

# **The Napa County General Plan Update EIR**

## **Technical Memorandum for Traffic and Circulation Supporting the Findings and Recommendations**

**Prepared for:  
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And  
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Transportation Engineering • Planning • Research • Education



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## Overview

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Dowling Associates, Inc. was retained, as part of the Napa County General Plan Update EIR team, to conduct traffic forecasts, assess impacts and propose mitigation measures for the Napa County General Plan Update EIR process. This memorandum provides the results of the technical analysis conducted for the General Plan Update EIR.

The Setting information cited in the EIR and provided herein was extracted from the recently completed Background Data Report developed by Jones and Stokes. The Solano/Napa County Travel Demand Model was used as the source of the initial land use and roadway street system data and the tool to generate all future year land use and roadway volume forecasts. These forecasts were the basis of the impact analysis and the identification of the appropriate mitigation measures to reduce impacts to less-than-significant levels.

Throughout the development of the DEIR traffic section, Dowling Associates, Inc. coordinated with County staff, the staff of the Napa County Transportation Planning Agency and the Pacific Municipal Consultants (PMC) environmental impact team to insure compliance with local impact criteria standards and to secure agreement on all assumptions and methodologies to be used for the EIR analysis.

This report is divided into two basic discussions. These include:

- A comprehensive discussion of the traffic model, its application to the EIR process, and details regarding the use, adjustments and other changes made to the original model to address the General Plan alternatives discussed in the EIR.
- The impact analysis including supporting assumptions, findings, recommendations and details regarding the specific relationship of the impacts between the alternatives evaluated for the EIR.

## Methodology

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The traffic and circulation analysis is based on field observations; review of existing peak-hour traffic conditions; review of the Napa County Baseline Data Report; application of the Solano/Napa County peak hour travel demand model, and analysis of the Napa County General Plan Update alternatives using accepted traffic analysis techniques such as those presented in the Highway Capacity Manual.

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## Transportation Model Assumptions

The Napa County Transportation Planning Agency (NCTPA), in collaboration with Solano County's transportation authority, developed a computer model (The Solano/Napa County Travel Demand Model) that can be used to evaluate traffic conditions in a manner that is "regionally compliant" (i.e. the model and its county-wide data/results have been accepted by the Metropolitan Transportation Commission [MTC]).

For the current analysis, the most recent version of the Solano/Napa County Travel Demand Model was secured from DKS Associates, the firm that developed the model. Land use assumptions found in the model, for all of the traffic analysis zones (TAZ) that comprise the unincorporated and incorporated portions of the Napa County were extracted and provided to the EIR team for review. These land use assumptions were generally based on ABAG Projections 2003, and were considered a reasonable prediction of future conditions.

The initial land use assumptions in the model were adjusted to reflect updated expectations regarding future employment and housing production based on an economic analysis prepared by Keyser Marston Associates (KMA) and were further adjusted where the General Plan would potentially affect the location or amount of growth predicted. Since the precise outcome of the General Plan Update cannot be determined at this point in the planning process, a series of candidate alternatives has been evaluated.

Alternative A represents an update of the existing General Plan with no major changes in infrastructure or land use patterns. The environmental consultant team developed population and employment assumptions specific to this alternative and to Alternatives B and C for the General Plan Update in consultation with County staff, and Keyser Marston Associates.

### *Description of the Model*

Travel demand models are complex tools used to predict future travel behavior on transportation facilities, and to predict how adequate or congested these facilities will be in the future. To predict the future, a base condition must be established. In this way, the behaviors are "calibrated" to real world conditions, and the resulting traffic flows are "validated" to sample counts. The following characteristics were incorporated into the model.

- The travel networks (street system) in the Solano/Napa County Travel Demand Model are aligned to match actual roadway configurations.
- The Solano/Napa County Travel Demand Model contains the networks and traffic analysis zones from nine Bay Area counties, the Sacramento Region, San Joaquin County, and Lake County. This blending of models allows for Napa and Solano Counties to be a "focus" of the model, rather than other parts of Northern California. It should be noted that as a model developed for use in Solano and Napa Counties, other county data provide a framework for moving persons, but the forecasts are not designed to replicate travel in places far away from the study area.

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- The model was developed to forecast **only** AM and PM peak hour weekday volumes. The forecasts include roadway segments. No provision for the estimation of intersection turn movements is included in the model.
  - To forecast future volumes, existing year AM and PM peak hour directional counts are needed. It should be noted that for many of the locations selected for analysis, the existing counts were extracted from existing sources. The most significant of these sources was the Background Data Report. That report included only the category of "peak hour" traffic volumes. Discussions with the authors of the Baseline Data Report noted that the majority of the existing traffic counts were for the PM peak hour. Given that new traffic counts were not developed at all of the analysis locations, only the PM peak hour was evaluated in the EIR.

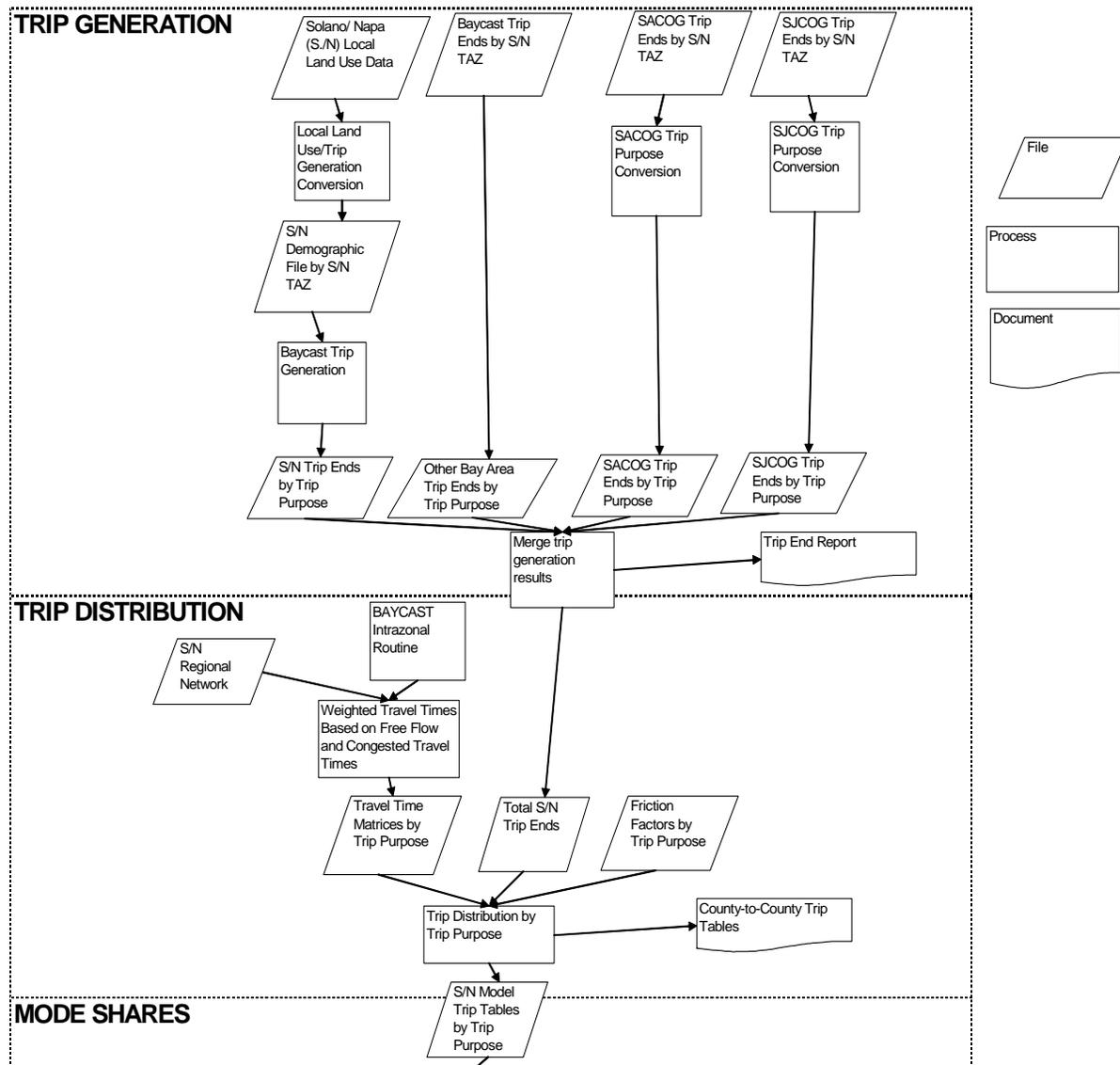
It is important to understand how the Solano/Napa County Model works to fully appreciate the results it produces and the limitations of the results. The model is comprised of a set of computerized software programs. The battery of programs can be divided into four basic components:

- **Street Network Development:** The existing and future street system is coded into the model and provides the basis for the distribution of peak hour trips between traffic analysis zones. The street system is coded into the computer using a series of points (nodes) and roadway segments (links). The existing network is coded to reflect existing conditions while the future network reflects future conditions. Future network changes can include new roads, increases in the number of travel lanes, changes in speed or capacity and changes in street classification. The network includes all freeways, highways, major and minor arterials and most collector streets within Napa County. Outside of Napa County a similar network has been provided. In fact, the Solano/Napa County model includes all of the nine Bay Area counties, Lake County, Sacramento County and most of the north central valley jurisdictions. For each roadway segment, travel speeds, number of lanes, capacities and other important transportation information is coded.
- **Trip Generation Module:** Converts land use information into two categories of model inputs: trip productions and trip attractions. As a general rule trip productions are created by housing and trip attractions by all other types of uses such as offices, retail facilities and other types of non-residential uses.
- **Trip Distribution:** The model through a very complicated set of procedures determines the number of vehicle trips that go between each of the traffic analysis zones found in the model. The result of this process is a "trip table" that is then used to assign traffic to the street network discussed above.
- **Trip Assignment:** Is the process where by the peak hour trip table is assigned to the street system. The process is very complicated and takes into consideration roadway capacity, travel speeds, and other factors, which effect people's traffic patterns.

### The Structure of the Model

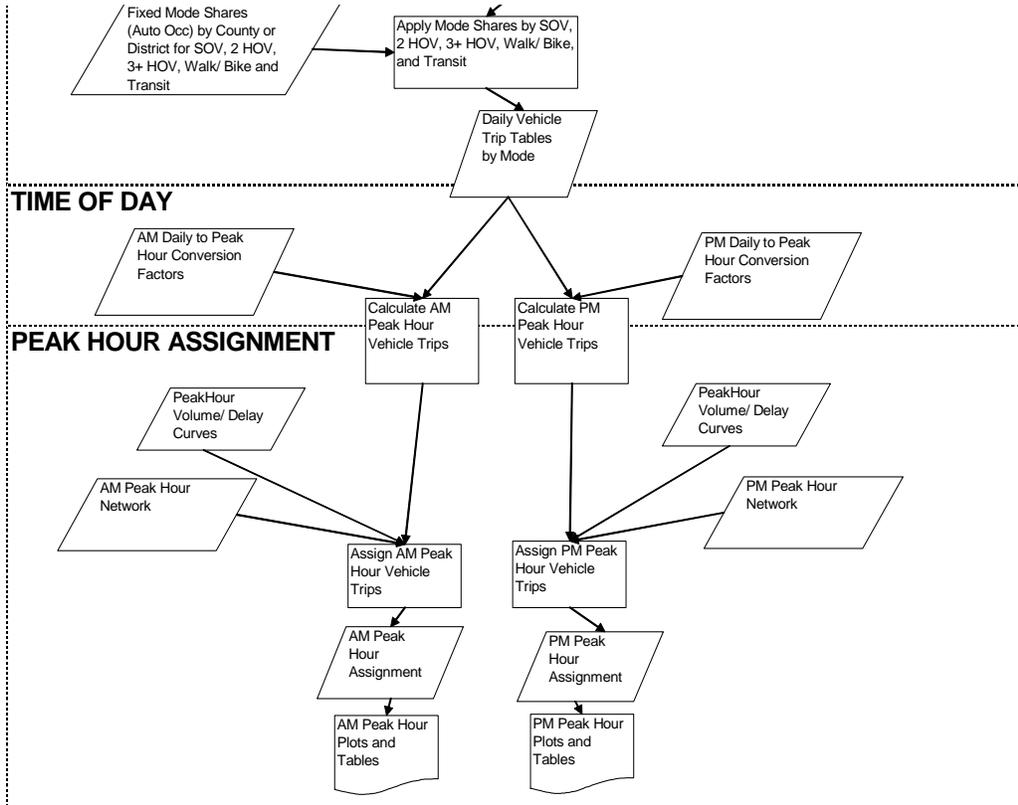
The overall model structure involves several detailed steps. A diagram showing the steps is provided as **Figure 1**. As the diagram shows, there is data taken from several regional models and local city land use files, assimilated into a standard structure and then merged together to create the Solano/Napa Travel Demand Model.

**Figure 1 - Model Flow Diagram**



Continued Below

Figure 1 - Model Flow Diagram - continued



**Trip Generation - Trip Purposes**

There are five primary trip purposes in the Solano/Napa County Travel Demand Model. These are the same trip purposes defined by the MTC model for intraregional personal travel:

- Home-based work (HBW),
- Home-based shop and other (HBSH),
- Home-based social and recreation (HBSR),
- Home-based school (HBSK), and
  - Home-based school trips are further broken down into:
  - Home-based school: Grade school (HBGS),
  - Home-based school: High school (HBHS), and
  - Home-based school: College (HBCol).
- Non-Home-Based (NHB).

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### ***The Model Forecast Time Periods***

The Solano/Napa County Travel Demand Model was designed to evaluate two time periods:

- AM peak period (generally 7:15 AM to 8:15 AM); and
- PM peak period (5:00 PM to 6:00 PM).

It should be noted that the Solano/Napa Travel Demand Model is strictly a peak hour model. Some models forecast peak traffic demand and spread the demand over more than one peak hour. This process is called "peak-spreading" and provides a more accurate of the actual peak hour impacts. However, it does not provide information regarding how long the peak period may be. The peak period is that period of time during which many facilities may experience congested unacceptable impacts. To summarize, the Solano/Napa Travel Demand Model assigns the total peak hour demand to the street system. No reductions in travel demand due to peak hour spreading are included. Therefore, peak hour impacts may be overstated from what might actually happen if motorist travel outside of the 5:00 to 6:00 PM peak hours.

### ***Traffic Analysis Zones (TAZ)***

The land area within the model is sub-divided into traffic analysis zones. The size of the traffic analysis zones is designed to get larger the further one moves away from Solano and Napa Counties. The smallest traffic analysis zones are found in Napa and Solano counties. The traffic analysis zones in western Sonoma County, northern Contra Costa County and Yolo County were also kept at a finer level. To allow for future development of mode choice models, dense employment areas such as Downtown Oakland, the northeast Quadrant of San Francisco and Downtown Sacramento were also structured with smaller zones. The other areas are represented in data are done so with larger traffic analysis zones.

### ***Limitations of the Model Results***

The model is a dynamic process. Therefore, as the street system is changed these changes can result in changes of travel patterns. These shifts affect both the zone-to-zone trip table and the routes motorist use to reach their destination. Hence, unless the traffic patterns (paths between zone-to-zone pairs) are left unchanged, different networks can produce significantly different traffic assignments and results.

When reviewing these results, it is very important to understand that the model does not factor the peak hour traffic to compensate for peak spreading. Peak spreading is the phenomenon where a roadway has a demand for more than one hour of traffic and the model results are adjusted to reflect only one hour of demand. The Solano/Napa County travel demand model does not factor the forecasts. Therefore, a roadway segment may show a demand (assignment forecast), which exceeds the one-hour capacity, when in actuality the segment is likely to function at capacity for a longer period of time than one peak hour.

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For those locations where the peak hour volume-to-capacity ratio is higher than 1.00 or 100%, it can be assumed that peak spreading would occur. As a general guideline, if the volume-to-capacity ratio is 1.50, one might assume that the LOS F condition would last for about 1½ hour. However, this may not be a valid assumption. While the planning models can forecast volume-to-capacity ratios of 1.0 and greater, this condition never occurs in the real world. Once a facility has reached capacity (volume-to-capacity ratio = 1.00), no more demand can be served. The flow rate of traffic and the speed of the traffic flow are reduced as you approach LOS E and F. This results in significant congestion and upstream backups in the direct that the traffic is coming. Therefore, the next hour of demand is subjected to delays created during the first hour of congestion. In summary, a volume-to-capacity ratio of 1.5 can be said to reflect 1½ hours of LOS F, but in fact, may reflect more than 1½ hours of LOS F conditions

### ***Traffic Generation from Special Events***

The County's traffic model does not factor in adjustments for special events at wineries, the County fair or peak summer day at Lake Berryessa. However, these types of special events are isolated, may include special traffic controls, and are not considered part of the typical ambient traffic conditions in the County. Generally, special events are evaluated on a case-by-case basis and can require to implement special transportation services, which are intended to reduce traffic levels and manage the flow of traffic to and from such events.

### **Roadway Segments Evaluated**

The following process was used to forecast future year roadway segment traffic volumes for the peak hour. The following roadway segments were identified for analysis in this EIR. County staff, the Napa County Transportation Planning Agency staff, and the EIR consultant team finalized the list (which includes portions of roadway segments within cities in the County as well as State Route facilities).

#### **Roadway - Analysis Segment**

1. American Canyon Road - I-80 to Flosden Road
2. Chiles Pope Valley Road - Pope Canyon Road to Lower Chiles Valley Road
3. Deer Park Road - Sanitarium Rd (North) to Silverado Trail
4. Deer Park Road - Silverado Trail to St. Helena State Route (SR 29/128)
5. Flosden Road - American Canyon Road to Solano/Napa County Line
6. Howell Mountain Road - Pope Valley Road to North White Cottage Road
7. Napa Vallejo Hwy - Kaiser Road to State Route 29(SR 29/12)
8. Oak Knoll Avenue - Big Ranch Road to State Route 29
9. Oakville Cross Road - Napa River to State Route 29
10. Old Sonoma Road - Buhman Avenue to Carneros Highway (SR 121/12)
11. Petrified Forest Road - Foothill Boulevard (SR 128) to Franz Valley School Road

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12. Pope Canyon Road - Berryessa-Knoxville Road to Chiles-Pope Valley Road
  13. Silverado Trail - Oak Knoll Avenue to Hardman Avenue
  14. Silverado Trail - Sage Canyon Road (SR 128) to Yountville Cross Road
  15. Silverado Trail - Pope Street to Zinfandel Lane
  16. Silverado Trail - Bale Lane to Deer Park Road
  17. Silverado Trail - Calistoga City Limits to Lincoln Avenue (SR 29)
  18. Soscol Avenue - First Street to Silverado Trail
  19. Spring Mountain Road - St. Helena City Limit to Langtry Road
  20. State Highway 12/121 - Cuttings Wharf Road to Stanly Road
  21. State Route 12 - Lynch Road to Kelly Road
  22. State Route 121 - Wooden Valley Road to Vichy Avenue
  23. State Route 121 - Circle Oaks Drive to Wooden Valley Road
  24. State Route 121 - Napa/Sonoma County Line to Old Sonoma Road
  25. State Route 128 - Napa/Sonoma County Line to Tubbs Lane
  26. State Route 128 - Tubbs Lane to Petrified Forest Road
  27. State Route 128 - Petrified Forest Road to Lincoln Avenue (SR 29)
  28. State Route 128 - Napa River to St Helena Hwy (SR 29)
  29. State Route 128 - Chiles-Pope Valley Road to Silverado Trail
  30. State Route 128 - Monticello Road (SR 121) to Berryessa-Knoxville Road
  31. State Route 128 - Napa/Yolo County Line to State Route 121
  32. State Route 29 - Napa/Lake County Line to Tubbs Lane
  33. State Route 29 - Green Island Road to American Canyon Road
  34. State Route 29 - California Drive to Oak Knoll Avenue
  35. State Route 29 - Oakville Grade to Madison Street
  36. State Route 29 - Rutherford Cross Road (SR 128) to Oakville Grade
  37. State Route 29 - Chaix Lane to Zinfandel Lane
  38. State Route 29 - Lodi Lane to Deer Park Road
  39. State Route 29 - Kelly Road to Jamieson Canyon Road (SR 12)
  40. State Route 29 - Napa-Vallejo Hwy (SR 221) to Kelly Road
  41. State Route 29 - Napa-Vallejo Hwy (SR 221) to Carneros Hwy (SR 121/12)
  42. State Route 29 - Imola Avenue (SR 121) to Carneros Hwy (SR 121/12)
  43. Tubbs Lane - State Route 29 to State Route 128
  44. Wooden Valley Road - Monticello Road (SR 121) to Solano/Napa Co Line
  45. Yountville Cross Road - Silverado Trail to Yountville town Limits
  46. Zinfandel Lane - Silverado Trail to St Helena Hwy (SR 29&128)

Roadway segments were selected for analysis (rather than intersections) due to the more general nature of the project being analyzed. Specifically, the General Plan Update is a countywide project consisting of goals and policies rather than a specific development proposal. Intersection operations were analyzed only to the extent they influence roadway segment performance. Thus, this program EIR assesses the overall impacts of projected growth, and is

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not intended to evaluate individual sites or infrastructure projects. Without a specific development proposal available at this time (i.e., without an exact mix of uses at precise locations with defined access and egress points), it is infeasible to conduct a comprehensive or reliable intersection level of service analysis. A comprehensive set of roadway segments were selected for analysis so that impacts throughout the transportation system could be evaluated.

Also, attention was paid to areas where changes are proposed in one or more alternative. For example, since Alternatives B and C would change the land uses permitted at Napa Pipe and the Pacific Coast/Boca properties, the analysis included the portion of the Napa Valley Highway, as well as portions of State Route 29 and Soscol south and north of the area. Similarly, since Alternative C would expand rural/urban land use designations in the unincorporated community of Angwin, the analysis included Deer Park Road from Sanitarium to Silverado Trail. Infrastructure changes proposed in one or more alternative also influenced the roadway segments selected for analysis.

## **Forecasting Future Year General Plan Traffic**

The future year roadway segment traffic forecasts for the peak hour were determined as follows:

- From an extensive set of resources including raw data from Caltrans, the Background Data Report, County and City traffic counts and the Solano/Napa County Travel Demand Model documentation, existing directional traffic counts were secured for each of the analysis roadway segments.
- At each of our analysis locations, the traffic model volumes from the base year (calibrated model) and the specific future year scenarios were extracted.
- The base year model volumes were subtracted from the future year model volumes to create a delta, which represented the growth in traffic for the analysis scenario.
- The delta was added to the existing traffic counts (cited in the Baseline Data Report and other sources) to create an adjusted future year traffic projection (peak hour).

Again, it should be noted that the analysis assessed only PM Peak Hour conditions, since this is what the model was designed to assess, and this time of day/week generally represents "worst case." In a very few areas of the County where tourist traffic is high, weekend peak conditions can exceed the PM Peak, and these were also considered using another methodology. (See discussion under Project Impacts - Travel Demand below.)

## **Adjustments Made to the Model for the EIR**

This section summarizes the adjustments made to the initial land use data in the model in order to evaluate the comparative traffic impacts between alternatives. The County retained Keyser Marston Associates (KMA) to develop growth projections (jobs, nonresidential uses,

dwelling units and population) for the Napa County General Plan Alternatives from year 2005 to year 2030. These projections were used to adjust traffic model traffic analysis zone data for specific geographic areas of the County for Alternatives A, B, and C.

These alternatives were specifically analyzed because they encompassed the range of growth identified in all of the Napa County General Plan Update Alternatives. No other land use adjustments were made to the model. Specific adjustments of individual traffic analysis zones (TAZs) were made to reflect the changes in land use for each alternative. Attached to this technical memorandum is another memorandum developed by PMC that details the various changes made to the travel demand model inputs. The following tables summarize the changes for each alternative. **Tables 1 and 2** summarize the changes in residential units and jobs for each alternative.

**Table 1 - Dwelling Unit Assumptions for General Plan Alternatives**

Area	ALT A	ALT B	ALT C
Angwin TAZ # 191	400 SF DU	400 SF DU	600 SF DU
Other Areas	TAZ # 147, 161, 170- 169 SF DU/each TAZ # 181, 196- 168 SF DU Total = 843 SF DU	TAZ # 147, 154, 161, 170 = 158 SF DU/each TAZ #'s 171, 181, 196, 197 = 159 SF DU/each	TAZ # 147, 154, 161, 170, 171, 181, 196, 197 221 SF DU/each
	TAZ # 197- 100 SF DU	159 SF DU/each	Total = 1,768
	TAZ # 171- 100 SF DU TAZ # 154- 225 SF DU Total = 425 SF DU	Total = 1,268	
	Total = 1,268 SF DU		
Other Ag Areas	TAZ # 123, 128, 133, 134, 137, 140-142 145, 146, 148, 150-157, 160-174, 178-180, 182, 183, 189-191 = 12 SF DU/each TAZ # 193-197= 13 SF DU/each Total = 567 SF DU	TAZ # 123, 128, 133, 134, 137, 140-142 145, 146, 148, 150-157, 160-174, 178-180, 182, 183, 189-191 = 12 SF DU/each TAZ # 193-197= 13 SF DU/each Total = 567 SF DU	TAZ # 123, 128, 133, 134, 137, 140-142 145, 146, 148, 150-157, 160-174, 178-180, 182, 183, 189-191 = 12 SF DU/each TAZ # 193-197= 13 SF DU/each Total = 567 SF DU
		149, 150-152, 157, 160, 162-166, 10 SF DU/each 167-169, 172-174, 180, 189, 190, 193 9 SF DU/each Total = 200 SF DU	TAZ # 123, 125, 128, 133, 134, 137, 141, 142-150, 152-154 Total = 400 SF DU TAZ # 179, 196 Total = 100 SF DU
Napa Pipe	N/A	TAZ # 118 = 700 MF DU	TAZ # 118 = 3,200 MF DU
Pacific Coast Boca	N/A	TAZ # 145 = 500 MF DU	TAZ # 145 = 500 MF DU
County Sites In Cities	N/A	TAZ # 83, 93, 97= 250 MF DU	TAZ # 83, 93, 97= 500 MF DU
Total	2,235 DU	3,885 DU	7,635 DU

**Table 2 - Employment (Jobs) Adjustments for General Plan Alternatives**

KMA Employment Alternatives	ALT A	ALT B	ALT C
Napa Pipe TAZ # 118	MFGEMP + 588 jobs OTHEMP + 298 jobs SEREMP + 1,103 jobs	MFGEMP + 441 jobs OTHEMP + 119 jobs SEREMP + 2,183 jobs RETEMP + 143 jobs	RETEMP + 150 jobs
Pacific Coast Boca TAZ # 145	MFGEMP + 313 jobs OTHEMP + 159 jobs SEREMP + 588 jobs	SEREMP + 98 jobs RETEMP + 286 jobs	SEREMP + 98 jobs RETEMP + 571 jobs
Hess Vineyards TAZ # 133			
Hess Environs/ Industrial Zoning TAZ # 133			
Airport Industrial Areas A.I.A. TAZ # 135, 136, 138, 139	MFGEMP + 1,568 jobs OTHEMP + 2,470 jobs SEREMP + 2,822 jobs	MFGEMP + 1,568 jobs OTHEMP + 2,470 jobs SEREMP + 2,822 jobs	MFGEMP + 1,568 jobs OTHEMP + 2,470 jobs SEREMP + 2,822 jobs
Wineries TAZ # 123, 133, 137, 140, 142 146-157, 160, 162-169, 172-175, 178-180, 189-191, 193-196, 198	AGREMP + 1,125 jobs	AGREMP + 1,125 jobs	AGREMP + 1,125 jobs
Vineyards TAZ # 123, 133, 137, 140, 142 146-157, 160, 162-169, 172-175, 178-180, 189-191, 193-196, 198	AGREMP + 750 jobs	AGREMP + 750 jobs	AGREMP + 750 jobs

**Trip Generation Associated With Alternatives**

The trip generation inputs for to the model, based upon the above land use data, were converted into "trip productions and attractions" for subsequent processing. This section provides the estimated trip generation for each of the alternatives based upon the standard trip generation rates published by the Institute of Transportation Engineers. **Table 3** details the residential and non-residential trip generation for each of the project alternatives. It should be noted

that Alternative A is not the same as the existing model/no project alternative.

**Table 3 - Standard Trip Generation - General Plan Alternatives**

Trips	Alternative A	Alternative B	Alternative C
Daily Trips	56,923	76,601	100,169
AM Peak Hour	7,073	8,379	9,458
PM Peak Hour	7,624	9,966	12,179

Source: Dowling Associates 2006

## Scenarios Selected for Evaluation

Alternatives A, B and C were evaluated using the future 2030 street network assumed in the traffic model without certain roadway improvements identified in the proposed General Plan Update Circulation Element (described further below). Alternatives B and C were also evaluated with the roadway improvements identified in the proposed General Plan Update Circulation Element. **Table 4** shows the five land use/roadway scenarios evaluated for this section of the EIR.

**Table 4 - Land Use/Roadway Scenarios**

Analysis Scenario	Land Use Alternative	Roadway Network Option
Scenarios 1	A	2030 Network without GP Improvements
Scenario 2	B	2030 Network without GP Improvements
Scenario 3	C	2030 Network without GP Improvements
Scenario 4	B	2030 Improved Network
Scenario 5	C	2030 Improved Network

Source: Dowling Associates 2006

## General Plan Update Circulation Element Roadway Improvements Included in 2030 Network

The following is a complete list of the improvements included in the additional scenarios for Alternatives B and C. It should be noted the travel model does not include intersection improvements. Therefore only changes in roadway classification and numbers of travel lanes (i.e., overall capacity) are included.

- Construction of a northern extension of the Flosden/Newell Road from American Canyon Road to Green Island Road.
- Widening of State Route 12 to four lanes from State Route 29 to Interstate 80 and constructing a new centerline safety barrier.
- Construct an interchange at the Airport Road/State Route 29/State Route 12 intersection.
- Improvements to State Route 29 between Green Island Road and SR 221 (widening and Soscol Flyover).

## Other Improvements Included in 2030 Network

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It should also be noted that the travel demand model 2030 network includes a number of roadway improvements beyond those listed above. For example, the 2030 model network for SR 29 in St. Helena has lower capacities than they do in the 2003 network (800 vehicles per lane versus 900 vehicles per lane). The model also includes completion of Devlin Road between Soscol Ferry Road and American Canyon. It was not possible, as part of the General Plan Update, to review all of the linkages in the model for these types of changes. However, they explain some of the counterintuitive results produced by the model. Specific corridors such as the Silverado Trail, Flosden Road and other parallel facilities appear to attract traffic under the 2030 configuration due to modest reductions in capacity on the parallel major routes. Additional details regarding the effects of these network assumptions are provided in the impact section under "Unique Model Results".

## **Existing Roadway Capacity and Level of Service Methodology**

To assess current conditions, the County roadway system was divided into 46 roadway segments representative of the County's overall network. Traffic volumes were provided by several different agencies including Napa County, Caltrans, the Napa County Transportation Planning Agency and the Cities of American Canyon, Calistoga, Napa, Saint Helena, and Yountville. The PM peak hour was selected as the time period for study because in most areas of the County this is generally the time when traffic volumes and congestion is highest. It is also the time of the day/week for which the most data exists. When data for the PM peak hour was not available, a factor was applied to daily or AM peak hour volumes to estimate the missing data based on the percentage of daily traffic occurring in the PM peak hour at other nearby roadway segments. Also, because the PM peak-hour traffic volume data represented various years and months, data from the same peak months were selected for the analysis.

Traffic conditions on roads and at intersections are generally characterized by their "level of service" or LOS. LOS is a convenient way to express the ratio between volume and capacity on a given link or at a given intersection, and is expressed as a letter grade ranging from LOS A through LOS F. Each level of service is generally described as follows:

- **LOS A** - Free-flowing travel with an excellent level of comfort and convenience and freedom to maneuver.
- **LOS B** - Stable operating conditions, but the presence of other road users causes a noticeable, though slight, reduction in comfort, convenience, and maneuvering freedom.
- **LOS C** - Stable operating conditions, but the operation of individual users is substantially affected by the interaction with others in the traffic stream.
- **LOS D** - High-density, but stable flow. Users experience severe restrictions in speed and freedom to maneuver, with poor levels of comfort and convenience.

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- **LOS E** - Operating conditions at or near capacity. Speeds are reduced to a low but relatively uniform value. Freedom to maneuver is difficult with users experiencing frustration and poor comfort and convenience. Unstable operation is frequent, and minor disturbances in traffic flow can cause breakdown conditions.
  - **LOS F** - Forced or breakdown conditions. This condition exists wherever the volume of traffic exceeds the capacity of the roadway. Long queues can form behind these bottleneck points with queued traffic traveling in a stop-and-go fashion.

**Table 5** presents the established peak-hour volumes and the volume-to-capacity ratios associated with the LOS thresholds for each roadway classification. The methodology used for the LOS analysis procedures were based on the Highway Capacity Manual, 2000 Edition. As discussed later, the analysis focused on roadway segments rather than intersections, due to the nature of the project (i.e. a county-wide general plan rather than a site-specific development. For each of the roadway segments selected for analysis, an existing and future roadway classification was assigned. **Table 5** shows the various roadway classes and their peak hour capacities. The table is divided into three sections. Section one shows the total peak hour directional capacities for the roadway classifications for levels of service A through F. These capacities are based upon procedures and criteria published by the Florida Department of Transportation (FDOT) and are used throughout the profession as standard practice for roadway capacities for determining level of service. Section two shows peak hour capacities (per lane) and finally section three shows the volume-to-capacity ratios for each roadway classification and each category of level of service. Reference is made, within these tables, to the specific source of the data from the Florida DOT guidelines. To summarize, the procedures for determining future traffic volumes and calculating level of service are based upon the 2000 Highway Capacity Manual; however, the roadway capacities are based upon data developed by the Florida Department of Transportation.

It should be noted that the FDOT guidelines for peak hour capacities and level of service are more fine grained or specific than the capacities utilized in the Solano/Napa County travel model. The County staff and Dowling Associates evaluated the various roadway segment selected for analysis and assigned roadway classifications and capacities that reflect the best judgment as to how these roadways function.

**Table 5 - Peak Hour Roadway Capacities**

Facility Class	Code	Lanes	Area Type	LOS A	LOS B	LOS C	LOS D	LOS E	Florida DOT Source
Facility Capacity Volumes									
Freeway	Fwy4	2	All	1,290	2,130	2,890	3,420	3,800	Table 4-8
Freeway	Fwy6	3	All	2,000	3,290	4,460	5,280	5,870	Table 4-8
Rural Highway	RurHwy2	1	Rural	100	330	620	870	1,200	Table 4-9
Rural Highway	RurHwy4	2	Rural	980	1,590	2,300	2,980	3,390	Table 4-8
Arterial	RurArt2	1	Rural	72	120	590	740	800	Table 4-9
Arterial	UrbArt2	1	Urban	77	100	590	810	850	Table 4-7
Arterial	RurArt4	2	Rural	166	290	1,360	1,570	1,660	Table 4-9
Arterial	UrbArt4	2	Urban	162	220	1,360	1,710	1,800	Table 4-7
Collector	Coll2	1	All	73	97	480	760	810	Table 4-7
Collector	Coll4	2	All	138	224	1,120	1,620	1,720	Table 4-7
Per Lane Capacity Volumes									
Facility Class	Code	Lanes	Area Type	LOS A	LOS B	LOS C	LOS D	LOS E	Florida DOT Source
Freeway	Fwy4	1	All	645	1065	1445	1710	1900	Table 4-8
Freeway	Fwy6	1	All	667	1097	1487	1760	1957	Table 4-8
Rural Highway	RurHwy2	1	Rural	100	330	620	870	1,200	Table 4-9
Rural Highway	RurHwy4	1	Rural	490	795	1150	1490	1695	Table 4-9
Arterial	RurArt2	1	Rural	72	120	590	740	800	Table 4-9
Arterial	UrbArt2	1	Urban	77	100	590	810	850	Table 4-7
Arterial	RurArt4	1	Rural	83	145	680	785	830	Table 4-9
Arterial	UrbArt4	1	Urban	81	110	680	855	900	Table 4-7
Collector	Coll2	1	All	73	97	480	760	810	Table 4-7
Collector	Coll4	1	All	69	112	560	810	860	Table 4-7
V/C Ratios as function of LOS E/F									
Facility Class	Code	Lanes	Area Type	LOS A	LOS B	LOS C	LOS D	LOS E	Florida DOT Source
Freeway	Fwy4	4	All	0.34	0.56	0.76	0.90	1.00	Table 4-8
Freeway	Fwy6	6	All	0.34	0.56	0.76	0.90	1.00	Table 4-8
Rural Highway	RurHwy2	2	Rural	0.08	0.28	0.52	0.73	1.00	Table 4-9
Rural Highway	RurHwy4	4	Rural	0.29	0.47	0.68	0.88	1.00	Table 4-9
Arterial	RurArt2	2	Rural	0.09	0.15	0.74	0.93	1.00	Table 4-9
Arterial	UrbArt2	2	Urban	0.09	0.12	0.69	0.95	1.00	Table 4-7
Arterial	RurArt4	4	Rural	0.10	0.17	0.82	0.95	1.00	Table 4-9

Facility Class	Code	Lanes	Area Type	LOS A	LOS B	LOS C	LOS D	LOS E	Florida DOT Source
Arterial	UrbArt4	4	Urban	0.09	0.12	0.76	0.95	1.00	Table 4-7
Collector	Coll2	2	All	0.09	0.12	0.59	0.94	1.00	Table 4-7
Collector	Coll4	4	All	0.08	0.13	0.65	0.94	1.00	Table 4-7

Source: Dowling Associates 2006: BDR 2005 and Florida Department of Transportation

The county-wide model is less discrete and uses a more generalized set of capacities to reflect the function of the roadways in the network. For comparison, the generalized capacities used in the model were:

- Freeways = 1,600 to 2,000 vehicles per hour per lane
- Freeway ramps = 1,500 vehicles per hour per lane
- Expressways = 1,400 vehicles per hour per lane
- Major Arterials = 900 vehicles per hour per lane
- Minor Arterials = 800 vehicles per hour per lane
- Collectors = 500 vehicles per hour per lane

## **The Existing Model Unadjusted Traffic Forecasts**

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The Solano/Napa County travel demand model was adjusted for application in this EIR. The base year model is designed to reflect 2003 conditions as the base model year, and was calibrated using 2003 data. For the year 2030 forecasts, the model was developed using land use data from several sources that was collectively found to be consistent with regional land use forecasts. This section provides the peak hour levels of service at each of the analysis segments for the base year (2003) and original unadjusted 2030 model configurations. Later sections explain adjustments to the model intended to reflect 2030 conditions under each of the EIR alternatives.

### **Weekday Traffic Conditions for Existing (2003) and Unadjusted Future (2030) Conditions**

The land use assumptions in the original (unadjusted) travel demand model for the 2030 condition reflected the most recent ABAG forecasts at the time of model creation (ABAG Projects 2003) as modified and agreed upon by the Napa County Transportation Planning Agency (NCTRA) and the majority of communities within Napa and Solano County. Some negotiations occurred between major jurisdictions such as the City of Napa and American Canyon regarding land use intensities, types and distributions at the time the model was created.

The unadjusted model also assumed certain transportation network improvements by the year 2030. These include:

- 
- Widening of Jamieson Canyon Road (SR 12) between Interstate 80 and State Route 29 for four lanes.
  - Improvements to the State Route 29/Napa Valley Highway interchange.
  - Installation of new traffic signals within St. Helena.
  - Construction of new roadway segments such as sections of Devlin Road and the planned Flosden/Newell Extension to Green Island Road.
  - Provision of localized roadway capacity improvements such as additional turn lanes.

**Table 6** shows the peak hour levels of service for each of the analysis locations. Two conditions are illustrated: 1) the base year 2003 volumes, and 2) the forecasted year 2030 volumes using the unadjusted model.

**Table 6 - Peak Hour Level Of Service - 2003 And Unadjusted 2030 Model**

Segment Number	Segment Descriptions			Level Of Service	
	RoadName	Segment Limit North / East	Segment Limit South / West	Existing 2003 Conditions	Original Year 2030 Model
1	AMERICAN CANYON ROAD	I-80	Flosden Road	LOS D	LOS F
2	AMERICAN CANYON ROAD	I-80	Flosden Road	LOS D	LOS E
3	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	LOS A	LOS B
4	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	LOS A	LOS A
5	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	LOS C	LOS E
6	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	LOS C	LOS C
7	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	LOS C	LOS D
8	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	LOS C	LOS C
9	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	LOS C	LOS D
10	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	LOS C	LOS F
11	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	LOS A	LOS C
12	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	LOS A	LOS A
13	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	LOS D	LOS F
14	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	LOS D	LOS D
15	OAK KNOLL AVE	Big Ranch Rd	State Route 29	LOS C	LOS C
16	OAK KNOLL AVE	Big Ranch Rd	State Route 29	LOS C	LOS C
17	OAKVILLE CROSS RD	Napa River	State Route 29	LOS A	LOS C
18	OAKVILLE CROSS RD	Napa River	State Route 29	LOS B	LOS B
19	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	LOS C	LOS C
20	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	LOS B	LOS B
21	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	LOS C	LOS F
22	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	LOS C	LOS C
23	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	LOS A	LOS B
24	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	LOS A	LOS A
25	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	LOS C	LOS C
26	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	LOS C	LOS D
27	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	LOS C	LOS C
28	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	LOS C	LOS D
29	SILVERADO TRL	Pope St	Zinfandel Ln	LOS C	LOS C
30	SILVERADO TRL	Pope St	Zinfandel Ln	LOS C	LOS D
31	SILVERADO TRL	Bale Ln	Deer Park Rd	LOS C	LOS C
32	SILVERADO TRL	Bale Ln	Deer Park Rd	LOS C	LOS C
33	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	LOS C	LOS C
34	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	LOS C	LOS C
35	SOSCOL AVE	First St	Silverado Trail	LOS D	LOS F
36	SOSCOL AVE	First St	Silverado Trail	LOS D	LOS D
37	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	LOS A	LOS C
38	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	LOS A	LOS B
39	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	LOS D	LOS F
40	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	LOS F	LOS F
41	STATE ROUTE 12	Lynch Road	Kelly Road	LOS F	LOS F
42	STATE ROUTE 12	Lynch Road	Kelly Road	LOS C	LOS B
43	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	LOS C	LOS F
44	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	LOS C	LOS C
45	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	LOS B	LOS C
46	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	LOS C	LOS C

**TABLE 6 - Continued**

Segment Number	Segment Descriptions			Level Of Service	
	RoadName	Segment Limit North / East	Segment Limit South / West	Existing 2003 Conditions	Original Year 2030 Model
47	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	LOS F	LOS C
48	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	LOS F	LOS C
51	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	LOS C	LOS C
52	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	LOS C	LOS F
53	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	LOS C	LOS E
54	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	LOS C	LOS C
55	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	LOS C	LOS D
56	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	LOS C	LOS F
57	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	LOS C	LOS C
58	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	LOS B	LOS B
59	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	LOS C	LOS C
60	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	LOS C	LOS C
61	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	LOS B	LOS B
62	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	LOS B	LOS C
63	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	LOS A	LOS C
64	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	LOS A	LOS A
65	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	LOS C	LOS C
66	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	LOS C	LOS C
67	STATE ROUTE 29	Green Island Rd	American Canyon Rd	LOS F	LOS F
68	STATE ROUTE 29	Green Island Rd	American Canyon Rd	LOS F	LOS F
69	STATE ROUTE 29	California Dr	Oak Knoll Ave	LOS C	LOS C
70	STATE ROUTE 29	California Dr	Oak Knoll Ave	LOS C	LOS C
71	STATE ROUTE 29	Oakville Grade	Madison St	LOS F	LOS F
72	STATE ROUTE 29	Oakville Grade	Madison St	LOS F	LOS F
73	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	LOS E	LOS F
74	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	LOS F	LOS F
75	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	LOS F	LOS F
76	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	LOS F	LOS F
77	STATE ROUTE 29	Lodi Lane	Deer Park Rd	LOS D	LOS F
78	STATE ROUTE 29	Lodi Lane	Deer Park Rd	LOS D	LOS F
79	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	LOS C	LOS F
80	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	LOS C	LOS F
81	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	LOS C	LOS C
82	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	LOS C	LOS B
83	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy (SR 121/12)	LOS C	LOS F
84	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy (SR 121/12)	LOS C	LOS C
85	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy (SR 121/12)	LOS C	LOS D
86	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy (SR 121/12)	LOS C	LOS B
87	TUBBS LN	Highway 29	Highway 128	LOS C	LOS D
88	TUBBS LN	Highway 29	Highway 128	LOS C	LOS C
89	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	LOS A	LOS B
90	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	LOS C	LOS C
91	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	LOS C	LOS C
92	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	LOS C	LOS C
93	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	LOS C	LOS C
94	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	LOS C	LOS B

Under the existing condition (year 2003 model), 13 out of 94 locations, representing 7 out of 47 different roadways operate over LOS E and F. Some segments operate at substandard levels in only one direction. These include:

- State Route 12/121 - Cuttings Wharf Road to Stanly Road
- State Route 12 - Lynch Road to Kelly Road

- 
- State Route 121 - Napa/Sonoma County Line to Old Sonoma Road
  - State Route 29 - Green Island Road to American Canyon Road
  - State Route 29 - Oakville Grade to Madison Street
  - State Route 29 - Rutherford Cross Road (SR 128) to Oakville Grade
  - State Route 29 - Chaix Lane to Zinfandel Lane

Under 2030 conditions, based upon the unadjusted year 2030 model, 27 out of 94 directional locations, representing 19 out of 47 different roadways were projected to operate at substandard LOS due to projected growth within the County and the region. Some segments operate at substandard levels in only one direction. These include:

- American Canyon Road - I-80 to Flosden Road
- Deer Park Road - Sanitarium Rd (North) to Silverado Trail
- Flosden Road - American Canyon Road to Solano/Napa County Line
- Napa Vallejo Hwy - Kaiser Road to State Route 29 (SR 29/12)
- Petrified Forest Road - Foothill Boulevard (SR 128) to Franz Valley School Road
- Soscol Avenue - First Street to Silverado Trail
- State Route 12/121 - Cuttings Wharf Road to Stanly Road
- State Route 12 - Lynch Road to Kelly Road
- State Route 121 - Wooden Valley Road to Vichy Avenue
- State Route 128 - Napa/Sonoma County Line to Tubbs Lane
- State Route 128 - Tubbs Lane to Petrified Forest Road
- State Route 128 - Petrified Forest Road to Lincoln Avenue (SR 29)
- State Route 29 - Green Island Road to American Canyon Road
- State Route 29 - Oakville Grade to Madison Street
- State Route 29 - Rutherford Cross Road (SR 128) to Oakville Grade
- State Route 29 - Chaix Lane to Zinfandel Lane
- State Route 29 - Lodi Lane to Deer Park Road
- State Route 29 - Kelly Road to Jamieson Canyon Road (SR 12)
- State Route 29 - Napa-Vallejo Hwy (SR 221) to Carneros Hwy (SR 121/12)

## **Evolution of Existing Roadway Operations**

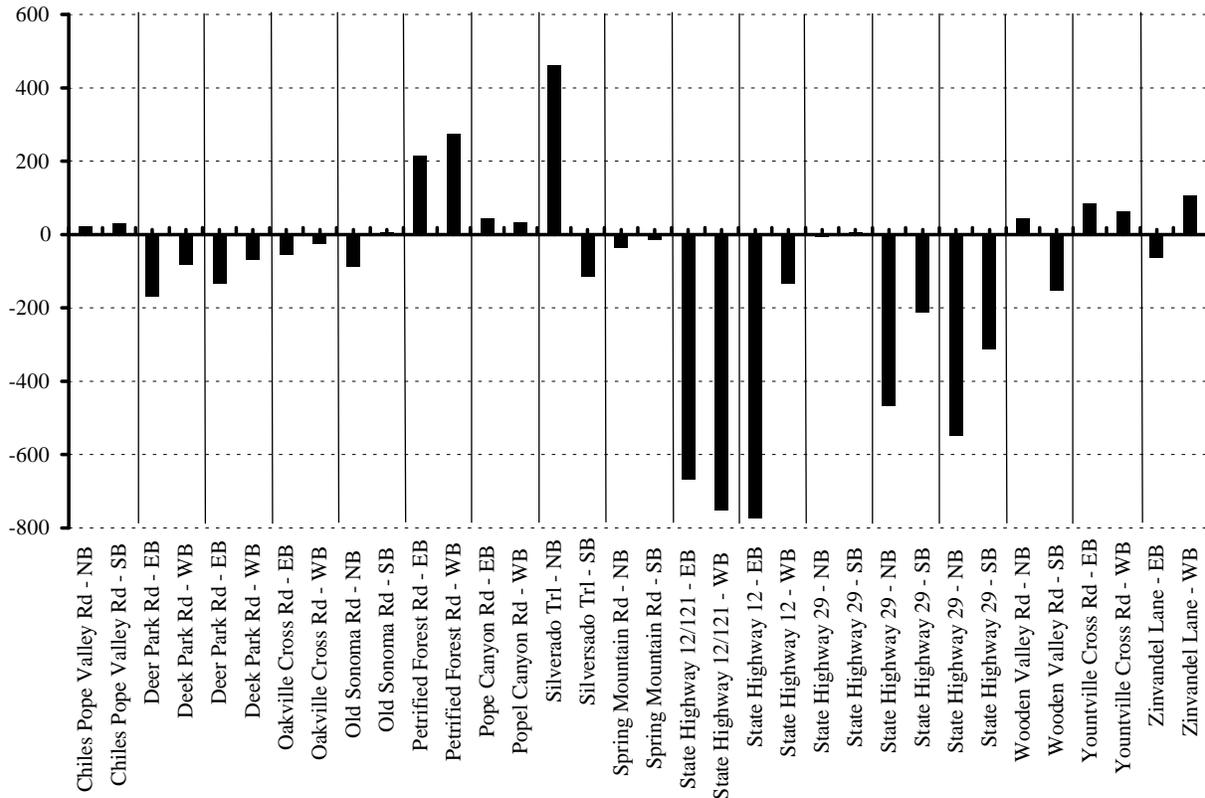
Based upon a comparison of traffic volumes from the 1983 Napa County General Plan and the more recent traffic volumes projected by Caltrans for the TIEP Draft EIR (NCTRA 2005), traffic volumes on state highways entering and exiting Napa County have increased by 128 percent, or 6 percent annually, since 1982. This increase in traffic is largely due to growth in portions of Napa and Solano Counties, and changes in jobs/housing balance. This growth has caused traffic volumes on State Route 12, connecting between American Canyon and Solano County to more than triple over the last 20 years. Overall, the population of Napa County increased by approximately 25 percent, or 1.3 percent annually, between 1980 and 2000. This suggests that travel into and out of Napa County has outpaced the growth in Napa County population by nearly a five to one margin.

## Weekend Traffic Estimates - Existing Conditions

The Solano/Napa transportation model does not forecast weekend traffic. The model only addresses weekday traffic volumes. To estimate weekend traffic along selected roadway segments in Napa County, the following process was used.

The traffic volumes (raw counts) from the BDR and other sources (Caltrans, Napa County and Napa County Transportation Planning Agency) were reviewed to determine the ratio of weekend to weekday traffic. Generally, the weekday volumes were higher than the weekend flows. There were exceptions, generally on the secondary arterial/collector roadways. **Figure 2** shows the locations where weekend and weekday counts were available and the difference between weekend and weekday traffic. The data is shown by direction (see legend) with the northbound/eastbound link listed first and the southbound/westbound link listed second for each named roadway. For all segments where the bar is above the zero line, the weekend traffic is greater than during the weekday. Below the zero line, weekday traffic is greater than weekend traffic. **Table 7** provides additional descriptions of the data shown in **Figure 2**.

**Figure 2 - Weekend Minus Weekday Peak Hour Traffic**



**Table 7 - Weekday Versus Weekend Traffic Volume Data**

Number of Segment	Direction A-B or B-A	Segment Descriptions RoadName	Segment Limit North / East	Segment Limit South / West	Weekday Peak Hour			Weekend Peak Hour			Weekend/ Weekday
					AM	PM	AM+PM	AM	PM	AM+PM	AM+PM
3	NB	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiler Valley Road	16	58	74	49	48	97	1.31
4	SB	CHILES POPE VALLEY RD			16	56	72	36	66	102	1.42
5	EB	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	199	384	583	166	249	415	0.71
6	WB	DEER PARK RD			235	309	544	242	220	462	0.85
7	EB	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	167	260	427	121	171	292	0.68
8	WB	DEER PARK ROAD			183	186	369	142	159	301	0.82
17	EB	OAKVILLE CROSS RD	Napa River	State Route 29	73	111	184	39	90	129	0.70
18	WB	OAKVILLE CROSS RD			92	141	233	84	123	207	0.89
19	NB	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	107	245	352	94	170	264	0.75
20	SB	OLD SONOMA ROAD			104	119	223	128	100	228	1.02
21	EB	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	n/a	471	471	276	411	687	1.46
22	WB	PETRIFIED FOREST ROAD			n/a	452	452	353	373	726	1.61
23	EB	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	9	4	13	21	35	56	4.31
24	WB	POPE CANYON RD			22	20	42	32	43	75	1.79
25	NB	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	n/a	387	387	424	425	849	2.19
26	SB	SILVERADO TRL			n/a	966	966	327	524	851	0.88
37	NB	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	26	57	83	20	27	47	0.57
38	SB	SPRING MOUNTAIN ROAD			35	53	88	42	30	72	0.82
39	EB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	872	1032	1904	406	829	1235	0.65
40	WB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	760	1067	1827	213	862	1075	0.59
41	EB	STATE ROUTE 12	Lynch Road	Kelly Road	1155	1375	2530	627	1131	1758	0.69
42	WB	STATE ROUTE 12	Lynch Road	Kelly Road	604	531	1135	180	820	1000	0.88
65	NB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	74	202	276	63	205	268	0.97
66	SB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	188	126	314	60	262	322	1.03
71	NB	STATE ROUTE 29	Oakville Grade	Madison St	1064	724	1788	399	923	1322	0.74
72	SB	STATE ROUTE 29	Oakville Grade	Madison St	491	1157	1648	273	1162	1435	0.87
75	NB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1065	854	1919	389	982	1371	0.71
76	SB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	685	1006	1691	262	1116	1378	0.81
89	NB	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	71	72	143	97	89	186	1.30
90	SB	WOODEN VALLEY RD			43	305	348	65	131	196	0.56
91	EB	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	n/a	105	105	83	108	191	1.82
92	WB	YOUNTVILLE CROSS RD			n/a	190	190	101	153	254	1.34
93	EB	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	n/a	200	200	68	68	136	0.68
94	WB	ZINFANDEL LN			n/a	119	119	135	89	224	1.88

Given the wide number of fluctuations between the weekday and weekend traffic volumes, it is not possible to a specific factor to the weekday traffic to quantify weekend traffic volumes. It should be noted however, the changes in future traffic will likely flow the trends as today unless there is a dramatic shift in land use. That is, in those locations where the existing weekend traffic is higher than the weekday, the future weekend traffic is likely to be higher than the projected weekday traffic.

### ***Monthly Variations In Traffic Volumes***

Napa County experiences variation in traffic volumes and traffic congestion that are attributable to the agricultural economy and the number of tourists that regularly travel the roads within Napa County. Some roadways experiences increased volumes in summer months due to tourists, and some roadways experience increased volumes in the fall (primarily October) due to harvest. In both cases, many of the seasonal trips occur outside of the PM peak hour.

## **Traffic Analysis**

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This analysis addresses Countywide and regional transportation impacts and identifies mitigation measures to lessen those impacts.

### **Existing Setting**

This section describes the existing transportation systems in the Napa County (County) Planning Area (Planning Area), characterizes different modes of transportation, discusses the adopted transportation plans and policies pertinent to the transportation in the area, and effects on transportation associated with the General Plan Update.

### ***Modes of Transportation***

Transportation and circulation in the County is provided through a variety of transportation modes. These modes present transportation choices for County residents and visitors depending on their destinations and reasons for transport. Existing transportation opportunities offer different travel times and levels of safety. The existing modes in the County include motorized transportation on the County's roadway network and non-motorized transportation on bicycle and pedestrian networks. Rail transportation in the County does exist, but is almost entirely commercial and freight serving with some recreational-rail service. There is no commuter rail transportation service in the County at this time.

Commuting to work is the primary use of the transportation network by County residents. Commuters utilize the transportation network at similar travel times during the morning and afternoon. During peak travel times, the County's transportation network experiences a heavy volume of commuters utilizing all modes of available transportation. **Table 8** compares the level at which County residents utilized

different transportation modes for their commute to work in 2000 in relation to all of California and the entire United States. These data show that compared to other Bay Area residents, Napa County residents commute in single-occupancy vehicles 5.7% more; however, compared to all California residents, the difference is less than 1% more.

**Table 8 - Napa County Resident Commuter Mode Choices- 2000 Census**

Commuter Mode Choice	Napa County Residents	Bay Area Residents	California Residents	U.S. Residents
Single-Occupant Vehicle	72.7%	67%	71.8%	75.7%
Carpool	14.8%	14%	14.5%	12.2%
Public Transit	1.4%	13%	5.1%	4.7%
Bicycling/Walking	5.0%	5%	3.7%	3.3%
Other Means	1.9%	<1%	1.0%	0.8%
Work At Home	5.1%	1%	3.8%	3.3%
Percentage Who Work Outside Napa County	22%	NA	17%	27%
Average Travel Time to Work	24.3	29.4%	27.7	25.5

Source: BDR 2005; RIDES Associates "Commuter Profile 2005, Regional Report"

**Table 9** summarizes the journey-to-work data for County residents from 1980, 1990, and 2000. These data show a 2% increase in commute via automobile from 1980 to 2000; however, the number of single-occupant automobiles has increased from 69% in 1980 to 73% in 2000.

**Table 9 - Changes in Napa County Commuter Mode Choices from 1980 to 2000**

Commuter Mode Choice	1980	1990	2000
Single-Occupant Vehicle	68.8%	75.2%	72.7%
Carpool	17.2%	12.8%	14.8%
Public Transit	1.8%	1.1%	1.4%
Bicycling/Walking	7.6%	3.9%	4.1%
Other Means	2.0%	2.2%	1.9%
Work At Home	2.6%	4.8%	5.1%
Other Commute-Related Data	1980	1990	2000
Percentage Who Work Outside Napa County	23.7%	25.4%	22.2%
Percentage Who Work Outside 9-County Bay Area	0.3%	0.9%	0.9%
Average Travel Time to Work	19.7	21.4	24.3

Source: BDR 2005 and US Census Bureau 2000

## Roadway System and Classification

The County's roadway network is comprised of a hierarchy of roads with different classifications and characteristics. The normal hierarchy of roadways would include freeways, highways, arterials, collectors, and local streets. However, the facilities within Napa County do not exactly match these categories. The roadway system in Napa County is focused on a truck route, State Route (SR) 29, which enters the County from the south (from Solano County at American Canyon) and leaves to the north (towards Lake County). The primary routes are augmented by east-west roadways, such as State Route 12 (Jamieson Canyon Road and Sonoma-Napa Highway), State Route 221 (Soscol Avenue), Silverado Trail, and State Route 121 (NCTRA 2005). Napa County also contains a grid of north-south and east-west arterial roadways. The hierarchy of

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roadway classifications in the County is explained in the following sections. **Figure 3** is a map presenting the County's roadway network.<sup>1</sup>

### **Freeways and Highways**

The County effectively has no freeways except for a small segment of I-80 that crosses the corner of the County boundary between Fairfield and Vallejo. There is also a segment of freeway located on State Route 29 south of Trancas Avenue to the Carneros Highway (SR 121/12/29) intersection. The following roadway segments are classified as **Rural Highways** within Napa County. It should be noted that some roadways have different classifications along their routes. Therefore, the classifications in the analysis and tables generated by the model runs are identified by roadway segment rather than the overall route.

- American Canyon Road
- Oak Knoll Avenue
- Oakville Cross Road
- Old Sonoma Road
- Silverado Trail
- State Route 12/121
- State Route 12
- State Route 128
- State Route 29

### **Arterials**

Most of the County's high volume, high-speed roadways are considered arterials, which range from: 1) Multi-lane urban thoroughfares with signalized intersections, 2) Multi-lane rural expressways with signalized and unsignalized intersections, and 3) Single-lane rural roads with generally unsignalized intersections.

The following roadways are classified as urban or rural arterials.

- Chiles Pope Valley Road
- Flodden Road
- Napa Vallejo Highway
- Petrified Forest Road
- Silverado Trail - within Calistoga
- Soscol Avenue
- Spring Mountain Road
- State Route 128/29 - (within St. Helena and Calistoga)

## **Figure 3 - Napa County Roadway Network**

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<sup>1</sup> Roadway classifications used in this EIR to identify impacts were derived from the Florida Department of Transportation. Roadway classifications proposed in the updated Circulation Element were derived by County staff to be specific to Napa County.

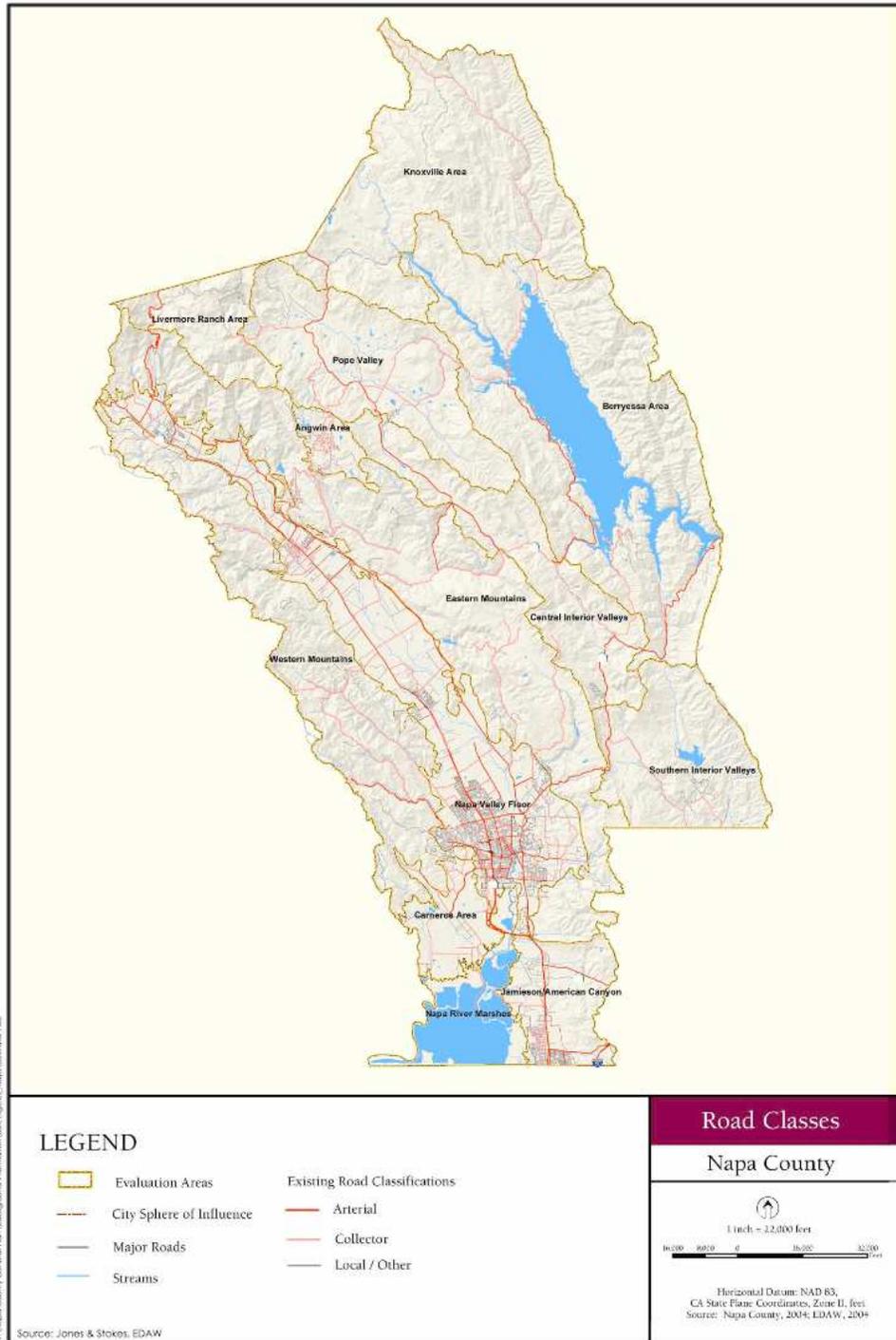


FIGURE 4.4-1  
 NAPA COUNTY ROADWAY NETWORK



## Collectors

Collector streets serve as principle traffic arteries within commercial and residential areas. Collector streets have more frequent access from abutting parcels. Access to collector streets is also provided from local streets that directly serve residential developments and commercial centers. In rural areas of the County there are many roadways that do not serve regional traffic and serve more as collectors, providing access between rural destinations and the regional roadway network. The following roadway segments are classified as collectors.

- Deer Park Road
- Howell Mountain Road
- Pope Canyon Road
- Wooden Valley Road
- Yountville Cross Road

## Local Streets

Local streets provide direct access to residential, commercial, industrial developments, or any other abutting land use. Local traffic uses these streets to reach collectors and arterials providing access to the regional network.

## ***Existing Year 2003 Levels of Service***

Service levels were determined for roadway segments by comparing existing PM peak-hour volumes compared to the LOS thresholds presented above. **Table 10** presents the peak hour capacities and levels of service for all of the roadway segments analyzed for the Napa County General Plan Update EIR. Roadway segments were selected where data was available, and so as to characterize conditions throughout the County transportation system. The following is a list of roadway segments that were determined to be operating at LOS E or F, or over-capacity, under existing conditions:

- State Route12/121 - Cuttings Wharf Road to Stanly Road
- State Route12 - Lynch Road to Kelly Road
- State Route121 - Napa/Sonoma County Line to Old Sonoma Road
- State Route29 - Green Island Road to American Canyon Road
- State Route29 - Oakville Grade to Madison Street
- State Route29 - Rutherford Cross Road (SR 128) to Oakville Grade
- State Route29 - Chaix Lane to Zinfandel Lane

**Table 10 - Year 2003 Peak Hour Traffic Volumes, Capacities and Levels Of Service**

Segment Number	Segment Descriptions			Segment Capacity and Count Values			Peak Hour Volume	Peak Hour V/C Ratio	
	RoadName	Segment Limit North / East	Segment Limit South / West	Lanes	Class	Directional Capacity			
1	AMERICAN CANYON ROAD	I-80	Flosden Road	1	RurHwy2	1200	958	0.80	LOS D
2	AMERICAN CANYON ROAD	I-80	Flosden Road	1	RurHwy2	1200	958	0.80	LOS D
3	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	1	RurArt2	800	66	0.08	LOS A
4	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	1	RurArt2	800	63	0.08	LOS A
5	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	1	Coll2	810	415	0.51	LOS C
6	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	1	Coll2	810	340	0.42	LOS C
7	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	1	Coll2	810	283	0.35	LOS C
8	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	1	Coll2	810	213	0.26	LOS C
9	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	2	UrbArt4	1800	629	0.35	LOS C
10	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	2	UrbArt4	1800	514	0.29	LOS C
11	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	1	Coll2	810	55	0.07	LOS A
12	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	1	Coll2	810	48	0.06	LOS A
13	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	2	UrbArt4	1800	1642	0.91	LOS D
14	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	2	UrbArt4	1800	1399	0.78	LOS D
15	OAK KNOLL AVE	Big Ranch Rd	State Route 29	1	RurHwy2	1200	218	0.18	LOS C
16	OAK KNOLL AVE	Big Ranch Rd	State Route 29	1	RurHwy2	1200	267	0.22	LOS C
17	OAKVILLE CROSS RD	Napa River	State Route 29	1	RurHwy2	1200	91	0.08	LOS A
18	OAKVILLE CROSS RD	Napa River	State Route 29	1	RurHwy2	1200	112	0.09	LOS B
19	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	1	RurHwy2	1200	267	0.22	LOS C
20	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	1	RurHwy2	1200	131	0.11	LOS B
21	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	1	RurArt2	800	545	0.68	LOS C
22	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	1	RurArt2	800	524	0.65	LOS C
23	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	1	Coll2	810	35	0.04	LOS A
24	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	1	Coll2	810	33	0.04	LOS A
25	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	1	RurHwy2	1200	485	0.40	LOS C
26	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	1	RurHwy2	1200	727	0.61	LOS C
27	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	1	RurHwy2	1200	541	0.45	LOS C
28	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	1	RurHwy2	1200	811	0.68	LOS C
29	SILVERADO TRL	Pope St	Zinfandel Ln	1	RurHwy2	1200	371	0.31	LOS C
30	SILVERADO TRL	Pope St	Zinfandel Ln	1	RurHwy2	1200	557	0.46	LOS C
31	SILVERADO TRL	Bale Ln	Deer Park Rd	1	RurHwy2	1200	224	0.19	LOS C
32	SILVERADO TRL	Bale Ln	Deer Park Rd	1	RurHwy2	1200	335	0.28	LOS C
33	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	1	RurArt2	800	314	0.39	LOS C
34	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	1	RurArt2	800	201	0.25	LOS C
35	SOSCOL AVE	First St	Silverado Trail	2	UrbArt4	1800	1568	0.87	LOS D
36	SOSCOL AVE	First St	Silverado Trail	2	UrbArt4	1800	1568	0.87	LOS D
37	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	1	RurArt2	800	40	0.05	LOS A
38	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	1	RurArt2	800	36	0.05	LOS A
39	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	1	RurHwy2	1200	952	0.79	LOS D
40	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	1	RurHwy2	1200	1767	1.47	LOS F
41	STATE ROUTE 12	Lynch Road	Kelly Road	1	RurHwy2	1200	1400	1.17	LOS F
42	STATE ROUTE 12	Lynch Road	Kelly Road	1	RurHwy2	1200	900	0.75	LOS E
43	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	1	RurArt2	800	322	0.40	LOS C
44	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	1	RurArt2	800	132	0.16	LOS C
45	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	1	RurArt2	800	78	0.10	LOS B
46	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	1	RurArt2	800	183	0.23	LOS C

**TABLE 10 - CONTINUED**

Segment Number	Segment Descriptions		Segment Capacity and Count Values			Peak Hour Volume	Peak Hour V/C Ratio		
	RoadName	Segment Limit North / East	Segment Limit South / West	Lanes	Class			Directional Capacity	
47	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1	RurHwy2	1200	1360	1.13	LOS F
48	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1	RurHwy2	1200	1360	1.13	LOS F
51	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	1	RurArt2	800	166	0.21	LOS C
52	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	1	RurArt2	800	172	0.22	LOS C
53	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	1	RurArt2	800	475	0.59	LOS C
54	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	1	RurArt2	800	475	0.59	LOS C
55	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	1	RurArt2	800	544	0.68	LOS C
56	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	1	RurArt2	800	544	0.68	LOS C
57	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	1	RurHwy2	1200	200	0.17	LOS C
58	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	1	RurHwy2	1200	113	0.09	LOS B
59	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	1	RurArt2	800	92	0.12	LOS B
60	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	1	RurArt2	800	172	0.21	LOS C
61	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	1	RurHwy2	1200	113	0.09	LOS B
62	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	1	RurHwy2	1200	109	0.09	LOS B
63	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	1	RurHwy2	1200	54	0.05	LOS A
64	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	1	RurHwy2	1200	57	0.05	LOS A
65	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	1	RurHwy2	1200	315	0.26	LOS C
66	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	1	RurHwy2	1200	384	0.32	LOS C
67	STATE ROUTE 29	Green Island Rd	American Canyon Rd	2	UrbArt4	1800	1890	1.05	LOS F
68	STATE ROUTE 29	Green Island Rd	American Canyon Rd	2	UrbArt4	1800	1890	1.05	LOS F
69	STATE ROUTE 29	California Dr	Oak Knoll Ave	2	RurHwy4	3390	1111	0.33	LOS C
70	STATE ROUTE 29	California Dr	Oak Knoll Ave	2	RurHwy4	3390	1358	0.40	LOS C
71	STATE ROUTE 29	Oakville Grade	Madison St	1	RurArt2	800	908	1.13	LOS F
72	STATE ROUTE 29	Oakville Grade	Madison St	1	RurArt2	800	1109	1.39	LOS F
73	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	1	RurArt2	800	794	0.99	LOS E
74	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	1	RurArt2	800	1243	1.55	LOS F
75	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1	RurArt2	800	874	1.09	LOS F
76	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1	RurArt2	800	1069	1.34	LOS F
77	STATE ROUTE 29	Lodi Lane	Deer Park Rd	1	RurArt2	800	605	0.76	LOS D
78	STATE ROUTE 29	Lodi Lane	Deer Park Rd	1	RurArt2	800	739	0.92	LOS D
79	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	2	RurHwy4	3390	2535	0.75	LOS C
80	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	2	RurHwy4	3390	2535	0.75	LOS C
81	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	2	RurHwy4	3390	1196	0.35	LOS B
82	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	2	RurHwy4	3390	1196	0.35	LOS B
83	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	2	RurHwy4	3390	1725	0.51	LOS B
84	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	2	RurHwy4	3390	1725	0.51	LOS B
85	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	2	Fwy4	3800	1328	0.35	LOS B
86	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	2	Fwy4	3800	1328	0.35	LOS B
87	TUBBS LN	Highway 29	Highway 128	1	RurHwy2	1200	248	0.21	LOS C
88	TUBBS LN	Highway 29	Highway 128	1	RurHwy2	1200	316	0.26	LOS C
89	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	1	Coll2	810	43	0.05	LOS A
90	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	1	Coll2	810	151	0.19	LOS C
91	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	1	Coll2	810	140	0.17	LOS C
92	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	1	Coll2	810	248	0.31	LOS C
93	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	1	RurArt2	800	193	0.24	LOS C
94	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	1	RurArt2	800	114	0.14	LOS B

## Transportation Safety

### Roadway Collision

California's Statewide Integrated Traffic Records System (SWITRS) collects, records and processes detailed collision data for the State. Uniform data collection tools and methods are used to produce meaningful statistics to improve roadway conditions and monitor the effectiveness of enforcement efforts. **Table 11** presents the top 20 locations where traffic collisions were reported in the County. The data is presented in the table by the proximity to the nearest intersection. Due to the rural nature of many roadways in the County, the location of the collision may be a considerable distance from the nearest intersection. As shown in the table nearly 75% of the

collisions occurring within the top 20 general areas for traffic collisions of the County occurred on SR 29, including 3 fatalities.

**Table 11 - Top 20 Collision Locations in Napa County by Nearest Intersection**

Nearest Intersection	Collisions	Fatal	Injury
<b>SR 29/Tubbs Lane</b>	<b>218</b>	<b>1</b>	<b>84</b>
<b>SR 29/SR 221</b>	<b>177</b>	<b>0</b>	<b>55</b>
SR 29/SR 12	125	0	46
SR29/SR121	107	1	32
SR 29/Imola Avenue	97	0	21
Jefferson Street/Pueblo Street	88	0	26
SR29/Trancas Street	84	0	27
SR 29/American Canyon Road	69	0	15
Jefferson Street/Trancas Street	68	0	17
<b>SR 121/Wooden Valley Road</b>	<b>68</b>	<b>0</b>	<b>32</b>
<b>SR 12/Kirkland Ranch Road</b>	<b>67</b>	<b>2</b>	<b>23</b>
SR 29/Redwood Road	62	0	18
<b>SR 29/South Kelly Road</b>	<b>60</b>	<b>0</b>	<b>28</b>
SR 29/Rio Del Mar	54	0	16
SR 29/1 <sup>st</sup> Street	53	0	13
SR 29/Trower Avenue	49	0	18
<b>SR 128/Silverado Trail</b>	<b>48</b>	<b>0</b>	<b>23</b>
SR29/Lincoln Avenue	46	1	20
Lincoln Avenue/Soscol Avenue	45	1	14
Redwood Road/Solano Avenue	44	0	8

**Bolded** intersections fall under unincorporated Napa County jurisdiction, not within City limits  
 Source: BDR 2005 and 2002-2004 SWITRS Data

### Intersection Collisions

**Table 12** presents the 20 intersections in the County with the most traffic collisions. Intersections with higher traffic volumes would be expected to have a proportionally higher number of collisions. Therefore, although an intersection in the table may have a high number of collisions, it does not necessarily indicate a safety concern.

**Table 12 - Top 20 Intersection Traffic Collision Locations Napa County**

Intersection	Collisions	Fatal	Injury
SR 29/SR121	64	1	29
<b>SR 29/SR 221</b>	<b>58</b>	<b>0</b>	<b>13</b>
Jefferson Street/Pueblo Street	54	0	18
SR 29/Trancas Street	54	0	19
SR 29/American Canyon Road	53	0	9
SR 29/Imola Avenue	51	0	13
SR 29/Redwood Road	48	0	12
Jefferson Street/Trancas Street	45	0	11
SR 29/Rio Del Mar	45	0	14
<b>SR 29/SR 12</b>	<b>43</b>	<b>0</b>	<b>20</b>
Lincoln Avenue/Main Street	40	0	14
SR 29/1 <sup>st</sup> Street	39	0	9
Solano Avenue/Trowler Avenue	38	1	18
Jefferson Street/Lincoln Avenue	37	0	10
SR 29/Trower Avenue	32	0	12
California Boulevard/Lincoln Avenue	30	0	8
Redwood Road/Solano Avenue	29	0	5
Lincoln Avenue/Soscol Avenue	28	0	9

Intersection	Collisions	Fatal	Injury
American Canyon Road/Flosden Road	25	1	9
<b>SR 29/South Kelly Road</b>	<b>24</b>	<b>0</b>	<b>14</b>

Source: BDR 2005 and 2002-2004 SWITRS Data - **Bolded** intersections under unincorporated Napa County jurisdiction

### Pedestrian and Bicycle Collisions

Pedestrian/vehicle collisions do occur at several intersections in the County. Pedestrian collision data was obtained from the SWITRS database for collisions reported between January 2002 and December 2004. A total of 131 vehicular collisions involving pedestrians were reported during this 3-year period, of which 113 resulted in injuries. Three of these accidents resulted in death. The intersection of Clay/Jefferson Streets in the City of Napa had five pedestrian-related collisions, the highest of any intersection in the County. However, none of these collisions were fatal. **Table 13** presents the top intersections for pedestrian related collisions for accidents resulting in at least two injuries or one death between January 2002 and December 2004.

**Table 13 - Top Pedestrian-Related Collisions Intersection Locations January 2002 through December 2004**

Intersection	Collisions	Fatal	Injury
Clay Street/Jefferson Street	5	0	5
Jefferson Street/Pueblo Avenue	3	0	3
SR 29/Washington Street	3	0	2
1 <sup>st</sup> Street/Seminary Street	2	0	2
Jefferson Street/Rubicon Street	2	0	2
Jefferson Street/Sheridan Street	2	0	2
Lincoln Avenue/Marin Street	2	0	2
3 <sup>rd</sup> Street/Soscol Avenue	2	0	1
Beard Road/Pueblo Avenue	2	0	1
Central Avenue/Jefferson Street	2	0	1
SR 29/Fulton Lane	2	0	1
Mariposa/Pope Street	1	1	0
<b>SR 29/Airport Road</b>	<b>1</b>	<b>1</b>	<b>0</b>

**Bolded** intersections under unincorporated Napa County jurisdiction

Source: BDR 2005 and 2002-2004 SWITRS Data

**Table 14** presents the top intersections for bicycle related collisions for accidents where at least two bicycle collisions have occurred between January 2002 and December 2004. None of the reported collisions were fatal.

**Table 14 - Top Bicycle-Related Collisions Intersection Locations January 2002 through December 2004**

Intersection	Collisions	Fatal	Injury
California Boulevard/Trancas Street	4	0	3
Lincoln Avenue/Soscol Avenue	4	0	2
Jefferson Street/Pueblo Avenue	3	0	3
SR 29/1 <sup>st</sup> Street	3	0	2
SR 29/Trancas	3	0	2
1 <sup>st</sup> Street/Freeway Drive	3	0	1
2 <sup>nd</sup> Street/Main Street	2	0	2
3 <sup>rd</sup> Street/Coombs Street	2	0	2
American Canyon Road/Broadway	2	0	2
Central Avenue/Jefferson Street	2	0	2
Claremont Way/Jefferson Street	2	0	2
Gasser Drive/Imola Avenue	2	0	2
Imola Avenue/Soscol Avenue	2	0	2
Jefferson Street/Sheridan Avenue	2	0	2
<b>Mount Veeder Road/Redwood Road</b>	<b>2</b>	<b>0</b>	<b>2</b>
Pueblo Avenue/Soscol Avenue	2	0	2
<b>SR 29/Whitehall Lane</b>	<b>2</b>	<b>0</b>	<b>2</b>
Trancas Street/Villa Lane	2	0	2

***Bolded** intersections under unincorporated Napa County jurisdiction  
 Source: BDR 2005 and 2002-2004 SWITRS Data*

**Public Transit Services**

Public transit services, though not a major travel mode in Napa County, are available in all of the cities and in much of the unincorporated areas of the County. The following transit providers provide fixed-route local, intercity and demand-response services and paratransit service.

**VINE**

The VINE provides intra- and inter-city fixed route services. VINE operates in the City of Napa, between Calistoga and the City of Vallejo (in Solano County), and between St. Helena and Santa Rosa (in Sonoma County).

**VINE Go Paratransit Service**

The VINE Go Paratransit Service provides curb-to-curb service for residents countywide who live within ¼ mile of a bus route.

**American Canyon Transit Fixed-Route Service**

The American Canyon Transit provides fixed-route service in the city of American Canyon.

**Saint Helena Shuttle**

The Saint Helena Shuttle operates a fixed-route service in the City and to St. Helena Hospital.

### **Yountville Shuttle**

The Yountville Shuttle provides fixed-route shuttle throughout the town of Yountville, including to the Veteran's Home.

### **Calistoga Handy-Van On-Demand Service**

The Calistoga Handy Van On Demand provides shuttle service in Calistoga and the various VINE system connections.

### **Downtown Napa Trolley**

The Downtown Napa Trolley provides free shuttle service in downtown Napa,

### **AMTRAK**

AMTRAK does not provide passenger rail service within the County. However, AMTRAK does offer fixed-route connector buses between two locations in the County and the nearest Amtrak station in Martinez, California. Passengers boarding AMTRAK at Martinez can connect to trains traveling to the Bay Area, the Central Valley, along the West Coast to Seattle and across the country to the East Coast.

### **Taxi Service**

Private taxis and shuttles are available in the County account for the remainder of the public transportation service in the County. Taxis are the only form of public transportation available at night.

### **California Northern Railroad**

The California Northern Railroad operates (CFNR) 216.3 miles of abandoned Southern Pacific track and part of the ex-Northern Pacific tracks. CFNR has its headquarters at the Lombard Yard in American Canyon and operates trains in Napa over 7.1 miles of tracks.

### **Area Airports**

Ten airports are located within a 25-nautical mile radius of Napa County Airport. Of these, seven are public-use facilities: Buchanan Field, Gness Field, Nut Tree, Petaluma, Angwin-Parrett Field, Sonoma Skypark, and Sonoma Valley; two are private-use facilities: San Rafael, Travis Aero Club; and one is a military airfield: Travis Air Force Base. Public access to the private facilities requires prior permission of the operator.

### **Napa County Airport**

Napa County Airport is located on the periphery of the very complex San Francisco Bay Area Class B airspace environment. The airspace in the vicinity of the Airport, as well as the operations of air traffic using the Airport, are significantly influenced by the complex interaction of aircraft operating to and from the Bay Area's numerous

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air carrier, general aviation, and military airports. See Section 4.2 (Land Use) for details on the Airport Master Plan and Section 4.9 (Human Health, Risk of Upset) for discussion of aviation safety.

### **Angwin-Parrett Field Airport**

Virgil O Parrett field is located in the unincorporated community of Angwin and is owned by Pacific Union College. Although the airport is privately owned, it is open to the public.

### **Waterway Transportation**

The two major waterways in Napa County include Lake Berryessa, a man-made reservoir that serves as a domestic water supply reservoir, and Napa River, which flows 55 miles from Mt. St. Helena to San Pablo Bay. The lake is used for recreational purposes and the river functions as a recreational waterway. The river is dredged part way up from San Pablo Bay and can accommodate barges up to 100 feet wide, which provides the opportunity for industrial transportation on the river, particularly for the American Canyon area. Boats can motor up the Napa River as far as the First Street Bridge in the city of Napa. The Napa River played an important role in the early days of Napa County's development, providing a means to move agricultural and other products to market.

### **Napa Valley Railroad (Wine Train)**

The Napa Valley Wine Train Incorporated was formed in 1984. It purchased 21 miles of track and 125 acres of right-of-way land for \$2.25 million in April 1987 from Southern Pacific, which had owned the line since 1885, when it purchased the Napa Valley Railroad, which had been founded in 1864. The recreational line now includes 36 miles of track runs from Rocram (south of the city of Napa) to north of the Krug Winery. Passengers on the Wine Train roll by 26 different wineries on their trip, which typically lasts about three hours, then return back to the downtown Napa station from which they departed.

### **Non-motorized Transportation**

With relatively long distances between cities in the County, commuting between Cities on a bicycle or as a pedestrian is difficult. Potential does exist for intra-city commuting via bicycle, as most cities in the county are relatively flat. The unique views and generally mild weather in the County does attract recreational cyclists. Pedestrian travel is possible in the most cities within the County. Although most of the cities are small, they are relatively dense, with pedestrian friendly streets. The following sections discuss the existing bicycle and pedestrian networks in the County.

### **Pedestrian Network**

The County's pedestrian network consists primarily of sidewalks and multi-use trails. Sidewalks are usually provided in developed commercial and residential areas and are rarely provided in the low-density rural areas of the County. Class I bicycle trails are usually

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designed as multi-use trails that can be shared with pedestrians. Pedestrian activity is often considered an uncounted mode, although over 4 percent of Napa County residents actually walk to work (NCTRA 2005). Pedestrian facilities also include crosswalks and pedestrian-actuated signals at major intersections within developed areas.

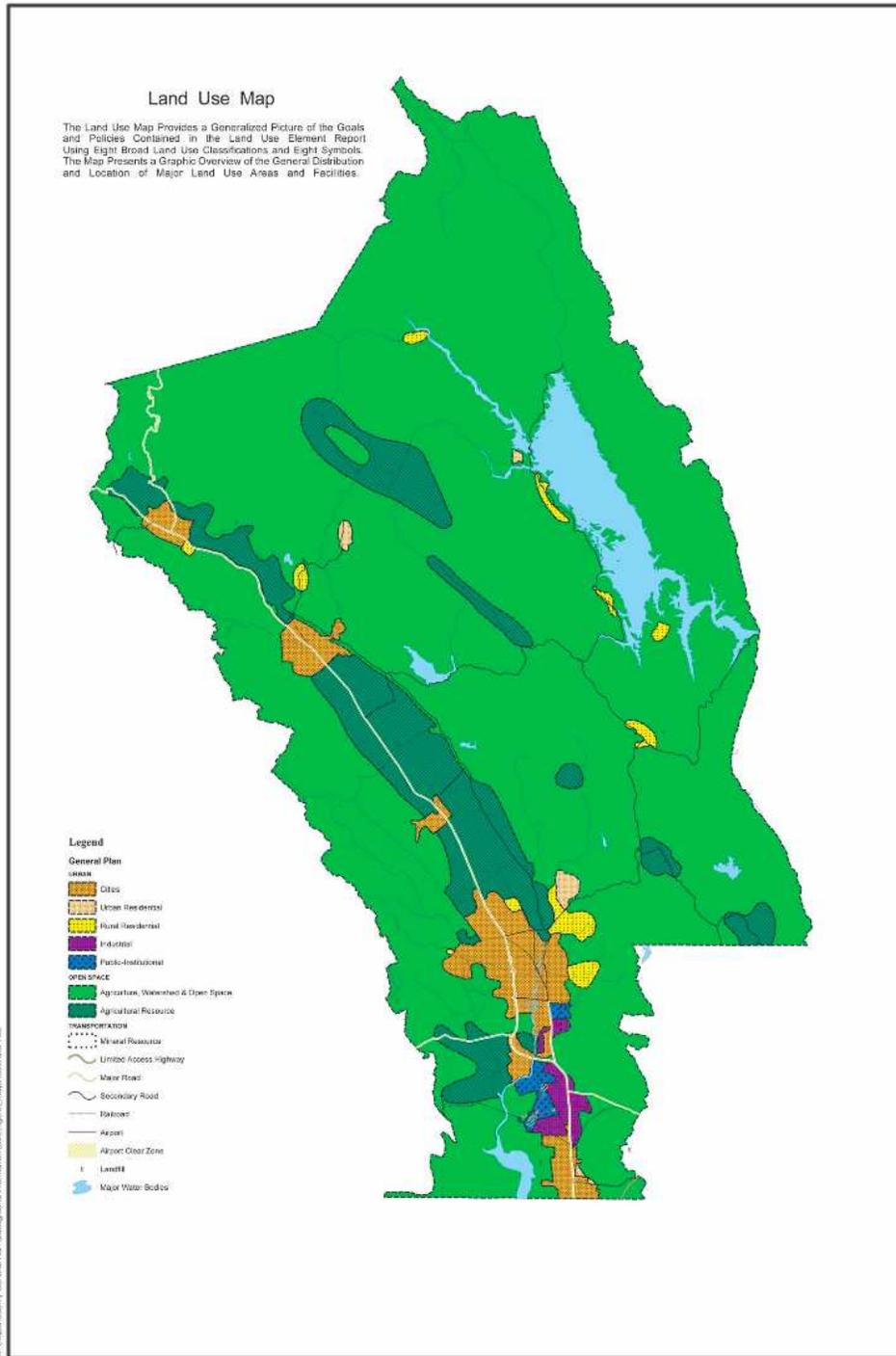
### ***Bicycle Network***

Napa County has several off-street trails and paths, as well as on street bicycle lanes and routes. Bicycle facilities are classified as follows:

- *Class I Bikeway (Bike Path)*. - A completely separate facility designated for the exclusive use of bicycles and pedestrians, with vehicle and pedestrian cross-flow minimized.
- *Class II Bikeway (Bike Lane)*. - A striped lane designated for the use of bicycles on a street or highway. Vehicle parking and vehicle pedestrian/ cross-flow are permitted at designated locations.
- *Class III Bikeway (Bike Route)*. - A route designated by signs of pavement markings for bicyclists within the vehicular travel lane (i.e. shared use) of a roadway.

**Figure 4** is a map presenting the County's bicycle network. While bicycle facilities are often located in newer neighborhood or developments, older neighborhoods and rural areas of the County often lack bicycle amenities. An example of this network is the many east-west roadways in the County that cross rivers and creeks on very narrow bridges. The narrow bridges squeeze cars and bicyclists together, forcing the bicyclists or cars to yield right-of-way to the other. These conditions create dangerous situations for bicyclists and motorists. The update to the Napa Countywide Bicycle Plan was adopted in 2003.

**Figure 4 - Napa County Bicycle Map**



**FIGURE 4.2-2**  
**GENERAL PLAN LAND USE MAP**  
 PMC

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## **Regulatory Framework**

### **Federal**

The Safe, Accountable, Flexible, Efficient Transportation Equity Act, or SAFETEA, was approved by Congress in July 2005 and signed into law by the President in August 2005. This law provides \$244 billion in guaranteed funding for federal surface transportation programs for the next 5 years, an average annual increase of 35% from previous years. This law replaces the Transportation Equity Act for the 21st Century (TEA-21), which expired in September 2003.

### **State**

The California Transportation Commission (CTC) is responsible for the programming and allocation of funds for the construction of highway, passenger rail and transit improvements throughout California. The CTC also advises and assists the Secretary of Business, Transportation and Housing Agency and the Legislature in formulating and evaluating state policies and plans for California's transportation programs. The State Transportation Improvement Program (STIP) is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the State Highway Account and other funding sources. STIP programming generally occurs every two years. State guidelines generally set the framework for regional and local planning efforts. State law requires the regional and local planning agencies to develop and submit a Regional Transportation Improvement Program (RTIP) every 3 years to the California Transportation Commission and the California Department of Transportation (Caltrans). In the Bay Area, this plan is prepared by the Metropolitan Transportation Commission (MTC), the regional planning agency, in cooperation with nine countywide Congestion Management Agencies (CMAs). The MTC in the case of Napa County, has the option of submitting a previous TRIP if it is deemed adequate, or submitting a revised version. MTC writes the RTIP, which along with Caltrans ITIP (Interregional Transportation Improvement Plan) goes to form the STIP, with the parts selected (to greater and lesser degrees) by the CTC. MTC is the Regional Transportation Planning Agency (RTPA). The RTIP is prepared every odd numbered year for STIP adoption by the CTC in even numbered years. Large capital expansion projects like the Trancas/SR29 interchange are funded by the STIP.

### **Regional**

The MTC's Transportation 2030 Plan for the San Francisco Bay Area (2030 Plan) is a long-range transportation plan for the nine-county San Francisco Bay Area (San Francisco, Alameda, Contra Costa, San Mateo, Santa Clara, Napa, Solano, Marin, and Sonoma Counties). The 2030 Plan sets priority for funding and implementation of transportation-related projects in the Bay Area. This Regional Transportation Plan is federally mandated and restricted to funding that can reasonably expected to be available over the IP period. Projects cannot use federal, or in many cases, state funds unless it is specifically listed or is consistent with the RTP. The RTP must be checked for conformance with the region's Air Quality Plan to ensure

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that the projects and programs in the RTP meet the air quality improvement and maintenance goals and policies require by the federal government.

The 2005 Transportation Improvement Program (TIP) is a list of transportation projects and programs to be funded and implemented over a minimum of the next 3 years and is required to be updated every 2 years. By law, the TIP must be fiscally constrained such that the amount of programmed expenditures does not exceed the amount of money expected to be available. All transportation projects that use federal funds, in whole or in part must be listed in the TIP. Also projects that touch the State or federal roadway systems require certain types of federal permits or are regionally significant, regardless of their funding source, must be in the TIP.

## **Local**

### ***Napa County Transportation Planning Agency***

The Napa County Transportation Planning Agency (NCTPA) was formed in 1988 as a joint effort, known as a Joint Powers Agency, by the cities of American Canyon, Napa, St. Helena, the town of Yountville and the County of Napa. The NCTPA was formed to serve as the countywide transportation planning body for the incorporated and unincorporated areas of Napa County. The agency is charged with coordinating short and long term planning and funding within an Intermodal policy framework in the areas of highways, streets and roads, Paratransit, and bicycle improvements.

In July 2000, the NCTPA debuted the VINE, which was formed by combing the V.I.N.E. and the Napa Valley Transit (NVT). Then in 2002, NCTPA began operating community shuttles, including the Calistoga HandyVan, the St. Helena VINA Shuttle and the Yountville Shuttle. As a combined system, the NCTPA provides service to residents throughout the Napa Valley.

### ***RTP Preparation and Strategic Transportation Plan***

The allocation of State and Federal transportation funds requires the adoption of a long range (20-year) Regional Transportation Plan (RTP). In the Bay Area, this plan is prepared by MTC (Metropolitan Transportation Commission) in cooperation with nine countywide Congestion Management Agencies (CMAs). Locally NCTPA performs the function of the CMA. The RTP forms the basis for NCTPA and MTC decision making related to highways, streets and roads, transit, and bicycle funding. The most recent RTP was prepared in 2001 (amended in 2002) and forecasts long-range planning to improve the surface transportation network to a 2025 horizon.

The current Strategic Transportation Plan (STP) was prepared through a special funding grant provided through MTC and augmented by the NCTPA. The purpose of the STP is to identify objectives for the various transportation corridors in Napa County for short and long term planning and funding within an Intermodal policy framework in the areas of highways, streets and roads, transit, Paratransit, and bicycle improvements. An update of the plan is ongoing.

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### ***Napa Community-Based Transportation Plan***

NCTPA has drafted the Napa Community-Based Transportation Plan that identifies the following solutions to improve transit service:

- Provision of a farm worker shuttle;
- Improve route connectivity through revised schedules for transit service;
- Provision of flexibility-route service for qualifying residents;
- Organization of vanpools to employment destinations;
- Expansion of marketing and advertising of transit services;
- Installation of bus shelters;
- Restripe crosswalks for improved safety accessing transit stops; and
- Improve transit route performance.

### ***Short Range Transit Plan (2004-2013)***

NCTPA has drafted this plan to address the anticipated 20% growth in transit services by the year 2013. The plan includes improvements to regional transit connections, expansion of hours for transit work stops, improvements to local route frequency and capital improvements (e.g., bus stop improvements and construction of park and ride lots).

## **Impacts and Mitigation Measures**

This section compares projected future conditions with the General Plan Update to the current conditions described earlier and to significance standards presented below. Potential impacts to the transportation system are described, along with any mitigation measures that could feasibly reduce the significance of impacts identified.

### ***Standards of Significance***

For purposes of this impact analysis, a transportation impact would be considered significant if it would:

1. Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system, exceeding a level of service standard as follows:
  - If roadways operate at LOS D or better with the General Plan Update, the impacts are considered less than significant. Use of LOS E and F as significant is common practice, and reflects industry standards.
  - For roadways that currently operate at LOS D or better, if the General Plan Update results in LOS E or F, the impacts are considered significant even if LOS E or F would occur in the future without the General Plan Update.

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- For roadways that currently operate at LOS E or F, if the General Plan Update would cause an increase in traffic or change in other conditions such that the volume-to-capacity ratio would increase by 5% or more, the impacts are considered significant. Although there is no national standard, using a percent change where the LOS is already unacceptable is a standard industry practice (e.g., Sacramento County Traffic Impact Guidelines).
2. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), as well as potentially adversely affected emergency access needs.
  3. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks, pedestrian facilities).
  4. Result in inadequate parking capacity?

Potential conflicts with air traffic are addressed in Section 4.2 (Land Use) and Section 4.9 (Human Health/Risk of Upset), while emergency access is also addressed in Section 4.9 (Human Health/Risk of upset) and Section 4.13 (Public Services and Utilities) of the EIR.

## **Project Impacts and Mitigation Measures**

### ***Travel Demand***

**Impact 4.4.1** Land uses and growth under the proposed General Plan Update could cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system, within the County and adjacent jurisdictions, and could affect emergency access. (Significant and Unavoidable - All Alternatives)

As previously noted the traffic impact modeling was conducted for the three alternatives using their unique land use conditions and projected growth by the year 2030. For each alternative, the corresponding changes in housing and employment were coded into the travel demand model. The details of the land use changes are discussed in the Land Use Element of the General Plan.

### **Second Units Trip Generation**

The County has noted that ¼ (25%) of the new housing units being constructed could have second units. The traffic generated by second units can vary significantly from unit to unit. Often units are used as vacation homes while others are used for home office and guest accommodations. Therefore, the trip generation rate for such units is difficult to establish. If half of the second units were fully occupied, they would generally create traffic levels similar to townhouses or condominium type units. The trip rate for these types of units is 5.86 daily trips per unit and 0.52 peak hour trips per

unit. Based upon a 50% occupancy rate would result in a daily trip rate of 3 trips per unit and a peak hour rate of .3 trips per unit. The estimate for Alternatives A, B and C could generate as many as 560, 610 and 860 second units. In addition, the peak hour trips are two-way and actually would generate a peak directional flow of from 65% or 109 to 168 peak trips. These increases in traffic would not cause any significant changes in the findings of this analysis. The location of these units would be spread across the county and therefore would not be concentrated in one area. **Table 15** shows the trip generation for second units.

**Table 15 - Second Unit Trip Generation**

Alternatives	Number of Second Units	Daily Trip Rate	Peak Hour Trip Rate	Daily trips	Peak Hour Trips
Alternative A (2030)	560	3	0.3	1,680	168
Alternative B (2030)	610	3	0.3	1,830	183
Alternative C (2030)	860	3	0.3	2,580	258

Source: Dowling Associates 2006

**Trip Distribution Patterns**

Trip distribution patterns created under each analysis scenario are shown in **Table 17**. The trip patterns are divided into five groupings. These include the following:

1. Trips that start and end within unincorporated portion of Napa County;
2. Trips that start and end within the Cities of Napa County;
3. Trips between the county and city portions of Napa County;
4. Trips between Napa County locations and the other 8 counties of the Bay Area;
5. Trips that travel through Napa County using Napa County roadways.

A short segment of I-80 (6,278 feet) is located within Napa County. The external-to-external trips on this segment are not included in the table since they have no impact on the balance of the County's road network and traffic conditions on the freeway are a regional matter beyond the County's control.

The model results summarized in **Table 16** suggest that all of the land use alternatives would result in substantially more traffic than existing conditions and would result in somewhat similar amounts of traffic and similar distribution patterns whether or not they incorporate network improvements. For example, Alternative B would generate approximately 8,434 to 8,489 peak hour vehicle trips internal to the County with or without the network improvements included in the Draft Circulation Element. (It should be noted that these values are County-wide and the differences between them is diminutive in that context. Therefore the numbers are basically a comparable number with the improved network.) Both numbers would be substantially higher than the 5,527 estimated under existing conditions.

There would be a substantial increase in both trips between Napa County and other counties, and pass through trips under all alternatives. For example, pass through trips would increase from 5,284 under existing conditions to 14,272 without the improvements identified in the proposed General Plan Update Circulation Element and 15,608 with those improvements.

**Table 16 - Peak Hour Vehicle Trip Patterns Under Each Analysis Scenario - PM Peak Hour**

Alternatives & Network Scenarios	Trips within County portion of Napa	Trips within Cities in Napa	Trips between Napa County and Napa Cities	Trips between All of Napa and Other 8 Counties	Trips passing through Napa (XX)
Existing Conditions	2,746	15,768	5,527	7,289	5,284
Alternative A (2030) without proposed General Plan Circulation Element Improvements	3,940	17,388	7,850	14,493	14,292
Alternative B (2030) without proposed General Plan Circulation Element Improvements	4,186	17,176	8,434	14,633	14,257
Alternative C (2030) without proposed General Plan Circulation Element Improvements	4,950	17,062	9,210	15,430	14,272
Alternative B (2030) with proposed General Plan Circulation Element Improvements	4,187	17,174	8,489	14,525	15,110
Alternative C (2030) with proposed General Plan Circulation Element Improvements	4,976	17,042	9,257	15,348	15,608

(XX) = External to external traffic.

Source: Dowling Associates 2006 from Napa-Solano County Travel Demand Model.

An evaluation of the local versus regional trips, using the existing conditions found that most regional through trips use State Route 12, and a few use State Route 29 from Vallejo and then split east or west on State Route 12. Fewer regional trips go upvalley on State Route 29, and only about 25% of the regional through traffic pass through the City of St. Helena. In contrast, a review of the 2030 model runs shows severe congestion on U.S. 101 in Marin and Sonoma counties. This explains the reason the select link analysis showed the larger amount of regional through traffic through St. Helena in all of the 2030 scenarios analyzed.

**Table 16** also demonstrates that the increased housing assumed in Alternative C would result in more trips in most categories than either Alternatives A or B.

**Vehicle Miles Traveled**

Another variable for comparing each of the alternatives is vehicle miles traveled (VMT) during the PM Peak Hour. VMT is the total number of peak hour trips times the total number of miles traveled between trip origins and destinations. This metric can be useful as a gross comparison of the amount of traffic generated by different alternatives and also takes into account the circuitous routes that drivers can take to avoid congested areas. **Table 17** illustrates the PM Peak Hour VMT. **Table 17** also shows the VMT for all trips that start and end within Napa County and all trips, which either start or end within Napa County for trips to locations outside of the County.

**Table 17 - Local and Regional Vehicle Miles Traveled (VMT) On Napa Roads**

Alternative & Network Scenario	Local VMT	Regional VMT	Total VMT
Existing Conditions	166,094	29,931	196,025
Alternative A (2030) without proposed General Plan Circulation Element Improvements	319,334	161,487	480,821
Alternative B (2030) without proposed General Plan Circulation Element Improvements	323,048	162,315	485,363
Alternative C (2030) without proposed General Plan Circulation Element Improvements	342,591	148,710	491,301
Alternative B (2030) with proposed General Plan Circulation Element Improvements	323,678	181,466	505,144
Alternative C (2030) with proposed General Plan Circulation Element Improvements	342,136	182,925	525,061

Local VMT = All trips that start and end within the County. - Regional VMT = All trips that start or end in County.  
 Source: Dowling Associates 2006 from Napa-Solano County Travel Demand Model

Due to limitations of the model, the VMT results do not include any external-to-external trips, which travel through the County. As noted above, the amount of regional VMT under the future conditions is significantly higher than under existing conditions. In the future conditions, the roadway network throughout the nine Bay Area counties reflects future capacity and planned roadway improvements. Often congestion remains on the facilities outside of Napa County. However, traffic is assigned to the network based upon available capacity. Therefore, due to capacity restraints in the adjacent Counties, more regional traffic is being assigned through Napa County in the model, thus increasing the overall number of vehicle miles traveled.

The VMT under any future scenario will be greater in the future due to the anticipated increase in traffic volumes as the number of people and jobs in the region continues to grow. As illustrated by the model results in **Table 17**, the PM Peak Hour VMT in 2030 would increase by 128% over existing conditions if no substantive policy changes were made to the update of the existing General Plan (Alternative A). In Alternatives B and C, the increases would be incrementally more, and if network improvements were made, the local PM Peak Hour VMT would be similar. One observation can be made by comparing the Regional VMT under Alternatives B and C. Alternative C, which has more housing units and slightly less jobs than Alternative B, has a better "balance" between housing and employment, and therefore Alternative C has similar vehicle miles going into and out of the County, although it has the greatest overall VMT.

**Travel Times Along Selected Routes**

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Travel time is another way to evaluate and understand changes in traffic under various scenarios, and travel times were evaluated for representative routes. The following routes were selected for analysis because they represent the network's most traveled corridors, and also include routes in all directions. **Table 18** shows the total travel time in minutes from the start to the end of each route by direction.

- Imola to I-80 via SR 29 and Jamieson Canyon
- Imola to I-80 via SR 29 and Jamieson Canyon
- SR 29 - St. Helena to Salvador
- SR 29 - St. Helena to Salvador
- SR 12/121 - SR 29 to County line
- SR 12/121 - SR 29 to County line
- Mt. St. Helena - SR 29 -Silverado Trail to County line
- Mt. St. Helena - SR 29 -Silverado Trail to County line
- Petrified Forest - Calistoga (SR 128) to County line
- Petrified Forest - Calistoga (SR 128) to County line
- Mt. George - SR 121 - Napa City to County Line via Wooden Valley
- Mt. George - SR 121 - Napa City to County Line via Wooden Valley

**Table 18 - Travel Times Along Selected Routes**

Segment	Dir.	Existing Traffic on Existing Roads	Alt A on 2030 Roads w/o General Plan Circulation Element Improvements	Alt B on 2030 Roads w/o General Plan Circulation Element Improvements	Alt C on 2030 Roads w/o General Plan Circulation Element Improvements	Alt B on 2030 Roads with General Plan Circulation Element Improvements	Alt C on 2030 Roads with General Plan Circulation Element Improvements
Imola to I-80 via 29 and Jamieson Canyon	EB	14.64	41.74	33.07	30.97	17.52	15.07
Imola to I-80 via 29 and Jamieson Canyon	WB	14.91	69.18	75.55	77.19	43.06	48.24
SR 29 - St. Helena to Salvador	SB	18.61	22.83	21.70	23.22	22.92	23.36
SR 29 - St. Helena to Salvador	NB	18.84	31.87	39.34	27.37	50.53	48.54
SR 12/121 - Hwy 29 to County line	WB	6.73	9.80	17.43	10.25	13.70	13.05
SR 12/121 - Hwy 29 to County line	EB	6.77	6.95	6.83	6.85	6.83	6.82
Mt. St. Helena - SR29 - Silverado Trail to County line	NB	9.14	9.13	9.12	9.11	9.11	9.10
Mt. St. Helena - SR29 - Silverado Trail to County line	SB	9.08	9.08	9.09	9.07	9.09	9.10
Petrified Forest - Calistoga (128) to County line	WB	4.44	4.58	4.54	4.73	4.65	4.66
Petrified Forest - Calistoga (128) to County line	EB	4.46	5.13	6.32	5.50	6.01	7.39
Mt. George - SR 121 - Napa City to County Line via Wooden Valley	SB	25.81	41.86	42.22	44.00	30.12	31.41
Mt. George - SR 121 - Napa City to County Line via Wooden Valley	NB	26.86	72.88	80.45	72.23	44.57	68.07

Source: Dowling Associates 2006

As shown in **Table 18**, travel times would vary depending on the Alternative and the location. With network improvements such as widening of Jamieson Canyon, travel times would improve at most, but not at all locations.

### ***Peak Hour Level of Service***

As explained in the methodology section above, the level of service (LOS) on a given roadway is a convenient measure of its performance, and can be used to characterize impacts under the various alternatives and network scenarios. **Tables 19** and **20** show the volume-to-capacity ratios and resultant LOS values for each of the analysis alternatives considered for this EIR. **Table 19** includes General Plan alternatives A, B and C using the 2030 roadway network excluding proposed General Plan Update Circulation Element roadway improvements. **Table 20** includes General Plan alternatives B and C using the Improved (2030) roadway network (which includes proposed General Plan Update Circulation Element roadway improvements). There are 46 segments shown and for each segment directional values are provided, therefore, 92 LOS results are included.

**Table 19 - Peak Hour - V/C Ratios and LOS - 2030 Network Without GP Improvements**

Segment Number	Direction A-B or B-A	Segment Descriptions			Peak Hour V/C Ratio				Level Of Service			
					Without GP Improvements				Without GP Improvements			
		RoadName	Segment Limit North / East	Segment Limit South / West	Existing PM	2030A PM	2030B PM	2030C PM	Existing PM	2030A PM	2030B PM	2030C PM
1	NB/EB	AMERICAN CANYON ROAD	I-80	Flosden Road	0.80	1.48	1.48	1.46	LOS D	LOS F	LOS F	LOS F
2	SB/WB	AMERICAN CANYON ROAD	I-80	Flosden Road	0.80	1.32	1.30	1.39	LOS D	LOS F	LOS F	LOS F
3	NB/EB	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	0.08	0.35	0.32	0.20	LOS A	LOS C	LOS C	LOS C
4	SB/WB	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	0.08	0.09	0.08	0.09	LOS A	LOS B	LOS A	LOS B
5	NB/EB	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	0.51	0.96	1.01	1.11	LOS C	LOS E	LOS F	LOS F
6	SB/WB	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	0.42	0.64	0.67	0.59	LOS C	LOS D	LOS D	LOS D
7	NB/EB	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	0.35	1.03	0.93	0.86	LOS C	LOS F	LOS D	LOS D
8	SB/WB	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	0.26	0.63	0.63	0.37	LOS C	LOS D	LOS D	LOS C
9	NB/EB	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	0.35	0.96	0.93	1.06	LOS C	LOS E	LOS D	LOS F
10	SB/WB	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	0.29	0.82	0.78	0.79	LOS C	LOS D	LOS D	LOS D
11	NB/EB	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	0.07	0.25	0.27	0.28	LOS A	LOS C	LOS C	LOS C
12	SB/WB	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	0.06	0.25	0.27	0.19	LOS A	LOS C	LOS C	LOS C
13	NB/EB	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	0.91	2.34	2.36	2.64	LOS D	LOS F	LOS F	LOS F
14	SB/WB	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	0.78	1.25	1.26	1.36	LOS D	LOS F	LOS F	LOS F
15	NB/EB	OAK KNOLL AVE	Big Ranch Rd	State Route 29	0.18	0.18	0.18	0.18	LOS C	LOS C	LOS C	LOS C
16	SB/WB	OAK KNOLL AVE	Big Ranch Rd	State Route 29	0.22	0.22	0.22	0.22	LOS C	LOS C	LOS C	LOS C
17	NB/EB	OAKVILLE CROSS RD	Napa River	State Route 29	0.08	0.13	0.11	0.12	LOS A	LOS C	LOS B	LOS C
18	SB/WB	OAKVILLE CROSS RD	Napa River	State Route 29	0.09	0.23	0.20	0.20	LOS B	LOS C	LOS C	LOS C
19	NB/EB	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	0.22	0.28	0.30	0.31	LOS C	LOS C	LOS C	LOS C
20	SB/WB	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	0.11	0.13	0.14	0.13	LOS B	LOS C	LOS C	LOS C
21	NB/EB	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	0.68	1.35	1.36	1.40	LOS C	LOS F	LOS F	LOS F
22	SB/WB	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	0.65	1.34	1.32	1.26	LOS C	LOS F	LOS F	LOS F
23	NB/EB	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	0.04	0.18	0.22	0.23	LOS A	LOS C	LOS C	LOS C
24	SB/WB	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	0.04	0.09	0.10	0.11	LOS A	LOS B	LOS B	LOS B
25	NB/EB	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	0.40	0.96	0.97	1.01	LOS C	LOS E	LOS E	LOS F
26	SB/WB	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	0.61	0.75	0.73	0.86	LOS C	LOS D	LOS C	LOS D
27	NB/EB	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	0.45	0.97	0.94	1.00	LOS C	LOS E	LOS E	LOS F
28	SB/WB	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	0.68	0.77	0.77	0.91	LOS C	LOS D	LOS D	LOS D
29	NB/EB	SILVERADO TRL	Pope St	Zinfandel Ln	0.31	0.86	0.84	0.86	LOS C	LOS D	LOS D	LOS D
30	SB/WB	SILVERADO TRL	Pope St	Zinfandel Ln	0.46	1.02	1.02	1.01	LOS C	LOS F	LOS F	LOS F
31	NB/EB	SILVERADO TRL	Bale Ln	Deer Park Rd	0.19	0.48	0.46	0.55	LOS C	LOS C	LOS C	LOS C
32	SB/WB	SILVERADO TRL	Bale Ln	Deer Park Rd	0.28	0.65	0.67	0.72	LOS C	LOS C	LOS C	LOS C
33	NB/EB	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	0.39	0.95	0.97	1.03	LOS C	LOS E	LOS E	LOS F
34	SB/WB	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	0.25	0.65	0.53	0.58	LOS C	LOS C	LOS C	LOS C
35	NB/EB	SOSCOL AVE	First St	Silverado Trail	0.87	1.03	1.00	0.91	LOS D	LOS F	LOS F	LOS D
36	SB/WB	SOSCOL AVE	First St	Silverado Trail	0.87	0.94	0.98	1.06	LOS D	LOS D	LOS E	LOS F
37	NB/EB	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	0.05	0.66	0.69	0.84	LOS A	LOS C	LOS C	LOS D
38	SB/WB	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	0.05	0.81	0.82	0.78	LOS A	LOS D	LOS D	LOS D
39	NB/EB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	0.79	0.98	0.97	1.02	LOS D	LOS E	LOS E	LOS F
40	SB/WB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	1.47	2.05	2.06	2.06	LOS F	LOS F	LOS F	LOS F
41	NB/EB	STATE ROUTE 12	Lynch Road	Kelly Road	1.17	1.09	1.11	1.08	LOS F	LOS F	LOS F	LOS F
42	SB/WB	STATE ROUTE 12	Lynch Road	Kelly Road	0.75	0.97	0.97	1.03	LOS C	LOS E	LOS E	LOS F
43	NB/EB	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	0.40	1.12	1.08	1.04	LOS C	LOS F	LOS F	LOS F
44	SB/WB	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	0.16	0.82	0.82	0.87	LOS C	LOS D	LOS D	LOS D
45	NB/EB	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	0.10	0.60	0.65	0.57	LOS B	LOS C	LOS C	LOS C
46	SB/WB	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	0.23	0.45	0.49	0.50	LOS C	LOS C	LOS C	LOS C

Table 19 - Continued

Segment Number	Direction A-B or B-A	Segment Descriptions			Peak Hour V/C Ratio				Level Of Service			
		RoadName	Segment Limit North / East	Segment Limit South / West	Existing PM	Without GP Improvements			Existing PM	Without GP Improvements		
						2030A PM	2030B PM	2030C PM		2030A PM	2030B PM	2030C PM
47	NB/EB	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1.13	0.68	0.69	0.72	LOS F	LOS C	LOS C	LOS C
48	SB/WB	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1.13	0.86	0.86	0.85	LOS F	LOS D	LOS D	LOS D
51	NB/EB	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	0.21	1.01	0.98	0.93	LOS C	LOS F	LOS E	LOS E
52	SB/WB	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	0.22	1.35	1.35	1.38	LOS C	LOS F	LOS F	LOS F
53	NB/EB	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	0.59	0.78	0.79	0.85	LOS C	LOS D	LOS D	LOS D
54	SB/WB	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	0.59	0.88	0.86	0.88	LOS C	LOS D	LOS D	LOS D
55	NB/EB	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	0.68	1.28	1.29	1.24	LOS C	LOS F	LOS F	LOS F
56	SB/WB	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	0.68	1.34	1.36	1.37	LOS C	LOS F	LOS F	LOS F
57	NB/EB	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	0.17	0.28	0.31	0.41	LOS C	LOS C	LOS C	LOS C
58	SB/WB	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	0.09	0.38	0.41	0.52	LOS B	LOS C	LOS C	LOS C
59	NB/EB	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	0.12	1.26	1.27	1.22	LOS C	LOS F	LOS F	LOS F
60	SB/WB	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	0.21	1.14	1.17	1.26	LOS C	LOS F	LOS F	LOS F
61	NB/EB	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	0.09	0.85	0.84	0.86	LOS B	LOS D	LOS D	LOS D
62	SB/WB	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	0.09	0.69	0.69	0.65	LOS B	LOS C	LOS C	LOS C
63	NB/EB	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	0.05	0.91	0.91	0.84	LOS A	LOS D	LOS D	LOS D
64	SB/WB	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	0.05	0.90	0.89	0.95	LOS A	LOS D	LOS D	LOS E
65	NB/EB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	0.26	0.26	0.26	0.26	LOS C	LOS C	LOS C	LOS C
66	SB/WB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	0.32	0.35	0.34	0.33	LOS C	LOS C	LOS C	LOS C
67	NB/EB	STATE ROUTE 29	Green Island Rd	American Canyon Rd	1.05	1.71	1.73	1.75	LOS F	LOS F	LOS F	LOS F
68	SB/WB	STATE ROUTE 29	Green Island Rd	American Canyon Rd	1.05	1.74	1.73	1.74	LOS F	LOS F	LOS F	LOS F
69	NB/EB	STATE ROUTE 29	California Dr	Oak Knoll Ave	0.33	0.60	0.59	0.60	LOS C	LOS C	LOS C	LOS C
70	SB/WB	STATE ROUTE 29	California Dr	Oak Knoll Ave	0.40	0.71	0.72	0.73	LOS C	LOS C	LOS C	LOS C
71	NB/EB	STATE ROUTE 29	Oakville Grade	Madison St	1.13	2.32	2.30	2.30	LOS F	LOS F	LOS F	LOS F
72	SB/WB	STATE ROUTE 29	Oakville Grade	Madison St	1.39	2.82	2.82	2.87	LOS F	LOS F	LOS F	LOS F
73	NB/EB	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	0.99	2.07	2.05	1.88	LOS E	LOS F	LOS F	LOS F
74	SB/WB	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	1.55	2.53	2.57	2.61	LOS F	LOS F	LOS F	LOS F
75	NB/EB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1.09	2.44	2.39	2.38	LOS F	LOS F	LOS F	LOS F
76	SB/WB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1.34	2.35	2.33	2.57	LOS F	LOS F	LOS F	LOS F
77	NB/EB	STATE ROUTE 29	Lodi Lane	Deer Park Rd	0.76	1.69	1.69	1.41	LOS D	LOS F	LOS F	LOS F
78	SB/WB	STATE ROUTE 29	Lodi Lane	Deer Park Rd	0.92	1.96	1.92	1.91	LOS D	LOS F	LOS F	LOS F
79	NB/EB	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	0.75	1.28	1.32	1.36	LOS C	LOS F	LOS F	LOS F
80	SB/WB	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	0.75	1.15	1.16	1.16	LOS C	LOS F	LOS F	LOS F
81	NB/EB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	0.35	0.71	0.73	0.78	LOS C	LOS C	LOS C	LOS D
82	SB/WB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	0.35	0.44	0.44	0.44	LOS C	LOS B	LOS B	LOS B
83	NB/EB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	0.51	1.06	1.07	1.11	LOS C	LOS F	LOS F	LOS F
84	SB/WB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	0.51	0.65	0.65	0.62	LOS C	LOS C	LOS C	LOS C
85	NB/EB	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	0.35	0.62	0.64	0.68	LOS C	LOS C	LOS C	LOS C
86	SB/WB	STATE ROUTE 29	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	0.35	0.42	0.46	0.46	LOS C	LOS B	LOS B	LOS B
87	NB/EB	TUBBS LN	Highway 29	Highway 128	0.21	0.93	0.92	0.95	LOS C	LOS E	LOS D	LOS E
88	SB/WB	TUBBS LN	Highway 29	Highway 128	0.26	0.84	0.80	0.75	LOS C	LOS D	LOS D	LOS D
89	NB/EB	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	0.05	0.57	0.57	0.60	LOS A	LOS C	LOS C	LOS C
90	SB/WB	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	0.19	0.28	0.28	0.28	LOS C	LOS C	LOS C	LOS C
91	NB/EB	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	0.17	0.17	0.17	0.17	LOS C	LOS C	LOS C	LOS C
92	SB/WB	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	0.31	0.31	0.31	0.31	LOS C	LOS C	LOS C	LOS C
93	NB/EB	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	0.24	0.35	0.36	0.47	LOS C	LOS C	LOS C	LOS C
94	SB/WB	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	0.14	0.28	0.28	0.34	LOS C	LOS C	LOS C	LOS C

**Table 20 - Peak Hour - V/C Ratio and LOS - Improved Network**

Segment Number	Direction A-B or B-A	Segment Descriptions			Peak Hour V/C Ratio			Level Of Service		
					Existing PM	Improved Network		Existing PM	Improved Network	
						2030B PM	2030C PM		2030B PM	2030C PM
1	NB/EB	AMERICAN CANYON ROAD	I-80	Flosden Road	0.80	1.32	1.32	LOS D	LOS F	LOS F
2	SB/WB	AMERICAN CANYON ROAD	I-80	Flosden Road	0.80	1.20	1.30	LOS D	LOS F	LOS F
3	NB/EB	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	0.08	0.44	0.44	LOS A	LOS C	LOS C
4	SB/WB	CHILES POPE VALLEY RD	Pope Canyon Road	Lower Chiles Valley Road	0.08	0.09	0.09	LOS A	LOS B	LOS B
5	NB/EB	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	0.51	0.91	1.04	LOS C	LOS D	LOS F
6	SB/WB	DEER PARK RD	Sanitarium Rd (North)	Silverado Trail	0.42	0.68	0.69	LOS C	LOS D	LOS D
7	NB/EB	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	0.35	0.98	0.99	LOS C	LOS E	LOS E
8	SB/WB	DEER PARK ROAD	Silverado Trail	St. Helena Highway (SR 29/128)	0.26	0.65	0.60	LOS C	LOS D	LOS D
9	NB/EB	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	0.35	1.01	1.07	LOS C	LOS F	LOS F
10	SB/WB	FLOSDEN ROAD	American Canyon Road	Napa/Solano County Line	0.29	0.77	0.80	LOS C	LOS D	LOS D
11	NB/EB	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	0.07	0.22	0.22	LOS A	LOS C	LOS C
12	SB/WB	HOWELL MOUNTAIN RD	Pope Valley Rd	N White Cottage Rd	0.06	0.29	0.32	LOS A	LOS C	LOS C
13	NB/EB	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	0.91	2.56	2.84	LOS D	LOS F	LOS F
14	SB/WB	NAPA VALLEJO HWY	Kaiser Rd	State Route 29 (SR 29/12)	0.78	1.30	1.33	LOS D	LOS F	LOS F
15	NB/EB	OAK KNOLL AVE	Big Ranch Rd	State Route 29	0.18	0.18	0.18	LOS C	LOS C	LOS C
16	SB/WB	OAK KNOLL AVE	Big Ranch Rd	State Route 29	0.22	0.22	0.22	LOS C	LOS C	LOS C
17	NB/EB	OAKVILLE CROSS RD	Napa River	State Route 29	0.08	0.17	0.19	LOS A	LOS C	LOS C
18	SB/WB	OAKVILLE CROSS RD	Napa River	State Route 29	0.09	0.22	0.21	LOS B	LOS C	LOS C
19	NB/EB	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	0.22	0.28	0.37	LOS C	LOS C	LOS C
20	SB/WB	OLD SONOMA ROAD	Buhman Avenue	Carneros Highway (SR 121/12)	0.11	0.15	0.15	LOS B	LOS C	LOS C
21	NB/EB	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	0.68	1.37	1.42	LOS C	LOS F	LOS F
22	SB/WB	PETRIFIED FOREST ROAD	Foothill Boulevard (SR 128)	Franz Valley School Road	0.65	1.33	1.34	LOS C	LOS F	LOS F
23	NB/EB	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	0.04	0.17	0.19	LOS A	LOS C	LOS C
24	SB/WB	POPE CANYON RD	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	0.04	0.10	0.11	LOS A	LOS B	LOS B
25	NB/EB	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	0.40	0.95	0.99	LOS C	LOS E	LOS E
26	SB/WB	SILVERADO TRL	Oak Knoll Ave	Hardman Ave	0.61	0.80	0.95	LOS C	LOS D	LOS E
27	NB/EB	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	0.45	1.02	1.01	LOS C	LOS F	LOS F
28	SB/WB	SILVERADO TRL	Sage Canyon Rd (SR 128)	Yountville Cross Rd	0.68	0.88	1.03	LOS C	LOS D	LOS F
29	NB/EB	SILVERADO TRL	Pope St	Zinfandel Ln	0.31	0.86	0.86	LOS C	LOS D	LOS D
30	SB/WB	SILVERADO TRL	Pope St	Zinfandel Ln	0.46	1.02	1.01	LOS C	LOS F	LOS F
31	NB/EB	SILVERADO TRL	Bale Ln	Deer Park Rd	0.19	0.54	0.53	LOS C	LOS C	LOS C
32	SB/WB	SILVERADO TRL	Bale Ln	Deer Park Rd	0.28	0.66	0.68	LOS C	LOS C	LOS C
33	NB/EB	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	0.39	0.95	0.99	LOS C	LOS E	LOS E
34	SB/WB	SILVERADO TRL	Calistoga City Limits	Lincoln Ave (SR 29)	0.25	0.66	0.60	LOS C	LOS C	LOS C
35	NB/EB	SOSCOL AVE	First St	Silverado Trail	0.87	1.00	0.94	LOS D	LOS F	LOS D
36	SB/WB	SOSCOL AVE	First St	Silverado Trail	0.87	0.98	1.05	LOS D	LOS E	LOS F
37	NB/EB	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	0.05	0.72	0.87	LOS A	LOS C	LOS D
38	SB/WB	SPRING MOUNTAIN ROAD	St. Helena City Limit	Langtry Road	0.05	0.85	0.87	LOS A	LOS D	LOS D
39	NB/EB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	0.79	1.01	0.96	LOS D	LOS F	LOS E
40	SB/WB	STATE ROUTE 12/121	Cuttings Wharf Road	Stanely Road	1.47	2.12	2.10	LOS F	LOS F	LOS F
41	NB/EB	STATE ROUTE 12	Lynch Road	Kelly Road	1.17	0.98	0.88	LOS F	LOS E	LOS E
42	SB/WB	STATE ROUTE 12	Lynch Road	Kelly Road	0.75	0.86	0.87	LOS C	LOS D	LOS D
43	NB/EB	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	0.40	0.88	0.88	LOS C	LOS D	LOS D
44	SB/WB	STATE ROUTE 121	Wooden Valley Rd	Vichy Ave	0.16	0.41	0.51	LOS C	LOS C	LOS C
45	NB/EB	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	0.10	0.69	0.67	LOS B	LOS C	LOS C
46	SB/WB	STATE ROUTE 121	Circle Oaks Dr	Wooden Valley Rd	0.23	0.29	0.34	LOS C	LOS C	LOS C

Table 20 - Continued

Segment Number	Direction A-B or B-A	Segment Descriptions			Peak Hour V/C Ratio			Level Of Service		
					Existing PM	Improved Network		Existing PM	Improved Network	
		RoadName	Segment Limit North / East	Segment Limit South / West		2030B PM	2030C PM		2030B PM	2030C PM
47	NB/EB	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1.13	0.70	0.72	LOS F	LOS C	LOS C
48	SB/WB	STATE ROUTE 121	Napa/Sonoma County Line	Old Sonoma Rd	1.13	0.89	0.88	LOS F	LOS D	LOS D
51	NB/EB	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	0.21	1.06	1.03	LOS C	LOS F	LOS F
52	SB/WB	STATE ROUTE 128	Napa/Sonoma County Line	Tubbs Lane	0.22	1.35	1.37	LOS C	LOS F	LOS F
53	NB/EB	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	0.59	0.79	0.95	LOS C	LOS D	LOS E
54	SB/WB	STATE ROUTE 128	Tubbs Ln	Petrified Forest Rd	0.59	0.86	0.95	LOS C	LOS D	LOS E
55	NB/EB	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	0.68	1.30	1.35	LOS C	LOS F	LOS F
56	SB/WB	STATE ROUTE 128	Petrified Forest Rd	Lincoln Ave (SR 29)	0.68	1.36	1.38	LOS C	LOS F	LOS F
57	NB/EB	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	0.17	0.26	0.33	LOS C	LOS C	LOS C
58	SB/WB	STATE ROUTE 128	Napa River	St Helena Hwy (SR 29)	0.09	0.31	0.32	LOS B	LOS C	LOS C
59	NB/EB	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	0.12	1.11	1.05	LOS C	LOS F	LOS F
60	SB/WB	STATE ROUTE 128	Chiles-Pope Valley Road	Silverado Trail	0.21	0.92	0.98	LOS C	LOS D	LOS E
61	NB/EB	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	0.09	0.79	0.81	LOS B	LOS D	LOS D
62	SB/WB	STATE ROUTE 128	Monticell Road (SR 121)	Berryessa-Knoxville Road	0.09	0.60	0.52	LOS B	LOS C	LOS C
63	NB/EB	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	0.05	0.77	0.69	LOS A	LOS D	LOS C
64	SB/WB	STATE ROUTE 128	Napa/Yolo County Line	State ROUTE 121	0.05	0.63	0.74	LOS A	LOS C	LOS D
65	NB/EB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	0.26	0.26	0.26	LOS C	LOS C	LOS C
66	SB/WB	STATE ROUTE 29	Napa/Lake County Line	Tubbs Lane	0.32	0.33	0.33	LOS C	LOS C	LOS C
67	NB/EB	STATE ROUTE 29	Green Island Rd	American Canyon Rd	1.05	1.73	1.72	LOS F	LOS F	LOS F
68	SB/WB	STATE ROUTE 29	Green Island Rd	American Canyon Rd	1.05	1.64	1.60	LOS F	LOS F	LOS F
69	NB/EB	STATE ROUTE 29	California Dr	Oak Knoll Ave	0.33	0.65	0.63	LOS C	LOS C	LOS C
70	SB/WB	STATE ROUTE 29	California Dr	Oak Knoll Ave	0.40	0.74	0.75	LOS C	LOS C	LOS C
71	NB/EB	STATE ROUTE 29	Oakville Grade	Madison St	1.13	2.44	2.42	LOS F	LOS F	LOS F
72	SB/WB	STATE ROUTE 29	Oakville Grade	Madison St	1.39	2.88	2.88	LOS F	LOS F	LOS F
73	NB/EB	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	0.99	2.12	2.12	LOS E	LOS F	LOS F
74	SB/WB	STATE ROUTE 29	Rutherford Cross Rd (SR 128)	Oakville Grade	1.55	2.55	2.61	LOS F	LOS F	LOS F
75	NB/EB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1.09	2.48	2.45	LOS F	LOS F	LOS F
76	SB/WB	STATE ROUTE 29	Chaix Ln	Zinfandel Ln	1.34	2.42	2.62	LOS F	LOS F	LOS F
77	NB/EB	STATE ROUTE 29	Lodi Lane	Deer Park Rd	0.76	1.67	1.62	LOS D	LOS F	LOS F
78	SB/WB	STATE ROUTE 29	Lodi Lane	Deer Park Rd	0.92	1.94	1.98	LOS D	LOS F	LOS F
79	NB/EB	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	0.75	1.84	1.94	LOS C	LOS F	LOS F
80	SB/WB	STATE ROUTE 29	Kelly Rd	Jamieson Cyn Rd (SR 12)	0.75	1.45	1.43	LOS C	LOS F	LOS F
81	NB/EB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	0.35	0.94	1.02	LOS C	LOS E	LOS F
82	SB/WB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Kelly Rd	0.35	0.61	0.60	LOS C	LOS C	LOS C
83	NB/EB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Careros Hwy(SR 121/12)	0.51	1.19	1.23	LOS C	LOS F	LOS F
84	SB/WB	STATE ROUTE 29	Napa-Vallejo Hwy (SR 221)	Careros Hwy(SR 121/12)	0.51	0.77	0.76	LOS C	LOS D	LOS D
85	NB/EB	STATE ROUTE 29	Imola Ave (SR 121)	Careros Hwy(SR 121/12)	0.35	0.66	0.68	LOS C	LOS C	LOS C
86	SB/WB	STATE ROUTE 29	Imola Ave (SR 121)	Careros Hwy(SR 121/12)	0.35	0.52	0.55	LOS C	LOS B	LOS B
87	NB/EB	TUBBS LN	Highway 29	Highway 128	0.21	0.92	0.95	LOS C	LOS D	LOS E
88	SB/WB	TUBBS LN	Highway 29	Highway 128	0.26	0.87	0.80	LOS C	LOS D	LOS D
89	NB/EB	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	0.05	0.50	0.53	LOS A	LOS C	LOS C
90	SB/WB	WOODEN VALLEY RD	Monticello Rd (SR 121)	Napa/Solano Co Line	0.19	0.19	0.19	LOS C	LOS C	LOS C
91	NB/EB	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	0.17	0.24	0.17	LOS C	LOS C	LOS C
92	SB/WB	YOUNTVILLE CROSS RD	Silverado Trail	Yountville Town Limits	0.31	0.31	0.32	LOS C	LOS C	LOS C
93	NB/EB	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	0.24	0.42	0.48	LOS C	LOS C	LOS C
94	SB/WB	ZINFANDEL LN	Silverado Trail	St Helena Hwy (SR 29&128)	0.14	0.31	0.34	LOS C	LOS C	LOS C

## **Observations of Results**

- As shown in **Table 19**, for the 2030 network without proposed General Plan Update Circulation Element Improvements, there are 25 segments that would experience significant congestion impacts under all alternatives when compared to existing conditions, and six that would experience significant congestion impacts under some, but not all, alternatives. In most cases, the impacts would occur whether or not General Plan policies are update. There are also 10 instances where existing road segments operate at LOS E or F under existing conditions and a significant impact would occur in the future due to increases in the Volume to Capacity (v/c) ratio of greater than 5% (e.g., segments of SR 12, 121, and 29). Traffic is projected to improve in the future at only one location: SR 121 at the Sonoma County line due to ongoing improvements in that area.
- The vast majority of the significant impacts would occur regardless of whether or not the General Plan is updated, since they result from projected traffic from the cities in the County as well as regional traffic volume increases.
- Some of the significant congestion impacts that are projected to occur could be resolved by constructing network improvements. For example, on State Route 128 between the Napa/Yolo County Line and State Route 121, the congestion projected under Alternative A and Alternatives B and C without network improvements would be improved under Alternatives B and C if network improvements are implemented. This can be attributed to improved capacity. In other locations, the network improvements would have no impact (e.g. on American Canyon Road between I-80 and Flosden Road), or would indirectly increase congestion (e.g. segments of Silverado Trail).
- In addition to traffic impacts in the unincorporated portion of the County, the projected increases in traffic by 2030 would also be significant on roadways within and adjacent to the cities of American Canyon, St. Helena, Calistoga, Napa and the Town of Yountville as well as Yolo, Solano, Lake and Sonoma counties (under both roadway improvement assumptions).
- For the scenarios where the 2030 network without the General Plan Circulation Element improvements is used, Alternatives A, B and C result in nearly identical impacts. A few locations occur where one alternative is better than the other. These include:
  - Deer Park Road - Sanitarium Road to Silverado Trail where Alternative A is better than B and C. (Alt A, B and C = LOS E, F and F)
  - Deer Park Road - Silverado Trail to St. Helena Highway where Alternative B and C are better than A. (Alt A, B and C = LOS F, D and D)
  - Flosden Road - American Canyon Road to Napa/Solano County Line where Alternative B is better than A and C. (Alt A, B and C = LOS E, D and F)

- Silverado Trail - Oak Knoll Avenue to Hardman Avenue where Alternatives A and B are better than C. (Alt A, B and C = LOS E, E and F)
- Silverado Trail - Sage Canyon Road to Yountville Cross Road where Alternatives A and B are better than C. (Alt A, B and C = LOS E, F and F)
- Silverado Trail - Calistoga City Limits to Lincoln Avenue where Alternatives A and B are better than C. (Alt A, B and C = LOS E, E and F)
- State Route 128 - Napa/Yolo County Line to SR 121 where Alternatives A and B are better than C (Alt A, B and C = LOS D, D, and E)
- Tubbs Lane - State Route 29 to State Route 128 where Alternative B is better than A and C. (Alt A, B and C = LOS E, D and E)
- For the scenarios where the improved (2030) network is used, Alternatives B and C results are also nearly identical impacts. A few locations occur where one alternative is better than the other. These include:
  - Deer Park Road - Sanitarium Road to Silverado Trail where Alternative B is better than C. (Alt B and C = LOS D and F)
  - SR 128 - Tubbs Lane to Petrified Forest Road where Alternative B is better than C. (Alt B and C = LOS D and E)
  - Tubbs Lane - State Route 29 to State Route 128 where Alternative B is better than C. (Alt B and C = LOS D and E)
- **SR 29 within American Canyon** - Within American Canyon all of the alternatives result in similar impacts. The traffic along the SR 29 corridor south of SR 12 is composed of local traffic from American Canyon and regional traffic between the Vallejo area to the south including other regional facilities such as SR 37 and Interstate 80 and the northerly portions of Napa County. Further, significant development has occurred along SR 29 within American Canyon that has direct access to this corridor. These conditions reduce the capacity of SR 29 through American Canyon and have resulted in the installation of traffic signals to allow side street traffic to enter and exit the corridor.
- **Traffic originating from Napa Pipe and Boca/Pacific Coast Areas** - Development on the Napa Pipe and Boca sites under Alternatives B and C south of the City of Napa would result in traffic changes that would have the greatest potential to impact the Napa Valley Highway, since this is the regional corridor closest to the sites. As shown in **Tables 19 and 20**, traffic congestion along the segment of the Napa Valley Highway between Kaiser Road and SR 29 is expected to be significant in the future under all alternatives - even Alternative A, which proposes continued industrial use of the Napa Pipe and Boca/Pacific Coast sites. Significant congestion would also occur whether or not the

network improvements analyzed for Alternatives B and C were implemented. Localized impacts on Kaiser Road, Napa Valley Corporate Drive and Syar Industrial Way may also be significant, however a comprehensive assessment of impacts on secondary streets serving these sites cannot be accomplished without further data, specific project proposals, and site-specific analysis.

- **Traffic originating from Angwin** - Increased development in the Angwin area would result in traffic changes that would have the greatest potential to impact Howell Mountain Road, Deer Park Road, and Silverado Trail, since these are the regional corridors closest to the community. As shown in **Tables 19 and 20**, traffic congestion along Howell Mountain Road is expected to increase under all alternatives, but would not reach LOS E or F. However Deer Park Road would experience significant congestion (LOS E or F) in one direction under all but one alternative, and Silverado Trail would experience congestion along some segments in all alternatives. Local segments of Howell Mountain Road, White Cottage Road and other roadways in the Angwin area may also experience increases in traffic, however a comprehensive assessment of impacts on secondary streets serving the area cannot be accomplished without further data, a specific project proposal, and site-specific analysis.
- Some roadway segments operate at a better LOS under the without the certain proposed General Plan Update Circulation Element roadway improvements than the with the certain proposed General Plan Update Circulation Element roadway improvements. This condition is the result of the dynamic nature of the travel demand project. When State Route 12 (Jamieson Canyon Road) is widened from 2 to 4 lanes, the model assigns more traffic to this corridor. At the same time, parallel corridors such as American Canyon Road, Wooden Valley Road and Sage Canyon Road experience reductions in traffic.

### ***Weekend Traffic***

A comparison of the amount of weekend versus weekday traffic for selected segments shown in **Figure 2** was evaluated for the PM peak hours. It was found that six out of the 34 segments for which data was provided had higher weekend than weekday traffic. For those segments the 2030 forecasted traffic was factored using the existing ratio of weekend to weekday traffic to estimate the future weekend traffic on these roadways. **Table 21** shows the impacts for the seven segments where either the LOS worsens on the weekend or the change in v/c ratio is greater than five (5) percent.

**Table 21 - Weekend Traffic Impacts - Selected Roadway Segments**  
 (2030 NETWORK WITH AND WITHOUT GP IMPROVEMENTS)

Segment	Dir	Without GP Improvements - Changes in LOS and V/C						With GP Improvements - Changes in LOS and V/C			
		2030 A - LOS	2030 B - LOS	2030 C - LOS	2030 A - V/C	2030 B - V/C	2030 C - V/C	2030 B - LOS	2030 C - LOS	2030 B - V/C	2030 C - V/C
Pope Canyon Road (Berryessa-Knoxville Road to Chiles Pope Valley Road)	EB	C to F	C to F	C to F	1.37	1.74	1.75	C to F	C to F	1.36	1.48
Silverado Trail (Oak Knoll Avenue to Harden Road)	NB	E to F	E to F	F to F	0.10	0.09	0.10	E to F	E to F	0.10	0.09
SR 12 (Lynch Road to Kelly Road)	WB	E to F	E to F	F to F	0.52	0.52	0.55	D to F	D to F	0.47	0.48
SR 29 (Oakville Grade to Madison Street)	NB	F to F	F to F	F to F	0.62	0.63	0.65	F to F	F to F	2.36	2.33
SR 29 (Chaix Lane to Zinfandel Lane)	NB	F to F	F to F	F to F	0.36	0.36	0.36	F to F	F to F	0.37	0.37
SR 29 (Chaix Lane to Zinfandel Lane)	SB	F to F	F to F	F to F	0.26	0.25	0.29	F to F	F to F	0.27	0.29

Source: Dowling Associates 2006

The two locations where the weekday LOS goes from an acceptable to unacceptable level are:

1. Pope Canyon Road from Berryessa-Knoxville Road to Chiles Pope Valley Road; and
2. SR 12 from Lynch Road to Kelly Road.

For all of the other segments, the LOS is already E or F, but the change in v/c ratio is greater than five (5) percent.

### ***Summary of Model Results by Alternative***

#### **Alternative A**

As shown in **Table 19**, Alternative A and associated growth of the incorporated cities and regional traffic growth would result in traffic increases in peak hour v/c ratio and LOS, with many road segments going from acceptable LOS (A, B or C) to failing (E or F). In addition to traffic impacts to the unincorporated portion of the County, this increase in traffic would also be significant on roadways within and adjacent to the cities of American Canyon, St. Helena, Calistoga, Napa and the Town of Yountville as well as Yolo, Solano, Lake and Sonoma counties. This alternative would significantly impact 39 roadway segments. Emergency response times and emergency access could also be affected, due to increase in road congestion from raised LOS levels. Pre-existing fire regulations currently address this particular impact as described in Section 4.9 (Human Health/Risk of Upset) and 4.13 (Public Services and Utilities) in the EIR. In addition, State Public Resource Code (PRC) 4290 requires local jurisdictions to implement fire safe standards for roads, bridges, driveways, and entrances that would disallow construction of residential housing on dead-end streets. While mitigation measures are proposed below to reduce this impact, the impacts remain **significant and unavoidable**.

#### **Alternative B**

**Table 19** and **Table 20**; identify traffic impacts associated with Alternative B with and without certain proposed General Plan Update Circulation Element roadway improvements. Similar to Alternative A, the anticipated traffic increase would raise LOS levels from acceptable levels to failing (E or F) on county roadways over existing conditions. **Table 19** and **Table 20** identify that Alternative B (along with associated growth of the incorporated cities and regional traffic growth) would significantly impact 37 roadway segments without the proposed General Plan Update Circulation Element roadway improvements and 36 roadway segments with these improvements. In addition to traffic impacts to the unincorporated portion of the County, this increase in traffic LOS levels would also be significant on roadways within and adjacent to the cities of American Canyon, St. Helena, Calistoga, Napa and the Town of Yountville as well as Yolo, Solano, Lake and Sonoma counties (under both roadway improvement assumptions). Emergency response times and emergency access could also be affected, due to increase in road congestion from raised LOS levels. Pre-existing fire regulations currently address this particular impact as described in Section 4.9 (Human Health/Risk of Upset) and 4.13 (Public Services and Utilities) in the EIR. In addition, State Public Resource Code (PRC) 4290 requires local jurisdictions to implement fire safe standards for roads, bridges, driveways, and entrances that would

disallow construction of residential housing on dead-end streets. While mitigation measures are proposed below to reduce this impact, the impacts remain **significant and unavoidable**.

### Alternative C

**Table 19** and **Table 20** identify traffic LOS impacts associated with Alternative C with and without proposed General Plan Update Circulation Element roadway improvement. Similar to Alternative A, the anticipated traffic LOS increases would go from acceptable (A, B, C) to unacceptable (E and F) on County roadways over existing conditions. **Table 19** and **Table 20** identifies that Alternative C (along with associated growth of the incorporated cities and regional traffic growth) would significantly impact 39 roadway segments without the proposed General Plan Update Circulation Element roadway improvements and 42 roadway segments with these improvements (which could be the highest of any of the alternatives evaluated). In addition to traffic LOS impacts to the unincorporated portion of the County, this increase in traffic LOS levels would also be significant on roadways within and adjacent to the cities of American Canyon, St. Helena, Calistoga, Napa and the Town of Yountville as well as Yolo, Solano, Lake and Sonoma counties (under both roadway improvement assumptions). Emergency response times and emergency access could also be affected, due to increase in road congestion from raised LOS levels. Pre-existing fire regulations currently address this particular impact as described in Section 4.9 (Human Health/Risk of Upset) and 4.13 (Public Services and Utilities) in the EIR. In addition, State Public Resource Code (PRC) 4290 requires local jurisdictions to implement fire safe standards for roads, bridges, driveways, and entrances that would disallow construction of residential housing on dead-end streets. While mitigation measures are proposed below to reduce this impact, the impacts remain **significant and unavoidable**.

### Mitigation Measure

The following mitigation measures would apply to all the alternatives.

- MM 4.4.1a** The County shall provide a policy in the General Plan establishing a standard for adequate level of service on roads and intersections to be applied to all discretionary projects reviewed by the County
- MM 4.4.1b** The County shall include a policy in the General Plan that requires new developments with the potential to significantly affect traffic operations to prepare a traffic analysis prior to discretionary approval of the project.
- MM 4.4.1c** The County shall include a policy in the General Plan that requires new development projects to mitigate their impacts and to pay their fair share of countywide traffic improvements they contribute the need for, including improvements identified in DEIR Table 4.4-20. A countywide traffic impact fee shall be developed in cooperation with NCTPA.
- MM 4.4.1d** The County shall include a policy in the General Plan that requires new residential and commercial development to be concentrated within already developed areas and areas

planned for development where sufficient densities can support transit services and development of pedestrian and bicycle facilities.

**MM 4.4.1e** The County shall include a policy to the General Plan that supports programs to reduce single-occupant vehicle use and encourage carpooling, transit use, and alternative modes such as bicycling, walking, and telecommuting. In addition, the County shall seek to maintain total trips in the County using travel modes other than private vehicles (transit, walking, bicycling, public transit, etc.) at 2006 levels.

**MM 4.4.1f** The County shall provide a policy in the General Plan that requires the County of Napa to demonstrate leadership in implementation of programs encouraging the use of alternative modes of transportation by its employees, as well as the use of alternative fuels. Example programs shall include:

- Preferential carpool parking and other ridesharing incentives,
- Flexible working hours,
- A purchasing program that favors hybrid, electric or other non-gasoline vehicles,
- Secure bicycle parking,
- Transit incentives

**MM 4.4.1g** The County shall include a policy in the General Plan that requires all developments along fixed transit routes to provide amenities designed to encourage carpooling, bicycle, and transit use in coordination with NCTPA. Typical features would include bus turnouts/access, bicycle lockers, and carpool/vanpool parking.

**MM 4.4.1h** The County shall include a policy in the General Plan that states where sufficient right of way is available, bicycle lanes shall be added to county roadways when repaving or upgrading of the roadway occurs as feasible.

**MM 4.4.1i** The County shall provide a policy in the General Plan that requires that abandoned rail right-of-way shall be used for alternative uses such as public transit routes, bicycle paths, or pedestrian/hiking routes when feasible.

**MM 4.4.1j** The County shall provide a policy in the General Plan that requires that pedestrian and bicycle access shall be integrated into all parking lots and considered in the evaluation of development proposals and public projects.

**Table 22** details the necessary roadway improvements that when applied to the 2030 network would mitigate the significant traffic operation impacts at the locations specified to LOS D or better conditions. **Table 23** details those roadway improvements, which are included in the General Plan Circulation Element.

**TABLE 22 - ROADWAY IMPROVEMENTS TO IMPROVED 2030 NETWORK (NOT INCLUDED IN GENERAL PLAN)**

Roadway Segment	Improvements
American Canyon Road - I-80 to Flosden Road	Widen this roadway from a two (2) lane rural highway to a four (4)-lane rural highway.
Deer Park Road - Sanitarium Road to Silverado Trail	Widen this roadway from a two (2) lane collector to a four (4) lane collector.
Deer Park Road - Silverado Trail to SR 29/128	Widen this roadway from a two (2)-lane collector to a four (4) lane collector.
Flosden Road - American Canyon Road to Solano/Napa County Line	Widen this roadway from a four (4) lane urban arterial to a six (6) lane urban arterial.
Napa Valley Highway - Kaiser Road to SR 29	Widen this roadway from a four (4) lane urban arterial to a six (6) lane urban arterial.
Petrified Forest Road - Foothill Boulevard to Franz Valley School Road	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
Silverado Trail - Oak Knoll Avenue to Hardman Avenue	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
Silverado Trail - Sage Canyon Road to Yountville Cross Road	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
Silverado Trail - Pope Street to Zinfandel Lane	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
Silverado Trail - Calistoga City Limits to Lincoln Avenue	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
Soscol Avenue - First Street to Silverado Trail	Widen this roadway from a four (4) lane urban arterial to a six (6) lane urban arterial.
SR 12 - Cuttings Wharf Road to Stanly Lane	Widen this roadway from a two (2) lane Rural Highway to a four (4) lane Rural Highway.
SR 12 - Lynch Road to Kelly Road	Widen this roadway from a four (4) lane Rural Highway to a six (6) lane Rural Highway.
SR 128 - Napa/Sonoma County Line to Tubbs Lane	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
SR 128 - Tubbs Lane to Petrified Forest Road	Widen this roadway from a two (2) lane rural arterial to a four (4) land rural arterial.
SR 128 - Petrified Forest Road to Lincoln Avenue	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
SR 128 - Chiles-Pope Valley Road to Silverado Trail	Widen this roadway from a two (2) lane rural arterial to a four (4) lane rural arterial.
SR 29 - Green Island Road to American Canyon Road	Widen this roadway from a four (4) lane rural highway to a six (6) lane rural highway.
SR 29 - Oakville Grade to Madison Street	Widen this roadway from a two (2) lane rural highway to a four (4) lane rural highway.
SR 29 - Rutherford Cross Road to Oakville Grade	Widen this roadway from a four (4) lane rural arterial to a six (6) lane rural arterial.
SR 29 - Chaix Lane to Zinfandel Lane	Widen this roadway from a four (4) lane rural arterial to a six (6) lane rural arterial.
SR 29 - Lodi Lane to Deer Creek Road	Widen this roadway from a four (4) lane rural arterial to a six (6) lane rural arterial.
SR 29 - Kelly Road to Jamieson Canyon Road (SR 12)	Widen this roadway from a four (4) lane rural arterial to a six (6) lane rural arterial.
SR 29 - Napa Valley Highway to Kelly Road	Widen this roadway from a four (4) lane rural highway to a six (6) lane rural highway.
SR 29 - Napa Valley Highway to	Widen this roadway from a six (6) lane freeway

Roadway Segment	Improvements
Carneros Highway	to an eight (8) lane freeway.
Tubbs Lane - SR 29 to SR 128	Widen this roadway from a two (2) lane rural highway to a four (4) lane rural highway.

Source: Dowling Associates 2006

**TABLE 23 - SPECIFIC ROADWAY IMPROVEMENTS UNDER THE PROPOSED GENERAL PLAN UPDATE CIRCULATION ELEMENT**

Roadway Segment	Summary of Improvements
SR 29 - Green Island Road to American Canyon Road	Widen this roadway.
SR 29 - SR 221 and Green Island Road	Widen this roadway
SR 12 - Airport Boulevard and SR 29	Construct an interchange
SR 12 (Jamieson Canyon)	Widen this roadway by adding one travel lane in each direction, provision of a safety median barrier and room for a class II bike lane
SR 221/SR 12/SR 29	Improve intersection
Flosden Road/Newell Road - American Canyon Road to Green Island Road	Extend this roadway
Devlin Road - Soscol Ferry Road and American Canyon	Complete this road
SR 29 and Rutherford Crossroad Intersection and Yountville Crossroad and Silverado Trail Intersection	Intersection improvements to improve safety and traffic flow.
SR 29 - between Oakville and St. Helena	Safety and flow improvements.
Countywide	Install safety improvements on rural roads and highways throughout County.

Source: Dowling Associates 2006, Napa County

While the above roadway improvements in **Table 22** would reduce the peak hour and daily levels of service to acceptable levels, roadway improvements beyond those listed in Policy CIR-2.3 are not considered feasible given the environmental effects associated with the roadway widening and that these improvements would be inconsistent with the vision set forth in the General Plan Update. The following statement from the Summary and Vision section of the proposed General Plan Update summarizes the County's provisions: "This General Plan will preserve and improve the quality of life and the rural character of the County by proactively addressing land use, traffic, and safety concerns in addition to sustaining the agricultural industry." Widening of these roadways would result in more severe environmental impacts (beyond what is addressed in this DEIR) associated with visual resources, water quality, noise, air quality, and growth inducement.

Additionally, roadway widening of several roadway segments such as SR 128 and Tubbs Lane would be infeasible due to lack of right-of-way and proximity to existing commercial and/or residential developments. For roads where right-of-way exists for widening, impacts would include increased traffic noise to existing commercial and/or residential uses.

Although mitigation measures **MM 4.4.1a** through **MM 4.4.1j** may reduce this impact, some VMT and LOS increases would still remain, therefore, this is considered a **significant** and **unavoidable** impact for Alternatives A, B and C.

### ***Roadway Safety and Emergency Access***

**Impact 4.4.2 Implementation of the proposed General Plan Update could substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses as well as potentially adversely affect emergency access needs. (Significant and Mitigable - All Alternatives)**

Implementation of any of the proposed General Plan Update Alternatives (A, B, and C) would increase the amount of vehicle traffic and the number of potential safety and emergency access conflicts. The reader is referred to Section 4.9 (Human Health/Risk of Upset) and Section 4.13 (Public Services and Utilities) for additional discussion on emergency access.

Impacts specific to each alternative are addressed below.

#### **Alternative A**

Alternative A would result in the least vehicle miles traveled (see **Table 17**) of the three alternatives, but total VMT would be substantially greater than under existing conditions. This alternative would not include the proposed General Plan Update roadway improvements. New development would be required to meet current County roadway standards; however, increased traffic could constrain emergency access. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative B**

Alternative B would contribute to a substantial increase in County-wide vehicle miles traveled (see **Table 17**) when compared to existing conditions. However, this alternative does include the proposed General Plan Update roadway improvements that would provide additional access routes in the southern portion of the County. The contribution of traffic could result in emergency access constraints. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative C**

Alternative C would result in similar impacts as Alternative B. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Mitigation Measure**

Implementation of mitigation measures **MM 4.9.4** and **MM 4.13.4a** and **b** as well as compliance with County Code (Chapters 15.32 and 18.84) and Public Resources Code Sections 4290 and 4291 (e.g., provisions associated with development standards and restrictions regarding structure design, fuel modification zone design, adequacy of emergency

access) would reduce this impact to **less than significant** for all alternatives.

### ***Conflicts with Existing Alternative Transportation Policies and Programs***

**Impact 4.4.3 Implementation of the proposed General Plan Update could conflict with NCTPA planning efforts associated with transit provision and pedestrian and bicycle facilities. (Significant and Mitigable - All Alternatives)**

The primary mode of travel during the commute periods is with single-occupant vehicles. A reasonable number of trips are also made in carpools. However, public transit amounts to only 1-2% of all travel. This is significantly lower than the Bay Area public transit usage of 13%. Bicycling and walking also present only a small portion of the travel during the commute. It is therefore unlikely that a doubling of travel via these alternative modes would improve peak hour levels of service sufficiently to result in a major improvement in roadway LOS.

As noted above, NCTPA has drafted plans to improve transit service, which is anticipated to grow by 20% by the year 2013. Subsequent development under the proposed General Plan Update could increase the demand for transit services that require the need for the construction of facilities to accommodate transit. NCTPA also has an adopted bicycle plan.

Impacts specific to each alternative are addressed below.

#### **Alternative A**

As described under Section 3.0 (Project Description), this alternative would result in the least amount of development. Most of the development under Alternative A would occur in existing rural and urban areas. However, this increase in population would place further demand on transit services and the need for additional transit facilities as well as pedestrian and bicycle facilities. This impact would be considered **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative B**

Alternative B would include development and densification of residential uses at Pacific Coast/Boca, Napa Pipe and County-owned sites in the City of Napa, in addition to land use patterns similar to Alternative A. This increase of development and density would place further demand on transit services and the need for additional transit facilities as well as pedestrian and bicycle facilities. This impact would be considered **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative C**

Alternative C would result in similar impacts as Alternative B. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Mitigation Measures**

Implementation of the mitigation measures MM 4.4.1d through g identified in Impact 4.4.1 above would support the provision of transit, pedestrian, and bicycle facilities as well as incentives for transit use consistent with NCTPA policies. Thus, implementation of these mitigation measures would reduce this impact to **less than significant** for all alternatives.

### ***Create Additional Demand for Parking Facilities***

**Impact 4.4.5 Land uses and development under the proposed General Plan Update could create additional demand for parking facilities and therefore inadequate parking capacity if these facilities are not constructed. (Significant and Mitigable - All Alternatives)**

In addition to increases in traffic volumes along existing roadways, subsequent development under the proposed General Plan Update would result in the need for new and/or modified parking facilities. In addition, construction of roadway improvements could result in the loss of parking at existing developed sites.

Impacts specific to each alternative are addressed below.

#### **Alternative A**

As identified in Section 3.0 (Project Description) of the EIR, this alternative would retain the existing land use designations under the current General Plan Land Use Map as well as the policy guidance set forth under the existing General Plan. Between the year 2005 and 2030, it is projected that there would be an additional 2,235 dwelling units and 16,014,000 square feet of non-residential uses in the unincorporated portion of the County. This increase in development would require new parking facilities and inadequate capacity if these facilities are not constructed. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative B**

This alternative would generally retain the existing land use designations under the current General Plan Land Use Map similar to Alternative A. However, this alternative would provide for additional growth within currently General Plan designated areas for rural and urban development (such as within the unincorporated community of Angwin) as well as re-use of the Pacific Coast/Boca site and Napa Pipe site and County-owned sites within the City of Napa. Between the year 2005 and 2030, it is projected that there would be an additional 3,885 dwelling units and 14,636,000 square feet of non-residential uses in the unincorporated portion of the County. This alternative also includes roadway improvements (proposed under the General Plan Update Circulation Element) that may result in the loss of existing parking at sites in the southern portion of the County. The resulting parking impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

#### **Alternative C**

Alternative C would result in similar impacts as Alternative B. This impact is **significant and mitigable** with the implementation of the mitigation measures identified below.

### **Mitigation Measure**

The following mitigation measures would apply to all three alternatives.

**MM 4.4.5a** The County shall provide a policy in the General Plan Update that new development projects shall provide adequate parking to meet their anticipated parking demand and shall not provide excess parking that could stimulate unnecessary vehicle trips or commercial activity exceeding the site's capacity. The required parking supply shall be based on compliance with County Zoning Code parking requirements.

**MM 4.4.5b** The County shall provide a policy in the General Plan Update that requires roadway improvement projects expected to result in the loss of parking for an existing use to provide replacement parking if required to meet County Zoning Code parking requirements.

Implementation of the above mitigation measures would ensure that additional parking demand from new development would be met. Thus, implementation of these mitigation measures would reduce this impact to **less than significant** for all alternatives.

## References

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1. 2000 Highway Capacity Manual, Transportation Research Board.
2. Trip Generation, 7th Edition, Institute of Transportation Engineers.
3. County of Napa, 2003, Draft Napa County Airport Master Plan. August 2003.
4. Florida Department of Transportation, web-site, roadway peak hour service volumes and associates levels of service.
5. Napa County, BDR 2005. Napa County Baseline Data Report-Version I, November 30, 2005.

## Appendices

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Attached to this report are two appendices. These are:

1. Technical Memorandum - PMC - Model Adjustments (insert as pdf)
2. Traffic Analysis for Alternative E (insert as pdf)

# **The Napa County General Plan Update EIR**

## **Technical Memorandum for Traffic and Circulation Supporting the Findings and Recommendations for Alternative E**

**Prepared for:  
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## Overview

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Dowling Associates, Inc. was retained, as part of the Napa County General Plan Update EIR team, to conduct traffic forecasts, assess impacts and propose mitigation measures for the Napa County General Plan Update EIR process. The primary alternatives established for the EIR are termed Alternative A (Existing General Plan) and Alternatives B and C. Reference should be made to the EIR Traffic and Circulation Section for information on these alternatives. The County requested that another alternative be evaluated. That alternative is termed "Alternative E" and includes a new growth scenario for the County plus additional roadway policy changes. This memorandum provides the results of the technical analysis of Alternative E. When appropriate, the information is shown together with the existing General Plan - Alternative A.

## Methodology

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This section describes adjustments made to the traffic models initial land use data in order to evaluate the traffic impacts for Alternative E under year 2030 conditions. As with the other alternatives evaluated in the EIR, adjustments to the original Solano/Napa County travel demand model land use inputs was needed to reflect Alternative E.

### ***Adjustments Made to the Model for the EIR***

The County retained Keyser Marston Associates (KMA) to develop growth projections (jobs, nonresidential uses, dwelling units and population) for the Napa County General Plan Alternatives from year 2005 to year 2030. These projections were used to adjust traffic model traffic analysis zone data for specific geographic areas of the County for Alternative E.

These alternatives were specifically analyzed because they encompassed the range of growth identified in all of the Napa County General Plan Update Alternatives. No other land use adjustments were made to the model. Specific adjustments of individual traffic analysis zones (TAZs) were made to reflect the changes in land use for each alternative. Referenced in the Technical Memorandum supporting the General Plan Traffic Analysis is another memorandum developed by PMC that details the various changes made to the travel demand model inputs. The following tables summary the changes for each alternative. **Tables 1 and 2** summarize the changes in residential units and jobs for each alternative.



**Table 1 - Dwelling Unit Assumptions for General Plan Alternative E**

Area	ALT E
Angwin TAZ # 191	1000 SF DU
Other Areas	TAZ # 147, 154, 161, 170 = 158 SF DU/each
	TAZ #'s 171, 181, 196, 197 = 159 SF DU/each
	Total = 1,268
Other Ag Areas	TAZ # 123, 128, 133, 134, 137, 140-142 145, 146, 148, 150-157, 160-174, 178- 180, 182, 183, 189-191 = 12 SF DU/each TAZ # 193-197= 13 SF DU/each
	Total = 567 SF DU
	TAZ # 133, 137, 140-142, 145-148, 153, 154, 160, 162, 164, 166, 167, 169, 172, 174, 178-183 189, 190, 193-195 Total = 2,000 SF DU
Napa Pipe	
Pacific Coast Boca	TAZ # 145 = 1,000 MF DU
County Sites in Cities	TAZ # 83, 93, 97= 700 MF DU
Total	6,535 DU

**Table 2 - Employment (Jobs) Adjustments for General Plan Alternative E**

KMA Employment Alternatives	ALT E
Napa Pipe TAZ # 118	SEREMP + 1,563 jobs + 35 Expo Center jobs + 600 Conference Center Total= 2,198
Pacific Coast Boca TAZ # 145	SEREMP + 98 jobs RETEMP + 286 jobs
Hess Vineyards TAZ # 133	MFGEMP + 451 jobs OTHEMP + 710 jobs SEREMP + 812 jobs
Hess Environs/ Industrial Zoning TAZ # 133	MFGEMP + 294 jobs OTHEMP + 463 jobs SEREMP + 530 jobs
Airport Industrial Areas A.I.A. TAZ # 135, 136, 138, 139	MFGEMP + 1,568 jobs OTHEMP + 2,470 jobs SEREMP + 2,822 jobs
Wineries TAZ # 123, 133, 137, 140, 142 146-157, 160, 162-169, 172-175, 178-180, 189-191, 193-196, 198	AGREMP + 1,125 jobs
Vineyards TAZ # 123, 133, 137, 140, 142 146-157, 160, 162-169, 172-175, 178-180, 189-191, 193-196, 198	AGREMP + 750 jobs

***Trip Generation Associated With Alternative E***

The trip generation inputs for the model were converted into trip productions and attractions for subsequent processing. **Table 3** includes only the land use associated with the County portion of the Napa County. **Table 4** includes all of the land use assumptions for the entire county. Within the unincorporated portions of the County, land use Alternative C generates the highest number of housing units while

alternative E provides the highest growth in employment. Similar growth occurs countywide as shown in **Table 4**.

**Table 3 - Land Use Assumptions - County Portion of Napa County**

Alternative	Total Housing Units	Total Employment
Existing Condition	9,260	27,186
Alternative A	14,611	51,461
Alternative E	17,960	54,914

**Table 4 - Land Use Assumptions - Entire Napa County**

Alternative	Total Housing Units	Total Employment
Existing Condition	46,285	66,469
Alternative A	64,498	104,197
Alternative E	68,339	107,688

The trip generation inputs for the model (as noted above) based upon the above land use data are converted into trip productions and attractions for subsequent processing. This section provides the estimated trip generation for each of the alternatives based upon the standards used by the Institute of Transportation Engineers. **Table 5** details the residential and non-residential trip generation for each of the project alternatives. It should be noted that Alternative A is not the same as the existing model/no project alternative. **Table 5** shows that Alternative E generates higher traffic levels than the existing General Plan (Alternative A).

**Table 5 - Standard Trip Generation - General Plan Alternatives**

Trips	Alternative A	Alternative E
Daily Trips	56,923	107,058
AM Peak Hour	7,073	11,403
PM Peak Hour	7,624	13,383

***Trip Distribution Patterns***

Trip distribution patterns created under each alternative are shown in **Table 6**. The trip patterns are divided into five groupings. These include: 1) trips that start and end within unincorporated Napa County; 2) trips that start and end within the Cities of Napa County; 3) trips between the Unincorporated County and city portions of Napa County; 4) trips between Napa County locations and the other 8 counties of the Bay Area; and finally 5) trips that travel through Napa County using Napa County roadways. It should be noted that a short segment of I-80 is located within Napa County. The external-to-external trips on this segment are not included in the table. Generally, all of the land use alternatives create similar amounts of traffic and distribution patterns. The trip patterns for the existing General Plan are shown for comparison purposes.

**Table 6 - Peak Hour Vehicle Trip Patterns Under Each Analysis Scenario**

Alternatives & Network Scenarios	Trips within Unincorporated Napa County	Trips within Cities in Napa	Trips between Unincorporated County and Napa Cities	Trips between All of Napa and Other 8 Counties	Trips passing through Napa (XX)
Existing Conditions	2,746	15,768	5,527	7,289	5,284
Alternative A without General Plan Circulation Element	3,940	17,388	7,850	14,493	14,292
Improvements Alternative E with 2030 Improved network	4,673	17,148	8,750	15,199	15,438

**Vehicle Miles Traveled**

Another variable for comparing each of the alternatives is vehicle miles traveled (VMT). VMT is the total number of peak hour trips times the total number of miles traveled between trip origins and destinations. **Table 7** illustrated the VMT for the existing condition, the existing General Plan and the VMT results for Alternative E. **Table 7** shows the VMT for all trips that start and end within Napa County (Local VMT), which either start or end within Napa County for trips to locations outside of the County. The VMT results do not include any external-to-external trips regional VMT), which travel through the County. Alternative E generates higher VMT than the existing General Plan

**Table 7 - Vehicle Miles Traveled**

Local and Regional VMT on Napa Roads for Alternatives			
	Local VMT	Regional VMT	Total VMT
Existing Conditions	166,094	29,931	196,025
Alternative A without General Plan Circulation Element	319,334	161,487	480,821
Improvements Alternative E with 2030 Improved network	338,724	175,004	513,728

**Roadway Improvements Included in 2030 Network**

The following roadway improvements were included in the 2030 scenario for Alternative E. It should be noted the travel model does not include intersection improvements. Therefore only changes in roadway classification and numbers of travel lanes are included. These issues are discussed under the Project Impacts - Travel Demand section of this report.

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### ***American Canyon Area***

- Construction of a northern extension of the Flosden/Newell Road

### ***Jamieson Canyon Area***

- Widening of Highway 12 to four lanes from Highway 29 to Interstate 80 and constructing a new centerline safety barrier
- Improvements to interchange at Airport Road and Highway 29 and Soscol and Highway 29 Improvements for American Canyon

### ***Other Improvements***

It should also be noted that the travel demand model 2030 network includes a number of roadway improvements beyond those listed above. For example, portions of SR 29 in St. Helena have less capacity in the 2030 network than they do in the 2003 network. It was not possible as part of the General Plan update to review all of the linkages in the model for these types of changes. However, they explain some of the counter intuitive results produced by the model. Specific corridors such as the Silverado Trail, Flosden Road and other parallel facilities appear to attract traffic under the 2030 configuration due to modest reductions in capacity on the parallel major routes.

The policies found in Alternative E include a number of improvements, which were not directly incorporated into the model. These include a number of Transportation Demand Management (TDM) strategies and the proposed by-pass around St. Helena. The St. Helena by-pass alignment has not been defined and therefore could not be coded into the network. Given these issues, alternative procedures were used to address these types of improvements.

### ***Impacts of Transportation Demand Management Strategies***

The Solano/Napa County travel demand model does not forecast transit ridership nor does it directly evaluate implementation of TDM programs. To address these types of programs, the model trip table was adjusted to reflect reductions in selected trips due to the successful implementation of trip reduction policies. Three trip reduction conditions were tested. These include:

- The implementation of TDM policies that result in a 3% reduction in all trips, which start and end within Napa County.
- The implementation of TDM policies that result in a 3% reduction in all trips within Napa County and all trips to and from Solano, Sonoma and Lake Counties.
- The implementation of TDM policies that result in a 10% reduction in all trips, which start and end within Napa County.

**Table 8** compares the peak hour levels of service for each of these policies against the roadway LOS that occurs under the existing General Plan and the base year conditions. While some roadway

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segments experience a slightly worse LOS, nine segments would operate at better levels of service. Specifically,

- Flosden Road between American Canyon Road and the Napa/Solano County line improves from LOS E to LOS D under all three policies.
- Silverado Trail between Oak Knoll Avenue and Hardman Avenue improves from LOS F to LOS E under all three policies.
- Silverado Trail between Pope Street and Zinfandel Lane improves from LOS F to LOS D under all three policies.
- Silverado Trail between Calistoga City Limits and Lincoln Avenue improves from LOS E to LOS C under all three policies.
- Soscal Avenue between First Street and Silverado Trail improves from LOS F to LOS E under Policies #1 and #3 and LOS D under policy #2.
- State Highway 121 between Wooden Valley Road and Vichy Avenue improves from LOS F to LOS D under all three policies.
- State Highway 128 between Tubbs Lane and Petrified Forest Road improves from LOS F to LOS D under all three policies.
- State Highway 29 between Napa-Valley Highway (SR 221) and Kelly Road improves from LOS F to LOS E under all three policies.
- State Highway 29 between Imola Avenue (SR 121) and Carneros Highway (SR 121/12) improves from LOS F to LOS C under all three policies.

**Table 8 - Comparison of Impacts of Peak Hour Trip Reduction Policies**

Number of Segment	Segment Descriptions	Direction	Segment Descriptions - Detail		Volume				V/C Ratio				Level of Service				
			Segment Limit North / East	Segment Limit South / West	2030E PM	3% Reduction Internal Napa (II) 2030E PM	3% Red II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM	2030E PM	3% Reduction Internal Napa (II) 2030E PM	3% Red II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM	Alternative A on 2030 without GP Circulation Element	Reduction Internal Napa (II) 2030E PM	3% Red II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM	
Segment	RoadName	A-B or B-A															
1	AMERICAN CANYON ROAD	NB/EB	I-80	Flosden Road	1671	1654	1670	1622	1.39	1.38	1.39	1.35	LOS F	LOS F	LOS F	LOS F	LOS F
2	AMERICAN CANYON ROAD	SB/WB	I-80	Flosden Road	1508	1499	1483	1497	1.26	1.25	1.24	1.25	LOS F	LOS F	LOS F	LOS F	LOS F
3	CHILES POPE VALLEY RD	NB/EB	Pope Canyon Road	Lower Chiles Valley Road	439	440	446	436	0.55	0.55	0.56	0.55	LOS C	LOS C	LOS C	LOS C	LOS C
4	CHILES POPE VALLEY RD	SB/WB	Pope Canyon Road	Lower Chiles Valley Road	64	69	70	69	0.08	0.09	0.09	0.09	LOS B	LOS A	LOS B	LOS B	LOS B
5	DEER PARK RD	NB/EB	Sanitarium Rd (North)	Silverado Trail	1065	830	830	817	1.31	1.02	1.02	1.01	LOS E	LOS F	LOS F	LOS F	LOS F
6	DEER PARK RD	SB/WB	Sanitarium Rd (North)	Silverado Trail	437	590	565	567	0.54	0.73	0.70	0.70	LOS D	LOS C	LOS D	LOS D	LOS D
7	DEER PARK ROAD	NB/EB	Silverado Trail	St. Helena Highway (SR 29/128)	885	814	814	845	1.09	1.00	1.00	1.04	LOS F	LOS F	LOS F	LOS F	LOS F
8	DEER PARK ROAD	SB/WB	Silverado Trail	St. Helena Highway (SR 29/128)	507	451	477	571	0.63	0.56	0.59	0.70	LOS D	LOS D	LOS C	LOS D	LOS D
9	FLOSDEN ROAD	NB/EB	American Canyon Road	Napa/Solano County Line	1864	1881	1897	1889	1.04	1.04	1.05	1.05	LOS E	LOS F	LOS F	LOS F	LOS F
10	FLOSDEN ROAD	SB/WB	American Canyon Road	Napa/Solano County Line	1711	1473	1467	1453	0.95	0.82	0.82	0.81	LOS D	LOS E	LOS D	LOS D	LOS D
11	HOWELL MOUNTAIN RD	NB/EB	Pope Valley Rd	N White Cottage Rd	167	146	145	154	0.21	0.18	0.18	0.19	LOS C	LOS C	LOS C	LOS C	LOS C
12	HOWELL MOUNTAIN RD	SB/WB	Pope Valley Rd	N White Cottage Rd	309	329	299	308	0.38	0.41	0.37	0.38	LOS C	LOS C	LOS C	LOS C	LOS C
13	NAPA VALLEJO HWY	NB/EB	Kaiser Rd	State Route 29 (SR 29/12)	5270	4752	4714	4666	2.93	2.64	2.62	2.59	LOS F	LOS F	LOS F	LOS F	LOS F
14	NAPA VALLEJO HWY	SB/WB	Kaiser Rd	State Route 29 (SR 29/12)	1530	2256	2233	2192	0.85	1.25	1.24	1.22	LOS F	LOS D	LOS F	LOS F	LOS F
15	OAK KNOLL AVE	NB/EB	Big Ranch Rd	State Route 29	218	218	218	218	0.18	0.18	0.18	0.18	LOS C	LOS C	LOS C	LOS C	LOS C
16	OAK KNOLL AVE	SB/WB	Big Ranch Rd	State Route 29	294	267	267	267	0.25	0.22	0.22	0.22	LOS C	LOS C	LOS C	LOS C	LOS C
17	OAKVILLE CROSS RD	NB/EB	Napa River	State Route 29	118	140	138	121	0.10	0.12	0.12	0.10	LOS C	LOS B	LOS C	LOS C	LOS B
18	OAKVILLE CROSS RD	SB/WB	Napa River	State Route 29	229	232	254	220	0.19	0.19	0.21	0.18	LOS C	LOS C	LOS C	LOS C	LOS C
19	OLD SONOMA ROAD	NB/EB	Buhman Avenue	Carneros Highway (SR 121/12)	387	352	345	348	0.32	0.29	0.29	0.29	LOS C	LOS C	LOS C	LOS C	LOS C
20	OLD SONOMA ROAD	SB/WB	Buhman Avenue	Carneros Highway (SR 121/12)	189	192	188	172	0.16	0.16	0.16	0.14	LOS C	LOS C	LOS C	LOS C	LOS C
21	PETRIFIED FOREST ROAD	NB/EB	Foothill Boulevard (SR 128)	Franz Valley School Road	1274	1114	1117	1102	1.59	1.39	1.40	1.38	LOS F	LOS F	LOS F	LOS F	LOS F
22	PETRIFIED FOREST ROAD	SB/WB	Foothill Boulevard (SR 128)	Franz Valley School Road	967	1100	1138	1108	1.21	1.38	1.42	1.39	LOS F	LOS F	LOS F	LOS F	LOS F
23	POPE CANYON RD	NB/EB	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	156	148	149	152	0.19	0.18	0.18	0.19	LOS C	LOS C	LOS C	LOS C	LOS C
24	POPE CANYON RD	SB/WB	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	76	87	87	83	0.09	0.11	0.11	0.10	LOS B	LOS B	LOS B	LOS B	LOS B
25	SILVERADO TRL	NB/EB	Oak Knoll Ave	Hardman Ave	1218	1188	1181	1165	1.02	0.99	0.98	0.97	LOS E	LOS F	LOS E	LOS E	LOS E
26	SILVERADO TRL	SB/WB	Oak Knoll Ave	Hardman Ave	766	932	949	902	0.64	0.78	0.79	0.75	LOS D	LOS C	LOS D	LOS D	LOS D
27	SILVERADO TRL	NB/EB	Sage Canyon Rd (SR 128)	Yountville Cross Rd	1394	1257	1257	1250	1.16	1.05	1.05	1.04	LOS E	LOS F	LOS F	LOS F	LOS F
28	SILVERADO TRL	SB/WB	Sage Canyon Rd (SR 128)	Yountville Cross Rd	905	990	1004	938	0.75	0.83	0.84	0.78	LOS D	LOS D	LOS D	LOS D	LOS D
29	SILVERADO TRL	NB/EB	Pope St	Zinfandel Ln	1249	1039	1038	1035	1.04	0.87	0.87	0.86	LOS D	LOS F	LOS D	LOS D	LOS D
30	SILVERADO TRL	SB/WB	Pope St	Zinfandel Ln	1076	1237	1229	1223	0.90	1.03	1.02	1.02	LOS F	LOS D	LOS F	LOS F	LOS F
31	SILVERADO TRL	NB/EB	Bale Ln	Deer Park Rd	720	674	646	622	0.60	0.56	0.54	0.52	LOS C	LOS C	LOS C	LOS C	LOS C
32	SILVERADO TRL	SB/WB	Bale Ln	Deer Park Rd	673	755	772	771	0.56	0.63	0.64	0.64	LOS C	LOS C	LOS C	LOS C	LOS C
33	SILVERADO TRL	NB/EB	Calistoga City Limits	Lincoln Ave (SR 29)	600	755	757	763	0.75	0.94	0.95	0.95	LOS E	LOS D	LOS E	LOS E	LOS E
34	SILVERADO TRL	SB/WB	Calistoga City Limits	Lincoln Ave (SR 29)	792	520	502	476	0.99	0.65	0.63	0.60	LOS C	LOS E	LOS C	LOS C	LOS C
35	SOSCOL AVE	NB/EB	First St	Silverado Trail	2123	1736	1674	1754	1.18	0.96	0.93	0.97	LOS F	LOS F	LOS E	LOS D	LOS E
36	SOSCOL AVE	SB/WB	First St	Silverado Trail	1568	1699	1686	1646	0.87	0.94	0.94	0.91	LOS D	LOS D	LOS D	LOS D	LOS D
37	SPRING MOUNTAIN ROAD	NB/EB	St. Helena City Limit	Langtry Road	570	600	591	604	0.71	0.75	0.74	0.76	LOS C	LOS C	LOS D	LOS D	LOS D
38	SPRING MOUNTAIN ROAD	SB/WB	St. Helena City Limit	Langtry Road	692	671	643	654	0.87	0.84	0.80	0.82	LOS D	LOS D	LOS D	LOS D	LOS D
39	STATE ROUTE 12/121	NB/EB	Cuttings Wharf Road	Stanely Road	1235	1186	1191	1177	1.03	0.99	0.99	0.98	LOS E	LOS F	LOS E	LOS E	LOS E
40	STATE ROUTE 12/121	SB/WB	Cuttings Wharf Road	Stanely Road	2509	2544	2516	2552	2.09	2.12	2.10	2.13	LOS F	LOS F	LOS F	LOS F	LOS F
41	STATE ROUTE 12	NB/EB	Lynch Road	Kelly Road	3751	3302	3342	3320	1.11	0.97	0.99	0.98	LOS F	LOS F	LOS E	LOS E	LOS E
42	STATE ROUTE 12	SB/WB	Lynch Road	Kelly Road	2841	2971	2988	2998	0.84	0.88	0.88	0.88	LOS E	LOS D	LOS E	LOS E	LOS E
43	STATE ROUTE 121	NB/EB	Wooden Valley Rd	Vichy Ave	1018	704	705	716	1.27	0.88	0.88	0.89	LOS F	LOS F	LOS D	LOS D	LOS D
44	STATE ROUTE 121	SB/WB	Wooden Valley Rd	Vichy Ave	132	304	309	297	0.16	0.38	0.39	0.37	LOS D	LOS C	LOS C	LOS C	LOS C
45	STATE ROUTE 121	NB/EB	Circle Oaks Dr	Wooden Valley Rd	616	586	583	612	0.77	0.73	0.73	0.76	LOS C	LOS D	LOS C	LOS C	LOS D
46	STATE ROUTE 121	SB/WB	Circle Oaks Dr	Wooden Valley Rd	183	237	231	225	0.23	0.30	0.29	0.28	LOS C	LOS C	LOS C	LOS C	LOS C

Table 8 - Continued

Number of Segment	Segment Descriptions	Direction	Segment Descriptions - Detail		Volume				V/C Ratio				Level of Service				
			Segment Limit North / East	Segment Limit South / West	2030E PM	3% Reduction Internal Napa (II) 2030E PM	3% II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM	2030E PM	3% Reduction Internal Napa (II) 2030E PM	3% II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM	Alternative A on 2030 without GP Circulation Element	2030E PM	3% Reduction Internal Napa (II) 2030E PM	3% II+IX(Solano, Sonoma, Lake) 2030E PM	10% Reduction Internal Napa (II) 2030E PM
47	STATE ROUTE 121	NB/EB	Napa/Sonoma County Line	Old Sonoma Rd	1753	1664	1662	1662	0.87	0.69	0.69	0.69	LOS C	LOS C	LOS C	LOS C	LOS C
48	STATE ROUTE 121	SB/WB	Napa/Sonoma County Line	Old Sonoma Rd	2092	2151	2119	2150	0.87	0.90	0.88	0.90	LOS D	LOS D	LOS D	LOS D	LOS D
51	STATE ROUTE 128	NB/EB	Napa/Sonoma County Line	Tubbs Lane	942	811	790	815	1.18	1.01	0.99	1.02	LOS F	LOS F	LOS F	LOS E	LOS F
52	STATE ROUTE 128	SB/WB	Napa/Sonoma County Line	Tubbs Lane	986	1092	1078	1102	1.23	1.36	1.35	1.38	LOS F	LOS F	LOS F	LOS F	LOS F
53	STATE ROUTE 128	NB/EB	Tubbs Ln	Petrified Forest Rd	905	709	703	690	1.13	0.89	0.88	0.86	LOS D	LOS F	LOS D	LOS D	LOS D
54	STATE ROUTE 128	SB/WB	Tubbs Ln	Petrified Forest Rd	667	788	798	758	0.83	0.99	1.00	0.95	LOS D	LOS D	LOS E	LOS F	LOS E
55	STATE ROUTE 128	NB/EB	Petrified Forest Rd	Lincoln Ave(SR 29)	1152	1030	1055	1057	1.44	1.29	1.32	1.32	LOS F	LOS F	LOS F	LOS F	LOS F
56	STATE ROUTE 128	SB/WB	Petrified Forest Rd	Lincoln Ave(SR 29)	1074	1082	1090	1074	1.34	1.35	1.36	1.34	LOS F	LOS F	LOS F	LOS F	LOS F
57	STATE ROUTE 128	NB/EB	Napa River	St Helena Hwy(SR 29)	360	325	296	325	0.30	0.27	0.25	0.27	LOS C	LOS C	LOS C	LOS C	LOS C
58	STATE ROUTE 128	SB/WB	Napa River	St Helena Hwy(SR 29)	410	356	340	380	0.34	0.30	0.28	0.32	LOS C	LOS C	LOS C	LOS C	LOS C
59	STATE ROUTE 128	NB/EB	Chiles-Pope Valley Road	Silverado Trail	900	894	884	928	1.13	1.12	1.11	1.16	LOS F	LOS F	LOS F	LOS F	LOS F
60	STATE ROUTE 128	SB/WB	Chiles-Pope Valley Road	Silverado Trail	737	741	747	735	0.92	0.93	0.93	0.92	LOS F	LOS D	LOS E	LOS E	LOS D
61	STATE ROUTE 128	NB/EB	Monticell Road (SR 121)	Berryessa-Knoxville Road	979	971	970	965	0.82	0.81	0.81	0.80	LOS D	LOS D	LOS D	LOS D	LOS D
62	STATE ROUTE 128	SB/WB	Monticell Road (SR 121)	Berryessa-Knoxville Road	660	624	605	674	0.55	0.52	0.50	0.56	LOS C	LOS C	LOS C	LOS C	LOS C
63	STATE ROUTE 128	NB/EB	Napa/Yolo County Line	State ROUTE 121	924	835	830	908	0.77	0.70	0.69	0.76	LOS D	LOS D	LOS C	LOS C	LOS D
64	STATE ROUTE 128	SB/WB	Napa/Yolo County Line	State ROUTE 121	758	779	787	752	0.63	0.65	0.66	0.63	LOS D	LOS C	LOS C	LOS C	LOS C
65	STATE ROUTE 29	NB/EB	Napa/Lake County Line	Tubbs Lane	496	315	315	315	0.41	0.26	0.26	0.26	LOS C	LOS C	LOS C	LOS C	LOS C
66	STATE ROUTE 29	SB/WB	Napa/Lake County Line	Tubbs Lane	384	416	414	413	0.32	0.35	0.35	0.34	LOS C	LOS C	LOS C	LOS C	LOS C
67	STATE ROUTE 29	NB/EB	Green Island Rd	American Canyon Rd	3084	3073	3069	3088	1.71	1.71	1.71	1.72	LOS F	LOS F	LOS F	LOS F	LOS F
68	STATE ROUTE 29	SB/WB	Green Island Rd	American Canyon Rd	2741	3032	3018	3025	1.52	1.68	1.68	1.68	LOS F	LOS F	LOS F	LOS F	LOS F
69	STATE ROUTE 29	NB/EB	California Dr	Oak Knoll Ave	2607	2261	2298	2254	0.77	0.67	0.68	0.66	LOS C	LOS C	LOS C	LOS C	LOS C
70	STATE ROUTE 29	SB/WB	California Dr	Oak Knoll Ave	2549	2468	2456	2408	0.75	0.73	0.72	0.71	LOS C	LOS C	LOS C	LOS C	LOS C
71	STATE ROUTE 29	NB/EB	Oakville Grade	Madison St	2392	2014	2042	2009	2.99	2.52	2.55	2.51	LOS F	LOS F	LOS F	LOS F	LOS F
72	STATE ROUTE 29	SB/WB	Oakville Grade	Madison St	2108	2282	2277	2272	2.63	2.85	2.85	2.84	LOS F	LOS F	LOS F	LOS F	LOS F
73	STATE ROUTE 29	NB/EB	Rutherford Cross Rd(SR 128)	Oakville Grade	2088	1747	1737	1710	2.61	2.18	2.17	2.14	LOS F	LOS F	LOS F	LOS F	LOS F
74	STATE ROUTE 29	SB/WB	Rutherford Cross Rd(SR 128)	Oakville Grade	1814	1943	1900	1887	2.27	2.43	2.37	2.36	LOS F	LOS F	LOS F	LOS F	LOS F
75	STATE ROUTE 29	NB/EB	Chaix Ln	Zinfandel Ln	2300	1983	1990	1978	2.88	2.48	2.49	2.47	LOS F	LOS F	LOS F	LOS F	LOS F
76	STATE ROUTE 29	SB/WB	Chaix Ln	Zinfandel Ln	1727	1834	1835	1817	2.16	2.29	2.29	2.27	LOS F	LOS F	LOS F	LOS F	LOS F
77	STATE ROUTE 29	NB/EB	Lodi Lane	Deer Park Rd	1777	1326	1364	1382	2.22	1.66	1.70	1.73	LOS F	LOS F	LOS F	LOS F	LOS F
78	STATE ROUTE 29	SB/WB	Lodi Lane	Deer Park Rd	1337	1528	1513	1498	1.67	1.91	1.89	1.87	LOS F	LOS F	LOS F	LOS F	LOS F
79	STATE ROUTE 29	NB/EB	Kelly Rd	Jamieson Cyn Rd(SR 12)	7591	6335	6268	6270	2.24	1.87	1.85	1.85	LOS F	LOS F	LOS F	LOS F	LOS F
80	STATE ROUTE 29	SB/WB	Kelly Rd	Jamieson Cyn Rd(SR 12)	3468	4669	4627	4538	1.02	1.38	1.36	1.34	LOS F	LOS F	LOS F	LOS F	LOS F
81	STATE ROUTE 29	NB/EB	Napa-Vallejo Hwy(SR 221)	Kelly Rd	6911	5662	5624	5575	1.18	0.96	0.96	0.95	LOS C	LOS F	LOS E	LOS E	LOS E
82	STATE ROUTE 29	SB/WB	Napa-Vallejo Hwy(SR 221)	Kelly Rd	2129	3330	3288	3200	0.36	0.57	0.56	0.55	LOS B	LOS B	LOS C	LOS C	LOS B
83	STATE ROUTE 29	NB/EB	Napa-Vallejo Hwy(SR 221)	Carneros Hwy(SR 121/12)	5931	4541	4490	4416	1.56	1.20	1.18	1.16	LOS F	LOS F	LOS F	LOS F	LOS F
84	STATE ROUTE 29	SB/WB	Napa-Vallejo Hwy(SR 221)	Carneros Hwy(SR 121/12)	1725	2765	2750	2664	0.45	0.73	0.72	0.70	LOS C	LOS B	LOS C	LOS C	LOS C
85	STATE ROUTE 29	NB/EB	Imola Ave(SR 121)	Carneros Hwy(SR 121/12)	4073	2510	2505	2442	1.07	0.66	0.66	0.64	LOS C	LOS F	LOS C	LOS C	LOS C
86	STATE ROUTE 29	SB/WB	Imola Ave(SR 121)	Carneros Hwy(SR 121/12)	1328	1919	1859	1779	0.35	0.51	0.49	0.47	LOS B	LOS B	LOS B	LOS B	LOS B
87	TUBBS LN	NB/EB	Highway 29	Highway 128	1095	1102	1091	1105	0.91	0.92	0.91	0.92	LOS E	LOS D	LOS D	LOS D	LOS D
88	TUBBS LN	SB/WB	Highway 29	Highway 128	1013	1032	1030	1016	0.84	0.86	0.86	0.85	LOS D	LOS D	LOS D	LOS D	LOS D
89	WOODEN VALLEY RD	NB/EB	Monticello Rd(SR 121)	Napa/Solano Co Line	467	415	409	415	0.58	0.51	0.51	0.51	LOS C	LOS C	LOS C	LOS C	LOS C
90	WOODEN VALLEY RD	SB/WB	Monticello Rd(SR 121)	Napa/Solano Co Line	151	151	151	151	0.19	0.19	0.19	0.19	LOS C	LOS C	LOS C	LOS C	LOS C
91	YOUNTVILLE CROSS RD	NB/EB	Silverado Trail	Yountville Town Limits	355	219	228	232	0.44	0.27	0.28	0.29	LOS C	LOS C	LOS C	LOS C	LOS C
92	YOUNTVILLE CROSS RD	SB/WB	Silverado Trail	Yountville Town Limits	282	248	248	248	0.35	0.31	0.31	0.31	LOS C	LOS C	LOS C	LOS C	LOS C
93	ZINFANDEL LN	NB/EB	Silverado Trail	St Helena Hwy(SR 29&128)	331	302	343	312	0.41	0.38	0.43	0.39	LOS C	LOS C	LOS C	LOS C	LOS C
94	ZINFANDEL LN	SB/WB	Silverado Trail	St Helena Hwy(SR 29&128)	212	238	236	209	0.26	0.30	0.30	0.26	LOS C	LOS C	LOS C	LOS C	LOS C

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### ***Impacts Associated with the Construction of a By-pass Around the Town of St. Helena***

At this time, there is no adopted alignment for the by-pass around St. Helena. Therefore, the traffic model could not be reasonably applied to project the impacts of the by-pass. However, to address this improvement, the Napa/Solano County model was used to determine the trip patterns for the traffic that uses SR 29 through St. Helena. Five segments were identified in the model for analysis. These included:

1. Deer Park Road to Pratt Avenue
2. Pratt Avenue to Madrona Street
3. Madrona Street to Pope Street
4. Pope Street to Sulphur Springs Avenue
5. Sulphur Springs Avenue to Chaix Lane

For each of these segments, six categories of trips were extracted from the model. These include:

- All trips that are on the segment that start and end within St. Helena
- All trips that are on the segment between St. Helena and all of Napa County
- All trips that are on the segment that start or end to the north or south of St. Helena
- All trips that are on the segment between the area east of St. Helena and north or south of St. Helena.
- All trips that are on the segment between the area west of St. Helena and north or south of St. Helena
- All trips that go through Napa County that are on each segment

**Table 9** provides details about the various trip patterns on SR 29 within the town of St. Helena. These are peak hour trips only and do not reflect daily traffic patterns. Generally, about 20-25% of all trips are between St. Helena and the rest of the world. That includes Napa County and the surrounding communities outside of Napa County. Further, about 60-65% of all trips are external trips, which go through Napa County. In other words, these are trips that start and end outside of Napa County but use SR 29 through St. Helena while traveling through the County.

**Table 9 - Trip Patterns On SR 29 within St. Helena**

Roadway Segment	Internal St. Helena Trips	Trips between St. Helena and all of Napa County	Through trips between Napa North/South of St. Helena	Through trips between Napa East of St. Helena and North/South	Through trips between Napa West of St. Helena and North/South	Non-Napa through trips	Total
Deer Park Road to Pratt Avenue	0%	25%	7%	2%	1%	64%	100%
Pratt Avenue to Madrona Street	4%	20%	6%	2%	1%	67%	100%
Madrona Street to Pope Street	12%	22%	8%	2%	1%	55%	100%
Pope Street to Sulphur Springs Avenue	5%	13%	7%	3%	0%	71%	100%
Sulphur Springs Avenue to Chaix Lane	0%	14%	5%	2%	1%	77%	100%

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## Traffic Analysis

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This analysis addresses Countywide and regional transportation impacts and identifies mitigation measures to lessen those impacts.

### *Peak Hour Level of Service*

As explained in the methodology section, the level of service (LOS) on a given roadway is a convenient measure of its performance, and can be used to characterize impacts under the various alternatives and network scenarios. **Table 10** shows the peak hour volumes, volume-to-capacity ratios and resultant LOS values for the existing General Plan (Alternative A) and Alternative E. Alternative A was run against the 2030 without General Plan Circulation Element Improvements network while Alternative E was run against the Improved 2030 network.

**Table 10 - Peak Hour - Volumes, V/C Ratio and LOS**

Number of Segment	Segment Descriptions RoadName	Direction A-B or B-A	Segment Descriptions - Detail		Volume 2030E PM	V/C Ratio 2030E PM	Existing Condition 2000 PM	Level Of Service	
			Segment Limit North / East	Segment Limit South / West				Alternative A on 2030 without GP Circulation Element	2030E PM
1	AMERICAN CANYON ROAD	NB/EB	I-80	Flosden Road	1671	1.39	LOS D	LOS F	LOS F
2	AMERICAN CANYON ROAD	SB/WB	I-80	Flosden Road	1508	1.26	LOS D	LOS F	LOS F
3	CHILES POPE VALLEY RD	NB/EB	Pope Canyon Road	Lower Chiles Valley Road	439	0.55	LOS A	LOS C	LOS C
4	CHILES POPE VALLEY RD	SB/WB	Pope Canyon Road	Lower Chiles Valley Road	64	0.08	LOS A	LOS B	LOS A
5	DEER PARK RD	NB/EB	Sanitarium Rd (North)	Silverado Trail	1065	1.31	LOS C	LOS D	LOS F
6	DEER PARK RD	SB/WB	Sanitarium Rd (North)	Silverado Trail	437	0.54	LOS C	LOS D	LOS C
7	DEER PARK ROAD	NB/EB	Silverado Trail	St. Helena Highway (SR 29/128)	885	1.09	LOS C	LOS F	LOS F
8	DEER PARK ROAD	SB/WB	Silverado Trail	St. Helena Highway (SR 29/128)	507	0.63	LOS C	LOS D	LOS D
9	FLOSDEN ROAD	NB/EB	American Canyon Road	Napa/Solano County Line	1864	1.04	LOS C	LOS F	LOS F
10	FLOSDEN ROAD	SB/WB	American Canyon Road	Napa/Solano County Line	1711	0.95	LOS C	LOS D	LOS E
11	HOWELL MOUNTAIN RD	NB/EB	Pope Valley Rd	N White Cottage Rd	167	0.21	LOS A	LOS C	LOS C
12	HOWELL MOUNTAIN RD	SB/WB	Pope Valley Rd	N White Cottage Rd	309	0.38	LOS A	LOS C	LOS C
13	NAPA VALLEJO HWY	NB/EB	Kaiser Rd	State Route 29 (SR 29/12)	5270	2.93	LOS D	LOS F	LOS F
14	NAPA VALLEJO HWY	SB/WB	Kaiser Rd	State Route 29 (SR 29/12)	1530	0.85	LOS D	LOS F	LOS D
15	OAK KNOLL AVE	NB/EB	Big Ranch Rd	State Route 29	218	0.18	LOS C	LOS C	LOS C
16	OAK KNOLL AVE	SB/WB	Big Ranch Rd	State Route 29	294	0.25	LOS C	LOS C	LOS C
17	OAKVILLE CROSS RD	NB/EB	Napa River	State Route 29	118	0.10	LOS A	LOS C	LOS B
18	OAKVILLE CROSS RD	SB/WB	Napa River	State Route 29	229	0.19	LOS B	LOS C	LOS C
19	OLD SONOMA ROAD	NB/EB	Buhman Avenue	Carneros Highway (SR 121/12)	387	0.32	LOS C	LOS C	LOS C
20	OLD SONOMA ROAD	SB/WB	Buhman Avenue	Carneros Highway (SR 121/12)	189	0.16	LOS B	LOS C	LOS C
21	PETRIFIED FOREST ROAD	NB/EB	Foothill Boulevard (SR 128)	Franz Valley School Road	1274	1.59	LOS C	LOS F	LOS F
22	PETRIFIED FOREST ROAD	SB/WB	Foothill Boulevard (SR 128)	Franz Valley School Road	967	1.21	LOS C	LOS F	LOS F
23	POPE CANYON RD	NB/EB	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	156	0.19	LOS A	LOS C	LOS C
24	POPE CANYON RD	SB/WB	Berryessa-Knoxville Rd	Chiles-Pope Valley Rd	76	0.09	LOS A	LOS B	LOS B
25	SILVERADO TRL	NB/EB	Oak Knoll Ave	Hardman Ave	1218	1.02	LOS C	LOS E	LOS F
26	SILVERADO TRL	SB/WB	Oak Knoll Ave	Hardman Ave	766	0.64	LOS C	LOS D	LOS C
27	SILVERADO TRL	NB/EB	Sage Canyon Rd (SR 128)	Yountville Cross Rd	1394	1.16	LOS C	LOS F	LOS F
28	SILVERADO TRL	SB/WB	Sage Canyon Rd (SR 128)	Yountville Cross Rd	905	0.75	LOS C	LOS D	LOS D
29	SILVERADO TRL	NB/EB	Pope St	Zinfandel Ln	1249	1.04	LOS C	LOS D	LOS F
30	SILVERADO TRL	SB/WB	Pope St	Zinfandel Ln	1076	0.90	LOS C	LOS F	LOS D
31	SILVERADO TRL	NB/EB	Bale Ln	Deer Park Rd	720	0.60	LOS C	LOS C	LOS C
32	SILVERADO TRL	SB/WB	Bale Ln	Deer Park Rd	673	0.56	LOS C	LOS C	LOS C
33	SILVERADO TRL	NB/EB	Calistoga City Limits	Lincoln Ave (SR 29)	600	0.75	LOS C	LOS D	LOS D
34	SILVERADO TRL	SB/WB	Calistoga City Limits	Lincoln Ave (SR 29)	792	0.99	LOS C	LOS C	LOS E
35	SOSCOL AVE	NB/EB	First St	Silverado Trail	2123	1.18	LOS D	LOS F	LOS F
36	SOSCOL AVE	SB/WB	First St	Silverado Trail	1568	0.87	LOS D	LOS D	LOS D
37	SPRING MOUNTAIN ROAD	NB/EB	St. Helena City Limit	Langtry Road	570	0.71	LOS A	LOS C	LOS C
38	SPRING MOUNTAIN ROAD	SB/WB	St. Helena City Limit	Langtry Road	692	0.87	LOS A	LOS D	LOS D
39	STATE ROUTE 12/121	NB/EB	Cuttings Wharf Road	Stanely Road	1235	1.03	LOS D	LOS F	LOS F
40	STATE ROUTE 12/121	SB/WB	Cuttings Wharf Road	Stanely Road	2509	2.09	LOS F	LOS F	LOS F
41	STATE ROUTE 12	NB/EB	Lynch Road	Kelly Road	3751	1.11	LOS F	LOS E	LOS F
42	STATE ROUTE 12	SB/WB	Lynch Road	Kelly Road	2841	0.84	LOS E	LOS D	LOS D
43	STATE ROUTE 121	NB/EB	Wooden Valley Rd	Vichy Ave	1018	1.27	LOS C	LOS D	LOS F
44	STATE ROUTE 121	SB/WB	Wooden Valley Rd	Vichy Ave	132	0.16	LOS C	LOS C	LOS C
45	STATE ROUTE 121	NB/EB	Circle Oaks Dr	Wooden Valley Rd	616	0.77	LOS B	LOS C	LOS D
46	STATE ROUTE 121	SB/WB	Circle Oaks Dr	Wooden Valley Rd	183	0.23	LOS C	LOS C	LOS C

**Table 10 - Continued**

Number of Segment	Segment Descriptions RoadName	Direction A-B or B-A	Segment Descriptions - Detail		Volume 2030E PM	V/C Ratio 2030E PM	Existing Condition 2000 PM	Level Of Service	
			Segment Limit North / East	Segment Limit South / West				Alternative A on 2030 without GP Circulation Element	2030E PM
47	STATE ROUTE 121	NB/EB	Napa/Sonoma County Line	Old Sonoma Rd	1753	0.73	LOS F	LOS C	LOS C
48	STATE ROUTE 121	SB/WB	Napa/Sonoma County Line	Old Sonoma Rd	2092	0.87	LOS F	LOS D	LOS D
51	STATE ROUTE 128	NB/EB	Napa/Sonoma County Line	Tubbs Lane	942	1.18	LOS C	LOS F	LOS F
52	STATE ROUTE 128	SB/WB	Napa/Sonoma County Line	Tubbs Lane	986	1.23	LOS C	LOS F	LOS F
53	STATE ROUTE 128	NB/EB	Tubbs Ln	Petrified Forest Rd	905	1.13	LOS C	LOS C	LOS F
54	STATE ROUTE 128	SB/WB	Tubbs Ln	Petrified Forest Rd	667	0.83	LOS C	LOS D	LOS D
55	STATE ROUTE 128	NB/EB	Petrified Forest Rd	Lincoln Ave (SR 29)	1152	1.44	LOS C	LOS F	LOS F
56	STATE ROUTE 128	SB/WB	Petrified Forest Rd	Lincoln Ave (SR 29)	1074	1.34	LOS C	LOS F	LOS F
57	STATE ROUTE 128	NB/EB	Napa River	St Helena Hwy (SR 29)	360	0.30	LOS C	LOS C	LOS C
58	STATE ROUTE 128	SB/WB	Napa River	St Helena Hwy (SR 29)	410	0.34	LOS B	LOS C	LOS C
59	STATE ROUTE 128	NB/EB	Chiles-Pope Valley Road	Silverado Trail	900	1.13	LOS B	LOS F	LOS F
60	STATE ROUTE 128	SB/WB	Chiles-Pope Valley Road	Silverado Trail	737	0.92	LOS C	LOS D	LOS D
61	STATE ROUTE 128	NB/EB	Monticell Road (SR 121)	Berryessa-Knoxville Road	979	0.82	LOS B	LOS D	LOS D
62	STATE ROUTE 128	SB/WB	Monticell Road (SR 121)	Berryessa-Knoxville Road	660	0.55	LOS B	LOS C	LOS C
63	STATE ROUTE 128	NB/EB	Napa/Yolo County Line	State ROUTE 121	924	0.77	LOS A	LOS D	LOS D
64	STATE ROUTE 128	SB/WB	Napa/Yolo County Line	State ROUTE 121	758	0.63	LOS A	LOS C	LOS C
65	STATE ROUTE 29	NB/EB	Napa/Lake County Line	Tubbs Lane	496	0.41	LOS C	LOS C	LOS C
66	STATE ROUTE 29	SB/WB	Napa/Lake County Line	Tubbs Lane	384	0.32	LOS C	LOS C	LOS C
67	STATE ROUTE 29	NB/EB	Green Island Rd	American Canyon Rd	3084	1.71	LOS F	LOS F	LOS F
68	STATE ROUTE 29	SB/WB	Green Island Rd	American Canyon Rd	2741	1.52	LOS F	LOS F	LOS F
69	STATE ROUTE 29	NB/EB	California Dr	Oak Knoll Ave	2607	0.77	LOS C	LOS C	LOS C
70	STATE ROUTE 29	SB/WB	California Dr	Oak Knoll Ave	2549	0.75	LOS C	LOS C	LOS C
71	STATE ROUTE 29	NB/EB	Oakville Grade	Madison St	2392	2.99	LOS F	LOS F	LOS F
72	STATE ROUTE 29	SB/WB	Oakville Grade	Madison St	2108	2.63	LOS F	LOS F	LOS F
73	STATE ROUTE 29	NB/EB	Rutherford Cross Rd (SR 128)	Oakville Grade	2088	2.61	LOS E	LOS F	LOS F
74	STATE ROUTE 29	SB/WB	Rutherford Cross Rd (SR 128)	Oakville Grade	1814	2.27	LOS F	LOS F	LOS F
75	STATE ROUTE 29	NB/EB	Chaix Ln	Zinfandel Ln	2300	2.88	LOS F	LOS F	LOS F
76	STATE ROUTE 29	SB/WB	Chaix Ln	Zinfandel Ln	1727	2.16	LOS F	LOS F	LOS F
77	STATE ROUTE 29	NB/EB	Lodi Lane	Deer Park Rd	1777	2.22	LOS D	LOS F	LOS F
78	STATE ROUTE 29	SB/WB	Lodi Lane	Deer Park Rd	1337	1.67	LOS D	LOS F	LOS F
79	STATE ROUTE 29	NB/EB	Kelly Rd	Jamieson Cyn Rd (SR 12)	7591	2.24	LOS C	LOS F	LOS F
80	STATE ROUTE 29	SB/WB	Kelly Rd	Jamieson Cyn Rd (SR 12)	3468	1.02	LOS C	LOS F	LOS F
81	STATE ROUTE 29	NB/EB	Napa-Vallejo Hwy (SR 221)	Kelly Rd	6911	1.18	LOS B	LOS E	LOS F
82	STATE ROUTE 29	SB/WB	Napa-Vallejo Hwy (SR 221)	Kelly Rd	2129	0.36	LOS B	LOS C	LOS B
83	STATE ROUTE 29	NB/EB	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	5931	1.56	LOS B	LOS F	LOS F
84	STATE ROUTE 29	SB/WB	Napa-Vallejo Hwy (SR 221)	Carneros Hwy(SR 121/12)	1725	0.45	LOS B	LOS D	LOS B
85	STATE ROUTE 29	NB/EB	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	4073	1.07	LOS B	LOS C	LOS F
86	STATE ROUTE 29	SB/WB	Imola Ave (SR 121)	Carneros Hwy(SR 121/12)	1328	0.35	LOS B	LOS B	LOS B
87	TUBBS LN	NB/EB	Highway 29	Highway 128	1095	0.91	LOS C	LOS E	LOS D
88	TUBBS LN	SB/WB	Highway 29	Highway 128	1013	0.84	LOS C	LOS D	LOS D
89	WOODEN VALLEY RD	NB/EB	Monticello Rd (SR 121)	Napa/Solano Co Line	467	0.58	LOS A	LOS C	LOS C
90	WOODEN VALLEY RD	SB/WB	Monticello Rd (SR 121)	Napa/Solano Co Line	151	0.19	LOS C	LOS C	LOS C
91	YOUNTVILLE CROSS RD	NB/EB	Silverado Trail	Yountville Town Limits	355	0.44	LOS C	LOS C	LOS C
92	YOUNTVILLE CROSS RD	SB/WB	Silverado Trail	Yountville Town Limits	282	0.35	LOS C	LOS C	LOS C
93	ZINFANDEL LN	NB/EB	Silverado Trail	St Helena Hwy (SR 29&128)	331	0.41	LOS C	LOS C	LOS C
94	ZINFANDEL LN	SB/WB	Silverado Trail	St Helena Hwy (SR 29&128)	212	0.26	LOS B	LOS C	LOS C

**Improved (2030) Network - LOS E or F Future Conditions**

For those conditions where the existing LOS is D or better, there are 13 locations that would experience significant congestion impacts under Alternative E. There are eight locations where the existing LOS is E or F and the future condition is also LOS E or F. The following are all of the locations where the future LOS is E or F.

Roadway Segments LOS D or better under Existing Conditions and LOS E or F in Future

- American Canyon Road - I-80 to Flodden Road
- Deer Park Road - Sanitarium Rd (North) to Silverado Trail
- Deer Park Road - Silverado Trail to St. Helena Highway (SR 29/128)
- Flodden Road - American Canyon Road to Solano/Napa County Line
- Napa Vallejo Hwy - Kaiser Road to Highway 29(SR 29/12)

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- Petrified Forest Road - Foothill Boulevard (SR 128) to Franz Valley School Road
  - Silverado Trail - Oak Knoll Avenue to Hardman Avenue
  - Silverado Trail - Sage Canyon Road (SR 128) to Yountville Cross Road
  - Silverado Trail - Pope Street to Zinfandel Lane
  - Silverado Trail - Calistoga City Limits to Lincoln Avenue (SR 29)
  - Soscol Avenue - First Street to Silverado Trail
  - State Highway 121 - Wooden Valley Road to Vichy Avenue
  - State Highway 128 - Napa/Sonoma County Line to Tubbs Lane
  - State Highway 128 - Tubbs Lane to Petrified Forest Road
  - State Highway 128 - Petrified Forest Road to Lincoln Avenue (SR 29)
  - State Highway 128 - Chiles-Pope Valley Road to Silverado Trail
  - State Highway 29 - Lodi Lane to Deer Park Road
  - State Highway 29 - Kelly Road to Jamieson Canyon Road (SR 12)
  - State Highway 29 - Napa-Vallejo Hwy (SR 221) to Kelly Road
  - State Highway 29 - Napa-Vallejo Hwy (SR 221) to Carneros Hwy (SR 121/12)
  - State Highway 29 - Imola Avenue to Carneros Highway (SR 121/12)

Roadway Segments at LOS E or F under Existing Conditions and in the Future

- State Highway 12/121 - Cuttings Wharf Road to Stanley Road
- State Highway 12 - Lynch Road to Kelly Road
- State Highway 29 - Green Island Road to American Canyon Road
- State Highway 29 - Oakville Grade to Madison Street
- State Highway 29 - Rutherford Cross Road (SR 128) to Oakville Grade
- State Highway 29 - Chaix Lane to Zinfandel Lane

**Observations of Results**

The following observations can be drawn from the above analysis of the General Plan Alternative E and proposed improvements to the existing street system.

- Most of the significant impacts would occur regardless of whether or not the General Plan is updated, since they would all occur if the current General Plan policies remain in place (Alternative A). In a few locations, the impacts are less under Alternative E than the existing General Plan. These include:
  - State Route 121 - Circle Oaks Drive to Wooden Valley Road
  - State Route 121 - Napa/Solano County line to Old Sonoma Road
  - State Route 128 - Napa/Solano County line to State Highway 121
- In all instances, the significant congestion impacts that are projected to occur could be resolved by constructing network improvements. For example, on State Highway 128 between the Napa/Yolo County Line and State Highway 121, the congestion

projected under Alternative E if network improvements are implemented. This can be attributed to improved capacity.

- Generally, the changes in land use, as represented by the individual alternatives, produce the increases in peak hour traffic that results in sub-standard LOS.