Rating Scale
10 – Very Strong Community Acceptance
9 -
8 - Significant Community Acceptance
7 -
6 -
5 - Community Neutral
4 -
3 -
2 - Significant Community Opposition
1 -
0 – Very Strong Community Opposition

Community Economic Impact Criteria Scoring

Rating Scale
10 – Little or No Impact
9 -
8 - Slight Impact
7 -
6 -
5 - Moderate Impact
4 -
3 -
2 - Significant Impact
1 -
0 –Very Significant Impact

Community Property Impact Criteria Scoring

Rating Scale
10 - 25% less than median
9 – 20% less than median
8 – 15% less than median
7 – 10% less than median
6 – 5% less than median
5 - Equal to median
4 - 5% greater than median
3 – 10% greater than median
2 – 15% greater than median
1 – 20% greater than median
0 - 25% greater than median

Design Standards

The Design criteria will score each project in relationship to variances required from Local, State and Federal design standards. The level of deviation from a mandatory or advisory standard will be scored based upon the number and severity of the deviation.

Relevant standards that will be quantified in the PPDM are as follows:

State Facilities:

- Mandatory Design Exceptions
  - Local Access opposite an Off Ramp
  - Interchange Spacing
  - Intersection Spacing
- Advisory Design Exceptions
  - Intersection Spacing
  - Auxiliary Lane Requirements
  - Weaving Length
- Preferences
  - No Loop Off Ramps
  - No Hook On Ramps
  - Good Pedestrian/ADA and Bicycle Compatibility
  - Good Driver Expectation

Local Facilities:

- County/City Design Standards
  - Roadway Cross-Section
  - Intersection Spacing
  - Design Speed
  - Max. Grade
  - Pedestrian Facility

Points are applied for each standard using the following qualitative ranking scale:

Design Standards Criteria Scoring

Ranking Scale
10 – Little or No Design Exceptions
9 -
8 - Slight Design Exceptions
7 -
6 -
5 - Moderate Level of Design Exceptions
4 -
3 -
2 - Significant Level of Design Exceptions
1 -
0 –Very Significant Level of Design Expectations

Constructability

This criterion measures the relative impacts associated with constructing a project, and is based upon the ability to efficiently construct the project in a timely manner. Some projects will require extensive phasing and traffic handling resulting in longer construction periods and greater impacts to the traveling public. The scoring criteria is subjective and is based upon the relative difficulty anticipated for constructing the project, and is based upon the significance of phasing and traffic handling required.

Constructability Criteria Scoring

Rating Scale
10 – Very Little Phasing and Traffic Handling
9 -
8 - Minor Phasing and Traffic Handling
7 -
6 -
5 - Moderate Phasing and Traffic Handling
4 -
3 -
2 - Significant Phasing and Traffic Handling
1 -
0 – Very Significant Phasing and Traffic Handling

1.5 - COMPOSITE SCORES

In this sixth and final step, raw scores earned within each evaluation criteria will be adjusted using their corresponding relative weighted factor to achieve a corresponding weighted score. The scoring in each evaluation category is multiplied by the "importance weighting" and totaled with the other categories to arrive at an overall project score. The projects are then ranked from highest to lowest score to provide a prioritized improvement and funding needs program.