Greater Tehachapi Area Circulation Study

Kern Council of Governments

Revised Final Report

Prepared for
Kern COG and the
City of Tehachapi

Prepared By

OMNI-MEANS, LTD.
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GREATER TEHACHAPI AREA CIRCULATION STUDY

The purpose of this study is to identify existing and future circulation and transportation issues that are within the Greater Tehachapi Area. For purposes of this study, the Greater Tehachapi Area refers to the City of Tehachapi and the outlining communities including areas west of Tehachapi in the Cummings Valley/Bear Valley areas (reference Figure 1). Specifically, these Valley areas include Bear Valley Springs, Stallion Springs, and Alpine Forest Park. In addition, the California Correctional Institution is located in the Greater Tehachapi Area.

Vehicular circulation within the Greater Tehachapi Area consists of a network of city streets and rural country roads. Streets and roads are classified by functional classification including freeways, arterials, collectors, and local roads. A freeway is defined as a divided highway with full control of access and two or more lanes for the exclusive use of traffic in each direction. Freeways provide for uninterrupted flow of traffic. There are neither signalized nor stop-controlled at-grade intersections and direct access to and from adjacent property is not permitted. Access to and from a freeway is limited to ramp locations.

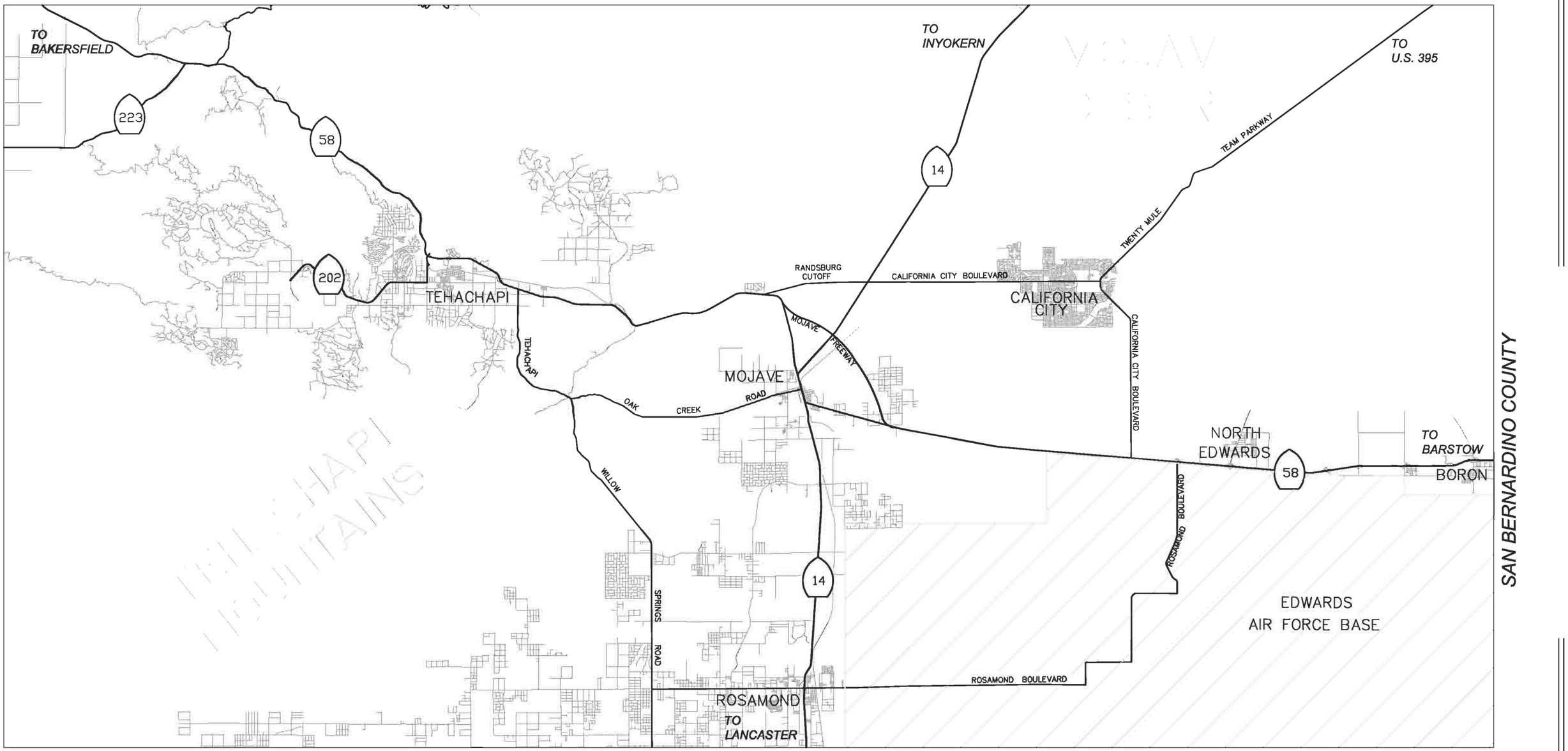
Arterials in Tehachapi serve as the principal network for traffic flow. They typically have no less than a 100 foot right-of-way and connect areas of major traffic generation within the urban areas and connect with important county roads and state highways. Arterials also provide for the distribution and collection of through traffic to and from collector and local streets serving residential, commercial, and industrial land uses.

Collector streets provide for traffic movement between arterial and local streets; traffic movement within and between neighborhoods and major activity centers; and limited direct access to abutting properties. Collector streets in Tehachapi typically have an 86-foot right-of-way. They are intended to connect arterials with local streets and activity centers.

Local streets provide for direct access to abutting properties and for localized traffic movements within residential, commercial, and industrial areas. In general, local collectors are local streets designated to connect neighborhoods that are designed to discourage through traffic.

Roadways that provide primary circulation in the vicinity of the study area include State Route 58, State Route 202, Cummings Valley Boulevard, Highline Road, Tucker Road, Curry Street, Dennison Road, Steuber Road, Tehachapi Willow Springs Road, Cummings Valley Road, Banducci Road, Giraudo Road, and Bear Valley Road.

> **State Route 58** provides the main access to southeast Kern County. This four-lane divided freeway traverses the entire county and is oriented in an east-west manner. Currently, the existing average daily traffic (ADT) on State Route 58 in Tehachapi is 20,900. Within the Greater Tehachapi Area, State Route 58 contains interchanges at State Route 202 and North Mill Street. A future interchange is planned at Dennison Road, which is currently an under-crossing.
>
> **State Route 202,** also known as Cummings Valley Boulevard for a portion of the route, is an arterial that generally runs in an east-west direction. This heavily used facility contains two and four lane sections and runs from the California Correctional Institution to State Route 58. On a portion of the roadway between Woodford-Tehachapi Road and Tucker Road, State Route 202 operates and an enhanced two-lane collector with a two-way turn lane acting as the median and adequate space to provide for acceleration and deceleration lanes that serve local businesses. The existing ADT on State Route 202 ranges from 2,300 in the Cummings Valley to 20,000 in Tehachapi.



Greater Tehachapi Area Circulation Study

Figure 1

Vicinity Map

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Cummings Valley Boulevard is an east-west facility that travels between Tucker Road and Dennison Road. Containing two and four lane sections, Cummings Valley Boulevard provides access to residential neighborhoods and commercial and retail land uses. On the same alignment and west of Tucker Road, State Route 202 continues to the west and serves the Valley residents in Kern County.

Highline Road is a two lane road that is located in southern Tehachapi. This east-west facility that provides relief to the State Route 202 corridor by "catching" trips that are traveling to/from the Cummings Valley/State Route 58 sub-areas. This facility currently serves residential and agricultural land uses.

Tucker Road is a four lane arterial that extends from Cheyenne Avenue in southern Tehachapi to Tehachapi Boulevard and a two lane collector between Tehachapi Boulevard and State Route 58. An interchange is located at State Route 58/Tucker Road. This roadway is the first major roadway travelers experience when entering Tehachapi. Tucker Road primarily serves commercial and retail type developments to the north and residences to the south in Tehachapi.

Curry Street is a two lane north-south street located in central Tehachapi. The limits of Curry Street are from Highline Road to Tehachapi Boulevard. Curry Street serves the downtown district to the north and a combination of commercial, residential, and institutional uses to the south.

Dennison Road is a two lane north-south roadway that is located in eastern Tehachapi. Within the city limits, Dennison Road extends from Highline Road to State Route 58. Industrial land uses are found along Dennison Road near State Route 58.

Steuber Road is also a two lane north-south road located in eastern Tehachapi. The limits of this roadway extend from Highline Road to State Route 58. In addition, industrial and agricultural properties utilize Steuber Road.

Tehachapi Willow Springs Road is a regional road that connects the City of Tehachapi with the communities of Willow Springs and Rosamond in southeastern Kern County. This two lane road acts as a cut-off alternative for locals who wish to avoid State Route 58 and State Route 14 to travel between these two regions. Wind mill farms and other agricultural uses are found adjacent to Tehachapi Willow Springs Road.

Cummings Valley Road, Banducci Road, Giraudo Road, and **Bear Valley Road** in the Cummings Valley and Bear Valley areas are two lane roads that serve local residents. These rural mountain roads eventually flow toward State Route 202 and Highline Road, where residents travel for local services and work day commuting.

EXISTING TRAFFIC VOLUMES

Based upon OMNI-MEANS' understanding of the project, the following 13 existing roadways were identified as critical roadways for this study.

- State Route 58
- State Route 202
- Cummings Valley Boulevard
- Highline Road
- Tucker Road
- Curry Street

- Dennison Road
- Steuber Road
- Tehachapi Willow Springs Road
- Cummings Valley Road
- Banducci Road
- Giraudo Road
- Bear Valley Road

LEVEL OF SERVICE METHODOLOGY

Traffic operations have been quantified through the determination of "Level of Service" (LOS). Level of Service is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection or roadway segment representing progressively worsening traffic conditions. Levels of Service were calculated for different intersection control types using the methods documented in the *Highway Capacity Manual-1985.* In order to determine the LOS, the average daily traffic (ADT) volume of the roadway is compared to the roadway type. The ADT thresholds are from the Florida Tables, which are based upon the HCM. The Florida Tables are Kern COG's currently adopted LOS methodology for roadway segments and utilized by the member agencies of Kern COG.

TABLE 1
LEVEL OF SERVICE THRESHOLD VOLUMES:

	Total Daily Vehicles in Both Directions (ADT)				
Roadway Type	**Level of Service A**	**Level of Service B**	**Level of Service C**	**Level of Service D**	**Level of Service E**
6-Lane Freeway	67,500	78,750	90,000	101,250	112,500
4-Lane Freeway	45,000	52,500	60,000	67,500	75,000
6-Lane Arterial	36,000	42,000	48,000	54,000	60,000
4-Lane Arterial	24,000	28,000	32,000	36,000	40,000
4-Lane Collector	18,000	21,000	24,000	27,000	30,000
2-Lane Collector with Enhanced Capacity (2E)	13,500	15,750	18,000	20,250	22,500
2-Lane Collector	9,000	10,500	12,000	13,500	15,000

Note: 1 Based on Florida DOT Tables (1985 Highway Capacity Manual). *ADT = Average Daily Traffic*

2. All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each Level of Service listed above may vary depending on a number of factors including curvature and grade, intersection or interchange spacing, percentage of trucks and other heavy vehicles, lane widths, signal timing, on-street parking, amount of cross traffic and pedestrians, driveway spacing, etc.

3. The capacities for the 2-lane collector with enhanced capacity (2E) were assumed to fall between the capacities of a 2-lane collector and a 4-lane collector.

The City of Tehachapi has designated LOS "C" as the minimum acceptable LOS standard on City facilities in general. However, upon City Council approval, LOS D at Peak periods may be found to be unacceptable LOS for street segments or intersections where residences are not directly impacted and improvements to meet the City standard would be prohibitively costly or disruptive. In this report, a peak-hour of LOS "C" is taken as the threshold for acceptable traffic operations at all study intersections.

Although Caltrans has not designated a LOS standard, Caltrans' *Guide for the Preparation of Traffic Impact Studies* (June 2001) indicates that when the LOS of a State highway facility falls below the LOS "C/D" cusp in rural areas and the LOS "D/E" cusp in the Urban Areas, any additional traffic may have a significant impact. When existing State highway facilities are operating at higher levels of service than noted above, 20-year forecasts or general plan build-out analysis for the facility should be considered to establish equitable project contributions to local development impact fee programs that address cumulative traffic impacts.

EXISTING CONDITIONS ANALYSIS

The existing roadway segment LOS results are presented in Table 2 and shown on Figure 2. Table 2 also shows the roadway segment and limits that were analyzed, the type of facility, and the annual average daily traffic (AADT).

TABLE 2
EXISTING ROADWAY SEGMENT LEVELS-OF-SERVICE

Roadway Segment	From	To	Type of Facility	Annual Average Daily Traffic Volume (AADT)	AADT - Based Level of Service
Bear Valley Road	Giraudo Road	Cumberland Road	2 Lane Collector	5,950	A
Water Canyon Road	County Park Road	Highline Road	2 Lane Collector	460	A
Tucker Road	Highline Road	Cummings Valley Boulevard	2 Lane Collector	3,150	A
Tucker Road	Tehachapi Boulevard	State Route 58	2 Lane Collector	9,500	A
Dennison Road	Highline Road	Cummings Valley Boulevard	2 Lane Collector	970	A
Steuber Road	Highline Road	Tehachapi Boulevard	2 Lane Collector	600	A
Tehachapi Willow Springs Road	Cameron Road	Highline Road	2 Lane Collector	3,600	A
Tehachapi Willow Springs Road	Highline Road	Tehachapi Boulevard	2 Lane Collector	1,800	A
Giraudo Road	Sasia Road	Pelliser Road	2 Lane Collector	500	A
Cummings Valley Road	State Route 202	State Route 202	2 Lane Collector	6,100	A
Banducci Road	Sasia Road	Pellisier Road	2 Lane Collector	2,650	A
Banducci Road	Pellisier Road	State Route 202	2 Lane Collector	2,950	A
Highline Road	Banducci Road	Tucker Road	2 Lane Collector	2,950	A
Highline Road	Tucker Road	Tehachapi Willow Springs Road	2 Lane Collector	2,650	A
Tehachapi Boulevard	State Route 58	Tehachapi Willow Springs Road	2 Lane Collector	3,900	A
Tehachapi Boulevard	Tehachapi Willow Springs Road	Sand Canyon Road	2 lane collector	960	A
State Route 202	California Correctional Inst.	Cummings Valley Road	2 Lane Collector	2,300	A
State Route 202	Cummings Valley Road	Old Town Road	2 Lane Collector	7,600	A
State Route 202	Old Town Road	Woodford Road	2 Lane Collector	7,400	A
State Route 202	Woodford Road	Tucker Road	2 Lane Collector (2E)	20,000	D
State Route 202	Cummings Valley Boulevard	Tehachapi Boulevard	4 Lane Collector	10,000	A
State Route 202	Tehachapi Boulevard	State Route 58	2 Lane Collector	8,800	A
State Route 58	Woodford Tehachapi Road	State Route 202	4 Lane Freeway	20,700	A
State Route 58	State Route 202	Mill Street	4 Lane Freeway	20,900	A
State Route 58	Mill Street	Summit	4 Lane Freeway	19,500	A
State Route 58	Summit	Sand Canyon	4 Lane Freeway	18,900	A

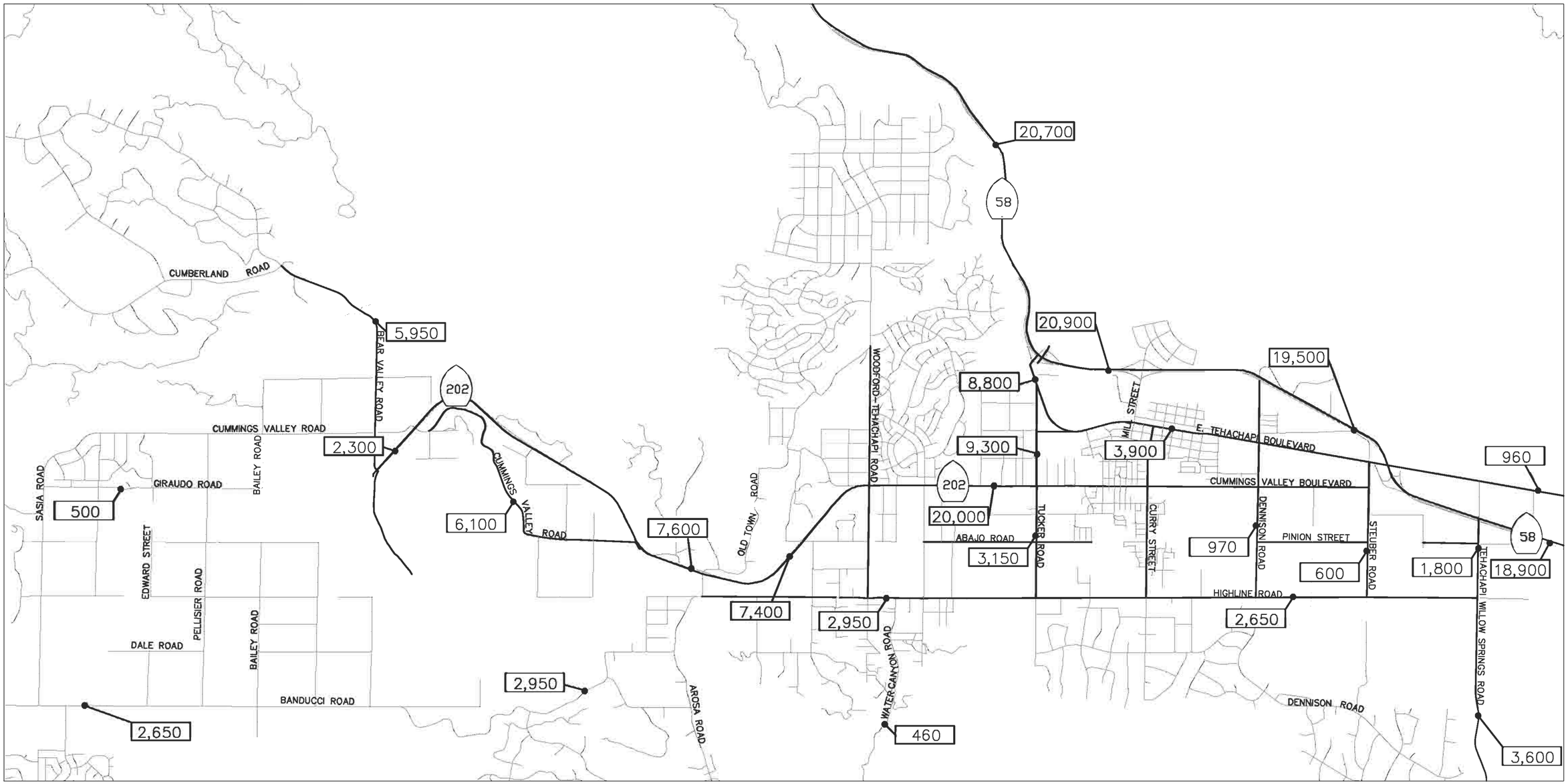

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Figure 2

Existing Average Daily Traffic Volumes

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As shown in Table 2, all of the roadway segments are currently operating at LOS “C” conditions or better on local roads and LOS “D” or better on state highways under the “Existing” conditions scenario.

YEAR 2030 CONDITIONS ANALYSIS

Roadway operations were also quantified under "Year 2030" conditions. Year 2030 daily traffic forecasts were provided by Kern COG, which uses *Viper/TP+* software. The travel forecasts are based upon the latest 2030 planning assumptions from the General Plans of Kern County and City of Tehachapi. Figure 3 illustrates the "Year 2030" average daily traffic volume forecasts within the Greater Tehachapi Area. Because only collectors, arterials, and freeways are shown in the model, the roadways selected for the following analysis may differ from those shown previously in Table 2. Also, due to the fact that not all roadways are represented in the Kern COG regional transportation demand forecast model, OMNI-MEANS opted to conduct a corridor screen line analysis as described below.

CORRIDOR SCREEN LINE ANALYSIS

In order to determine if adequate capacity will exist in the Greater Tehachapi Area in the Year 2030, OMNI-MEANS conducted a Year 2030 corridor screen line analysis. A screen line analysis uses the forecasted traffic volumes and compares them to the planned roadway capacity at a screen line location on selected routes within a corridor. Typically, this is done on east-west and north-south collectors and/or arterials. The selected roadways should generally be in the same geographical location. For instance, OMNI-MEANS conducted corridor screen line analysis on east-west and north-south roads at several locations. Traffic forecasts were obtained across a screen line within a corridor that shares a common location and compares the traffic forecasts to the collective available capacity of each roadway within the corridor.

Based upon roadway capacities identified in Table 1, a daily roadway capacity of 12,000 was used for a two-lane collector and a daily roadway capacity of 24,000 was used for four-lane collectors/arterials. The results of the Year 2030 Screen Line Analysis are presented in Table 3 for north-south streets and in Table 4 for east-west streets.

TABLE 3
CITY OF TEHACHAPI SCREENLINE ANALYSIS

North-South Screenline Analysis	1998 Kern COG Model LOS "C" Capacity			2030 Kern COG Model LOS "C" Capacity		
A-A North of Tehachapi Boulevard	**# Lanes**	**Volume**	**Capacity**	**# Lanes**	**Volume**	**Capacity**
Tucker Road (State Route 202)	2	2,890	12,000	2	20,240	12,000
Mill Street	2	40	12,000	2	730	12,000
Dennison Road	2	110	12,000	2	2,140	12,000
Total	**8**	**3,040**	**36,000**	**8**	**23,110**	**36,000**
B-B South of Tehachapi Boulevard						
Red Apple Avenue	N/A	N/A	N/A	2	1,210	12,000
Tucker Road (State Route 202)	4	3,390	24,000	4	18,140	24,000
Curry Street	2	4,590	12,000	2	4,500	12,000
Dennison Road	2	3,870	12,000	2	6,990	12,000
Steuber Road	2	60	12,000	2	4,270	12,000
Total	**12**	**13,170**	**72,000**	**14**	**35,110**	**84,000**
C-C South of Cummings Valley Road						
Tucker Road (State Route 202)	2	1,570	24,000	2	3,780	24,000
Curry Street	2	630	12,000	2	1,150	12,000
Dennison Road	2	1,040	12,000	2	2,550	12,000
Steuber Road	2	60	12,000	2	3,110	12,000
Total	**8**	**3,300**	**60,000**	**8**	**10,590**	**60,000**
D-D South of Highline Road						
Dennison Road	N/A	N/A	N/A	2	1,360	12,000
Total	**0**	**0**	**0**	**2**	**1,360**	**12,000**
E-E North of Highline Road						
Tehachapi-Willow Springs Road	2	1,040	12,000	2	15,900	12,000
Total	**2**	**1,040**	**12,000**	**2**	**15,900**	**12,000**
Screenline Total		**20,550**	**180,000**		**86,070**	**204,000**

As shown in Table 3 and identified on Figure 3, two north-south corridors (A-A and E-E) are projected to experience traffic volumes in excess of existing and planned roadway capacities. Tucker Road (State Route 202) north of Tehachapi Boulevard and Tehachapi-Willow Springs Road north of Highline Road (E-E) are forecasted to have greater traffic volumes beyond Level of Service 'C' roadway capacities in Year 2030. Without additional planned improvements to this roadway or within its corridor, the level of service could drop below acceptable levels.

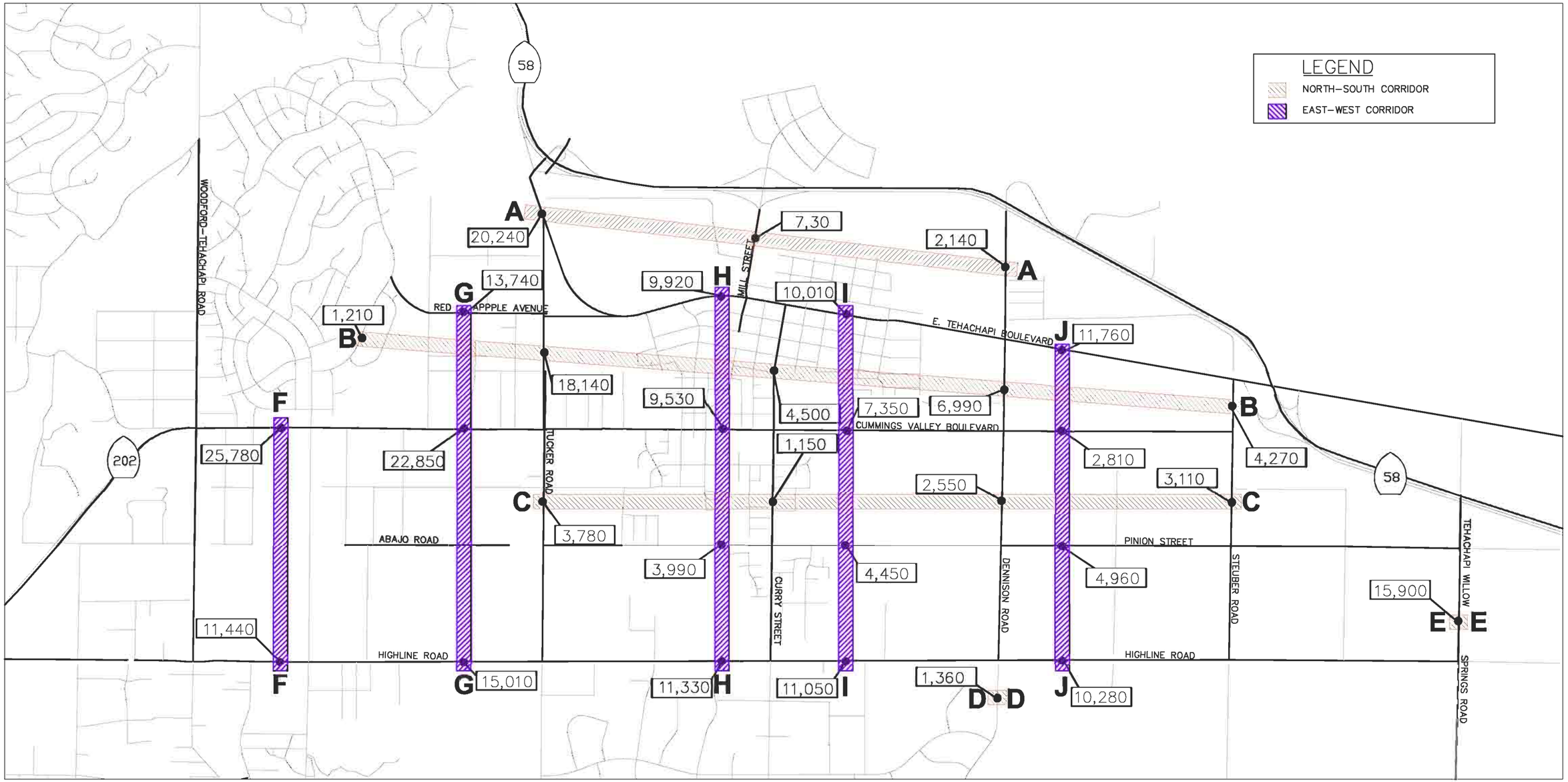

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Figure 3

Year 2030 Screenline Projected Volumes

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TABLE 4
CITY OF TEHACHAPI SCREENLINE ANALYSIS

East-West Screenline Analysis	1998 Kern COG Model LOS "C" Capacity			2030 Kern COG Model LOS "C" Capacity		
F-F West of Red Apple Avenue	**# Lanes**	**Volume**	**Capacity**	**# Lanes**	**Volume**	**Capacity**
State Route 202/Cummings Valley Road	2E	11,800	18,000	4	25,780	18,000
Highline Road	2	4,920	12,000	2	11,440	12,000
Total	**6**	**16,720**	**30,000**	**6**	**37,220**	**30,000**
G-G West of Tucker Road (State Route 202)						
Red Apple Avenue	N/A	N/A	N/A	2	13,740	12,000
State Route 202/Cummings Valley Road	2E	15,270	18,000	3	22,850	18,000
Highline Road	2	5,960	12,000	2	15,010	12,000
Total	**4**	**21,230**	**30,000**	**6**	**51,600**	**42,000**
H-H West of Curry Street						
Tehachapi Boulevard	4	2,530	24,000	4	9,920	24,000
State Route 202/Cummings Valley Road	2	8,090	12,000	2	9,530	12,000
Pinon Street/Abaj Avenue Corridor	N/A	N/A	N/A	2	3,990	12,000
Highline Road	2	5,540	12,000	2	11,330	12,000
Total	**8**	**16,160**	**48,000**	**10**	**34,770**	**60,000**
I-I East of Curry Street						
Tehachapi Boulevard	4	3,640	24,000	4	10,010	24,000
State Route 202/Cummings Valley Road	2	4,570	12,000	2	7,350	12,000
Pinon Street/Abaj Avenue Corridor	N/A	N/A	N/A	2	4,450	12,000
Highline Road	2	5,490	12,000	2	11,050	12,000
Total	**8**	**13,700**	**48,000**	**10**	**32,860**	**60,000**
J-J East of Dennison Road						
Tehachapi Boulevard	2	6,490	12,000	2	11,760	12,000
Cummings Valley Boulevard	N/A	N/A	N/A	2	2,810	12,000
Pinon Street/Abaj Avenue Corridor	N/A	N/A	N/A	2	4,960	12,000
Highline Road	2	5,580	12,000	2	10,280	12,000
Total	**6**	**12,070**	**24,000**	**10**	**13,994**	**48,000**
Screenline Totals		**79,880**	**180,000**		**186,260**	**240,000**

As shown in Table 4, additional volume to capacity deficiencies are also forecasted in the east-west corridors (F-F and G-G) within the Greater Tehachapi Area as well. Most notably are forecasted deficiencies that are projected on east-west roadways west of Tucker Road (State Route 202) (G-G). These include Red Apple Avenue, State Route 202 (Cummings Valley Boulevard), and Highline Road. The Year 2030 forecasted traffic volumes across this screen line is over 51,600 ADT, well beyond the available capacity of 42,000 ADT. Therefore, based upon the Year 2030 forecasted traffic volumes, additional capacity on east-west streets is recommended.

East west facilities, including State Route 202 (Cummings Valley Road) and Highline Road, are forecasted to have capacity constraints. These two-lane facilities are forecasted to have approximately 22,850 and 15,010 daily trips, respectively. Therefore, based upon the Year 2030 traffic model forecast, an additional four lanes should be constructed on east-west routes west of State Route 202 (Tucker Road) in order to have these facilities operate at acceptable levels of service.

Currently, Kern COG, California City, the City of Tehachapi, and Kern County are in the process of preparing the *Southeast Kern County Regional Fee Nexus Study* which proposes a regional fee that would raise funds to widen portions of State Route 202 between Woodford-Tehachapi Road and Tucker Road; State Route 202 between Tehachapi Boulevard and State Route 58; and Tehachapi-Willow Springs Road within the Greater Tehachapi Area. As of this publication, no fees have been levied for these or other transportation improvements in Southeast Kern County.

FUTURE INTERSECTION IMPROVEMENTS

Although this study did not address individual intersection operations, the City of Tehachapi has conducted an evaluation of intersections and has made projections as to when existing stop-controlled intersections would warrant signalization. Table 5 identifies six intersections to be signalized by 2010; four additional intersections to be signalized by Year 2015; and 10 additional intersections to be signalized by Year 2020.

TABLE 5
FUTURE INTERSECTIONS TO BE SIGNALIZED

Year 2010	Year 2015	Year 2020
Tehachapi Boulevard/Mt. View Avenue	Tehachapi Boulevard/Hays Street	Tehachapi Boulevard/Dennison Road
Tehachapi Boulevard/Mill Street	Tehachapi Boulevard/Snyder Street	Tehachapi Boulevard/Tehachapi-Willow Springs Road
Tehachapi Boulevard/Greene Street	Valley Boulevard/Pinos Street	Tehachapi Boulevard/Dennison Road
Tehachapi Boulevard/Curry Street	Valley Boulevard/Dennison Road	Tucker Road/Highline Road
Valley Boulevard/Mt. View Avenue		Valley Boulevard/Stuber Road
Valley Boulevard/Mill Street		Valley Boulevard/Snyder Street
		Highline Road/Curry Street
		Highline Road/Dennison Road
		Highline Road/Stuber Road
		Highline Road/Tehachapi-Willow Springs Road

As shown in the table, many of these future signals are at intersections on Tehachapi Boulevard, Valley Boulevard, and Highline Road. It is recommended that these intersections be monitored to determine if appropriate traffic signal warrants are met prior to installation.

OTHER LOCAL IMPROVEMENTS

In addition to future transportation improvements identified on Tehachapi-Willow Springs Road, State Route 202, Highline Road, and the aforementioned intersections, the City of Tehachapi has indicated a need for the following transportation-related improvements:

- Add two additional travel lanes on the recently constructed Tucker Road (State Route 202) Bridge, which is also known as the Tehachapi Creek Bridge (submitted for consideration in the *Southeast Kern County Regional Fee Nexus Study*).
- Widen the intersections of Highline Road with the following four urban arterial streets that intersect with Highline Road: Tucker Road, Curry Street, Dennison Road, and Stueber Road. The intersection widening is intended to accommodate an eastbound turn lane, westbound acceleration lane, and a westbound deceleration lane. The City of Tehachapi estimates that these intersection widening projects would cost $1,270,000.
- Widen Tehachapi Boulevard to a four-lane facility from Hayes Street easterly to Dennison Road.
- Widen Valley Boulevard to a four-lane facility from Curry Street easterly to the intersection of Tucker Road.

Although no funding sources are identified for localized transportation improvement projects, the City of Tehachapi will likely fund future intersection and roadway improvements utilizing several funding sources including, but not limited to, state and local transportation funds, developer impact fees, potential grants, etc.