CAMBRIDGE SYSTEMATICS

The San Joaquin Valley Goods Movement Sustainable Implementation Plan

prepared for

San Joaquin Council of Governments

prepared by

Cambridge Systematics, Inc.

June 30, 2017

www.camsys.com

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date

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1.0 Introduction

The San Joaquin Valley (SJV) has long been acknowledged as one of the critical freight transportation and goods movement centers in California. The SJV economy relies on an efficient and well-functioning goods movement system. The San Joaquin Valley Interregional Goods Movement Plan (SJVIGMP), released in 2013, showed that goods movement dependent industries (including agriculture, food processing, construction, energy production, and transportation and logistics) accounted for more than 564,000 jobs and $56 billion in economic output in 2010. More than 463 million tons of goods were moved into, out of, and within the SJV in 2007 and this was expected to grow to over 800 million tons by 2040. While agriculture and food products will continue to play an important role in this growth, the SJV also is becoming a major distribution and logistics center with expanding numbers of megadistribution centers and even new manufacturing facilities, as businesses seek to reshore jobs that had been going overseas. All of this growth will contribute to needs for improved goods movement systems in the SJV and innovative approaches will be necessary to meet this demand.

The SJVGMIP identified a number of key issues that face the Valley. Several of these led to follow-up work in this study, the San Joaquin Valley Goods Movement Sustainable Implementation Plan (SIP):

- **Growth in population and industry activity leading to growth in congestion, bottlenecks, and safety issues on key corridors –** While the two most significant goods movement corridors in the SJV are I-5 and SR99, there are other rural highways that serve important roles for east-west connectivity and provide farm-to-market and farm-to-processor connectivity. Many of these highways are among the State's most important rural corridors. The 2015 Federal Fixing America's Surface Transportation (FAST) Act requires state departments of transportation to designate priority rural corridors as part of the National Highway Freight Network.

- **The need to maintain and improve connections to international markets –** Agricultural exports are critical and growing. There is very limited trade infrastructure in the Valley so connections to ports and airports are important. Again the Priority Rural Corridors that are evaluated in the SIP may address this need.

- **The need to improve and maintain East-West (E-W) Corridors and Last-Mile facilities –** Many of the east-west corridors along state highways are outdated and not keeping up with growing volumes. Much of the region's traffic is intraregional and these east-west routes need to be designated as priority rural corridors. Last-mile connectors are often referred to as the orphan of the goods movement system. These are often city streets or county roads that connect directly to intermodal and rail facilities, major industrial parks, and warehouse and distribution center concentrations. Because they have so much truck traffic, these connectors tend to be undermaintained, capacity constrained or unsafe. Local governments generally do not have the resources to address these concerns and they are not supported by major state or Federal programs. The Federal Highway Administration (FHWA) recently released the condition and performance report on the National Highway System (NHS) intermodal connectors, and is examining questions such as – how should the critical connectors be designated, what are the most critical aspects of condition and performance that should be examined, what type of data and tools are available, and this all feeds questions about future funding. Many of these questions are addressed for first and last-mile connectors in this SIP.

- **The need to build a transportation system to support economic development –** Key industry sectors and growth opportunities were identified and transportation investments that support these industries were prioritized. These priority investments further emphasize the need to identify a comprehensive truck route system, including last-mile connectors, rural priority corridors, and intercity truck routes that connect to and serve the needs of key industries and clusters of economic activity.

- **Truck parking shortages –** Changes in truck driver hours of service (HOS) regulations have increased the need for truck parking throughout the SJV as well as the need for real-time information about parking availability.

- **Need for improved analysis tools and performance measures –** Federal transportation legislation emphasizes that freight planning should be supported by robust performance measures. The SJV has an interregional truck model but it needs to be updated, it needs a long-term maintenance plan, and staff need training in how to use the model.

2.0 Purpose and Scope of the Study

2.1 Objectives of the study

The purpose of this study was to build on the work conducted in the San Joaquin Valley (SJV) Interregional Goods Movement Plan (SJVIGMP), and take the next steps to address issues raised in the SJVIGMP. This was accomplished by designating priority first and last-mile goods movement connectors and identifying any needed improvements to the connectors; identifying truck route and parking needs and strategies; identifying priority rural corridors; developing a framework for improving and maintaining the Valleywide truck model; and coordinating all of these efforts with the Valley Regional Transportation Planning Agencies' (RTPA) Sustainable Communities Strategies (SCS) and other planning efforts at the local, state, and Federal level.

This study tackled several of the issues identified in the SJVIGMP, including:

- Identifying high-priority, first- and last-mile connectors that emphasize improved connectivity to critical economic sectors. The study also identifies connector needs and recommends a plan of improvements and an approach to funding.

- Identifying areas of concern related to truck routing and parking and identifying truck route and parking needs and proposing policies, guidelines, and improvements to ensure truck routes are well planned, provide access and maintain continuity across jurisdictional lines. The study examined parking needs and shortages and proposes options for improving information about legal parking, encouraging the development and expansion of private truck stops and parking facilities, and identifying locations for new state or public parking facilities.

- Identifying rural and connecting urban priority corridors. This information will support the process by which the State will designate critical rural and urban corridors and inclusion their inclusion in the National Priority Freight Network as required by the FAST Act.

- Recommending improvements to the SJV goods movement model and a process to ensure that it is kept up to date with the best available data inputs and freight modeling best practices. To this end, the study developed a concept for institutionalizing freight modeling to support freight planning in the Valley so that goods movement considerations become part of the core analytical capabilities in each of the Valley Council of Governments (COG). The revised model and supporting data can then be used to generate performance measures that are consistent with Federal and state guidance and that are linked to the SJVIGMP Vision and Goals.

2.2 Key Tasks

- **Task 1** focused on the issue of first and last-mile connectors. We started by identifying all of the major clusters of goods movement facilities, industrial parks and manufacturing centers, and warehouse and distribution facilities. We incorporated the data identifying the location of these facilities that were collected and mapped in the SJVIGMP study. We also surveyed local stakeholders to identify the routes they think are the key connectors.

- **Task 2** focused on truck routing and parking needs. While it was impossible to inventory all of the truck route systems for every city and county in the Valley, we focused on high-priority intercity truck routes

that include the State highways and county roads and we assembled a map of these priority routes and how these relate to the STAA network. We also obtained land use maps and examined how the existing routing provides connectivity to major goods movement centers and issues of continuity across jurisdictions. We provided recommendations about changes to the truck route system and physical and operational improvements to make the system function more effectively. The SJVIGMP already includes some information about the locations of public rest areas and private truck stops. We expanded upon this to get a more complete inventory of the major truck parking facilities in the region. Ultimately, we identify where there are high levels of truck activity and limited parking, and we made recommendations for both public and private investments in truck parking and public policies that can encourage private investment.

- **Task 3** focused on designation of priority rural freight corridors. This task identified and updated information on California's priority network and key rural corridors as identified in the SJVIGMP, and then established criteria for designating priority rural corridors in the region. This Task and the routes identified are part of the overall system of roads important to the movement of goods as identified in Task 1 (Connectors) and Task 2 (Truck Routes).

- **Task 4** reviewed the Valleywide truck model to recommend improvements, methods to ensure integration with other freight data and modeling efforts that are ongoing in the State, and methods to ensure that the model can support performance measures and analysis.

- **Task 5** involved integrating the implementation of the SJVIGMP recommendations with implementation of the Regional Transportation Plan (RTP) Sustainable Communities Strategy (SCS) plans. We identified how the goods movement programs can be aligned with, and supportive of, the SCS goals and mandates.

3.0 Truck Routes

3.1 Truck Route Types

The study looked at the complete roadway network to best address goods movement in the Valley. This included highways (I-5 and SR 99), rural and urban corridors (critical for connections to and from the major roadway system), and connectors (providing key first and last-mile connectivity to businesses).

3.2 Freight Cluster Identification

One of the first steps in identifying critical truck routes (i.e., first- and last-mile connectors, priority rural corridors, and other intercity truck routes) was identifying land uses that drive the movement of freight. Nearly all businesses require freight in some capacity to operate, from shipments of machinery to a manufacturing facility to parcel and package services for a law firm. However, some businesses rely on shipments of goods on a daily basis in order to carry out core business functions. These typically fall in one of eight North American Industry Classification System (NAICS) Categories:[1]

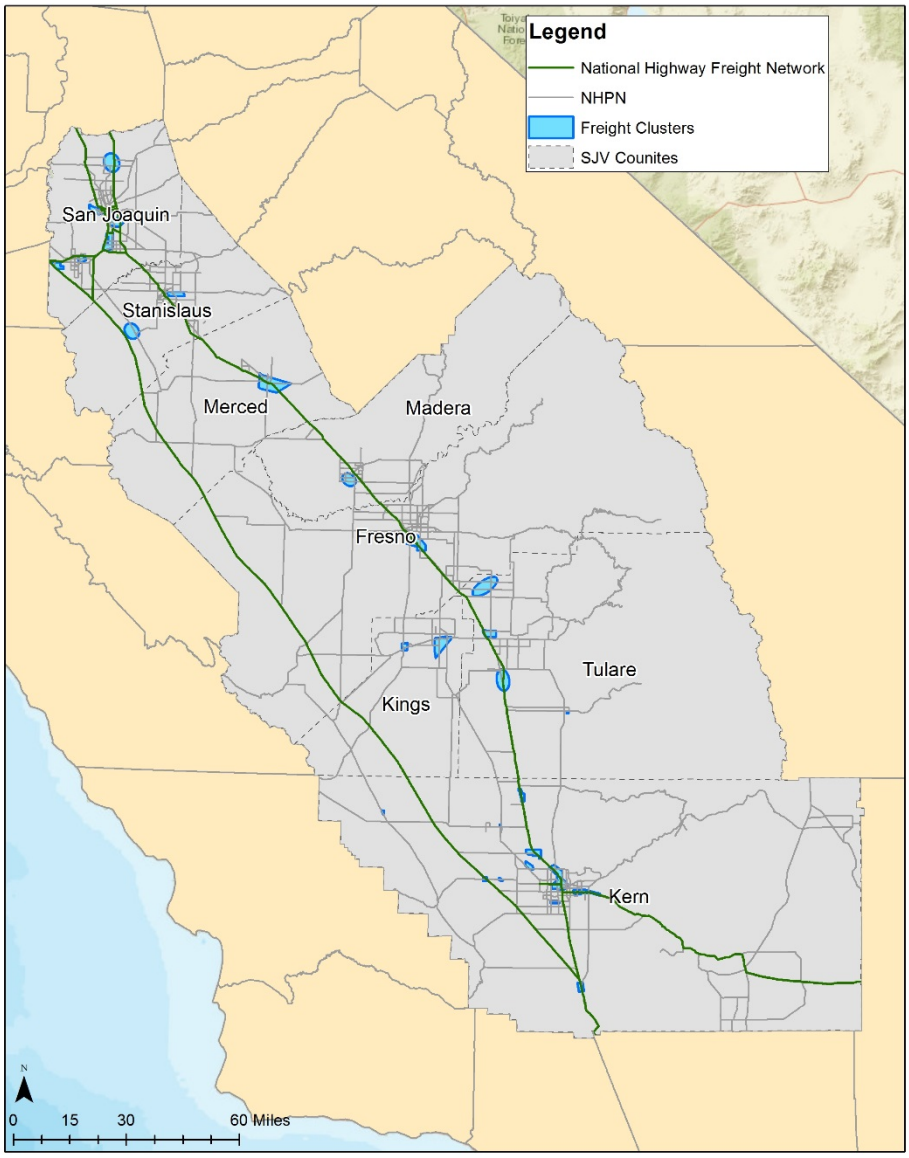
- 11: Agriculture, Forestry, Fishing and Hunting;
- 21: Mining, Quarrying, and Oil and Gas Extraction;
- 22: Utilities;
- 23: Construction;
- 31-33: Manufacturing;
- 42: Wholesale Trade;
- 44-45: Retail Trade; and
- 49: Transportation and Warehousing.

Goods movement clusters compiled and mapped as part of the SJV Interregional Goods Movement Plan (SJVIGMP), along with additional clusters identified by stakeholders as part of this study, are shown in Figure 3.1 below.

The locations of these clusters and the individual businesses within them provided a first cut at freight reliant businesses. As noted above, additional clusters and major freight activity centers were added to this initial set of clusters based on feedback from the study's Technical Advisory Committee (TAC). In keeping with one of the findings of the SJVIGMP, all of the work to identify key truck routes started with understanding the network of roadways needed to link these centers of goods movement activity to customers and suppliers. Additional detail on how these clusters were identified and how they were used to identify critical truck routes is described in the following sections of this report.

[1] http://www.census.gov/eos/www/naics/.

Figure 3.1 SJV Freight Clusters



Note: The size of the polygons on the map does not represent the intensity of the freight activities. In some regions the freight industries were more spread out so the cluster shows a larger area (like the one in kings county). in some regions the clusters are more dense (like the areas in Kern county)

3.3 First and Last-Mile Connector Identification

The role of first- and last-mile connectors is to provide critical connections to centers of freight activity. So the first step in identifying connectors is to identify these centers of freight activity. These could be individual facilities, like an intermodal terminal or a port; or they could be clusters of facilities, like an industrial park or an area with multiple distribution facilities. As a starting point for identifying freight activity centers in this study, the project team used all of the major clusters of goods movement facilities, industrial parks

What is a connector?
Roadway that connects a major truck route to/within a vicinity of freight activity centers in the region.

What is NOT a connector?
Primary highways
Primary through-routes

and manufacturing centers, and warehouse and distribution facilities identified in the concurrent San Joaquin Valley I-5/SR 99 Goods Movement Study to identify roadways that connect to these freight activity centers. The clusters identified for the I-5/SR 99 study were developed based on information about major manufacturing, wholesale trade, intermodal and port terminals, and other freight facilities, which was compiled during the 2013 San Joaquin Valley Interregional Goods Movement Plan. The roadways connecting to these clusters were the initial list of connectors. Subsequently, this initial list of connectors was supplemented with feedback from the TAC. This feedback included identification of additional major freight activity centers around the Valley that were not accounted for in the I-5/SR 99 Study list of goods movement clusters, as well as recommendations of specific roadways as connectors.

The study also drew on recent analysis conducted by Cambridge Systematics, Inc. for the Federal Highway Administration (FHWA) and criteria used at the Federal level to identify the national system of intermodal connectors. The National Highway System (NHS) comprises five components: 1) Interstate Highways, 2) Other Principal Arterials, 3) Strategic Highway Network (STRAHNET), 4) Major Strategic Highway Network Connectors, and 5) Intermodal Connectors. NHS Connector Criteria were established in 1999, and are displayed in Table 3.1. These criteria identify the types of intermodal facilities for which connectors should be designated, as well as the level of truck activity that should be present on an NHS intermodal connector. Connector criteria for the San Joaquin Valley takes the process a step further and evaluates connectors and networks from a local and regional perspective. In addition, while NHS connectors are intermodal by definition, this study includes connectors to a broader array of freight activity centers, and does not specifically require intermodal or multimodal activities.

Table 3.1 FHWA NHS Intermodal Connector Criteria

Primary Criteria	
Airports	100 trucks per day in each direction on the principal connecting route; or 100,000 tons per year arriving or departing by highway mode.
Ports	Terminals that handle more than 50,000 20-foot equivalent units (TEU) per year, or other units measured that would convert to more than 100 trucks per day in each direction; or Bulk commodity terminals that handle more than 500,000 tons per year by highway or 100 trucks per day in each direction on the principal connecting route.
Rail	50,000 TEUs per year, or 100 trucks per day, in each direction on the principal connecting route, or other units measured that would convert to more than 100 trucks per day in each direction.
Pipelines	100 trucks per day in each direction on the principal connecting route.

Secondary Criteria
Intermodal terminals that handle more than 20 percent of freight volumes by mode within a state.
Intermodal terminals identified either in the Intermodal Management System or the state and metropolitan transportation plans as a major facility.
Significant investment in, or expansion of, an intermodal terminal.
Connecting routes targeted by the state, metropolitan planning organization (MPO), or others for investment to address an existing, or anticipated, deficiency as a result of increased traffic.

The Central Valley has a considerable number of roadways designated as connectors under NHS criteria, including nearly 20 intermodal and STRAHNET connectors. Figure 3.2 and Table 3.2 provide an overview of

NHS infrastructure in the region. One of the goals of the SIP is to complement this infrastructure, as well as add another level of detail to connectors that are important locally and regionally.

Figure 3.2 NHS System in the San Joaquin Valley

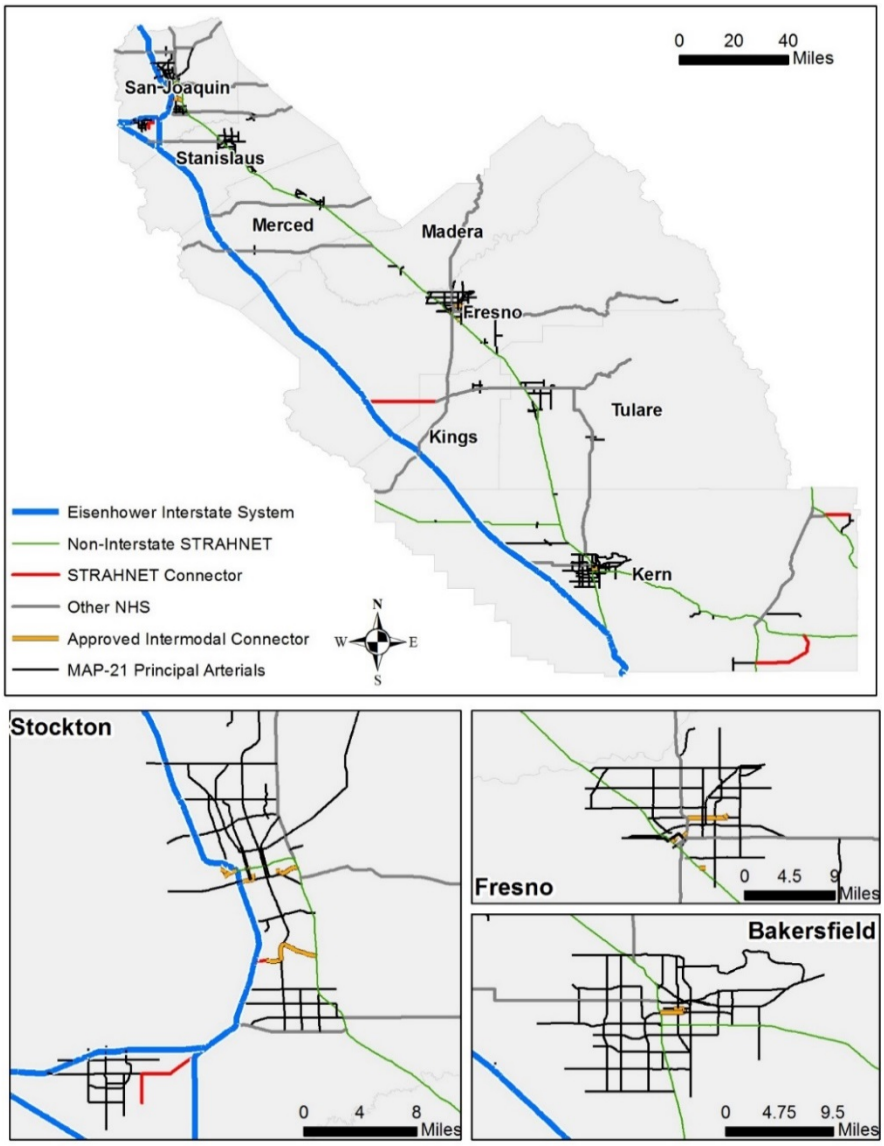


Table 3.2 San Joaquin Valley Federally Designated Connectors

Connector Description	Type	Mode	Connector ID
Anderson St (Facility to Diamond St), Diamond St (Anderson to Mariposa Road), Mariposa Road (Diamond St to Rte 99), Charter Wy (Diamond St to Rte 99)	NHS	Truck/Rail	CA67R
Broadway (Station to Fresno St), Fresno St (Broadway to Rt. 99)	STRAHNET	Freight/Passenger	MIL_CA32P2
CA 178 W to U.S. 395	STRAHNET	Freight/Passenger	MIL_CA32
CA 198 W to I-5	STRAHNET	Freight/Passenger	MIL_CA9P1
California Avenue (Rt. 99 to Q), Q St. (California to Truxtun), Truxtun Avenue (Q to Station)	NHS	AMTRAK Station	CA16S
Center St: Stockton Bus Terminal to Rte 4 (one-way street)	NHS	Intercity Bus Terminal	CA50B
Chrisman Road N to 11th St, 11 St E to I-5	STRAHNET	Freight/Passenger	MIL_CA28P2
Clinton Way (Airport to McKinley), McKinley Avenue (Clinton to Rt 41)	NHS	Airport	CA2A
E Roth Road (Lathrop Rlyd IFC Airport Wy to I-5), Airport Wy (E Roth Road to French Camp Road), French Camp Road (Airport Wy to Rte 99)	NHS	Truck/Rail Facility	CA63R
El Dorado St: Stockton Bus Terminal to Rte 4 (one-way street)	NHS	Intercity Bus Terminal	CA50B
Harbor St (Terminal to Fresno), Fresno Avenue (Harbor to Navy), Navy Drive (W Washington to Charter Way), Charter Way (Navy to I-5), @ Washington St (Navy to Fresno)	NHS	Port Terminal	CA41P
North Avenue(Facility to Rt.99)	NHS	Truck/Rail Facility	CA60R
Rosamond Blvd W to CA 14	STRAHNET	Freight/Passenger	MIL_CA25P2
Roth Road W to I-5	STRAHNET	Freight/Passenger	MIL_CA27P2
San Joaquin St (station to Lafeyette), Lafeyette St and Washington St (San J to Stanislaus)	NHS	Amtrak Station	CA77S
Served by connector to Bakersfield-Amtrak a distance of 1.2 miles along California Avenue (Rt. 99 to H), H St. (California to 18th), 18th St. (H to Station)	NHS	Intercity Bus Terminal	CA46B
Tulare St. (Station to Rt. 41)	NHS	Amtrak station	CA22S

Once critical freight clusters/goods movement activity centers were identified and intermodal connectors already designated as part of the NHS were identified, the following steps were taken to develop the expanded list of first- and last-mile connectors for the SJV:

1. Identified a preliminary list of connectors based on cluster and business establishment-level data in relation to highway accessibility. An excerpt of this exercise is shown in Figure 3.3. Using establishment-level data, the team identified cluster connectivity from specific industries to major highways. For example, trucks using the Amazon Distribution Facility (Row 8) in Tracy would likely use McArthur Drive to connect to Business 205, and eventually I-5. This exercise produced a list of potential local routes throughout the region that might serve as logical connectors between similar facilities and highways.

Figure 3.3 Preliminary Connector Identification
Excerpt

Name	City	COUNT	Address	Econor	EDA (o	Cluster	Key Local Routes	Connects to	Notes
Gap Distribution Center	Fresno	Fresno	3685 Gap Drive, Fresno, CA 9372	Economic Developme		Fresno	N Clovis Ave/E Airways Blvd	SR180	
Merry X-Ray Chemical Corp	Fresno	Fresno	5971 East Harvard Avenue, Fresn	Economic Developme		Fresno	N Fowler Ave	SR180	
Napa	Fresno	Fresno	56, Fresno, CA 93727	Economic Developme		Fresno	N Clovis Ave	SR180	
Ikea Wholesale Inc	Lebec	Kern	4104 Industrial Parkway Drive, Le	Kern EDC		Tejon	Laval Rd/Tejon Industrial Dr	I5	Collector routes for multiple DCs
Paramount Logistics Park near St	Shafter	Kern	4805 Centennial Plaza Way, Suit	Kern EDC		Shafter	7th Standard Road	SR99	
Tejon Ranch	Tejo Ranch	Kern	Tejon Ranch	Kern EDC		Tejon	Laval Rd/Tejon Industrial Dr	I5	Collector routes for multiple DCs
Amazon Fulfillment Centerr, Tracy	Tracy	San Joaqu	1555 N Chrisman Rd, Tracy, CA 95304	San Joaquin County E		Tracy	N McArther Dr	I205 to I5	
JC Penney Distribution Center, La	Lathrop	San Joaqu	700 D'Arcy Parkway, Lathrop, CA	San Joaquin County E		Lathrop	S Howland Rd/Harlan Road	Collector roads for industrial area to E. Louise Ave and I5	
Raley's Hbc Distribution Center, S	Stockton	San Joaqu	1919 Boeing Way, Stockton, CA 95206	San Joaquin County E		Stockton	S B St/Arch Airport Rd	SR99	
Safeway's Distribution Center, Tra	Tracy	San Joaqu	16900 W Schulte Rd, Tracy, Calif	San Joaquin County E		Tracy	W Schulte Rd	I580	
Super Store Industries, Lathrop D	Lathrop	San Joaqu	16888 McKinley Ave, Lathrop, CA	San Joaquin County E		Lathrop	McKinley Ave	E Louise Ave and I5	
The Home Depot - Import Distribu	Lathrop	San Joaqu	18300 S Harlan Rd, Lathrop, CA 95330	San Joaquin County E		Lathrop	S Howland Rd/Harlan Road	Collector roads for industrial area to E. Louise Ave and I5	
Toys R US Distribution Center, St	Stockton	San Joaqu	1624 Army Ct, Stockton, CA 95206	San Joaquin County E		Stockton	Army Ct	SR4	
Cvs Caremark Distribution Center	Patterson	Stanislaus	2400 Keystone Pacific Pkwy, Pat	Stanislaus County Ec		Patterson	Keystone Pacific Pkwy/Park Cen	Sperry Ave and I5	CVS, Amazon, Kohls DCs
WALMART DISTRIBUTION CTR	Porterville	Tulare	1300 S F ST PORTERVILLE, CA	Tulare County Econor		Poterville	Poplar Ave	S Jaye St/SR190	
BNSF-FRESNO-CA	FRESNO	Fresno	2599 Sunland Ave, Fresno, CA 93	Economic Developme		Fresno	E Jensen Ave (Bypass) - NHS Pr	SR 99	
BUDWAY ENTERPRISES, INC.-F	FRESNO	Fresno	221 Cardinal Ave, Stockton, CA 9	Economic Developme		Fresno	Cardinal Ave	SR26 to SR99	
FRESNO YOSEMITE INTERNATI	FRESNO	Fresno	5175 E Clinton Way, Fresno, CA	Economic Developme		Fresno	N Clovis Ave	SR 180	
J.B. HUNT-FRESNO-CA	FRESNO	Fresno	3210 S E Ave, Fresno, CA 93725	Economic Developme		Fresno	South East Ave/E North Ave	Connector between SR41	Further connection to SR99
USPS-P AND DC-P AND DF-FRE	FRESNO	Fresno	1900 E St, Fresno, CA 93706	Economic Developme		Fresno	E St	Fresno St (Intermodal Connector)	
BAKERSFIELD QUALITY DISTRI	Shafter	Kern	32535 7th Standard Rd, Bakersfie	Kern EDC		Shafter	7th Standard Road	SR 99, Meadows Field Air	Collector for District Blvd (many warehouses)
BNSF-BAKERSFIELD-CA	BAKERSFIEL	Kern	1501 F St, Bakersfield, CA 93301	Kern EDC		Bakersfield	H St.	SR 58, SR99	
FORDCO FOODS COMPANY, IN	BAKERSFIEL	Kern		Kern EDC		Bakersfield	South H St	SR 58, SR99	
RailEx	Delano	Kern	2121 S Browning Rd, Delano, CA	Kern EDC		none	S. Lexington St	Connects to Woolhomes Ave and SR99	
YELLOW-BAKERSFIELD-CA TE	BAKERSFIEL	Kern	4901 Lisa Marie Ct, Bakersfield, C	Kern EDC		Bakersfield	Stine Road	Connects to White Lane to SR99	
George Verhoeven Feed Co.	Hanford	Kings	301 E 6th St, Hanford, CA 93230	Kings County EDC		Hanford	W and E 5th St	S. Redington and S. Douty St. (to reach SR 198)	
Merced Regional Airport	MERCED	Merced	20 Macready Dr, Merced, CA 953	Merced County Econ		Merced	Thornton Rd	SR140 to SR99	
BNSF-STOCKTON-CA	STOCKTON	San Joaqu	720 S B St, Stockton, CA 95205	San Joaquin County E		Stockton	Diamond St.	Warehouse/Dist Centers to SR4	
CHEMICAL TRANSFER COMPA	STOCKTON	San Joaqu	1033 Stokes Ave, Stockton, CA 9	San Joaquin County E		Stockton	El Dorado St./South McKinley - N	Alternative N-S connection between SR4 and SR120 between I5 and SR99	
FAIRVIEW DISTRIBUTION CENT	STOCKTON	San Joaqu	4114 S Airport Way, Stockton, CA	San Joaquin County E		Stockton	(South) Airport Way - NHS Princi	Alternative N-S connection between SR4 and SR120 between I5 and SR99	
LATHROP TERMINAL	FRENCH CAM	San Joaqu	Roth Road, Lathrop CA	San Joaquin County E		Lathrop	Roth Road	Connection to I5	Navy Drive is a Priority "Last Mile" project from SJVIGMP
Nulaid Foods, Inc.	Ripon	San Joaqu	200 W Fifth St, Ripon, CA 95366	San Joaquin County E		none	S Stockton Ave	Main St to SR99	
PORT OF STOCKTON	STOCKTON	San Joaqu	2201 W Washington St, Stockton	San Joaquin County E		Stockton	McCloy Ave/Port of Stockton Exp	Internal collector roads and connection to SR 4 and I5	
YELLOW-TRACEY-CA TERMINA	TRACY	San Joaqu	1535 E Pescadero Ave, Tracy, CA	San Joaquin County E		Tracy	E. Pescadero Ave	Collector road, connection to I205	
additional road						Dinuba	S Elm Ave	N-S Collector to E. Jensen or E North Ave (to SR41 or SR99)	

2. **Circulated initial connector list to the TAC and other interested parties for review and input.** This critical local knowledge contributed to a substantial amount of clarifications in certain areas of the Central Valley. The project team used a survey, as well as direct input/comment for this step. Examples are shown in Figure 3.4 below. Direct input included county-specific identification of major trucking sources in addition to those in the initial freight cluster list (for example, those provided by Kern Council of Governments (COG)), as well as specific point and line comments regarding freight generation locations and roadway characteristics submitted through the team's on-line geographic information system (GIS) system.

Figure 3.4 Draft Connector Input

Detailed Feedback Survey

Local Connector Conditions

Please select the connector you're describing

KINGS - 11th Ave

If you'd like to include a connector not listed above, please describe here: *

No

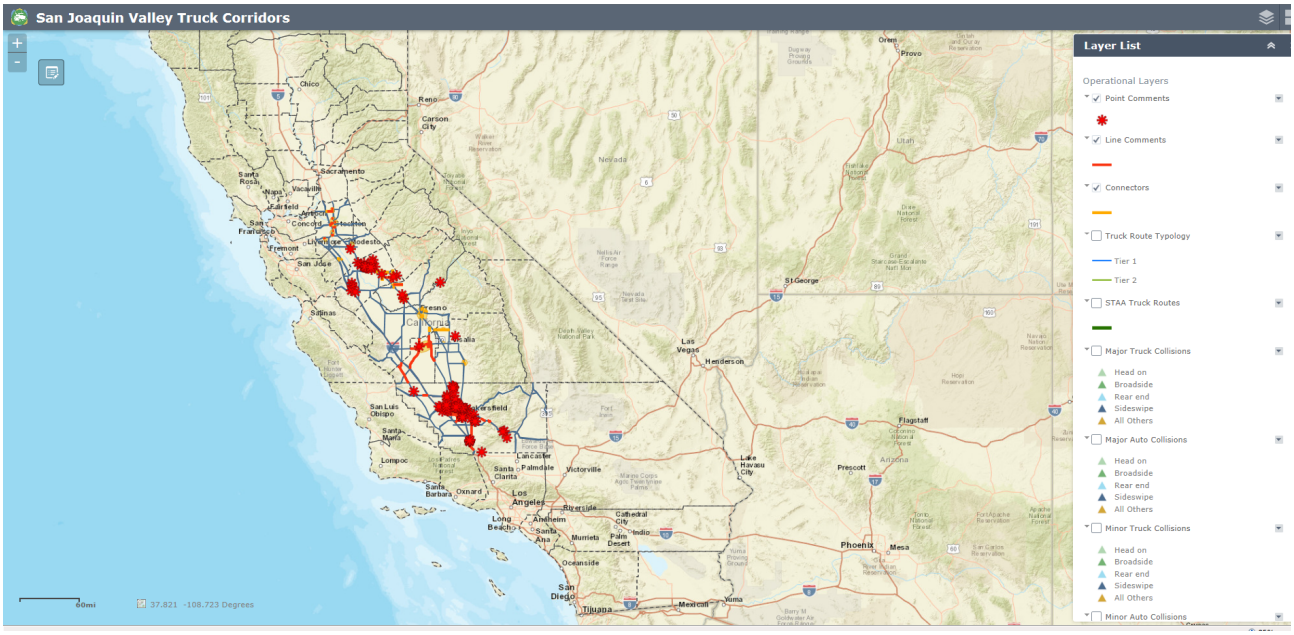
1. Traffic Conditions: Please describe the conditions for both freight and local traffic on the connector.

- Good: light traffic, no delay
- Fair: moderate traffic, short delays
- Poor: heavy traffic, long delays
- Other:

2. Road Conditions: Connector Pavement Condition.

- Good: well maintained, safe, and does not impede truck movements
- Fair: deteriorating, still safe, but restricts truck movements
- Poor: bad condition, potentially unsafe, and significantly impedes truck movements

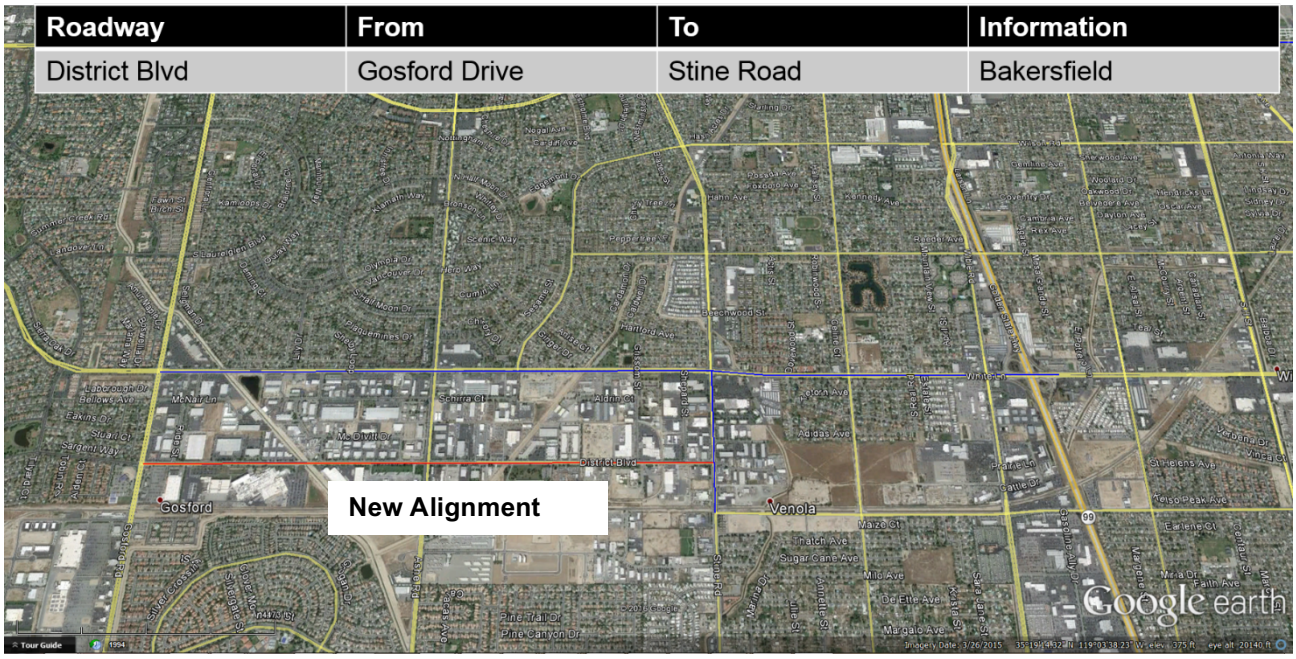
Interactive Web map



3. **Further refined connector list based on feedback and recommendations.** Much of this refinement included a desktop scan of the Valley using Google Earth to determine land uses that are likely freight activity centers and accessibility to these locations. This process helped to identify any likely freight activity centers/clusters that were not identified in Steps 1 and 2 and also helped with the location of the logical routing of trucks to and from these freight activity centers/clusters by looking at configuration and geography of the roadway network in the vicinity of the clusters. These revisions based on additional

cluster analysis were reviewed in a second round of feedback with the TAC, who made suggestions for more logical truck routing in cases where there may have been multiple routes that looked like candidate connectors to a cluster. This review process led to a number of additions and revisions to the initial list of connectors. An example of Kern County recommendations is shown in Figure 3.5 below. Note the red roadway was added based on Kern County feedback.

Figure 3.5 Example Connector Edit
Bakersfield



4. The final list of connectors is shown in Table 3.3.

Table 3.3 SJV Key Connectors

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Fresno County			
Fowler Avenue	Shields Avenue	CA 180	Manufacturing/Industrial Land
H St	Belmont Avenue	Calaveras St	Alt to SR 99 corridor, major freight generation
E Jensen Avenue/ E Jensen Avenue Bypass	CA 99	Willow Avenue	Major freight generation, intermodal/transload to PHFS
N Clovis Avenue	SR 168	McKinley Avenue	Major freight generation, intermodal (airport) to PHFS
North Avenue	Elm Avenue	Willow Avenue	Major freight generation, warehouse, logistics, etc.
S Railroad Avenue	S Van Ness Avenue	E Church Avenue	Serves warehouse and industrial land
Van Ness Avenue	Los Angeles St	Railroad Avenue	Major freight generation

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Kern County			
Brown Material Road	SR 33	SR 46	
Browning Road	Pond Road	Schuster Road	Major freight generation (multiple), intermodal (Railex, airport)
Cherry Avenue	7th Standard Road	Lerdo Highway	
China Grade Loop	Manor St	Round Mountain Road	Petroleum Production
Delano – Woollomes Avenue	Lexington Avenue	SR 99	
Di Giorgio Road	SR 184	Tejon Hwy	Access to agriculture (Grimmway, Kern Ridge, Heck Cellars)
District Blvd	Gosford Drive	Stine Road	Major freight generation (multiple, Nestle/Dryer)
Driver Road/Express Avenue	BNSF	Merced Avenue	Freight Container Yard (under construction), major freight generation, logistics warehouse center
Edison Highway	SR 184	Pvt Grade Crossing East of Malaga Road	Agriculture
F St (Wasco)	SR 46	Gromer Avenue	Access to major Ag processing facility (Sunny Gem)
Fruitvale Avenue	Hageman Road	end	Multiple freight generators
Holloway Road	SR 46	Twisselman Road	Petroleum Production
Lerdo Highway	SR 33	I-5	Petroleum Production
Lerdo Highway	Cherry Avenue	SR 65	Major freight generation (multiple, GAF) Access to ag, intermodal facility (rail-existing bulk and planned UP intermodal container facility, airport)
Lost Hills Road	SR 46	SR 33	Petroleum Production
Merle Haggard Drive	SR 99	Airport Drive	Major freight generation (multiple, Carquest DC, Camping World DC), Intermodal facility (airport, rail), energy (Valley Pacific, Haliburton)
Midway Road	SR 33	SR 119	
Mt Vernon Avenue	Virginia Avenue	Gateway Avenue	Major freight generation (warehouse and manufacturing)
Mountain View Road	S Fairfax Road	SR 184	Serves Grimmway Farms
Pegasus Drive	Merle Haggard Drive	Norris Road	Alt to SR 99, major freight generation (Pactiv, others), intermodal (rail, airport)
Pond Road	SR 99	Browning Road	Major freight generation (multiple), intermodal (Railex, airport)
Schuster Road	Browning Road	S. Lexington Avenue	Major freight generation (multiple), intermodal (Railex, airport)
S Wheeler Ridge Road	I-5	1st St	Major freight generation (caterpillar)
S Lexington Avenue	Schuster Road	Balboa Avenue	Major freight generation (multiple), intermodal (rail, airport)

Street Name	From	To	FAST Act Criteria Met (If Applicable)
S Zerker/Zerker Road	Lerdo Hwy	Zerko Extension	Major freight generation (GAF, Grimmway, Garlic Company)
Pepper Drive/Packing House Road	Edison Hwy	Edison Highway	Major freight generation
Snow Road/Norris Avenue	Fruitvale Avenue	Airport Drive	Major freight generation, intermodal (airport)
Oak Creek Road	Tehachapi Willow Springs Road	SR 58	Petroleum Production
Tehachapi Blvd	SR 58	Monolith	Major freight generation (cement)
Wasco Avenue/J St	Paso Avenue	Just north of SR 46	Energy (intermodal rail facility)
Panama Lane	Gosford Drive	SR 99	Major freight generation
Zachary Avenue	7th Standard Road	Burbank St	Major freight generation, logistics/warehouse center
7th Standard Road	Santa Fe Way	I-5	Serves multiple manufacturing/industrial clusters
7th Standard Road	Santa Fe Way	SR 99	Serves multiple manufacturing/industrial clusters
7th Standard Road/Merle Haggard Drive	Coffee Road	Beach	Petroleum Production
SR 14	Oak Creek Road	Tehachapi Willow Springs Road	
Stockdale Highway	Nord Road	Allen Road	Petroleum Production
Woollomes Avenue	SR 99	S Lexington	
Kings County			
11th Avenue	W Lacey Blvd	Jackson Avenue	Major freight generation
5th St	11th Avenue	10th Avenue	Major freight generation (Marquez Brothers), manufacturing/warehousing land use
E. Lacey Boulevard	10th Avenue	SR 43	Serves manufacturing, industrial land
9th Avenue	E. Lacey Blvd	E Hanford Armona Road	Westside Locker Plan, Central Valley Meat
10th Avenue	Jackson Avenue	Hanford Armona Road	Agriculture, some manufacturing
Fox Drive/Fox St	W Hanford Armona Road	W Bush St	Serves Leprino Foods
Bush St	Belle Haven Drive/Industrial Way	18th Avenue	Serves Leprino Foods
S. 19th Avenue	Jackson Avenue	SR 198	Olam – major freight generator
Idaho Avenue	SR 41	S 19th Avenue	Olam – major freight generator
W Industrial Way/Belle Haven Drive	SR 41	Leprino Foods	Serves Leprino Foods
Madera County			
Avenue 12	Road 23	CA 99	Major freight generation (Constellation wines/mission bell winery, Victor packing)

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Avenue 14/Howard Road/W Olive Road	Road 23	CA 99	Major freight generation
West Almond Avenue/S Pine St/W Olive Avenue	S Granada Drive	CA 99 Madera Avenue	Warehouse/industrial cluster
Airport Drive/Avenue 17	Aviation Drive	SR 99	Connection to airport and associated industry
S Pine St	Howard Road	Avenue 12	Multiple Freight generators, City truck route
N Gateway Drive	SR 145	W Cleveland Avenue	Connection between SR 145 and SR 99, limited freight generators
Merced County			
Healy Road	Doppler Road	Sandy Mush Road	Access to agriculture
Cooper Avenue	Ashby Road	CA 59	Manufacturing (Quad Graphics, Scholle, White Oak)
Volta/Ingomar/Husman	SR 33	SR 33	Two packaging facilities and agriculture
Ortigalita Road/Sunset Avenue	SR 152	Canyon Road	Vulcan Materials-quarrying
Meadow Drive/Shaffer Road	Jones Road	Oakdale Road	Serves Aggregate Mine-Oakdale Road also is on Corridor List
Shaffer Road	Oakdale Road	end of road	Serves Aggregate Mine-Oakdale Road also is on Corridor List
Collier Road	SR 99	end of road	Foster Feed Farm and agriculture-some transloading
River Road/Vinewood Avenue/B St	Winton Pkwy	Griffith Avenue	Gallo Winery, agriculture
Magnolia Avenue	Sultana Blvd	Robin Avenue	Multiple small businesses, freight, packaging
Westside Blvd	Robin Avenue	Gipson St	Garcia Farms and Dole
Applegate Road	SR 99	Atwater Jordan Road	Atwater Packing Company
Atwater-Merced Expressway	Santa Fe Drive	SR 99	Connection to airport, limited freight
Vassar Avenue/Henry St/E Mission Avenue	Healy Road	SR 99	Connection to Yosemite Wholesale Warehouse
White Rock Road/ Le Grand Road	S Santa Fe Avenue	Quarry	Connection to aggregate site
San Joaquin County			
Airport Way	SR 120	French Camp Road	Alt to SR 99/I5, intermodal connection, warehouse/logistics
Arch Airport Road/Arch Road	I-5	Mariposa Rail Yard	Intermodal facility (airport and rail), warehouse/industrial land
McCloy Avenue/Port of Stockton Expressway	CA 4	Navy Drive	Intermodal (port), industrial/warehouse/manufacturing
Spreckles Avenue	S Main St	E Yosemite Avenue	Manufacturing and Distribution companies

Street Name	From	To	FAST Act Criteria Met (If Applicable)
French Camp Road	SR 99	S Airport Way	Major freight generation, agricultural and forestry processing, access to intermodal (Air)
Hammer Lane	West Lane	CA 99	Major freight generation
Diamond St	E Charter Way	E Worth St	Diamond Foods, Stockton Tri Industries, Access to Stockton Intermodal
E Mariposa Way	E Charter Way	SR 99	Access to Stockton Intermodal
E Charter Way (Dr. Martin Luther King Jr. Blvd)	Diamond St	SR 99	Access to Stockton Intermodal
E Anderson Road	Facility	Diamond St	Access to Stockton Intermodal
Harbor St	Terminal	Fresno Avenue	Access to Port of Stockton
Fresno Avenue	Harbor St	Navy Drive	Access to Port of Stockton
Navy Drive	W Washington	Charter Way	Access to Port of Stockton
Charter Way	Navy Drive	I-5	Access to Port of Stockton
Washington St	Navy Drive	Fresno Avenue	Access to Port of Stockton
MacArthur Drive	I-205	I-205 Bus (W 11th St)	Major freight generation, logistics/warehouse, mining
Grant Line Road	MacArthur Dr	I-5	Major freight generation, logistics
Roth Road	I-5	S Airport Way	Intermodal (rail), freight generators, logistics/warehouses
Turner Road	Lower Sacramento Road	CA 99	Major freight generation
S. Stockton Road	E Lodi Avenue	E Century Blvd	Multiple manufacturing/industrial on west side of street, alt corridor to SR 99
S. Guild Avenue/N. Guild Avenue	Auto Center Road	Winemaster Way	Multiple manufacturing/industrial, alt corridor to SR 99
W Fremont	Carlton Avenue	N Center St	Multiple manufacturing industries
Guthmiller Road/W Yosemite Avenue	CA 120	Airport Way	Logistics, warehouses
D'Arcy Pkwy	Yosemite Avenue	Harlan Road	Serves multiple warehouses, logistics centers
Harlan Road	E Louise Avenue	end	Connector from interstate to multiple warehouse/distribution sites
Stanislaus County			
Faith Home Road, Garner Road, and Claus Road	SR 219	SR 108 (SR 99-SR 108)	Manufacturing/Industrial/Distribution
Crows Landing Road/Fink Road	SR 99	I-5	Warehouse/industrial land, major freight generation
Mitchell Road	SR 132	SR 99	Intermodal (airport), major freight generation, logistics/warehouses
Rogers Road	Zacharias Road	Sperry Avenue	3 major warehouses
Park Center Drive	Keystone Pacific Pkwy	Sperry Avenue	Amazon/CVS Warehouses/Logistics, Major freight generation

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Sperry Avenue	I-5	Baldwin Road	Amazon/CVS Warehouses/Logistics, Major Freight generation
Kansas Avenue/Needham St	N Carpenter Road	McHenrey Avenue (SR 108)	Retail and manufacturing along northern edge
Tulare County			
Avenue 416/E Mountain View Avenue	SR 99	Road 88	Access to agricultural, major freight generation (Best Buy Distribution)
S Blackstone St	E Bardsley Avenue	Industrial Avenue	Major freight generation, logistics/warehouse/manufacturing
E Bardsley Avenue	South I St	SR 99	Major freight generation, logistics/warehouse/manufacturing
E Paige Avenue	South K St	SR 99	Major freight generation, logistics/warehouse/manufacturing
Industrial Avenue (Future SR 99 IC)	South K St	S Blackstone St	Major freight generation, logistics/warehouse/manufacturing
K St	SR 99	E Owens Avenue	Major freight generation, logistics/warehouse/manufacturing
Road 80 (Plaza Drive)	W Airport Dr	W Riggin Avenue	Intermodal (airport), major freight generation, warehousing
W Goshen Avenue	SR 99	N Shirk St	Major freight generation, warehouse/logistics/industrial
Drive 68	Betty Dr	Pacific Supply (Bus)	Major freight generation (Conway, Pacific Supply)
Sierra Way (S Alta Avenue)	Road 72	Road 80	Best Buy Distribution Center, Ruiz Foods
Poplar Avenue/S Jaye St	End	SR 190	Major freight generation, Walmart DC
Avenue 368	SR 99	Road 132	Serves multiple large dairy farms, Ventura Coastal
Spruce Road/Road 204	SR 198	SR 137	Serves multiple agricultural processing, one chemical site
Road 152	SR 137	SR 190	Serves multiple large dairy farms
Terra Bella/Avenue 96/Avenue 95	SR 65	Road 236	Multiple Freight generators (agricultural and forestry)
Avenue 56	SR 99	SR 65	Serves trucking/agricultural facilities
Avenue 0/Reed Road/Avenue 8	SR 99	Richgrove Dr	Serves multiple agricultural and processing facilities

4.0 Priority Rural Corridor Identification

A second key component of the Valley's truck route network that, like first- and last-mile connectors, has been given relatively limited attention in prior freight studies is the system of priority rural corridors. For purposes of the SIP, *State and U.S. routes in rural areas* (defined as outside of U.S. Census designated Urbanized Areas) *form the backbone of the priority rural corridor system.* These routes are designed to move goods on a regional, state, and national level. Select county and local routes that provide vital redundancy and act as long-distance corridors between freight attractors/generators on the state and Interstate network also are included. Rural corridors provide a complement to the connectors, intercity, and STAA truck routes that also were identified in this study.

The designation of priority rural corridors took on a heightened importance with the passage the FAST Act in late 2015. The FAST Act authorizes states to designate Critical Rural Freight Corridors (CFRC) and Critical Urban Freight Corridors (CUFCs), subject to certain limitations on total mileage and consistent with criteria established by the Act. While the priority rural corridors identified in the SIP go beyond the CRFCs that Caltrans is designating in compliance with the FAST Act, the CRFCs can be thought of as a subset of the SIP's priority rural corridors. In the future, as the CRFCs are revised, Caltrans and the Valley transportation planning agencies can look to the priority rural corridors identified in the SIP as a resource for updating the CRFC list. In addition, since many of the priority rural corridors in the SJV also include segments that pass through urban areas, an effort was made in the SIP to identify those portions of the rural corridors that would also meet criteria for designation as CUFCs.

The FAST Act establishes criteria that a route must meet in order to be designated a Critical Urban Freight Corridor or Critical Rural Freight Corridor. Routes so designated join routes on the Primary Highway Freight System (PHFS) and any remaining Interstate portions to become the National Highway Freight Network (NHFN).[2] Projects on the NHFN, or that impact goods movement on these routes, are eligible to receive freight formula funding allocated to each state under the National Highway Freight Program (NHFP), and also qualifies the project to seek U.S. DOT's Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) Grant program funding.[3]

Caltrans is responsible for designating California's CUFC and CRFCs, but they will rely on regional input, and in the case of CUFC must consult with the MPOs. The discussion below pertains to the designation of CRFCs, as priority rural corridors are by definition found outside of Urbanized Areas. Due to the mileage cap, it is unlikely that many local routes will be chosen by the State as CRFCs, but the below discussion and identification of potential routes positions the region to advocate for such routes if they choose.

The FAST Act establishes criteria that a route must meet in order to be designated a Critical Rural Freight Corridor (CRFC). To qualify under this designation, the following conditions must be met. The route *cannot* be in an urbanized area AND must meet one or more of the following criteria:

[2] http://ops.fhwa.dot.gov/freight/infrastructure/nfn/index.htm.

[3] This is the same as the Nationally Significant Freight and Highway Projects (NSFHP) Program identified in the FAST Act legislation.

4.1 CRFC Conditions for Proposing Corridors and Facilities[4]

A. Be a rural principal arterial roadway with trucks equaling 25 percent or more of AADT (FHWA vehicle class 8 to 13).

B. Provides access to energy exploration, development, installation, or production areas.

C. Connect the Primary Highway Freight System (PHFS) or the Interstate system to facilities that handle: 1) 50,000 or more twenty-foot equivalent units (TEU) per year; 2) 500,000 tons bulk commodity per year; and 3) provide access to grain elevators, agricultural facility, mining facility, forestry facility or intermodal facility.

D. Provides access to a grain elevator, an agricultural facility, a mining facility, a forestry facility, or an intermodal facility.

E. Connects to an international port of entry.

F. Provides access to significant air, rail, water or other freight facility.

G. Is determined by the State to be vital to improving efficient movement of freight of importance to the State's economy.

4.2 CUFC for Proposing Conditions and Facilities

Corridors and facilities in urbanized areas 50,000 to 500,000 are proposed by the State DOT in consultation with the MPOs. MPOs with urbanized areas larger than 500,000 population can propose corridors and facilities to FHWA for urbanized areas directly, in consultation with the State DOT. Fresno and Bakersfield are the only two urbanized areas in the San Joaquin Valley with population greater than 500,000. Routes that are in urbanized areas must meet the following criteria:

H. Connects an intermodal facility to PHFS, the Interstate System, or an intermodal freight facility;

I. Located within a corridor or route on the PHFS and provides an alternative highway option important to goods movement;

J. Serves a major freight generator, logistic center, or manufacturing and warehouse industrial land; and

K. Corridor that is important to the movement of freight within the region as determined by the MPO or state.

A discussion of each of these criteria and maps showing routes where such criteria may be satisfied are shown in the sections below. California may designated up to 623.54 miles of roads as CRFCs and 311.77 miles of CUFC.[5] Table 4.1 presents the list of proposed priority rural corridors proposed in the SIP.

[4] See FHWA FAST Act CRFC/CUFC guidance: http://ops.fhwa.dot.gov/fastact/crfc/sec_1116_gdnce.htm.

[5] http://ops.fhwa.dot.gov/freight/infrastructure/nfn/maps/nhfn_mileage_states.htm.

Table 4.1 Priority Rural Corridors

Route	From	To	County	Potential CRFC?	Notes (FAST Act Criteria, AADT, Other)
SR 99	Entire Region		All	No-already on PHFN	G. ITSP/CFMP Corridor
SR 58	West edge of urbanized Bakersfield		SR 33 (Buttonwillow)	Kern	Yes (Section W of SR 99/Bakersfield)
SR 58 (new route Mohawk St-Westside Pkwy-Stockdale Hwy to I-5)	Westside Parkway (west edge of urbanized Bakersfield)	I-5 at Stockdale Hwy	Kern	Yes	Nonurban, non-PHFN section, New parallel freeway partially constructed to be designated SR 58 and rescind current route (I-5 to Mohawk St) in 2018. B. access to energy production area, C. improved linkage between I-40 and Port of Oakland via I-5/580, G. ITSP/CFMP corridor
SR 4	Contra Costa County	Calaveras County	San Joaquin	Yes	Nonurban, non-PHFN section
SR 14	L.A. County	U.S. 395	Kern	Yes	Nonurban, non-PHFN section, G. ITSP/CFMP Corridor
SR 33	I-5	SR 166	San Joaquin, Stanislaus, Merced, Fresno, Kings, Kern	Yes	A. Truck AADT, D. access to agriculture, B. energy, mining
SR 41	SR 99	San Luis Obispo border (SR 46)	Kings, Fresno, Kern	Yes	A. Truck AADT, G. ITSP Corridor
SR 43	SR 99	I-5	Fresno, Kings, Tulare, Kern	Yes	A. Truck AADT, B. energy, D. access to agriculture, mining, F. Shafter container yard and major freight distribution cluster
SR 46	SR 99	San Luis Obispo border (U.S. 101)	Kern	Yes	A. Truck AADT, B. access to energy/mining and D. agriculture, G. ITSP/CFMP Corridor
SR 65	SR 99	SR 190	Tulare	Yes	D. Access to agriculture and B. energy
SR 119	SR 33	SR 99	Kern	Yes	B. Energy production
SR 120	I-5	SR 108	San Joaquin, Stanislaus	Yes	Nonurban, non-PHFN section
SR 132	I-5	SR 99 or Toulumne border	San Joaquin, Stanislaus	Yes	A. Truck AADT, D. access to agriculture
SR 152	SR 99	Santa Clara border	Merced, Madera	Yes	A. Truck AADT, D. access to agriculture, G. ITSP corridor

Route	From	To	County	Potential CRFC?	Notes (FAST Act Criteria, AADT, Other)
SR 166	SR 99	San Louis Obispo Boarder (U.S. 101)	Kern	Yes	Alternate truck route for when the grapevine is shut down and connects to SR 33. D. agriculture access
SR 184	SR 223	SR 178	Kern	Yes	D. Access to agriculture
SR 198	SR 99	I-5	Tulare, Kings, Fresno	Yes	D. Access to agriculture
SR 223	I-5	SR 58	Kern	Yes	D. Access to agriculture
Houston/Caldwell Avenue	SR 43	SR 198	Tulare, Kings	Yes	D. Access to agriculture
W Main St/ E Las Palmas Avenue/Sperry Avenue	SR 99	I-5	Stanislaus	Yes	A. Truck AADT, F. Warehousing
W Nees Avenue/Avenue 7 1/2/Firebaugh Boulevard/Avenue 12	I-5	SR 99	Fresno, Madera	Yes	D. Access to agriculture
Santa Fe Avenue/Drive	SR 132	SR 59	Stanislaus, Merced	Yes	D. Access to agriculture
7th Standard Road	I-5	SR 65	Kern	Yes	B. Energy production area C. 50k+ TEUs per day, F. Shafter container yard and major freight distribution cluster
Tehachapi-Willow Springs Road/Oak Creek Road	SR 58	SR 14	Kern	Yes	B. Energy, D. Mining
Wheeler Ridge Road	I-5/Tejon Industrial Drive	SR 184/223	Kern	Yes	D. Agriculture, F. Warehousing

Many of the above rural corridors connect with urban corridors. Here is a listing of urban corridors Valley MPOs have identified in urbanized areas. Fresno and Kern have urbanized areas larger than 500k population and have lead in requesting FHWA to designate urban corridors in those areas. The State has the lead on designating urban corridors in urbanized areas between 50k and 500k population, in consultation with MPOs.

Table 4.2 Priority Urban Corridors

Route	From	To	County	Potential CUFC?	Notes (FAST Act Criteria, AADT, Other)
SR 99	Entire Region		All	No-already on PHFN	ITSP Corridor
SR 58 (Centennial Connector)	SR 99 at existing SR 58 freeway to freeway interchange	Westside Pkwy (west edge of urbanized Bakersfield)	Kern	Yes	I. route SR 58 on the PHFS provides an important highway option. K. important freight corridor as determined by the MPO. New parallel freeway under construction, scheduled to be complete in 2021 and to be designated SR 58. Mohawk St and Rosedale Hwy to SR 99 north to retain SR 58 route status.
SR 119	SR 99	I-5	Kern	Yes	J. serves major energy production area. K. important freight corridor determined by the MPO. STAA route.
SR 184	SR 178	SR 223	Kern	Yes	J. serves energy and ag, K. important freight corridor determined by the MPO. STAA route.
SR 204	SR 99	SR 58	Kern	Yes	I. portion of the route on the PHFS provides an important highway goods movement option. K. important freight corridor as determined by the MPO. STAA route.
7th Standard Road/Merle Haggard Drive	SR 65	Santa Fe Wy,	Kern	Yes	J. Serves a major freight generator (Shafter) K. important freight corridor as determined by the MPO.
North County Corridor	Tully Road	SR 120/108	Stanislaus	No	J. Serves a major freight generator (Planned) K. important freight corridor as determined by the MPO.

4.3 Other Intercity Truck Routes and STAA Routes[6]

In addition to connectors and priority rural corridors, the remainder of the Valley's truck route network includes other intercity routes, portions of the national STAA route network, and critical local truck routes in urbanized areas. The SIP identified the remainder of this network by drawing on a variety of sources (including the existing STAA network map maintained by Caltrans and the freight highway network designated in the California Freight Mobility Plan). In addition to mapping the existing truck route network,

[6] The Surface Transportation Assistance Act (STAA) of 1982 creates a national network of routes on which the largest trucks may operate and sets standards for these routes. States may designate STAA routes and often work with local agencies to identify the most appropriate routes, particularly the STAA access routes which link the national STAA network to final origins/destinations of trucking activity.

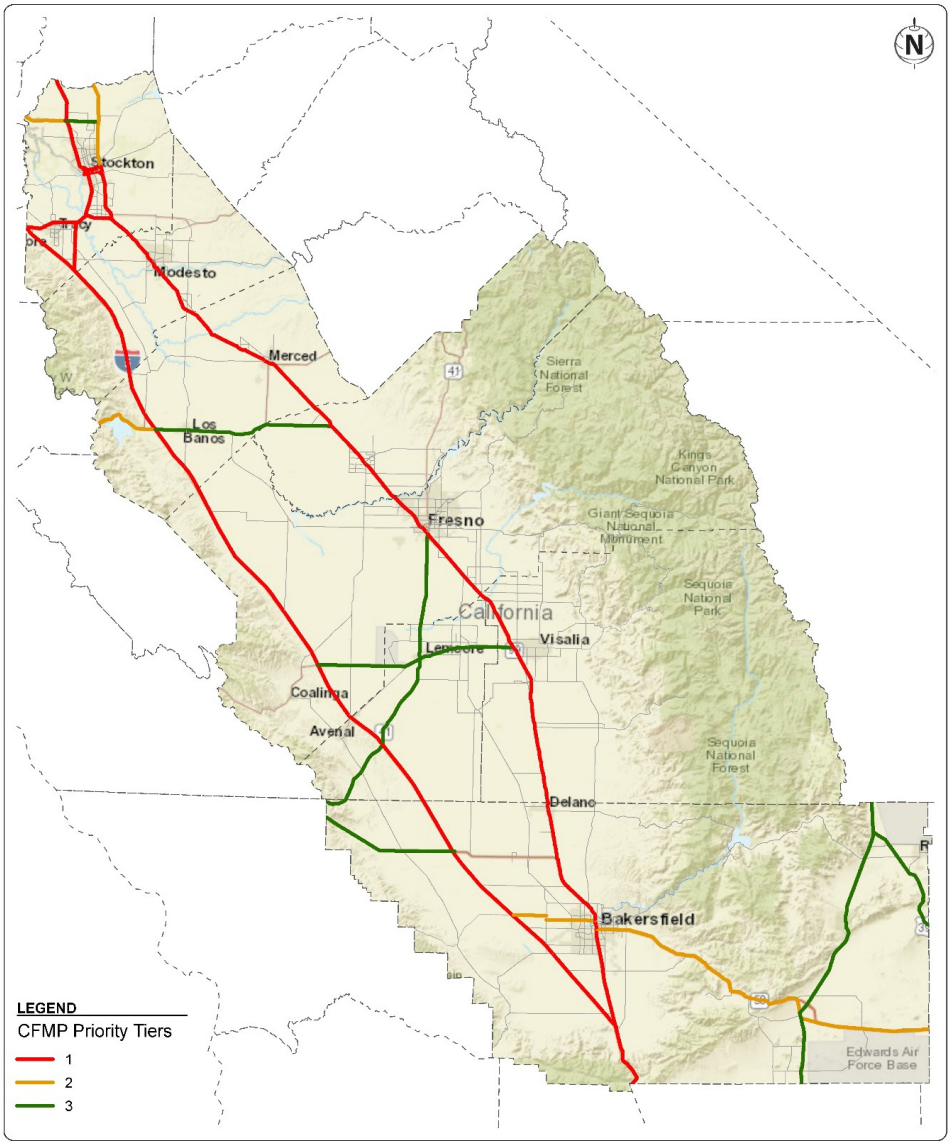
the SIP also examined the connectivity and configuration of the current network and made suggestions for revisions and changes in truck route designations.

The California Freight Mobility Plan (CFMP) prioritizes the highway freight network throughout the State based on truck volumes and significance in providing access to major freight generator regions. Figure 4.1 shows the CFMP Tiers in the Valley. While all of the freight network facilities are important, the Tier 1 facilities are more likely to have projects prioritized for funding. Most of the Tier 1 highways have been identified by the Federal Highway Administration as components of the proposed national Primary Freight Network (PFN). Not all of California's portion of the PFN routes is included in Tier 1. Those portions of the PFN that are not included in Tier 1 are designated as Tier 2, with Tier 2, including additional Interstate and State Routes. Tier 3 represents the balance of the highway freight network. This is important because as future freight projects are identified and developed, it is expected that sponsoring organizations will integrate high-priority attributes into their projects. Combined, all three highway tiers represent a subset of the freight network in the San Joaquin Valley. For the purpose of this report, the freight network in the Valley is summarized in three layers in addition to the connectors and priority rural corridors that do not fit any of these three truck route categories:

- National STAA truck routes: includes I-5, SR 99 and SR 198
- STAA access routes;
- Local truck routes.

Figure 4.1 present maps of the complete truck route system with all elements displayed for each county in the SJV.

Figure 4.1 CFMP Priority Truck Routes



5.0 Truck System Issues and Needs

In addition to developing a truck route network comprised of all of the components described in the previous sections, the SIP conducted limited evaluations of the truck system issues and needs. In the case of the connectors, a representative set of connectors was selected to obtain a sense of the broadest and most common issues encountered on these roadways. Based on this analysis, a set of strategies was identified for improving and maintaining the connector system that could form the basis of a new program to support local roads. In the case of STAA routes and other intercity routes, a similar sampling of roadways was examined to identify common needs. In addition, some focus was devoted to identifying where the existing STAA network was providing poor connectivity to freight activity throughout the region and some suggestions were made to add new routes to the STAA system.

Since most of the cities in San Joaquin Valley do not have an updated STAA truck route map (exceptions are Bakersfield, Tracy, and Stockton), the critical first step is to prepare such a map and advertise it for trucking companies to educate them. A good example is the Sacramento County web site.

In this report, we review the overall connectivity of the STAA route network in the Valley and identify potential recommended designations. Detailed review of design attributes of each facility is required to finalize these options.

5.1 Fresno County

The Fresno Council of Governments (Fresno COG) provided base year (2014) and future year (2040) travel demand model inputs which provided information about industrial activity and anticipated growth. This allowed for an analysis of how well the existing truck route network serves this anticipated growth. The future industrial and agricultural employment growth in the county are highest in the cities of Fresno, Selma, and Reedley. Some traffic analysis zones (TAZ) with moderate to high agricultural employment growth are located along I-5 in the western portion of Fresno County. The industrial employment growth is concentrated in the greater Fresno area. A TAZ north of Reedley is approximately four miles from a major truck route and a TAZ west of Mendota is located a minimum of approximately two miles from a major truck route. The rest of the TAZs with industrial or agricultural employment growth over 300 are located along STAA Truck Routes.

Notable growth is predicted along Bethel Avenue in the Sanger area. Bethel Avenue is presently a truck route, with one lane in each direction and no shoulder. Bethel Avenue connects directly with SR 99, approximately 11 miles south of Sanger, which is a long distance for trucks to travel at lower speeds and with several stop-controlled intersections at cross-streets. The nearest east-west truck route is Jensen Avenue, connecting with SR 99 in Fresno. An alternate east-west route may be considered along Central Avenue, which presently serves truck-related uses near SR 99, or by continuing the Adams Avenue truck route from west of SR 99 eastwards to Bethel.

Jenson Avenue, Shaw Avenue and Herndon Avenue are major east-west truck routes connecting the major industries in Fresno to the State Highway Network. The truck volume varies across each corridor, as shown in Table 5.1. These corridors are crossing high-density mixed-use developments with several closely spaced intersections. They also have a significant history of truck-involved collisions, as shown in Figure 5.1. Even though most of these collisions are not severe, they cause traffic congestion, delay and disruption in the

transportation system. Given the significant expected growth in the Fresno area, it is recommended to review the safety signage along these corridors and evaluate them as potential STAA routes.

Figure 5.1 Major Truck Routes and Industrial Employment Growth from 2010 to 2040. Fresno County

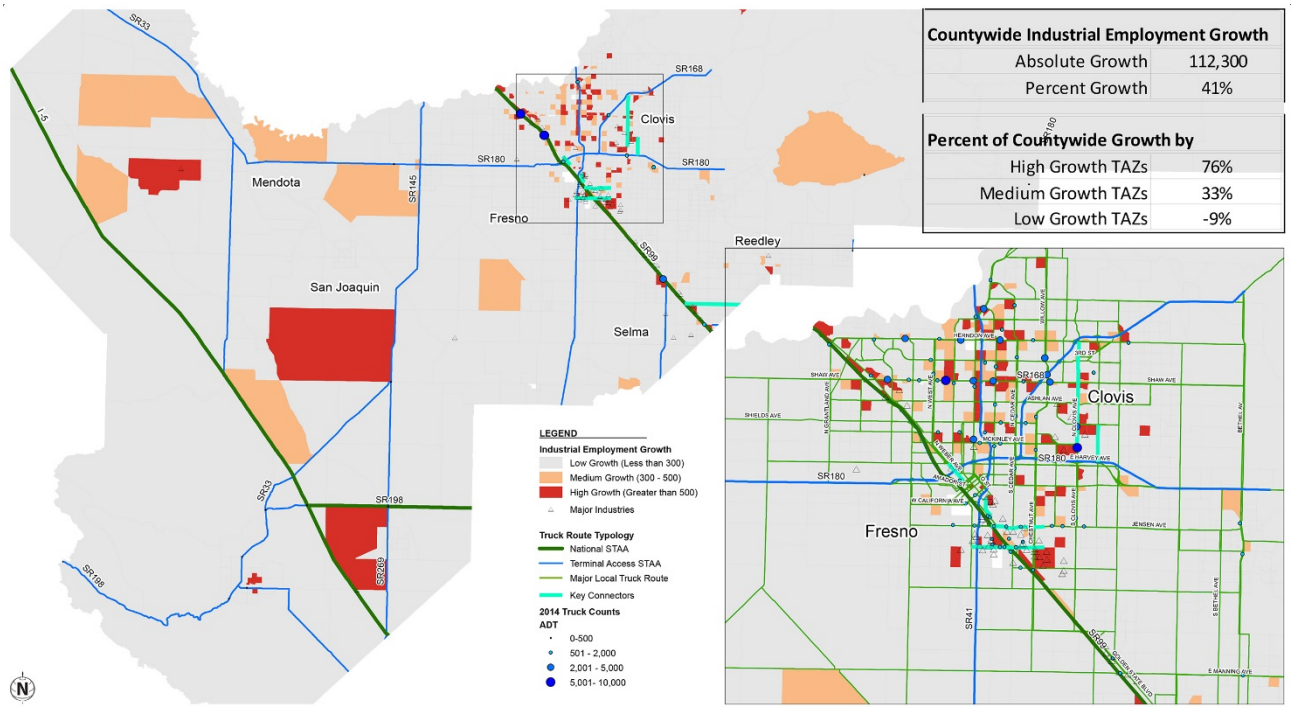


Table 5.1 Critical Truck Routes in Fresno

Arterials	Number of lanes	AADT	Truck AADT
Herndon Avenue	6	45,000-65,000	2,000-4,000
Ashlan Avenue	4	16,000-25,000	200-400
Jenson Avenue	4	10,000-20,000	500-900
Shaw Avenue	6	30,000-45,000	2,000-5,000

By designating Jenson Avenue and Shaw Avenue as STAA routes, improving safety and way finding signage and pavement quality, truck drivers would be encouraged to use these routes and avoid arterials with heavy auto traffic. These arterials have grade-separated interchanges with SR 99, SR 41 and SR 165. The detailed design of the interchanges must be reviewed for STAA compliance.

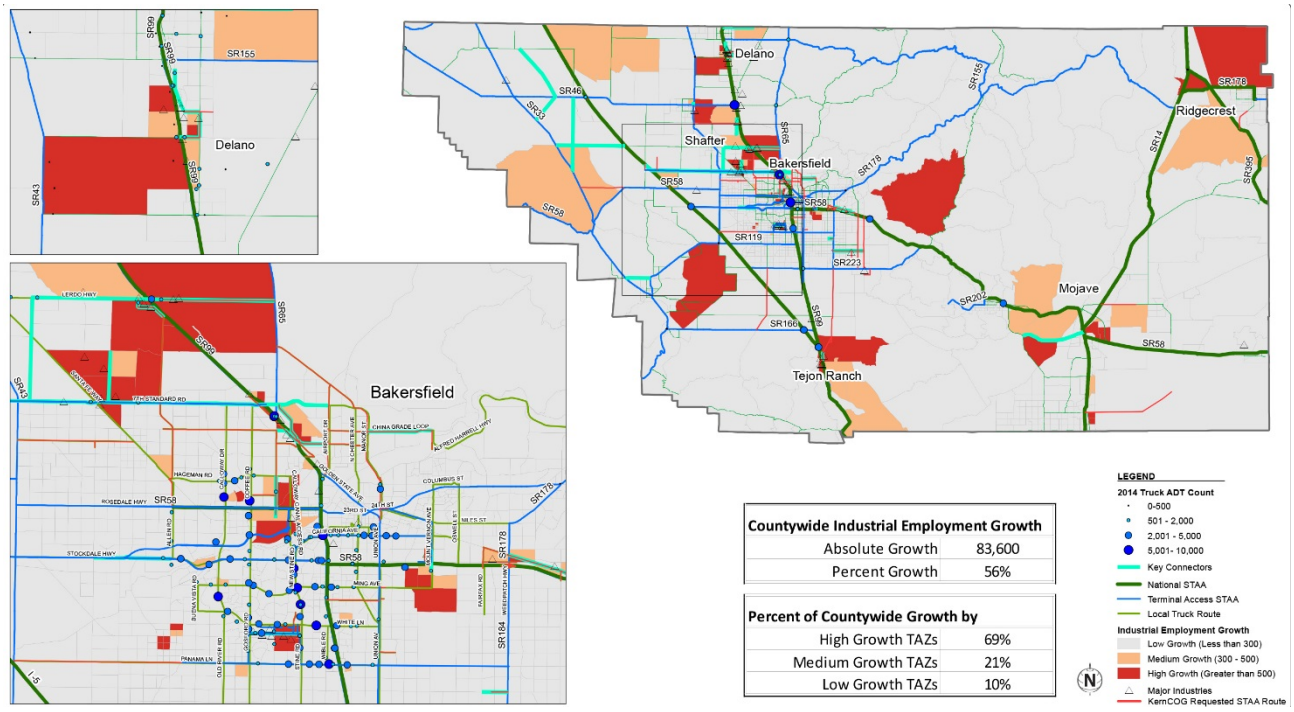
Jenson Avenue has a raised median with good quality pavement and wide shoulders for most of the route. There are several unsignalized intersections and driveways without adequate safety signage. With posted speeds as high as 50 miles per hour, it is recommended to improve safety measures to avoid further collisions on this corridor.

Ashlan Avenue has a center two-way turn lane on several segments of the route and mainly provides access to residential areas; therefore this road is an undesirable option for STAA route designation. It is recommended to redirect trucks from this route to Shaw Avenue, and limit this route to only last-mile deliveries if needed.

5.2 Kern County

Kern County Council of Governments (Kern COG) provided base year (2008) and future year (2040) travel demand model inputs for the industrial employment analysis. TAZs with high future industrial employment densities (over 500 employees per square mile) are located within Bakersfield, largely along existing STAA routes. Some additional high-density future industrial employment TAZs are located in Tejon, Mojave, and Ridgecrest (Figure 5.2). The industrial employment growth in Kern County will occur across the entire county, with growth concentrated along STAA Truck Routes. Significant Industrial employment growth is predicted southeast of Shafter between SR 43 and SR 99. The large TAZ east of Bakersfield with industrial employment growth over 500 is located between SR 178 and SR 58, but does not have direct access to a truck route. Depending on where in the TAZ the employment is located, the employment center(s) could be between three and 10 miles from a truck route; many of the roads in this region also become windy due to topography, meaning actual travel time could be quite long and there may be issues with road grade and weather conditions that could create delay and unreliability.

Figure 5.2 Major Truck Routes and Industrial Employment Growth from 2008 to 2040, Kern County



Kern COG provided their latest STAA route network (2016) and their future requested enhancement shown in Figure 5.2. The SR 58 corridor project, once completed, will provide high capacity straight connectivity not only across Kern County but also for truck trips from eastern neighboring states to I-5.

Overall the recent requested enhancements to the STAA network provide good connectivity across the county and between major freight clusters. 7th Standard Road does not have a full interchange with I-5; access is only provided to and from I-5 southbound. Northbound traffic must use the Buttonwillow Drive ramps via Wasco Way, an additional distance of about 1.5 miles. Wasco Way is a narrow, two-lane road without paved shoulders. In order to maintain safe, direct, and reliable access for trucks, Wasco Way should be upgraded as part of the 7th Standard Road connector, or the 7th Standard Road interchange should be upgraded for access to I-5 in both directions. Establishing a north-south connector between 7th Standard Road and Lerdo Highway would facilitate access for future growth in the Shafter area.

Pegasus Drive is very wide to accommodate the needs of a typical industrial park-style area, allowing for tractor-trailers and other vehicles to park along the road. However, the high number of driveways and the reduced visibility when trucks are parked on the roadside creates a safety hazard when paired with a relatively high speed limit and a two-mile corridor with no need to stop. Even if most vehicles are making local trips (employees coming and going in addition to freight) and there is little cut-through traffic, there is no disincentive to drive as fast as possible. Safety measures should be considered to reduce the speed of vehicles and the risk of turning collisions at driveways. The collisions are concentrated on the northern end of Pegasus Drive between Merle Haggard Drive and the southern end of the Unicorn Road loop, a distance of less than one mile.

As Wheeler Ridge Road continues to develop, access management, speed, and road width should be considered to discourage high speeds through the area nearest to the freeway where volumes will be higher and through-motorists stopping on long trips will be mixing with freight and local traffic.

The portion of the Mount Vernon Avenue north of SR 58 to Virginia Avenue is exclusively industrial in terms of land use, but the road also provides access for residents north of Virginia Avenue to SR 58. Additional safety measures along this portion could reduce the risks of freight interaction with other motorists.

Fruitvale Avenue serves as both a freight connector and an access corridor for residents to reach SR 58. Additional safety signs to alert auto drivers about heavy truck volumes along the freight connector corridor could reduce the risk of collisions.

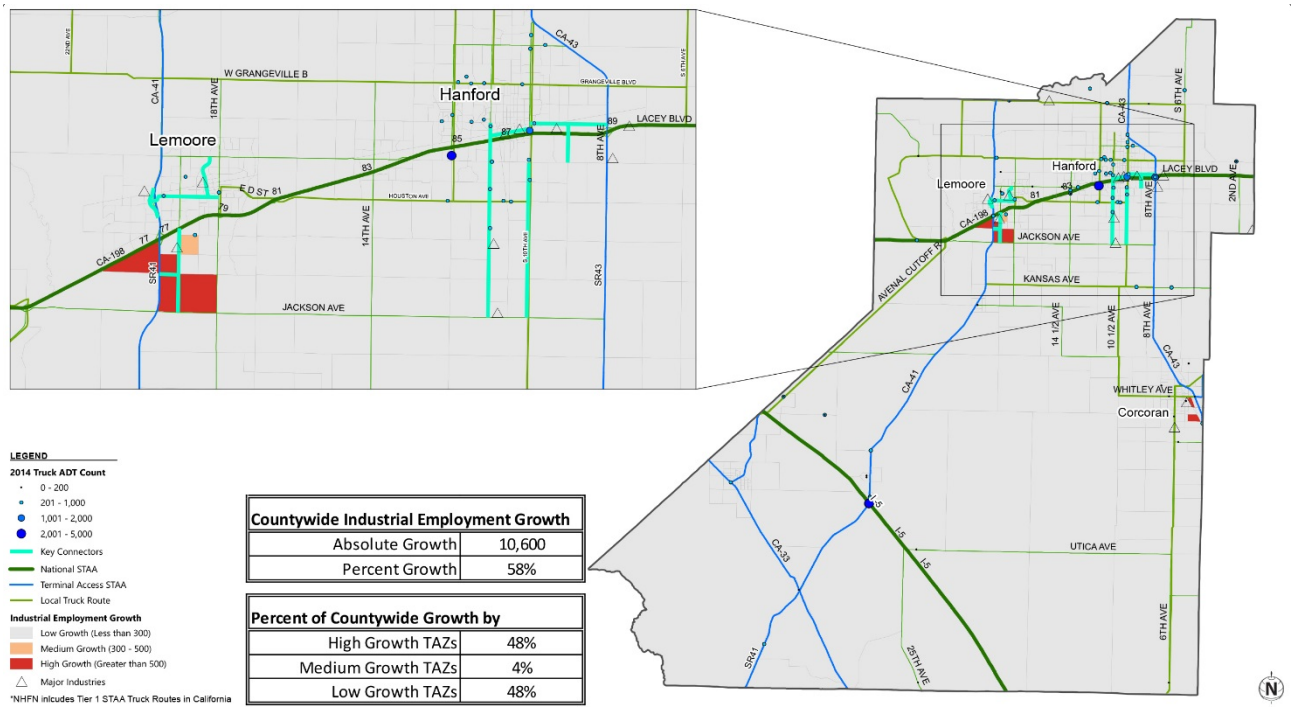
The Di Giorgio Road connector passes through the residential portion of Lamont, posing a safety risk due to freight and local traffic interactions. This corridor should be closely monitored for collisions and incidents. Attention should be paid to the incidence of collisions at the stop-controlled intersections from Vineland Road to Tejon Highway. Collisions such as these may not commonly involve trucks, but can cause safety risks and delays for trucks, decreasing the reliability of this route. If there are issues with visibility of the intersection and stop signs, the signs could be replaced with solar-powered LED flashing variants. Alteration of the intersection geometry and design is unlikely due to the adjacent railroad right-of-way.

5.3 Kings County

Industrial clusters in Kings County are located between I-5 and SR 99, with nearer and better access to the latter. The cities of Hanford and Lemoore are located along SR 198, a STAA Truck Route. The stretch of SR 198 in Kings County has recently improved and all crossings are at-grade. However, the stretch of SR 198 in Kings and Fresno County has poor pavement and many interchanges when crossing urban areas. Several truck routes are available for north-south and east-west connectivity through the area. Trucks have multiple route options, whether coming from I-5 or SR 99 to the north or south, but the cluster is located far enough from either that some time must be spent on rural highways.

Kings County Association of Governments (KCAG) provided base year (2005) and future year (2040) travel demand model inputs for the industrial employment analysis. The TAZs with high 2040 industrial employment densities are located in the greater Lemoore, Hanford, and Corcoran areas (Figure 5.3). There are only a few TAZs in Kings County with industrial employment growth over 500 in Hanford and Lemoore along SR 198.

Figure 5.3 Major Truck Routes and Industrial Employment Growth from 2005 to 2040, Kings County



Countywide Industrial Employment Growth	
Absolute Growth	10,600
Percent Growth	58%

Percent of Countywide Growth by	
High Growth TAZs	48%
Medium Growth TAZs	4%
Low Growth TAZs	48%

Kansas Avenue provides access between SR 43 and SR 41 with recurrent fatal or severely injured collisions. Speed is the primary factor for most of these truck-involved collisions. It is a two-lane road with poor pavement quality crossing farms. There are many unpaved driveways without any warning along this route. Although Truck ADT on this segment is not very high (about 800), it contributes to over 25 percent of total ADT. High truck percentage and unsafe conditions of this segment resulted in high truck-involved collision rates and severity of collisions. It is recommended to review safety measures on this corridor. If this is a preferred truck route for local agriculture, safety improvements are essential and if it is heavily used by STAA trucks, it has to be evaluated for STAA compliance.

Houston Avenue south of SR 198, and Excelsior Avenue north of SR 198 provide access between dairy farms in Kings county and major creameries in Tulare County. The existing truck volume on these routes is about 1,000 trucks per day and this is about 30 percent of their total ADT. In speaking with Kings and Tulare County staff, they are recommended to evaluate these routes as potential STAA routes in the future to encourage trucks from using other local routes.

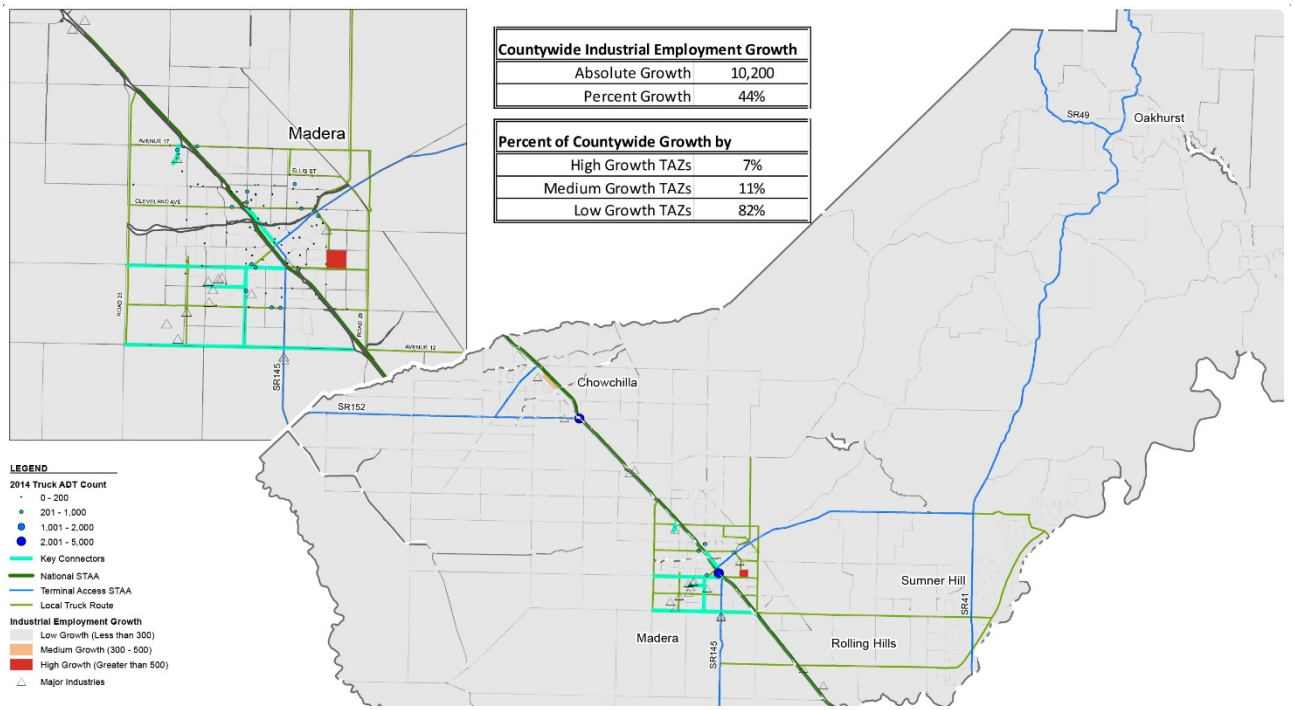
The 11th Avenue corridor has a substantial portion shared with noncommercial traffic, where a high number of collisions occurred in a five-year period. Safety measures should be considered with regards to speed, turning vehicles, and intersection controls.

If future residential development continues along 10th Avenue, traffic volumes and collision rates and types should continue to be analyzed. An access management plan can reduce risks on a corridor shared between trucks and residential traffic.

5.4 Madera County

Madera County Transportation Commission (MCTC) provided base year (2010) and future year (2035) travel demand model inputs for the industrial employment analysis. The 2035 industrial employment density is concentrated along the SR 99 corridor. There also are TAZs in Rolling Hills, Sumner Hill, and Oakhurst with high future industrial employment densities (Figure 5.4). The TAZs with high industrial employment density in the future are a mix of industry and agriculture. There are only a few TAZs in Madera County with industrial employment growth over 500. The strongest growth is projected just one mile east of SR 99 along Olive Avenue, with direct freeway access.

Figure 5.4 Major Truck Routes and Industrial Employment Growth from 2010 to 2035, Madera County



If possible, a before-and-after analysis of collision data along Avenue 14 and Olive Road would help support the case for improved safety due to the median divider and other design elements. If a positive relationship is found, these strategies should be extended west as future development occurs.

As future development is planned, the current design of the Airport Drive and Avenue 17 intersection will become inadequate to handle higher volumes safely and efficiently. The intersection could be designed as a roundabout rather than implementing a signal, with appropriate geometric and design considerations to accommodate regular truck traffic.

Several major industries are located along Avenue 12 and Avenue 13. Recurrent minor truck-involved collisions have been reported on Avenue 12. We do not have truck counts on these roads to evaluate traffic conditions. There also is a high school on Avenue 13 at the Stadium Road crossing. Residential blocks are on the eastern end of Avenue 13. Therefore a preferred truck access from SR 99 and SR 145 is via SR 12 then Road 26 and then Avenue 13. It is recommended to review safety measures and evaluate the design characteristics of these routes for potential STAA designation.

5.5 Merced County

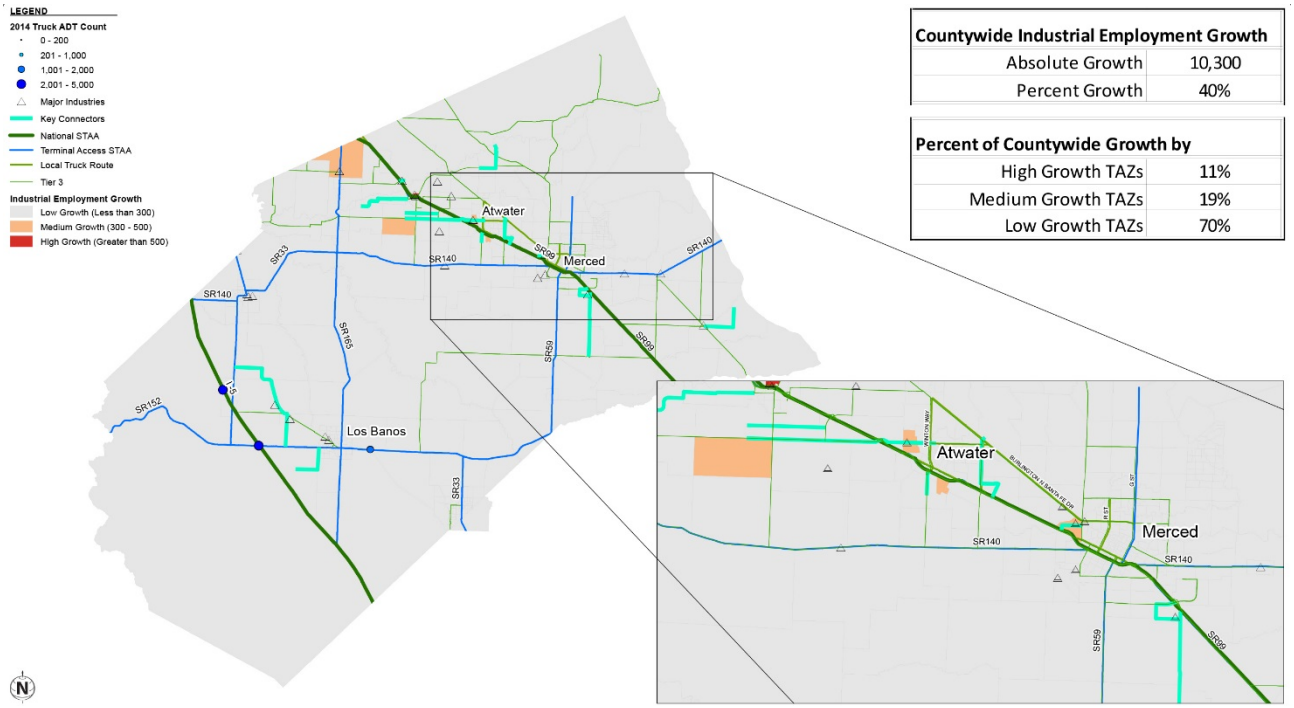
Merced County Association of Governments (MCAG) provided base year (2010) and future year (2035) Three County Model (TCM) inputs for the industrial employment analysis. Industrial employment was defined as Agriculture/Other and Industrial.

The 2040 industrial employment density is highest in the Merced and Atwater areas. There also are TAZs with high future industrial employment density in Los Banos and Gustine (Figure 5.5). The high industrial employment growth areas (TAZs with growth over 500) are generally located in agricultural major truck routes. A single agricultural TAZ west of Atwater is approximately three miles from a major truck route; this area is accessible from Westside Boulevard, providing a direct connection to SR 99. Westside Boulevard is narrow, and visibility of turning and entering traffic may be poor in some areas. Where possible, paved shoulders should be provided and improvements made to visibility on intersection approaches. Pavement quality should be monitored. Based on Merced County General Plan, Transportation and circulation (2012), "Merced County has no designated truck routes. However, the major carriers of truck traffic are contained on I-5 and on SR 152, SR 99, and SR 165. This will continue through the period of this General Plan."

The intersection of Applegate Road and Atwater Jordan Road is controlled only by stop signs on Atwater Jordan with a 50 mph speed limit on Applegate. With truck and other through traffic moving quickly through a relatively narrow intersection, collisions with turning vehicles are likely. Alternatives should be studied, including reducing the speed limit on Applegate on the approach to the intersection, improving intersection visibility, and possibly installing flashing beacons in advance of the intersection for through traffic.

SR 165 is a designated STAA route and provides access to several large dairy farms; however the pavement quality and safety measures needs detail review and further improvements. For example, there is an irregular curve near Hagman Park where several fatal and severe injury truck-involved collisions have been reported. If the curve cannot be eliminated due to right-of-way constraints, it is recommended to review detailed design characteristics of this segment and implement required modification as needed. The Collier Road ramps provide access to major dairy and fresh produce farms from SR 99 (Figure 5.5). Collier Road is not a designated truck route. Several fatal and severe truck collisions have been reported at SR 99 near this ramp. Without detailed truck count information, it is not possible to provide detailed analysis. It is recommended to review safety measures and how many large trucks use this ramp to access their destination. Design modification might be required to improve the safety of this segment.

Figure 5.5 Major Truck Routes and Industrial Employment Growth from 2008 to 2040, Merced County



5.6 San Joaquin County

The San Joaquin Council of Governments (SJCOG) provided base year (2010) and future year (2035) TCM model inputs for the industrial employment analysis. Industrial employment was defined as Agriculture/Other and Industrial.

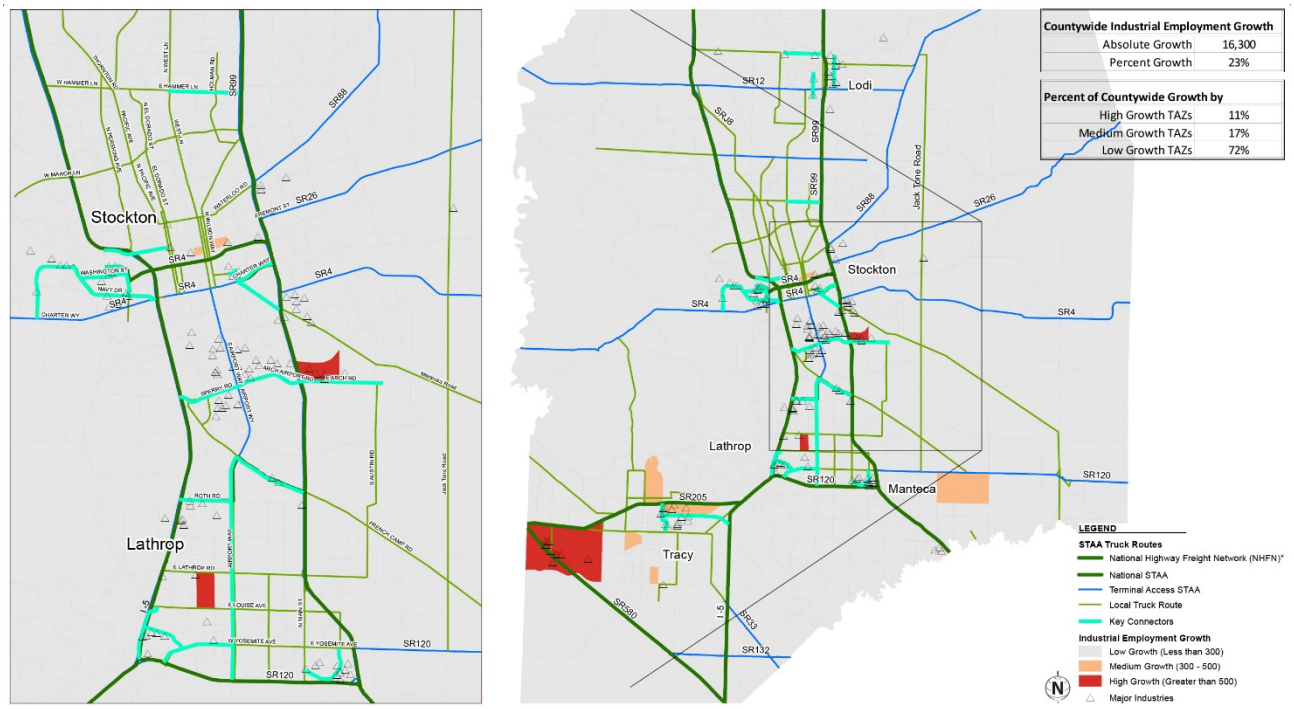
The 2040 industrial employment density is highest in the central areas of Stockton, Lathrop, Tracy, and Lodi (Figure 5.6). All TAZs with industrial employment growth greater than 300 are along major truck routes. The growth is in a mix of industrial and agricultural areas with high growth areas (an increase in industrial employment of greater than 500) located west of Tracy, in southeast Lathrop, and southeast Stockton.

San Joaquin County has recently conducted a though review of their STAA routes. The report prepared by Tioga Group provided detailed recommendations to improve accessibly, efficiency and safety of the truck network in the county. We would echo their recommendations here as well.

During our project outreach, two segments were identified by trucking association members to be included in STAA network (Figure 15):

- French Camp Road from SR 120 to SR 99; and
- Escallon-Belltoa/Mariposa Road from SR 120 to I-4.

Figure 5.6 Major Truck Routes and Industrial Employment Growth from 2008 to 2040, San Joaquin County



These two-lane roads pass through several small and medium dairy and agricultural farms. They provide an east/west shortcut from SR 120 to I-5. They currently are not STAA designated routes but have been frequently used by STAA trucks. Given the congestion on I-5 between SR 120 and SR4, these roads can provide congestion relief for this segment of I-5. It is recommended to review the design characteristics of these candidate roads in detail. Several fatal and severe collisions have been reported on these roads. At a minimum, safety measures on these roads require immediate improvements.

Collisions along heavily traveled and high-speed roads tend to occur primarily at intersections. On French Camp Road in particular, the intersections at Airport Way, Union Road, and the SR 99 ramps are where nearly all collisions have occurred. Crash rates and incidents should continue to be studied to determine appropriate measures at each location:

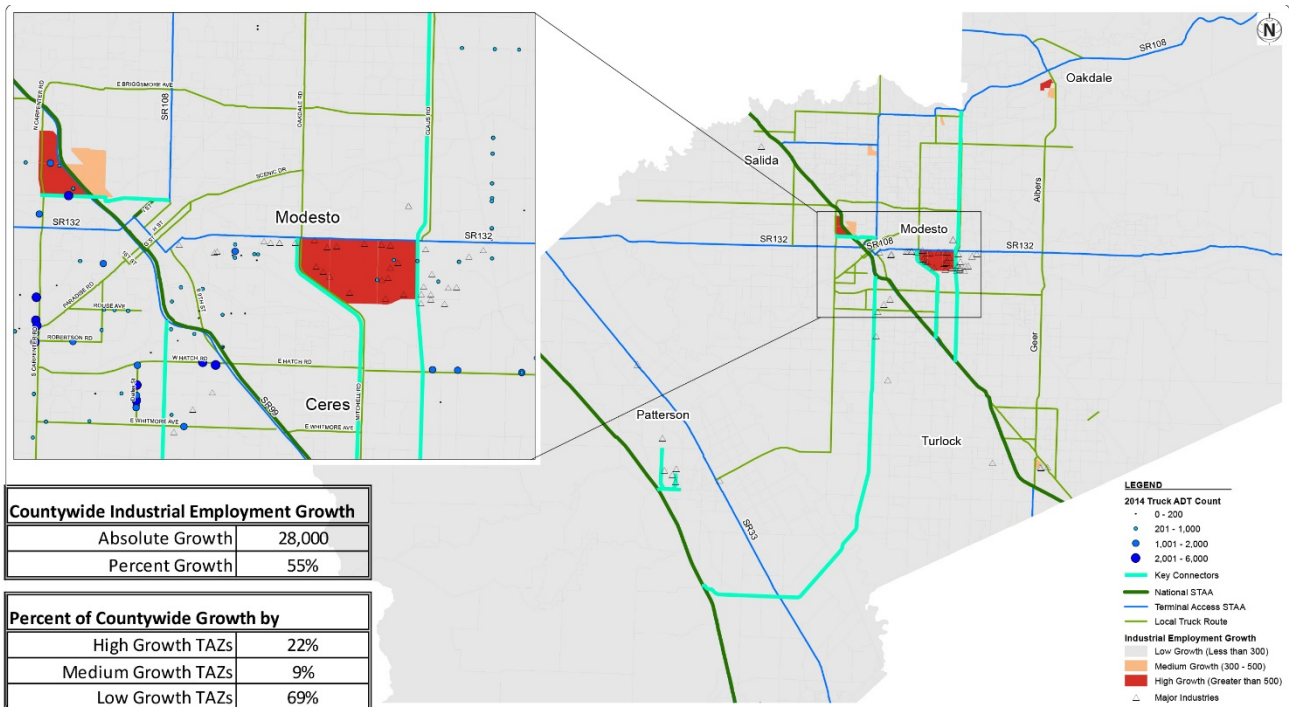
- Liberty Road from SR 99 to SR 88;
- Turner Road between I-5 and SR 99 in Lodi;
- Airport Way between French Camp and SR 120;
- Austin/Moffatt Road between Spreckles access and SR 99; and
- East Grant Line Road between interchange with I-5 and MacArthur Drive, including Paradise Road, and Pescadero Road.

5.7 Stanislaus County

The Stanislaus Council of Governments (StanCOG) provided base year (2010) and future year (2035) TCM model inputs for the industrial employment analysis. Industrial employment was defined as Agriculture/Other and Industrial.

The 2040 industrial employment density is highest along the SR 99 corridor and in central Modesto, Turlock, and Oakdale (Figure 5.7). All TAZs with industrial employment growth greater than 300 are along truck route corridors in greater Modesto and Oakdale. The majority of this growth is located in TAZs already dominated by industrial land use. The strongest growth is projected along or within a 2- to 5-mile radius of SR 99 in Modesto. A smaller area of growth near Oakdale is accessible by STAA routes and close to SR 108, but is at least 16 miles from the nearest SR 99 interchange. These zones are near active freight railroad lines.

Figure 5.7 Major Truck Routes and Industrial Employment Growth from 2008 to 2040, Stanislaus County



Countywide Industrial Employment Growth	
Absolute Growth	28,000
Percent Growth	55%

Percent of Countywide Growth by	
High Growth TAZs	22%
Medium Growth TAZs	9%
Low Growth TAZs	69%

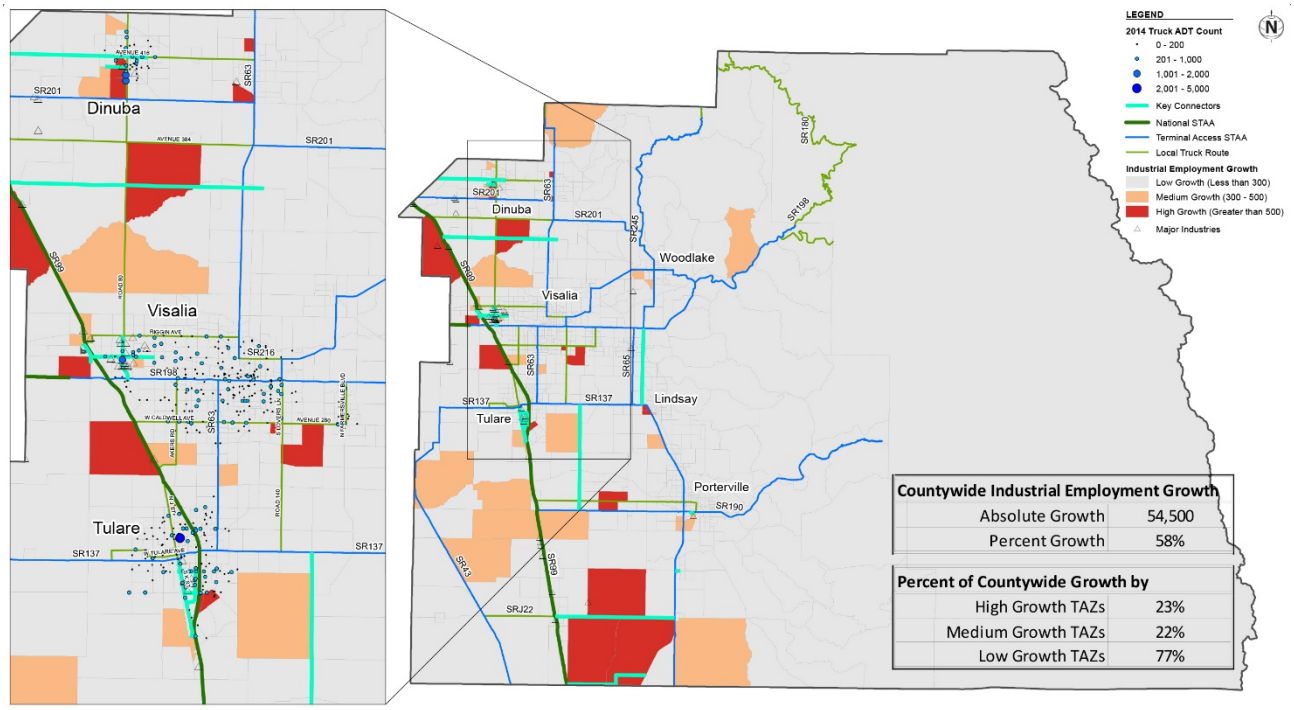
The area between E. Whitmore Avenue, E. Hatch Road and Crows Landing Road south of SR 99 is an industrial cluster surrounded by residential areas. There also is a major multimodal logistic facility in this corner. We do not have detailed information about the expected future growth of these facilities.

E. Whitmore Avenue and Crows Landing Road are not STAA routes. It is recommended to consider evaluating these roads as future STAA access routes. Crows Landing Road requires adequate signage and warning signs especially near residential areas to improve the safety of the communities nearby. StanCOG currently is working on a Cows Landing corridor feasibility study to improve the safety of this corridor.

5.8 Tulare County

The Tulare County Association of Governments (TCAG) provided base year (2010) and future year (2040) travel demand model inputs for the industrial employment analysis. Industrial employment was defined as the sum of all agriculture (agriculture, forestry, fishing, and hunting), mining (mining, quarrying, and oil and gas extraction), utilities, construction, manufacturing, wholesale trade, retail trade, transportation, and warehousing employment. The highest industrial employment densities in 2040 are located in Dinuba, Visalia, Woodlake, Tulare, Lindsay, and Porterville as well as along the SR 99 corridor and SR 245 corridor (Figure 5.8). Most industrial employment growth in Tulare County is projected to occur along truck routes. There is an exception; a large agricultural TAZ southwest of Porterville between SR 65 and SR 99 has industrial employment growth of over 300, and lies approximately three miles from a truck route. This area is accessible from Sierra Avenue (Avenue 56).

Figure 5.8 Major Truck Routes and Industrial Employment Growth from 2010 to 2040, Tulare County



Blackstone St is somewhat unusual in that it is a large industrial zone with access to both rail and SR 99 without needing to interact with nearby neighborhoods or other noncommercial traffic at all. The arrangement of the Paige Avenue ramps to SR 99 is unusual and the Paige Avenue intersection in particular is not ideally configured. However, given no collisions were reported in a five-year period, there is no apparent justification for making modifications to the intersection. If future expansion and infill of the industrial zone generates a great deal more traffic at this location, the intersection could be configured as a truck-accessible roundabout, which would reduce the risk of collision and likely decrease queueing and delay. Bardsley Avenue borders both an exclusively industrial zone to the south and a primarily residential neighborhood to the north. The route provides alternative access for the industrial area, but truck traffic may be more likely to use Paige Avenue to the south, which has less than one-third of the traffic volume and

minimal interaction with noncommercial traffic. For the safety of the residential neighborhoods nearby, Bardsley Avenue should be considered an alternate route rather than the primary access.

Goshen Avenue provides straight-line access to SR 99 for residential neighborhoods on the outskirts of Visalia, who would have to drive through the industrial zone of the connector. Given the low number of collisions and the relatively low AADT, the concern is low but volumes and collisions should be monitored. Industrial infill in this area may be desirable given the access to both SR 99 and the railroad; this should be considered when working with the railroad to expand or restore industrial spurs crossing Goshen Avenue.

Spruce Road seems to serve as a bypass to avoid following the route of SR 65 north through Exeter on the way to or from SR 198. This may be largely unavoidable, but should be considered in relation to providing a safe and reliable route for trucks to local industries. Advance warning signals and crossing upgrades for the railroad may help alert fast-driving motorists that a train is approaching and slow down earlier.

The Sierra Avenue connector has a moderate number of collisions that are by and large associated with turning traffic at cross streets. Collisions should be monitored and analyzed as a rate; based on our data, it seems like there are a high incidence of crashes per trip. Safety measures could be implemented at certain intersections to warn motorists to expect cross traffic and improve visibility for turning vehicles entering Sierra Avenue.

Collisions along County Line Road is related to local vehicles turning from or into the residential neighborhoods to the south and to a lesser degree the cross streets to the north that access area farms. Speed limits and visibility should be considered to reduce the likelihood of crashes, which could delay trucks and decrease the reliability of traveling this route.

Avenue 416 connecting Dinuba to SR 99 has recently been improved to two lanes in each direction and has been heavily used by trucks (up to 2,000 trucks per day). It is recommended to evaluate this route as a STAA access route.

In speaking with Tulare MPO staff, Farmoso Porterville Hwy/Richgrove Drive (in Kern County) is identified as a shortcut truck route from SR 99 to SR 65 and to Porterville. This route currently is one lane each direction with about 200 trucks per day. This route is about 10 miles shorter than using SR 99 and SR 190 to access Porterville. Given the congestion on SR 99 and significant expected growth in Porterville, it is recommended to improve this route as a STAA route and also as a congestion relief path for SR 99.

Avenue 184 between SR 99 and SR 43 with about 500 trucks per day is one of the Farm to Market routes. This route is not directly connected to SR 43. There has been significant records of fatal and severe collisions on this route. In speaking with local staff, severe fog and low visibility were identified as a challenge between December to February. It is recommended to evaluate safety measures along this route. If improvements are not possible, prohibit this routes for regional trucks.

5.8.1 Summary of STAA Truck Routing Recommendations

After reviewing previous reports and discussing the existing issues with Valley MPOs and truck drivers, we identified several general recommendations to improve existing conditions and prevent future worsening. Many of them require promotion and encouragement by government agencies and a private-sector investment.

- **Data management:** Develop and maintain an inventory of local STAA routes at each jurisdiction. Also regularly collect classification counts to identify the change in truck traffic patterns.
- **Routing guidance:** Prepare high-quality electronic and paper maps and broadcast them so that any truck driver can easily get a copy.
- **Public outreach:** It is important to drivers to use designated routes as often as possible for the safety and efficiency of the network.
- **Safety measures and signage:** Review STAA routes with high truck-involved collisions. Identify the factors that contribute to repeated collisions. Evaluate the design characteristics of each of these locations. If the issue is caused by poor design, develop an improvement plan. Also review the trends of truck-involved collisions on local truck routes (the non-STAA designated ones); an increase in truck-related collisions can be a warning to reevaluate truck routes to be compatible with surrounding land use changes.
- **Pavement Maintenance:** STAA trucks have more impact on pavement deterioration than smaller trucks. Poor pavement conditions will result in higher fuel consumption and safety risks. It is important to evaluate the pavement conditions on STAA routes regularly to minimize the maintenance cost.

Beyond the above recommendations, to the extent of available data, we provided detailed review of intercity and local STAA routes at each county in the San Joaquin Valley.

5.9 Condition and Performance of Connectors

Because connectors are local roadways that do not have any special designation or eligibility for state or Federal funding set-asides, they may not be maintained to the same standards as other routes in the Valley's freight roadway network. In order to get a better sense of the improvement needs on connectors, a subset of connectors from the full list was identified and the condition and performance of this subset was evaluated. The reason why the condition and performance evaluation was limited to a subset of connectors is because full data necessary to conduct condition and performance evaluations was not available in all cases. The subset of connectors for which data were available are roughly representative of connectors throughout the Valley and contains connectors from each of the counties in the Valley. Through this analysis, it is possible to generalize about the needs of all of the priority connectors and to begin to develop ideas for a program of ongoing maintenance and improvement of connectors. Given the lack of designated funding for connectors, such a program would likely need to be initiated by MPOs and RTPAs in the Valley. In the future, it will be important to advocate for state and Federal funding for a connector program. This is discussed further later in this report.

To characterize condition and performance of connectors, the team compiled available data on truck volumes by roadway and any available O-D data from prior studies to identify the subset of connectors for which condition and performance evaluations were conducted. The team used a combination of the most recent Caltrans truck count data, Highway Performance Monitoring System (HPMS) data and other publicly available data sources (for example, classification counts on local roads provided by the COGs or cities) to identify the local roads and connectors that have high truck volumes. Where actual local road data are not available, the team relied on data on truck volumes on connectors obtained from the Valleywide truck model to identify the preferred routes to major freight activity centers.

Using data on traffic conditions/bottlenecks, pavement and bridge conditions, geometric constraints, and safety conditions, the team built on an analytical approach that was used in the FHWA intermodal connector study to provide a profile of conditions on the critical connectors in the Valley.

5.10 Connector Evaluation Methodology

5.10.1 Roadway Classification

Roadway classification is based on the networks developed for each MPO's latest travel demand model as part of the "Model Improvement Plan (MIP II)." For future (planned and proposed) connectors, information is acquired from local jurisdictions.

5.10.2 Speed Limit(s) and Number of Lanes

The number of lanes and speed limit on some of the longer connectors changes, especially as the roadways travel into and from cities. Where the count data are available, the connector was divided into multiple segments with similar attributes.

5.10.3 Number of Intersections/Signalized Intersections

The analysis accounts for the number and type of roadway intersections as an indicator of the number and type of conflicts within the roadway segment. The first number is the total number of intersections on the segment. The second number accounts for the signalized intersections. Thus, the difference between the two numbers may be assumed to be unsignalized intersections.

5.10.4 Pavement Assessment

The analysis includes a qualitative pavement assessment. This evaluation measures the pavement quality according to the categories in Table 5.2.

Table 5.2 Pavement Quality Assessment

Category	Description
Excellent	New, smooth, little damage
Good	Average quality, some cracks/holes, needs superficial repairs
Poor	Major cracks, holes; needs significant capital-intensive repairs

5.10.5 Surrounding Land Use(s)

One of the most important determinations of truck/freight trip generation on roadways is the surrounding land use. This assessment includes qualitative and quantitative land use analysis for each connector using MIP II Traffic Analysis Zone (TAZ) data. The presence of residential land uses (and in some cases, commercial land uses) along connectors may also be an indication of land use conflicts and the need for buffers between the truck routes and the adjacent land uses.

5.10.6 Location Type

The data collection includes an assessment of the connector location, noting whether the roadway is within a city or in a rural area. This category is of note because city roadways typically have slower speeds, higher rates of congestion, and higher rates of conflicts with other modes.

5.10.7 Shoulder

Each connector roadway evaluation includes whether or not the segment has a sufficient shoulder in the right-of-way to accommodate trucks or other vehicles.

5.10.8 Bicycle Lanes

The assessment also includes whether or not the segment has bicycle lanes in the right-of-way. A "yes" designation in this column means that some or the entire connector segment includes a bicycle lane. A "no" designation means that there are no bicycle facilities on the connector roadway.

5.10.9 Sidewalks

Sidewalk availability on each connector also is documented in the assessment. A "yes" designation means that some or the entire connector segment includes a sidewalk. A "no" designation means that there are no sidewalk facilities on the connector roadway.

5.10.10 Number of Railroad Crossings

Railroad crossings present another form of conflict for vehicles, especially freight trucks. Thus, the number of at-grade railroad crossings on each connector segment is noted in the assessment.

5.11 County-Specific Assessments

5.11.1 Fresno County First-/Last-Mile Connector Highlights

Jensen Avenue [FR_3], between SR 99 and Willow Avenue is a four-lane road providing east-west connections from SR 99 as well as SR 41 a short distance to the west. This route also provides truck access east of Fresno towards Sanger. The road is separated from nearby residential neighborhoods by way of a short bypass segment. Residential uses are primarily north of Jensen Avenue and pedestrian access should be considered with regards to safety. Most of the corridor is industrial or low-density other uses and farmland. The estimated AADT on Jensen Avenue is 24,716. There are five signalized intersections along the 2.6-mile corridor.

North Avenue [FR_5] is an east-west arterial providing local access to industries on either side of SR 99 between Elm Avenue and Willow Avenue. Most of the route travels through industrial areas with some small residential areas at either end of the connector. The 3.5-mile corridor is mostly a two-lane road, with a four-lane segment between SR 99 and SR 41. There are seven signalized intersections along the corridor, as well as three at-grade railroad crossings within a short stretch of each other, just east of SR 99. The estimated AADT for North Avenue is 8,128.

The right-of-way of California High-Speed Rail in Fresno goes through Railroad Avenue between Jensen Avenue and East California Avenue, so it might not be reasonable to include this connector in a priority list. **Railroad [FR_6]** and **Van Ness [FR_7]** avenues serve as north-south connectors near downtown Fresno, running parallel to SR 99 and connecting with SR 41. The area served by both streets is primarily industrial. The AADT is very low, under about 2,900 vehicles on either street. Both are two-lane roads with no signalized intersections in the identified segment, and together they comprise a length of about one mile, so trucks should experience little delay.

Table 5.3 Fresno County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
FR_2	H St	Divisadero St	Belmont Avenue	Calaveras St	Alt to SR99 corridor, major freight gen
FR_3	E Jensen Avenue/ E Jensen Avenue Bypass		SR 99	Willow Avenue	Major freight gen, intermodal/transload to PHFS
FR_4	N Clovis Avenue	Shaw Avenue	Herndon Avenue	McKinley Avenue	Major freight gen, intermodal (airport) to PHFS
FR_5	North Avenue	SR 99	Elm Avenue	Willow Avenue	Major freight gen, warehouse, logistics, etc.
FR_6	S Railroad Avenue		S Van Ness Avenue	E Church Avenue	Serves Warehouse and industrial land
FR_7	Van Ness Avenue		Los Angeles St	Railroad Avenue	Major freight gen

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
FR_2	8/2	2 or 4	Poor	Industrial	Yes	Yes	Yes
FR_3	6/5	4	Good	Industrial, Commercial, Residential	Yes	No	Yes
FR_4	32/14	4 or 6	Good	Commercial, Residential, Industrial	No	No	Yes
FR_5	11/7	2 or 4	Good	Industrial, Rural, Residential	Yes	No	Yes
FR_6	2/0	2	Poor	Industrial	Yes	No	Yes
FR_7	4/0	2	Excellent	Industrial	No	No	Yes

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
FR_2	7	0	1	8	13,162	4,526
FR_3	29	2	2	40	24,716	
FR_4	86	4	5	117		45,121
FR_5	20	0	0	26	8,128	4,415
FR_6	2	0	0	8	2,741	
FR_7	1	0	0	1	2,895	

However, there is an at-grade railroad crossing at the intersection of Railroad Avenue and Van Ness, which could create delay and a high degree of unreliability as freight trains are generally unscheduled and hard to predict. Additionally, due to the approach angle of the streets to the railroad crossing, visibility is limited for commercial vehicles to the driver's right (approaching the crossing from either direction). Vehicles carrying hazardous materials must make a safety stop approaching the crossing.

5.11.2 Kern County First-/Last-Mile Connector Highlights

7th Standard Road [KE_14] between I-5 and Santa Fe Way provides direct access to an industrial cluster located between Shafter and Bakersfield. Most of the connector is two lanes with paved shoulders. A grade separation project was recently completed at Santa Fe Way to route through traffic over the railroad; this one-mile stretch is four lanes wide. There are no signalized intersections along the corridor, and with the grade separation at the railroad, delays should be minimal and reliability high. To the east of Santa Fe Way, the road is an STAA truck route connecting with SR 99. The connector is approximately 15 miles long. AADT ranges from about 5,400 to 8,200 vehicles.

Lerdo Highway [KE_2] between Driver Road and Kyte Avenue is a 3.94-mile connector serving either side of SR 99 in the Shafter area. The portion from SR 99 west to Driver Road is a truck route. The connector serves industries and the Shafter Airport. Lerdo Highway is a four-lane road west of SR 99 and a two-lane road to the east. The AADT ranges from about 6,000 vehicles to 16,000 vehicles. Land use is primarily industrial, and there are three signalized intersections in the corridor (about 0.8 signals per mile), so delay should be relatively low. There have been 19 collisions between 2010 and 2014, two of which involved trucks. There may be some safety risks associated with turning vehicles at cross streets; a small number of broadside collisions have occurred at the intersection of Zerker Road, which is signalized. The intersection has preventative measures in place, including flashing warning beacons in advance of the signal.

Pegasus Drive [KE_4] is a north-south connector running parallel to SR 99 north of Bakersfield along Meadows Field Airport. The road serves a commercial-industrial area. It intersects with Merle Haggard Drive (which becomes 7th Standard Road), a STAA truck route, just east of SR 99. Although only a two-lane road plus center turn lane, the road and lanes are very wide. The AADT is about 5,400 vehicles. There are no signalized intersections along the 1.72-mile corridor, and the posted speed limit is 45 mph. There have been 18 collisions on Pegasus Drive between 2010 and 2014, many of which were broadside collisions. Due to the high number of driveways along Pegasus Drive and the high-speed limit for through traffic, collisions involving turning vehicles appear to be a high risk.

Wheeler Ridge Road [KE_5] is a north-south connector in the southern portion of the county, from I-5 north to 1st St. The 1.4-mile corridor includes three signalized intersections, which is relatively high for a short corridor, but these are concentrated close to the I-5 interchange and facilitate safe access for commercial developments along the route. Most of the connector is four lanes wide, although it is six lanes wide nearest to I-5, and narrows down to two lanes after Santa Elena Drive, where a major industrial development lies. The AADT on this road is 8,867 vehicles. Between 2010 and 2014 there were seven collisions, two of which involved trucks.

Table 5.4 Kern County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
KE_1	District Blvd	Gosford Dr		Stine Road	Major freight gen
KE_2	Lerdo Highway	N Driver Road	SR 99 NB ramps	Kyte Avenue (change)	Access to ag, intermodal facility (airport), major freight gen (GAF)
KE_4	Pegasus Dr	Merle Haggard Dr		Norris Road	Alt to SR99, major freight gen, intermodal (airport)
KE_5	S Wheeler Ridge Road	I5		1st St	Major freight gen (Caterpillar)
KE_6	S. Lexington St	Schuster Road	Woollomes Avenue	Balboa Avenue	Major freight gen (multiple), intermodal (airport)
KE_7	S. Zerker/Zerker Road	Lerdo Hwy	1/2 mile east of GAF warehouse	Zerker Extension	Major freight gen (GAF, Grimmway, Garlic Company)
KE_10	Wasco Avenue/J St	Poso Avenue	6th St	Just north of SR 46	Access to ag, sig freight facility
KE_11	White Lane/District Blvd	Gosford Dr		SR 99	Major freight gen
KE_12	Zachary Avenue	7th Standard Road	NE corner of Ross Distribution Center	Burbank St	Major freight gen, logistics/warehouse center
KE_13	Mt Vernon Avenue	Virginia Avenue	SR 58	Gateway Avenue	Major freight gen (warehouse and manu)
KE_14	7th Standard Road	Santa Fe Way	Galpin St	I-5	Serves multiple manu/ind clusters
KE_15	Fruitvale Avenue	Hageman Road	SR 58	end	Multiple freight generators
KE_16	Mountain View Road	S Fairfax Road		SR 184	Serves Grimmway Farms (weak candidate)
KE_17	Di Giorgio Road	SR 184		Tejon Hwy	Access to Ag (Grimmway, Kern Ridge, Heck Cellars)

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s)	Shoulder	Bicycle Lane	Sidewalk
KE_1	8/1	4	Excellent	Industrial, Retail	No	No	Yes
KE_2	7/3	2 or 4	Good	Agriculture, Industrial	Yes	No	No
KE_4	7/0	2	Good	Industrial, Commercial	No	No	Yes
KE_5	4/3	2, 4 or 6	Good	Commercial, Rural Land, Agriculture	Yes	No	Yes
KE_6	3/0	2 or 4	Good	Airport, Industrial, Residential	Yes	No	Yes
KE_7	1/0	2 or 3	Good	Industrial, Agriculture, Rural Land	Yes	No	No
KE_10	4/0	2 or 4	Good	Industrial, Agriculture, Residential	Yes	No	Yes
KE_11	19/9	6	Excellent	Retail, Residential, Commercial	No	Yes	Yes
KE_12	5/0	2 or 4	Poor	Industrial, Agriculture	Yes	No	Yes
KE_13	5/2	4	Good	Industrial, Commercial, Residential	Yes	No	Yes
KE_14	18/0	2 or 4	Good	Agriculture, Industrial	Yes	No	No
KE_15	6/0	2	Good	Industrial, Residential, Rural Land	Yes	No	Yes
KE_16	1/0	2	Poor	Agriculture, Industrial, Residential	Yes	No	No
KE_17	5/0	2	Good	Agriculture, Industrial, Residential	Yes	No	No

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
KE_1		0	0	0	17,269	
KE_2	19	2	2	29	16,178	6,009
KE_4	18	2	0	24	5,399	
KE_5	7	2	1	9	8,867	
KE_6	3	0	0	4	2,860	10,801
KE_7	7	0	0	12	4,497	3,272
KE_10	21	2	0	34	3,313	
KE_11	150	6	5	209	45,405	
KE_12	0	0	0	0	774	
KE_13	28	4	4	38	20,153	10,171
KE_14		0	0	0	8,190	5,454
KE_15	20	2	1	39	15,182	2,428
KE_16		0	0	0	1,594	
KE_17		0	0	0	6,041	

White Lane [KE_11] is an east-west connector approximately three miles long between Gosford Drive and SR 99. The corridor serves a large industrial zone between White Lane and District Boulevard to the south. Surrounding land also uses include residential and commercial. The busy six-lane corridor carries approximately 45,400 vehicles per day on average. A bike lane is present for a short distance between Gosford Drive and Akers Road. In addition to nine signalized intersections (almost three signals per mile), there are numerous local cross-streets and driveway cuts for the businesses and industries along the corridor. There have been 150 collisions on this portion of White Lane between 2010 and 2014, which is high for a corridor of this length. However, the share of truck-involved collisions is relatively low, with only six incidents recorded during the five-year period.

Zachary Avenue [KE_12] is a north-south connector just under two miles long, extending from 7th Standard Road to Burbank St. 7th Standard Road is a truck route. Zachary Avenue is surrounded by industrial and agricultural uses. There are no signals through this segment, which is primarily a four-lane road through the industrial area and narrows to two lanes about one half-mile south of Burbank St. There were no reported collisions along the segment between 2010 and 2014. The AADT is fewer than 800 vehicles.

Mt. Vernon Avenue [KE_13] is a north-south connector just over 0.75 mile between Virginia Avenue and Gateway Avenue in Bakersfield. The connector provides local access to a large industrial area on either side of SR 58. The route also provides access to residential areas north of Virginia Avenue from SR 58. The road is four lanes wide through this segment with two signalized intersections. The AADT is approximately 20,150 vehicles. There were 28 collisions in this segment between 2010 and 2014, four of which involved trucks. All of the reported collisions in the connector segment were north of SR 58, where interactions with residential traffic are far more likely to occur.

Fruitvale Avenue KE_15] is a north-south connector from Hageman Avenue to its end just south of SR 58. The surrounding land use is primarily industrial, transitioning to residential at the north end. The 1.1-mile

connector is a two-lane road with no signals in the segment. The AADT is approximately 15,180 vehicles. Between 2010 and 2014 there were 20 vehicle collisions, of which two involved trucks. Residential traffic passing through the industrial area to access CA-58 and interactions with turning trucks may pose safety risks.

Di Giorgio Road [KE_17] is an east-west connector between SR 184 and Tejon Highway. SR 184 is a STAA truck route. The two-lane road is approximately five miles long and has no signals in this segment. Di Giorgio Road passes primarily through agricultural and industrial land uses, but the intersection with CA-184 in Lamont is residential. The AADT in this segment is approximately 6,040 vehicles. There were 43 reported collisions on the connector between 2010 and 2014, of which eight involved trucks. Broadside collisions were somewhat more common than other types of collisions, and commonly occur at cross-streets. Intersections in this segment are controlled by all-way stop signs, suggesting that the prevalence of collisions at these locations is due to failure to obey the stop sign.

5.11.3 Kings County First-/Last-Mile Connector Highlights

11th Avenue [KI_1] between W. Lacey Boulevard and Jackson Avenue is a five-mile connector from either side of SR 198. The route is four lanes wide from Lacey Boulevard south until Houston Avenue, where it narrows to two lanes. The land use through the four-lane portion is mostly residential and commercial, changing to industrial in the south near Houston Avenue. There are seven signalized intersections in the corridor, or about 1.4 signals per mile. The AADT ranges from approximately 16,280 to 3,210 vehicles. Ninety-five collisions occurred along the connector between 2010 and 2014, the majority of which were concentrated in the residential portion of the corridor.

Table 5.5 Kings County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
KI_1	11th Avenue	W. Lacey Boulevard	Houston Avenue	Jackson Avenue	Major freight gen
KI_2	5th St	11th Avenue		10th Avenue	Major freight gen (Marquez Brothers), manu/ warehousing land use
KI_3	E. Lacey Boulevard	10th Avenue	Kaweah St	SR 43	Serves Manu industrial land
KI_4	9th Avenue	E. Lacey Blvd		E Hanford Armona Road	Westside Locker Plan, Central Valley Meat
KI_5	10th Avenue	Jackson Avenue		Hanford Armona Road	Agriculture, some manu
KI_6	Fox Drive/Fox Avenue	W Hanford Armona Road		W Bush St	Serves Leprino Foods

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
KI_1	23/7	2 or 4	Good	Residential, Retail, Industrial, Agriculture	Yes	No	Yes
KI_2	8/0	2	Good	Industrial, Commercial	No	No	Yes
KI_3	3/1	3 or 4	Good	Retail, Residential, Industrial, Open Land	No	No	Yes
KI_4	4/0	2	Good	Industrial, Commercial, Agriculture	Yes	No	No
KI_5	6/0	2	Good	Agriculture, Residential	Yes	No	No
KI_6	12/0	2	Good	Residential	Yes	Yes	Yes

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
KI_1		0	0	0	16,284	3,219
KI_2	7	0	0	9	317	
KI_3	30	0	0	41	9,576	
KI_4		0	0	0	2,237	
KI_5		0	0	0	5,368	
KI_6	23	0	0	36	5,216	

The 9th Avenue connector [KI_4] between E. Lacey Boulevard and Hanford Armona Road is a two-mile route serving either side of SR 198. The two-lane road has no signalized intersections and AADT is approximately 2,230 vehicles. There were eight reported collisions in the corridor between 2010 and 2014, one of which involved a truck.

The 10th Avenue connector [KI_5] is a three-mile segment between Jackson Avenue and Hanford Armona Road, connecting industrial uses on either side of SR 198. The segment is two lanes wide and has no signalized intersections. The AADT is approximately 5,360. The route passes through primarily industrial/ agricultural land uses as well as some low-density residential areas. Eighteen collisions occurred on the corridor between 2010 and 2014, with one involving a truck.

Fox Street [KI_6] is a north-south connector between Hanford Armona Road and Bush Street. The connector is a two-lane road approximately 1.1 miles in length. Fox Street provides access for trucks to Leprino foods, a major industrial site located in the heart of Lemoore. A bike lane is present on the site, and it also is intersected by the San Joaquin Railroad at an at-grade crossing. The site is presently surrounded

by residential neighborhoods, and to access the connector itself, trucks must use other arterials coming from either SR 198 (east-west) or SR 41 (north-south). A portion of Lemoore Avenue and East D Street is designated a Truck Route, but neither of these connect directly with Fox Street. Trucks coming from the west must pass through residential neighborhoods, including school zones to access the site, creating passenger vehicle and truck conflicts. The AADT is approximately 5,210 vehicles. There were 23 reported collisions between 2010 and 2014, none of which involved trucks. According to recent Google Street View (May 2016), for most part of this connector, it is signed as "NO TRUCKS." The alternative access for this facility is via 18th Avenue and G Street. Although there is a school at 18th Avenue and Devon Drive, the street is generally wider, has fewer driveways and straight geometry (Fox Street, curves through residential neighborhood), which increase visibility and safety.

5.11.4 Madera County First-/Last-Mile Connector Highlights

Avenue 14/Howard Road/Olive Road [MA_2] is an east-west connector extending from Road 23 to SR 99. Except for the portion of Olive Avenue between SR 99 and Howard Road, the connector is a truck route. The connector is approximately four miles long and is four lanes wide between SR 99 and Autumn Road, where it narrows to two lanes. Much of the four-lane portion is separated by a landscaped median. There are six signalized intersections, or about 1.5 signals per mile, mostly concentrated near SR 99. The eastern portion of the corridor is surrounded by primarily residential and commercial land use, and becomes industrial/agricultural west of Westberry Boulevard. The AADT on the connector ranges from 7,020 to 10,140. There were 29 collisions reported between 2010 and 2014, one of which involved a truck. This is a relatively low number of collisions for a corridor of this length and land use composition, which may be due in part to the careful access management and median divider in the wider portion of the road.

Airport Drive/Avenue 17 [MA_4] is a connector between Aviation Drive and SR 99. The route is approximately 3/4 mile long with no signalized intersections. The roads are primarily two lanes wide and AADT ranges from approximately 2,750 to 8,340. Avenue 17 provides a direct connection to SR 99 and is itself a truck route. Airport Drive serves the Madera airport and is surrounded by industrial and airport-commercial land use. There were two reported collisions in the period from 2010 to 2014, neither of which involved trucks. However, both occurred at the intersection of Airport Drive and Avenue 17, which is a relatively wide, two-way stop-controlled intersection.

Pine Street [MA_5] is a north-south connector between Howard Road and Avenue 12. The connector is approximately two miles long with no signalized intersections. It connects with three east-west major truck routes, which provide access to nearby SR 99. The two-lane road carries an AADT of approximately 8,910 vehicles. There were 10 collisions reported between 2010 and 2014, none of which involved trucks; these were concentrated to the north of the connector close to Howard Road, where retail is the dominant land use. The segment of Pine Street south of Howard Road is surrounded by primarily industrial and commercial land use; however, there is a fairly large school grounds located at the intersection with Pecan Avenue, which should be considered for safety. Intersections and retail-oriented driveways near Howard Road, Almond Avenue, and Pecan Avenue have received upgrades in recent years for access management and lane delineation, which improve separation of commercial vehicle traffic and reduce the risk of collisions with turning traffic.

Table 5.6 Madera County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
MA_2	Avenue 14/Howard Road/W. Olive Road	Road 23	Granada Dr	SR 99 (change)	Major freight gen
MA_3	West Almond Avenue/S Pine St/W Olive Avenue	S Granada Drive		SR 99 Madera Avenue	Warehouse/ industrial cluster
MA_4	Airport Drive/ Avenue 17	Aviation Dr	Yeager Dr	SR 99	Connection to airport and assoc industry
MA_5	S Pine St	Howard Road		Avenue 12	Multiple Freight generators, City truck route
MA_6	N Gateway Drive	SR 145		W Cleveland Avenue	Connection between SR 145 and SR 99, limited freight generators (weak candidate)

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
MA_2	26/6	2 or 4	Good	Residential, Retail, Agriculture, Open Space	Yes	No	Yes
MA_3	2/0	2	Poor	Industrial, Rural Land	Yes	No	No
MA_4	4/0	2 or 3	Good	Airport, Commercial, Industrial, Rural Land	Yes	No	Yes
MA_5	7/0	2	Excellent	Agriculture, Commercial	Yes	No	Yes
MA_6	8/1	2 or 3	Good	Open Space, Commercial, Retail	No	No	Yes

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
MA_2	29	1	3	43	7,027	10,141
MA_3	4	0	0	8	2,421	
MA_4		0	0	0	8,343	2,756
MA_5		0	0	0	8,917	
MA_6	19	0	0	38	10,783	

5.11.5 Merced County First-/Last-Mile Connector Highlights

The truck classification count was not available for any of the connectors identified in Merced County.

Westside Boulevard [ME_10] is an east-west connector running from Robin Avenue to Gipson Street, crossing SR 99 to the east. The connector is approximately 5.6 miles long with no signalized intersections. It is a two-lane road, most of which is relatively narrow with no paved shoulders. The surrounding land use is agricultural and industrial. Between 2010 and 2014, 17 collisions occurred in the corridor, of which eight involved trucks. This is a relatively high proportion of truck-involved collisions, but could be accounted for by their proportion of overall traffic.

Applegate Road [ME_11] is a north-south connector extending south from SR 99 to Atwater Jordan Road. The connector segment is just under one mile long, is two lanes wide, and has one signalized intersection at Bell Drive/Commerce Avenue, just south of SR 99. The area nearest to SR 99 is primarily retail commercial land use, and some residential. South of Sunset Drive, the adjacent land use is primarily agricultural and industrial. The connector presently serves manufacturing industry and agriculture located near the intersection with Atwater Jordan Road. There were 13 collisions in this corridor between 2010 and 2014, nine of which occurred at or near the Atwater Jordan Road intersection, and one of those involved a truck. The speed limit on this portion of Applegate Road is 50 miles per hour and the intersection is a two-way stop for traffic on Atwater Jordan Road.

Table 5.7 Merced County Connector Information

ID	Street Name	Intermediate point	From	To	FAST Act Criteria Met (If Applicable)
ME_1	Healy Road	Doppler Road		Sandy Mush Road	Access to agriculture
ME_2	Cooper Avenue	Ashby Road		SR 59	Manufacturing (Quad Graphics, Scholle, White Oak)
ME_3	Volta/Ingomar/ Husman	SR 33		SR 33	Two packaging facilities and agriculture
ME_4	Ortigalita Road/Sunset Avenue	SR 152		Canyon Road	Vulcan Materials-quarrying
ME_5	Meadow Dr/Shaffer Road	Jones Road		Oakdale Road	Serves Aggregate Mine-Oakdale Road is on our Corridor List
ME_6	Shaffer Road	Oakdale Road		End of road	Serves Aggregate Mine-Oakdale Road is on our Corridor List
ME_7	Collier Road	SR 99		End of road	Foster Feed Farm and ag-some transloading
ME_8	River Road/Vinewood Avenue/B St.	Winton Pkwy		Griffith Avenue	Gallo Winery, ag (weak candidate)
ME_9	Magnolia Avenue	Sultana Blvd		Robin Avenue	Multiple small businesses, freight, packaging
ME_10	Westside Blvd	Robin Avenue		Gipson St	Garcia Farms and Dole

ID	Street Name	Intermediate point	From	To	FAST Act Criteria Met (If Applicable)
ME_11	Applegate Road	SR 99		Atwater Jordan Road	Atwater Packing Company (weak candidate)
ME_12	N Buhach Road/Green Sands Avenue/Atwater-Merced Expressway	Hospital Avenue		SR 99	Connection to airport, limited freight
ME_13	Vassar Avenue/Henry St/E Mission Avenue	Healy Road		SR 99	Connection to Yosemite Wholesale Warehouse
ME_14	White Rock Road/Le Grand Road	S Santa Fe Avenue		Quarry	Connection to aggregate site (weak candidate)

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
ME_1	8/0	2		Agriculture	Yes	No	No
ME_2	0/0	2		Industrial	Yes	No	No
ME_3	13/0	2		Agriculture, Industrial	Yes	No	No
ME_4	9/1	2 or 4		Agriculture, Residential, Retail	Yes	No	Yes
ME_5	5/0	2		Agriculture	Yes	No	No
ME_6	7/0	2		Agriculture	Yes	No	No
ME_7	4/0	2		Agriculture, Industrial	Yes	No	No
ME_8	4/0	2		Agriculture, Industrial	No	No	No
ME_9	3/0	2		Agriculture	Yes	No	No
ME_10	11/0	2	Poor	Agriculture	Yes	No	No
ME_11	2/1	2	Excellent	Agriculture, Retail	Yes	No	Yes
ME_12	10/6	4		Residential, ends at Airport	No	No	Yes
ME_13	3/0	2 or 4		Agriculture, Industrial	Yes	No	Yes
ME_14	3/0	2		Agriculture	Yes	No	No

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries
ME_1	5	1	0	6
ME_2	10	0	0	16
ME_3	0	0	0	0
ME_4	0	0	0	0
ME_5	0	0	0	0
ME_6	0	0	0	0
ME_7	0	0	0	0
ME_8	3	0	0	4
ME_9	0	0	0	0
ME_10	0	0	0	0
ME_11	13	1	1	35
ME_12	0	0	0	0
ME_13	0	0	0	0
ME_14	0	0	0	0

5.11.6 San Joaquin County First-/Last-Mile Connector Highlights

French Camp Road [SJ_5] is a connector between Airport Way and SR 99, a segment of 2.2 miles, and continues west to connect with I-5. The connector was identified through outreach to trucking associations, which identified this route as a primary means to cross between I-5 and SR 99 south of Stockton. The road is not designated an STAA truck route, although it has high volume of heavy-duty trucks. The route has two signalized intersections and is two lanes wide throughout, with paved shoulders. The AADT on this segment is approximately 7,750 vehicles. There is an at-grade railroad crossing located between SR 99 and Union Road, where the railroad crosses at a wide angle across French Camp Road. The crossing is protected by signals and gates. Surrounding land use is primarily agricultural-industrial, and some rural residential. There were 24 reported collisions in the period from 2010 through 2014, of which five involved trucks. Several truck collisions occurred at or near the Union Road intersection, which is a signalized T-intersection.

Table 5.8 San Joaquin County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
SJ_1	Airport Way	SR 120		French Camp Road	Alt to SR 99/I5, intermodal connection, warehouse/ logistics
SJ_2	Arch Airport Road/Arch Road	I-5	Airport Way	Mariposa Rail Yard	Intermodal facility (airport and rail), warehouse/ industrial land
SJ_5	French Camp Road	SR 99		S Airport Way	Major freight gen, Ag and forestry processing, access to intermodal (Air)

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
SJ_6	Hammer Lane	West Lane		CA 99	Major freight gen (weak candidate)
SJ_14	Charter Way	Navy Drive		I-5	Access to Port of Stockton

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to least)	Shoulder	Bicycle Lane	Sidewalk
SJ_1	13/6	2	Good	Agriculture, Residential	Yes	No	Yes
SJ_2	16/10	2, 3, 4 or 6	Good	Agriculture, Airport, Commercial	Yes	No	Yes
SJ_5	5/2	2	Excellent	Agriculture, Residential, Industrial, Open Space	Yes	No	No
SJ_6	7/7	8	Good	Residential, Retail	No	Yes	Yes
SJ_14	1/1	4	Excellent	Retail, Open Space	No	Yes	No

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
SJ_1	42	2	5	53	10,224	
SJ_2	23	6	2	34	7,756	18,449
SJ_5	24	5	1	26	7,756	
SJ_6		0	0	0	32,622	
SJ_14	11	2	0	16	27,000	

5.11.7 Stanislaus County First-/Last-Mile Connector Highlights

Crows Landing Road [ST_1] is a connector more than 20 miles long, passing through a rural residential area and providing access from I-5 to several medium and large farms, dairy and food processing firms. It has one lane in each direction and many driveway crossings distributed short distances from each other without proper signage. A relatively high number of collisions, especially truck-involved collisions, is a warning regarding the lack of safety measures. Traffic volumes vary across the connector, with low AADT of 2,500 near I-5 and high volumes of 30,000 near Shackelford. The posted speed is mostly 45 mph, but it is likely that auto drivers, drive at higher speed. Both the I-5 and SR 99 interchanges are grade-separated and unsignalized.

Mitchell Road [ST_2] is a connector approximately 4.8 miles in length, bridging SR 99 and SR 132 and providing access to the Modesto City-County Airport and nearby industrial land uses, including several distribution warehouses and food processing firms. South of the airport zone, Mitchell Road passes through residential and commercial land uses in the community of Ceres. The road is generally two lanes in each direction with a center turn lane. Mitchell Road provides direct access for trucks with origins or destinations south of Modesto to reach the airport industrial zone from SR 99. At the intersection with SR 132 also is an active grade crossing running parallel to SR 132 and immediately adjacent to an industrial siding; frequent train switching activities could decrease reliability of this access point. The crossing is protected by gates and signals. There are 12 signalized intersections along the corridor, most of which are located south of the airport. Although collisions along the corridor are relatively high, trucks are involved in very few. Collisions tend to be concentrated near the residential area south of the airport, where AADT also is likely higher and there are more vehicles turning and entering. The posted speed limit in the industrial zone is 50 mph, and decreases to 45 mph between SR 99 and the Tuolumne River.

Table 5.9 Stanislaus County Connector Information

ID	Street Name	Intermediate point	From	To	FAST Act Criteria Met (If Applicable)
ST_1	Crows Landing Road/Fink Road	SR 99	SR 33	I-5	Warehouse/industrial land, major freight generation
ST_2	Mitchell Road	SR 132		SR 99	Intermodal (airport), major freight generation, logistics/warehouses
ST_3	Rogers Road	Zacharias Road	Rogers Ct	Sperry Avenue	3 major warehouses
ST_6	Kansas Avenue/Needham St	N Carpenter Road	Franklin St	McHenry Avenue (SR 108)	Retail and Manu along northern edge

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
ST_1	>30	2	Good	Agriculture, Rural Land, Residential	Yes	No	No
ST_2	19/12	4	Good	Airport, Commercial, Open Space, Residential, Retail	Yes	No	Yes
ST_3	9/1	2 or 4	Good	Agriculture, Industrial, Retail	Yes	No	Yes
ST_6	22/9	2, 4 or 6	Excellent	Commercial, Residential, Industrial, Open Space	No	Yes	Yes

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
ST_1	241	15	7	362	2,500	14,000
ST_2	197	4	3	285	32,710	
ST_3	1	0	0	1	1,532	
ST_6	79	0	1	106	12,554	

5.11.8 Tulare County First-/Last-Mile Connector Highlights

Avenue 416/Mountain View Avenue [TU_1] is an east-west route connecting Dinuba with SR 99. This connector is a truck route.

Blackstone Street [TU_2] is a north-south route parallel to SR 99 that serves a commercial-industrial area between Bardsley Avenue and Industrial Avenue, located between the Union Pacific railroad and SR 99. The connector is 1.4 miles long with no signalized intersections, and direct access to SR 99 at Paige Avenue. Much of the road is only two lanes wide plus center turn lanes, but certain portions include two lanes in one or both directions. The length of Blackstone Street was repaved relatively recently. Despite being very wide even in the two-lane segments, and with a posted speed limit of 50 and no signalized intersections, only two collisions were reported on the connector between 2010 and 2014. Both occurred at the intersection with Bardsley Avenue, where the adjacent land use is more retail-commercial and there are residential neighborhoods nearby. Neither incident involved a truck. The apparent safety of the corridor is all the most surprising given the unusual geometry and intersection configuration of the SR 99 southbound on-/off-ramp that approaches the Paige Avenue intersection at a steep angle. The Paige Avenue intersection itself has three-lane approaches to an all-way stop-controlled intersection, an arrangement that could be dangerous for visibility and correctly yielding right-of-way. It is likely that the strong safety record is due in part to little noncommercial traffic passing through. The AADT on Blackstone Street is approximately 5,560 vehicles. The residential neighborhoods to the north of Bardsley Ave have access to SR 99 without needing to travel through the industrial area, and there are no neighborhoods west of Blackstone Street that would require passing through to access the freeway.

Bardsley Avenue [TU_3] is an east-west connector between I Street and SR 99, providing access to a large industrial zone to the south between the UPRR and SR 99 and connecting with K Street, a major truck route, and Blackstone Street, for local access to industries. To the north of Bardsley Avenue is a residential neighborhood and some retail-commercial areas. A grade separation project was recently completed at the Union Pacific railroad crossing, near I Street. The route is approximately one mile long, with three signalized intersections. Bardsley Avenue is four lanes wide with center turning lanes, and sidewalks run the length of the segment. The AADT on Bardsley Avenue is approximately 17,900 vehicles. There were 14 collisions reported from 2010 through 2014, none of which involved trucks. Most collisions occurred at intersections.

Goshen Avenue [TU_8] is an east-west route running from SR 99 to Shirk Street. The connector is about 2.9 miles long with two signalized intersections. The surrounding land use is primarily industrial, changing to residential and commercial immediately east of Shirk Street. Most of the road is four lanes wide and divided by a median, but is only two lanes wide and undivided west of American Street to SR 99. North-south access also is provided by Plaza Drive, crossing Goshen Avenue approximately in the middle of the segment. Plaza Drive is a truck route. There were only four collisions reported in the period between 2010 and 2014, and none of these involved trucks. The San Joaquin Valley Railroad (SJVR) runs immediately parallel to Goshen Avenue on the north side of the road, and there are some active spurs crossing Goshen to serve industries on the south side. Some spurs appear to be disused but tracks and some crossing signals are still present across Goshen Avenue. The AADT of Goshen Avenue ranges from 6,470 to 8,030 vehicles.

Spruce Road [TU_13] is a north-south route between SR 198 to SR 65, traversing primarily agricultural-industrial areas and some small pockets of residential. The route is 7.9 miles long with no signalized intersections, and is two lanes wide throughout. The AADT is approximately 8,800 vehicles. There are two at-grade railroad crossings approximately central to the connector segment. Both crossings would be considered branch lines and do not appear heavily used, but are likely still active. Each are protected by signals. There were 63 collisions in this corridor between 2010 and 2014, of which three involved trucks. Although a long corridor, this is a relatively high number of crashes given the AADT and adjacent land use. Collisions appear to be distributed throughout the corridor. Contributing factors are likely the high speed along the road, numerous driveways to access farms and other lots, and its viability as a ‘‘shortcut’’ between

SR 65 and SR 198 that eliminates the need to travel a mile further west to follow SR 65. Some collisions near the railroad crossings are to be expected, since motorists may not be expecting a train crossing; several rear end crashes occurred on the approach to the crossings, suggesting that vehicles may be stopping short or following too close as a train activates the crossing signals.

Sierra Avenue (Avenue 56) [TU_10] is an east-west connector between SR 99 in Earlimart extending east to SR 65. The majority of the surrounding land use is agricultural, except nearest to SR 99 where the residential neighborhoods of Earlimart lie. The two-lane-wide corridor is 12.2 miles long with no signalized intersections. Traffic volumes are very low along most of the road with an AADT of approximately 2,500. Between 2010 and 2014 there were 18 collisions reported, of which none involved trucks. The collisions are predominantly broadside-type crashes and occur at the cross-streets along the entire corridor.

County Line Road/Road 184/Avenue 8 [TU_17] is a series of roads traveling primarily east-west between SR 99 and Famoso Porterville Highway near Richgrove. The route is two lanes wide with no signalized intersections. The adjacent land use is primarily agricultural-industrial, but the segment from SR 99 east to about Road 160 includes residential neighborhoods mostly to the south of County Line Road. The AADT along the route is approximately 13,810 vehicles. Forty-two collisions were reported in the period from 2010 to 2014, with three involving trucks. Collisions occurred mostly near the residential areas of Delano and eastwards about to Road 176; far fewer occurred between there and Famoso Porterville Highway.

Table 5.10 Tulare County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
TU_1	Avenue 416/E Mountain View Avenue	SR 99	Road 72	Road 88	Access to ag, major freight gen (Best Buy Dist)
TU_2	S Blackstone St	E Bardsley Avenue	Continental Avenue	Industrial Avenue	Major freight gen, logistics/warehouse/manu
TU_3	E Bardsley Avenue	South I St		SR 99	Major freight gen, logistics/warehouse/manu
TU_6	K St	SR 99	Paige Avenue	E Owens Avenue	Major freight gen, logistics/warehouse/manu
TU_7	Road 80 (Plaza Drive)	W Airport Drive	Neeley Road/Hurley Avenue	W Riggin Avenue	Intermodal (airport), major freight gen, warehousing
TU_8	W Goshen Avenue	SR 99	Road 76	N Shirk St	Major freight gen, warehouse/logistics/indu
TU_12	Avenue 368	SR 99		Road 132	Serves multiple large dairy farms, Ventura Coastal
TU_13	Spruce Road/Road 204	SR 198		SR 137	Serves multiple ag processing, one chemical site
TU_14	Road 152	SR 137		SR 190	Serves multiple large dairy farms
TU_15	Terra Bella/Avenue 96/Avenue 95	SR 65		Road 236	Multiple Freight gen (ag and forestry)

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
TU_16	Avenue 56	SR 99		SR 65	Weak candidate – serves a few trucking/ag facilities, but limited
TU_17	Avenue 0/Reed Road/Avenue 8	SR 99		Richgrove Drive	Serves multiple ag and processing facilities

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
TU_1	40/7	2 or 4	Good	Agriculture, Residential, Open Space	Yes	No	Yes
TU_2	6/0	2 or 4	Good	Commercial, Rural Land	Yes	No	Yes
TU_3	8/3	4	Excellent	Retail, Residential, Open Space, Rural Land	No	No	Yes
TU_6	17/2	2 or 4	Good	Commercial, Industrial, Rural Land	Yes	No	Yes
TU_7	6/6	4 or 6	Good	Commercial, Agriculture	No	Yes	Yes
TU_8	7/2	2 or 4	Good	Industrial, Commercial, Agriculture	Yes	No	Yes
TU_12	14/1	2	Poor	Agriculture	Yes	No	No
TU_13	17/0	2	Good	Agriculture	Yes	No	No
TU_14	11/0	2	Excellent	Agriculture	Yes	No	No
TU_15	2/0	2	Good	Industrial, Residential, Retail	Yes	No	No
TU_16	21/0	2	Good	Agriculture, Residential	Yes	No	No
TU_17	23/0	2	Excellent	Agriculture, Residential	Yes	No	Yes

ID	Number of Collision	Truck-Involved Collisions	Number of Fatalities	Number of Injuries	Vol s1	Vol s2
TU_1	108	12	8	171	11,166	15,080
TU_2	2	0	0	2	5,566	
TU_3	14	0	1	19	17,897	
TU_6	12	1	2	13	7,170	5,209
TU_7	5	0	0	6	21,658	12,882
TU_8	4	0	0	6	6,470	8,028
TU_12	16	5	3	24		
TU_13	63	3	1	97	8,804	
TU_14	21	4	7	36	2,702	
TU_15	7	1	0	9		
TU_16	18	0	3	38	2,504	
TU_17	42	3	1	71	13,810	

5.11.9 Connector Needs and Strategies

Performance metric data collected for select connectors revealed multiple needs that could improve safety and efficiency on connectors throughout the region. Examples include:

- **Improved signage for both passenger and commercial vehicle traffic.** In areas with a mix of traffic, it is important for conspicuous and legible signage to direct various vehicle types. One example of needed signage improvement is in Stanislaus County on Crows Landing Road. This is an industrial and warehousing area with heavy freight generation. It was noted that Crows Landing Road [ST_1] requires adequate signage and warning signs especially near residential areas to improve the safety of the communities.

- **Safety analysis and improvement.** The issue of increased collisions came up in a number of different areas. A thorough safety analysis on the region's connectors could help identify more distinct patterns in commercial vehicle crashes, such as causes (human factors, signage, environmental), crash types, vehicle mix, and other factors. Based on these findings appropriate countermeasures can be identified. Examples include several connectors in San Joaquin, Tulare, and Kern County that exhibit higher than average numbers of collisions. Potential causes on these roadways include freight and local traffic interaction, traffic turning patterns and conflicts, and visibility concerns from geometry of intersections and routes.

- **Signal coordination on truck routes.** Efficiency of truck routes and last-mile connections are impacted significantly by stop signs and signals. Signalization of key intersections with high AADTT could be explored to expedite truck movements, particularly through rural areas with nonsignalized intersections. In urban areas, steps can be taken to coordinate signals on truck routes and adjacent connectors to enhance fluidity of traffic. Another suggestion included adding safety signs to alert auto drivers about heavy truck volumes along the freight connector corridor could reduce the risk of collisions.

- **Pavement quality improvements.** Pavement quality on selected connectors is generally rated good or better. For designated connectors that did not have data, steps should be taken to collect basic qualitative pavement data. Poor pavement is represented by "Major cracks, holes; needs significant capital-intensive repairs" which should signal programmatic and/or maintenance improvements to these roadways. These areas have potential to inhibit safety standards and cause increased damage to both commercial and passenger vehicles.

- **Exploring design standards for heavy truck routes and connectors.** A clear finding of this analysis was that, as expected, the designated connectors vary widely in geometry, appearance, adjacent land uses, and other attributes. In order to address goods movement and safety concerns the SJV COGs could consider devising recommended design standards for first and last-mile connectors to establish baseline "best practices" for issues such as: turning radii, signage and signalization, shoulder dimensions, Complete Streets elements (if applicable), and other geometric elements. These standards could be incorporated into new and existing capital improvements as part of each municipality's and county's planning programs. Based on performance metrics and feedback, nearly each county could benefit from standardized recommendations on selected connectors.

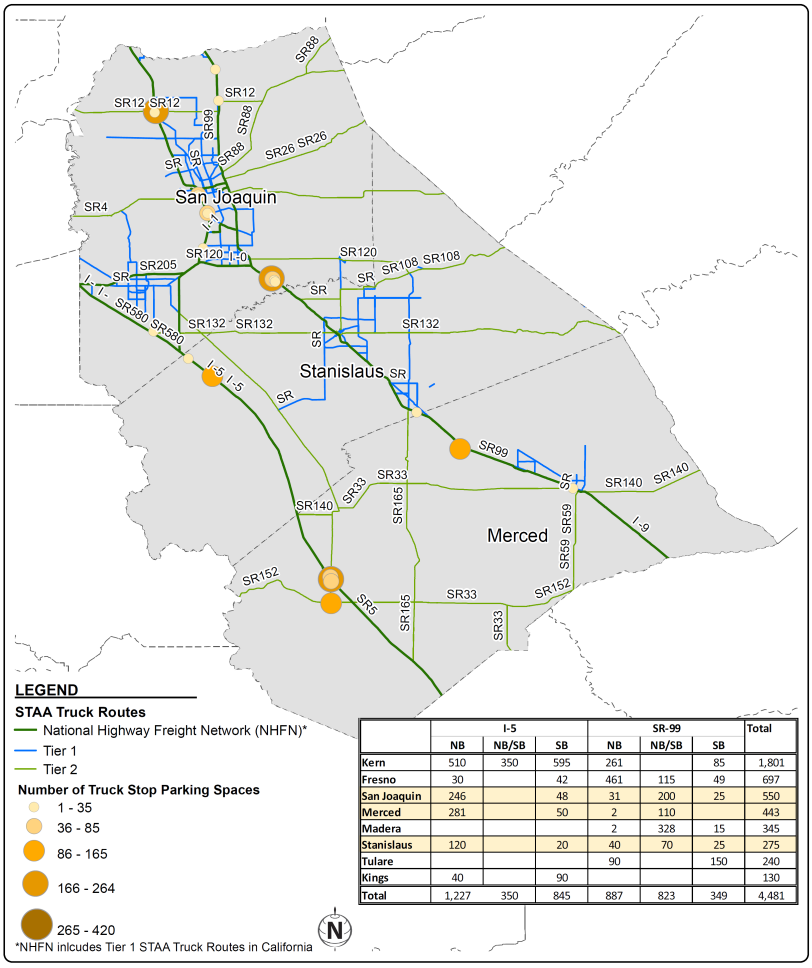
6.0 Truck Parking

6.1 Background

Truck parking availability is a concern for both the goods movement/logistics industry as well as local and state government agencies. Parking along truck routes is necessary for truck drivers to take breaks and rest, or to sleep and wait long enough to comply with Federal laws limiting hours of on-duty driving time. According to the Jason Law report, California ranked second among all the states in terms of severity of need for truck parking spaces. There are 53.7 truck parking spaces per 100 thousand of Vehicle Miles Traveled (KVMT) or 90.6 spaces per 100 miles of National Highway System (NHS). Less than 10 percent of truck parking spaces are public facilities. California ranked 14th in providing public truck parking access in the nation, where rank 1 is the worst. I-5 in California also is ranked 11th in terms of cited interstates with a shortage of truck parking. There is often a disconnect between perceived need and actual need for truck parking. Parking on a shoulder or ramp does not always correlate to a truck parking shortage. Truck drivers may park along the side of highways and exit ramps in several situations:

- When parking is at capacity, unavailable, or inadequately located, truck drivers may not risk continuing further than they should to find a legitimate space to park at their own cost.
- When the truck operator is focused on the need for or pressure to deliver their load by a specific time, leading the driver to push onward regardless of the actual possibility of making it to their destination on time or before they reach their hours of service (HOS) limit. This may cause the driver to park and wait on state routes, rather than entering city boundaries to avoid restrictions on city roads.
- When parking cost is not covered by shippers or employers separately, truck drivers are more likely to park along the side of the highways as a free alternative.
- When information about parking availability and the possibility of booking a parking space in advance at an affordable cost is not available, truck drivers must plan their trip with high uncertainty.
- This uncertainty is higher during the busy months and weekdays when travel time also is not reliable. In these conditions, the truck driver may run out of HOS and need to stop at a nondesignated truck parking space.

Figure 6.1 San Joaquin Valley Truck Parking Availability



	I-5			SR-99			Total
	NB	NB/SB	SB	NB	NB/SB	SB	
Kern	510	350	595	261		85	1,801
Fresno	30		42	461	115	49	697
San Joaquin	246		48	31	200	25	550
Merced	281		50	2	110		443
Madera				2	328	15	345
Stanislaus	120		20	40	70	25	275
Tulare				90		150	240
Kings	40		90				130
Total	1,227	350	845	887	823	349	4,481

Changes in Federal rules between 2005 and 2013 began limiting the hours that truck drivers may be consecutively driving and requires drivers to take a 30-minute break during the first eight hours of their shift. The new HOS rules have reportedly had a profound effect on established trucking patterns across the country. Drivers must plan ever more carefully to balance the timing of deliveries, rest periods, and anticipating traffic congestion or detours.

Planning accurately for all of these variables can be challenging; for example, an unexpected delay at a shipping location could easily throw off an otherwise well-planned trip, making the driver need to search for parking at an unplanned and/or unfamiliar location. Parking on the shoulder of a limited-access highway is prohibited by law, however, law enforcement officials often compare the risk of a tired driver at his HOS limit parking and resting along freeway versus driving until the next available parking space. State officials have safety concerns with illegal side-of-highway parking from the increased risk of vehicle collisions due to poor visibility around the trucks or even the threat of terrorist activities. Having official, sanctioned truck parking also is important for truck driver safety. Driver Jason Rivenburg was killed in 2009 while sleeping in his truck at an abandoned gas station due to a lack of available, lit, and well-used truck stops near his shipping location. In speaking with representatives of the California Highway Patrol's Commercial Vehicle Section, parking on freeway shoulders or ramps happens only sporadically, especially if a driver doesn't anticipate the need for a rest area until too late. Law enforcement officers often have a conflict when it comes to trucks parked illegally along ramps and highways; although it is illegal to park in these locations, it also is a violation

of Federal rules to make the driver resume driving until they reach a legal parking area, and could pose a major liability if the driver were to get involved in a collision as a result of driving during their required rest period.

In speaking with representatives of San Joaquin Valley Metropolitan Planning Organizations (MPOs) and Caltrans Districts 6 and 10, illegal parking along the shoulders or ramps of I-5 and SR 99 has been seen frequently in different seasons. With the exception of the City of McFarland in Kern County, MPOs have not received any complaints from local communities, local industries and firms or trucking companies regarding illegal truck parking. Emissions due to truck idling was identified as the only significant impact of illegal truck parking along state highways by some of the MPOs.

6.1.1 Summary of Truck Parking Recommendations

After reviewing previous reports and discussing the issue with public agencies, truck stop operators and truck drivers, we identified several factors that contribute to the truck parking problem in the Valley. We offer the following recommendations to improve conditions. Many of them require promotion and encouragement by government agencies and a private-sector investment.

6.1.2 Planning and Funding

- Improve data collection and analysis to have a better understanding of short-term and long-term parking demand. Surveys that are conducted at truck stops are naturally underrepresenting short-haul trips. Shipper/Carrier surveys and truck diaries are required to have better understanding of goods movement at the local level.

- Work with law enforcement to educate and train them about improved use of safe and available parking spaces (where parking space is actually available). This requires communication systems to identify parking availability.

- Update plans and investment programs to include truck parking solutions, both for facilities and technology for truck parking information services. Investigate P-3 approaches (Public Private Partnership) that involve private-sector partners in the development of truck parking investments.

- MPOs should consider ways to incentivize land use decisions to facilitate private-sector expansion of existing facilities or opening of new ones.

- Surplus public properties can be converted to truck stops (e.g., converting a former weigh station to truck parking spaces). If the property has adequate pavement, this is fairly easy. If not, the cost is higher.

- Funding provided by FAST could be used to construct or expand truck parking facilities and deploy tools for commercial motor vehicle drivers to find safe, available places to park and rest. Sponsoring parking in industrial parks, small truck stops, or converting unused public property to truck parking would increase the supply of parking spaces. The National Highway Freight Program (NHFP) created under FAST, allocates $1.2 billion annually by formula to states to undertake freight planning, performance measures, operational improvements and construction activities. While the program is highway focused, it allows states to allocate up to 10 percent of the program funds to truck parking, rail, intermodal and port projects.

6.1.3 Demand Control

- Policies that incentivize off-peak deliveries can reduce demand for long-term parking spaces. According to the Jason's Law survey, many states reported that most parking problems occur during nighttime hours. States reported that delivery timing and hours of operation at freight facilities (such as ports), can help reduce night-time parking demand.

- Truck circulation is a problem in some older parking facilities that are not designed for larger trucks. Drivers avoid places where their trucks cannot maneuver easily or may be blocked by other vehicles. Standard striping and use of way-finding signage are low-cost improvements that can increase the efficiency and traffic circulation in truck parking areas.

- Shippers/receivers often demand that drivers leave the facility immediately after delivery. Trucking association and public agencies may encourage industries to develop procedures or agreements to allow drivers to use their parking facility as possible for short breaks if drivers need.

Technology

- Problems usually occur when drivers operate outside of familiar areas Apps showing information for adjacent or nearby interchanges that have parking helps drivers know their options. Availability of information systems are useful tools and a part of the solution to the parking problem; however, they are only helpful when there really is parking available.

- TA Petro's TruckSmart app offers users parking availability information across the network. The information is updated every two hours by staff at each location. They are the only one of the big three chains to have implemented such a system to date. Promoting this type of information sharing even by crowdsourcing through drivers themselves would increase the efficiency of the trucking industry.

- The predictability of available spaces is a key need for the trucking industry. Caltrans also can develop (or sponsor) an integrated parking app to show public and private locations, amenities, occupancy, maybe even reservations. Caltrans launched real-time parking solutions on segments of I-5, the results shows increase in parking occupancy. More of these applications would be beneficial.

Emission Reduction Policies

- Many EPA SmartWay carrier partners use Truck Stop Electrification (TSE) where it fits with their travel patterns, and more seem to be establishing private TSE in their yards and allowing visiting truckers to use it. Trucking associations can encourage fleet owners to pay drivers to use designated parking areas. Caltrans also can help DOE and EPA to promote it.

- One source of opposition to establishing new open-access truck parking facilities may be that they "count" in EPA's inventory of sources of mobile sources air emissions (MOVES). If these facilities are outfitted with idle reduction equipment, they might qualify for a lower impact. Also, including TSE equipment in the proposed design of facilities could improve local acceptance.

7.0 Modeling and Performance Evaluation

7.1 Background

The growing demand for various freight-related analysis from public agencies has resulted in significant improvements in in the availability of freight-related data sources such as accessibility and affordability of truck GPS data and truck diaries, increase in data quality and sample size of freight-related surveys such as, local establishment surveys, and national and local commodity flow/origin-destination studies. Currently, the Federal Highway Administration and the Bureau of Transportation Statistics are considering re-establishing the Vehicle Inventory and Use Survey (VIUS), while at the state level, California is in the process of conducting its own statewide VIUS program to provide data for state and local freight modeling. The National Cooperative Freight Research Program (NCFRP), the National Cooperative Highway Research Program (NCHRP), and the Strategic Highway Research Program (SHRP) have all conducted applied research projects to advance the state-of-the-art of freight modeling and an increasing number of states and metropolitan planning organizations (MPOs) have adapted methodologies from this research in state and regional freight models.

The San Joaquin Valley transportation planning agencies have access to a Valleywide truck travel demand model that has been integrated with their auto model. The model was originally developed in the early 2000s and has been updated twice since it was originally developed. Nonetheless, during outreach workshops with transportation modelers and planners in the Valley, it became clear that this model is rarely used. Several reasons for this were cited including:

- Concerns about how accurately the model predicts truck traffic;
- Limited need to analyze freight issues until recently;
- Lack of long-term maintenance plans for the model leading to out of date input data; and
- Lack of training for users.

All of these issues suggest that it may be beneficial to look at developing a new model but along with it, to establish a program for maintaining the model and training new users on a regular basis. Any new model should draw from the current state of the practice approaches and take advantage of new sources of data.

Prior to developing the modeling framework for a new freight/commercial vehicle model, it is useful to review existing literature on freight and truck travel modeling in order to identify conceptual frameworks that could be useful in the San Joaquin Valley as well as pitfalls that should be avoided. This report reviews and summarizes the modeling techniques that currently are being used by various MPOs and states. The ensuing sections provide a brief description of the various techniques identified in those reviews.

The modeling techniques can be generally classified into seven categories (A-G) based on objective, methodology, and data requirements as shown Table 1. The models are ordered by complexity:

a. Link-based factoring model, where future traffic volumes are estimated by factoring the base year traffic counts and a fixed-growth rate.

b. Origin-destination (O-D) factoring model, where future truck flows are estimated by factoring the base year O-D matrix and a fixed-growth rate.

c. Three-step truck models with similar steps to traditional passenger travel demand model; trip generation, trip distribution and traffic assignment.

d. Four-step commodity models relates are similar to group C with an extra step of mode choice or mode split before network assignment.

e. Economic activity models include an economic or land use model as a step before the traditional four steps.

f. Tour-based model with similar concept to activity-based passenger models.

g. Logistics/supply chain model combine features of logistics chain models and tour-based models to analyze urban goods movement flows.

Table 7.1 Comparison of Freight Modeling Techniques and Framework

Model	Strength	Limitations	Major model components
A- Link-based factoring model	• Low complexity • Low cost • Multi-variable • Corridor /mode specific	• Not suitable for analyzing complicated scenarios • Unable to provide any forecast on locations without existing counts • Developing accurate growth factors requires a separate economic model • No supply/demand relationship • Not network based	• Truck count data base • A set of growth factors
B- Origin-destination (O-D) factoring model	• Low complexity • Relatively low cost • Available national data • Easily adaptable to different scale • Multi-modal commodity flows	• Observed disaggregate data is proprietary • Estimated disaggregate data is expensive • It is not directly integrated with economic census	• Sample O-D surveys or GPS OD Data • Expanded Truck O-D table (developed using origen-destination matrix estimation (ODME) process) • Network assignment module
C- 3-step truck models / D- 4-step commodity models	• Predictive model • Multi-modal commodity flows • Able to do detailed scenario analysis	• Extensive data collection requirement or needs to purchase expensive data • Takes relatively long time to develop	• Trip generation • Trip distribution • (mode split) • Trip Assignment
E- Economic activity models	• Economic and land use data are integrated with 3 or 4 step model • Available public data at local level as well as national	• Linear relationship between economic activity and freight flows is not always true	• Land use model • All components of 4-step models. • Tonnage/ $ to truck conversion module

Model	Strength	Limitations	Major model components
F- Tour-based model	• Involved detail data about raw materials and finished goods • Capture movements of vehicles and decisions of carriers more realistically • More accurately forecast truck traffic at local level	• Significant data requirements such as truck load data, intermodal facilities, firm shipment sizes and distribution and truck activity diaries • Takes very long time to develop and validate	• All component of 4-step • Modules to generate components of a tour
G- Logistics/supply chain model	• Very sensitive to economics of various industries for policy making • Similar to Hybrid models	• Significant amount of data is required from various data sources, which might be difficult to acquire,	• Complex economic model including domestic and international all component of table

7.2 Recommended Freight Modeling Framework

After reviewing the available modeling methodologies and their associated cost and the various needs of San Joaquin Valley MPOs for freight planning, the following options are available:

Option 1: Updating the Valley Truck Model with latest sociodemographic data, improve the structure to seamlessly integrate with each county passenger model and enhance the model to provide desired performance measures. Develop a plan to maintain and update the model periodically and provide training for MPOs to be able to use the model as needed.

Option 2: Adapt the new statewide freight model and develop a process to disaggregate a subarea model for each MPO and integrate with their passenger model.

- Option 1 requires major investment to update the Valley truck model and continuous commitment to maintain the model and training the staff for new applications. However, the model would be customized to the local needs and the MPOs have more control about the structure of the model and related assumptions.

- Option 2 Requires Valleys' MPOs close coordination with Caltrans modeling staff to ensure that their projects are properly included in CSFFM. The input data for future forecast year are consistent with Valley's assumptions and modeling staff at each MPO are familiar with the model application and developing different scenarios. The advantage of this option is that Caltrans would maintain the model, provide regular updates and offer training for all MPOs.

Considering the above, a hybrid framework is recommended, where option 2 is adapted and procedures will be developed to address all local needs. Under this framework there will be no need to maintain a separate Valleywide freight model; every MPO will have a freight module integrated with their passenger model. This recommended framework is summarized in two steps and explained in Table 7.2 and Table 7.3:

- Valley Freight Data Plan; and

- Valley Freight Model Update Plan.

Table 7.2 Valleywide Freight Data Plan

Step One

1. Maintain an inventory of truck routes, truck parking, major freight activity centers.
2. Maintain a database of classification counts for major arterials and regional screen lines.
3. Prepare a maintenance plan and review/update the data base every five years.
4. Maintain a single set of input data base for passenger and freight models.

- As part of *I-5/SR 99 Freight Corridor Study and Sustainable Implementation Plan Study* a lot of freight-related data have been collected and geocoded. This geo data base can be published on the Valley web site as a valuable resource for practitioners.
- The shared input data between passenger models under MIP and freight model (such as land use information or network information) must be consistent and seamlessly integrated.

Table 7.3 Freight Model Update Plan for Each MPO

Step Two

1. Maintain the consistency with California Statewide Freight Forecasting Model (CSFFM). Ensure the consistency of model's assumption.

   Maintaining consistency of the Valley MPO models with CSFFM can provide the opportunity to easily integrate the information provided by CSFFM into the Valley model. The following elements are few examples:

   - Commodity groups definition
   - Regional flow (import/export flows)
   - Route choice patterns, through trips and local trips
   - Share of each mode
   - Vehicle classification.

   Coordinate closely with Caltrans modeling group and provide future land use forecast, this will ensure that the statewide model can forecast volumes consistent with MIP.

2. Develop a sketch freight planning tool for quick interregional commodity flow analysis.

   - It can be an efficient spread sheet tool based on disaggregated FAF data from CSFFM base year. Compiling the data in a data visualization packages (such as Tableau) can help to quickly make filters and plot the distributions and derive basic statistics about commodity flow between origin and destination sets.
   - The tool can include the distribution of long-haul trucks (by origin and destination) on major corridors derived from select link assignment run of CSFFM model or GPS trajectories. This information will help to coarsely estimate the percent of trucks that might shift their route when comparable alternative route is provided.

3. Modify Valleywide truck model to include new modules and user-friendly interface for easy and seamless integration with the MIP passenger model and Statewide model.

   - Ensure that the Valleywide truck network has all of the required attributes for multi class assignment (truck speed, functional class, grade, capacity).
   - The interregional truck trips (I-X, X-I, X-X) trips can be derived easily from CSFFM and disaggregated to the Valley vide TAZs. This is important for Valley truck model since it is located on the spinal cord of the State.

4. Include truck trips by their purpose: freight and nonfreight trips.

   - Heavy-duty trucks are not as sensitive to network changes as passenger vehicles. The number of alternative truck routes between an OD pair is usually very limited. Information about truck purposes helps to evaluate the impact of capital projects, corridor improvements and last-mile connectors accessibility based on targeted trucks by trip purpose.

Step Two

5. Improve model validation on local level and conduct model sensitivity test.
   - In order to use the model to evaluate the impacts of smaller projects at local level, it is important to improve the validation of the model and focus on more local screen lines as well as regional screen lines.

8.0 Funding

For the first time since the San Joaquin Valley regional transportation planning agencies have begun to address their freight transportation needs, both the state and Federal governments now have dedicated freight transportation funding programs. This presents a new opportunity to implement many of the recommendations included in this study.

8.1 Federal Funding

In the fall of 2015, Congress passed and the President signed the Fixing America's Surface Transportation (FAST) Act. The FAST Act provides multiple funding sources for freight projects and programs.

The first freight-specific funding program is the National Highway Freight Program (NHFP). The NHFP is a $6.3 billion program over five years that is apportioned among the states by formula. States may spend up to 10 percent of their funding on rail and intermodal projects, with the remainder going to projects that are located on or improve freight movement on the National Highway Freight Network which has four components:

1. The Primary Highway Freight system;
2. Critical Urban Freight Corridors (311.77 miles to be designated in California);
3. Critical Rural Freight Corridors (623.54 miles to be designated in California); and
4. The remainder of the Interstate Highway System.

The second potential source for Federal freight-specific funding is the Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) Grant Program. The FASTLANE Program is a $4.5 billion program over five years that consists of competitive grants. Funds can be used for projects on the National Highway System and the National Highway Freight Network. Projects must be "shovel-ready" when the State applies for a grant.

Goods movement also can be enhanced by projects funded through nonfreight-specific sources in the FAST Act. Projects on local and state roads, such as those addressing last-mile connector needs, could be considered for funding through these "general" highway programs. For example, safety improvements that benefit both trucks and passenger vehicles (such as a truck climbing lane) or projects that reduce heavy truck delay, reducing idling and decreasing greenhouse gas emissions, could obtain some funding from these sources which include: National Highway Performance Program (NHPP), Congestion Mitigation and Air Quality (CMAQ) Program, Local Assistance Program (LAP), Highway Safety Improvement Program (HSIP), and the Surface Transportation Program (STP) which has been modified to become the Surface Transportation Block Grant Program (STBGP). STBGP funding is flexible and could be used for a number of programs, including intelligent transportation systems (ITS) and Freight Parking.

Finally, "innovation" is a theme found throughout the FAST Act and one program under that heading could provide funding for freight projects. The FAST Act provides $60 million per year for an Advanced Transportation and Congestion Management Technologies Deployment Program. This competitive grant program will focus on the development of pilot projects and model deployment sites for the installation and operation of advanced transportation technology. For example, the Federal emphasis on truck parking

could be combined with an ITS component such as real-time space availability to address multiple Federal priorities and increase the chance of receiving funds.

Table 8.1 below shows California's share of Federal FAST Act money in different programs over the next five years.

Table 8.1 California Funding from the FAST Act Millions of Dollars

	NHPP	National Freight	Metropolitan Planning	STP	HSIP	TAP	Railway-Highway Crossings	CMAQ
FY 2015	1,930.3	N/A	48.5	887.9	196.8	Unknown	15.3	463.6
FY 2016	1,924.7	106.3	49.8	894.1	195.5	74.7	15.7	462.2
FAST Act 5-year annual average	2,006.5	116.5	52.0	936.1	203.5	75.5	16.2	481.4
FAST Act FY 2016-2020 Total	**10,032.5**	**582.4**	**259.8**	**4,680.5**	**1,017.6**	**377.3**	**82.1**	**2,407.0**

Source: http://www.dot.ca.gov/hq/transprog/map21/reauthorization/ca-fedtranliaison-fastactmemo.pdf.

8.2 State Funding

In April 2017, the Governor signed Senate Bill (SB) 1, the Road Repair and Accountability Act of 2017, creating significant new funding resources for transportation in California. The bill is projected to provide over $52 billion in new revenues from gasoline and diesel excise tax increases, a transportation improvement fee levied on all registered vehicles, and loan repayments under the Transportation Congestion Relief Program.

One of the stated performance outcomes that the bill is intended to help achieve by 2027 is to leverage funding provided by the act for trade corridors and other highly congested travel corridors in order to obtain matching funds from Federal and other sources to maximize improvements in the State's high-priority freight corridors. The bill estimates that approximately $3 billion will be allocable by the State to investments in high-priority freight corridors. The bill creates a new Trade Corridor Enhancement Account to receive 50 percent of the funding collected from the new 20 cent diesel excise tax increase. These funds can be spent on corridor-based freight projects nominated by local agencies and the State.

The SJV has an opportunity to work with the State Transportation Agency and Caltrans to ensure that a portion of the funding that will become available under this new program can be used to address goods movement needs identified in this plan.

9.0 Recommended Next Steps

The SJV Sustainable Implementation Plan has identified a system of truck corridors and connectors and recommendations for how to proceed with improvements on these roadways to address identified needs. In order to move forward with these recommendations, implementation actions should be taken in four key areas:

1. Taking steps to secure funding for near-term opportunities;
2. Conduct additional local analysis to prioritize corridor improvements, including truck parking;
3. Establish a process for regular input on connectors, priority corridors, and truck routes; and
4. Work with Caltrans to adapt the statewide freight model for Valley applications.

Funding Next Steps. During the summer of 2017, Caltrans will complete the designation of priority rural and urban corridors as required by the FAST Act. The approach will be to designate corridor segments that line up with regional priority projects on these corridors. The input from the San Joaquin Valley transportation agencies is consistent with the larger priority corridor recommendations in the Sustainable Implementation Plan. As the projects on this first round of priority corridor designations receive funding, Caltrans is committed to adding new segments. The San Joaquin Valley agencies can use the data from this Plan to inform these subsequent priority corridor designations.

One of the biggest new opportunities is the money that will flow to trade corridor improvements from the SB1 programs. Using the information about priority corridor needs identified in the Sustainable Implementation Plan, SJV transportation agencies will have a good starting point to work with Caltrans to flesh out the details of how the new funds will be spent and ensure that funds are available to support needs identified in this Plan. A related opportunity is one that the SJV agencies can develop themselves using SB1 funds that are available for local streets and roads. At the present time, there is no comprehensive program to address the needs of last-mile connectors in the Valley. Individual regional transportation agencies can create their own program or a Valleywide program could be developed based on the recommendations in this Plan and targeted to the priority connectors identified in the Plan.

Additional Local Analysis. Condition and performance evaluations were conducted for a representative sample of last-mile connectors across the Valley. However, the lack of data made it impossible to conduct a more comprehensive analysis. Using the examples provided in this study with a focus on the types of issues identified for connectors, SJV regional transportation agencies can develop programs to collect new data on the priority connectors to more comprehensively identify project needs. Similar types of analysis also can be developed to better prioritize priority rural corridor needs. These data collection and analysis efforts would focus on better understanding truck crash patterns, truck/passenger vehicle conflicts, and pavement quality, signage, and geometric issues on local roads.

Regular Input on Truck Routes. One lesson learned from the review of intercity truck route designations conducted for this study is that changing land use patterns and the rapid new development of logistics centers and warehouse/distribution center facilities in the Valley requires a regular review of designated truck routes to ensure that the system maintains good connectivity to goods movement centers and that land use conflicts along truck routes are identified as they develop. As part of the regular regional long-range transportation plan process, the metropolitan planning organizations and regional transportation

planning agencies in the Valley should undertake a review of designated truck routes and connectors from this study to make necessary changes. A process for further prioritization of last-mile connectors and rural corridors also could be beneficial in order to ensure that funding is targeted to the corridors of greatest importance to the Valley economy.

Updated Freight Model. The SJV Sustainable Implementation Plan recommended that the Valley transportation agencies consider adapting the statewide freight model as a replacement for the current Valleywide truck model. The benefits, in addition to consistency with statewide planning tools, is that Caltrans will provide support through ongoing data collection programs and model updates that the Valley transportation planning agencies can take advantage of. Work is continuing to complete and validate the statewide model. SJV modelers should participate to the maximum extent possible in reviewing and advising Caltrans as it finalizes the model for statewide applications and should approach Caltrans about creating an adaptation of the model for use in the Valley.

Appendix A. San Joaquin Valley Goods Movement Sustainable Implementation Plan

Sustainable Community Strategies (SCS) define land use and transportation strategies to empower residents and stakeholders of each region to reduce greenhouse gas emissions (GHG) as required by state mandates under Senate Bill (SB) 375.

In this task we reviewed the most recent RTPs in San Joaquin Valley and summarized all the policies and programs related to freight in each MPO as presented in Table A.1 to A.8. The objective is to ensure that the recommendations provided in task 1-4 of the "San Joaquin Valley Goods Movement Sustainable Implementation Plan" are consistent with regional plans.

The following policies or programs are highlighted by majority of MPOs in the Valley:

1. Promote of multi modal goods movement and identify opportunities to increase share of rail in regional freight flows.
2. Develop freight advisory/ freight stakeholder group and have regular meetings to improve coordination between various activates, projects and planning efforts
3. Support economic growth by improving last mile accessibility to strategic economic centers
4. Develop strategies to improve efficiency of freight movement in the valley
5. Improve maintenance of intermodal freight facilities prior to expansion of new ones
6. Improve traffic safety on routes with high truck volumes and at-grade rail crossings

Table A.1 Summary of Freight Policies, Programs, and Performance Metrics

Fresno COG 2014 Regional Transportation Plan (RTP)

Quad-County Freight Advisory Committee (Fresno Kings, Madera, Tulare), Caltrans, Industry
Identified major truck routes. Figure A.1 below (Figure 5-2 from RTP document)
Goal of shifting larger market share to rail. Figures A.2 and A.3 show rail facilities (Figures 5-17 and 5-18 from RTP)
Developed SJV truck model
Goods Movement Action Plan
California Interregional Intermodal Services (CIRIS) study of rail\truck to Port of Oakland
Discussions of rail preservation is primarily focused on passenger rail
Discussions of airfreight cargo from multiple airports
Policy to pursue development of strategies and methods to enhance the efficient movement of freight through the multimodal network
Objective: Increase the use of air and rail transportation and the efficiency of the truck transportation system. Policies: • Encourage the multimodal movement of goods through Fresno County where possible. • Recognize freight rail service in Fresno County as a significant transportation mode, providing service to industry.

- Provide special consideration to transportation projects that improve the operational efficiency of goods movement and air quality.

Objective: Promote the growth of rail passenger and freight usage.

Policy: Seek ways to either relocate all mainline Burlington Northern Santa Fe passenger and freight rail traffic to the Union Pacific alignment through the City of Fresno or relocate BNSF and/or UP freight rail traffic to an alignment west of the Fresno Metropolitan Area to assure smoother, faster and safer service.

Table A.2 Summary of Freight Policies, Programs, and Performance Metrics

Kern COG 2014 Regional Transportation Plan

Executive Summary

- Seven core goals of RTP
  - Goal 1: Mobility – "Improve the mobility of people and freight"
- Strategic investments in "potential nation freight program/freight fees"

Policy Action 21: Coordinate planning efforts to ensure efficient, economical, and environmentally sound movement of goods.

- 21.3 – Encourage coordination and consultation between the public and private sectors to explore innovative and efficient goods movement strategies.
- 21.4 – Identify opportunities for truck-to-rail and truck-to-intermodal mode shifts, and evaluate the contributions of truck traffic on regional air quality.
- 21.5 – Encourage the use of rail and air for goods movement to reduce impacts to state and inter county routes and lessen air quality impacts.
- 21.6 – Oppose higher axle load limits for the trucking industry on general purpose roadways

Policy Action 22: Advocate programs and projects for the intermodal linkage of all freight transportation.

- 22.1 – Consider constructing truck climbing lanes on eastbound SR 58 from General Beale Road to the Bena Road overcrossing.
- 22.2 – Program Infrastructure improvements such as widening of Seventh Standard Road in response to proposed freight movements activities in the area.
- 22.3 – Widen State Route 184 to four lanes to respond to increasing agriculture trucking activity.
- 22.4 – Widen Wheeler Ridge Road to four lanes as a gap-closure measure to tie I-5 to SR 58 via SR184.

Policy Action 23: Develop an annual freight movement stakeholders group for coordination and expansion efforts.

- 23.1 – Encourage communication between short-line rail operators, shippers, and economic development agencies.
- 23.2 – Explore options for potential uses of the southern portion of Arvin Subdivision as identifies in the Kern County Rail Study Phase 2.

Policy Action 24: Explore rail intermodal, transfer facility, and alternative transfer options for the region.

- 24.1 – Continue development of the Paramount Logistics Park for intermodal freight transfer activities.
- 24.2 – Continue development of the Delano RailEx Facility for intermodal freight shipping to the east coast.
- 24.3 – Expand rail service to existing distribution centers throughout Kern County when feasible.

Policy Action 25: Maintain liaison with Southern California Association of Governments and all San Joaquin Valley Councils of Government for efficient coordination of freight movement between regions and counties.

- 25.1 – Work with other agencies to create an effective Central Valley-wide truck model to track regional commodity flows and to identify critical economic trends that will drive truck flows on regionally significant truck routes.

Policy Action 26: Provide heavy truck access planning guidance, including a review of the current surface transportation act route system, review of geometric issues, and signaling for all routes identified as major local access routes, as well as the development of performance standards.

- 26.1 – Add "missing links" (streets) to roadway network that reduce out of direction travel: Centennial Connector will provide a major free flow traffic connector that will improve air quality by reducing stop and go truck travel on local arterials. Hageman Flyover Project will provide another east/west connection over SR 99 to downtown Bakersfield central business district; Mohawk Street Extension provides an extension from Rosedale Highway south that connects to Truxtun Avenue accessing downtown Bakersfield.

Proposed Greenhouse Gas Emission and Vehicle Trip Reduction Strategies (Table 4-7)

- Relief of Tehachapi Pass rail bottleneck (increase class 1 rail capacity by 30%).
- Increase activity at intermodal rail freight facilities (Delano RailEx and Shafter PLP intermodal)
- Smoother traffic flows through major highway corridors (SR58 & SR99 improvements)
- Distribution centers closer to center of population (graphic center of pop. for California is in Kern)

List of Constrained Program of Projects List on Table 5-1

Freight Movement Action Element (Chapter 5, Page 28)

- **Rail:** Discussion of rail as the most economical means of transporting bulk goods over long distance (versus truck and air), however identifies limitations due to speed, fixed track, and scheduling. Due to Kern's location at the geographic center of population for California the county is looking to invest in an inland port to serve as a cargo facilitation center.
- **Trucks:** Discussion of trucking as the most economical means of transporting bulk goods over short distances (up to 600 miles) and recognition of impacts on pavement deterioration and air quality. Notes the need for high-capacity east/west truck corridors and regulatory needs in urban areas. County seeks to find alternative transportation modes to reduce long-distance trucks on roads.
- **Air:** Although air freight has not played large role in the Kern Area, with the continued growth of the Los Angeles basin, Kern may be considered a favorable alternative location. The Meadow Field Airport Master Plan allows for the construction of a third runway to meet any resulting air freight capacity expansion.
- **Pipelines:** Discussion of opportunities for expansion and creation of new terminal facilities.

Proposed Actions (Chapter 5, Page 35)

Near Term (2014-2020)

- Develop an annual freight movement stakeholders group for coordinating preservation and expansion efforts.
  - Coordinate preservation and expansion efforts.
  - Encourage communication between short-line rail operators, shippers, and economic development agencies.
  - Explore options for potential uses of the southern portion of Arvin Subdivision as identified in the Kern County Rail Study Phase 2.
  - Explore the potential to retain freight rail service on the southern portion of Arvin Subdivision. Coordinate with SJVR, Tejon Ranch Company, and other potential area shippers/users, area economic development agencies and the Central California Rail Authority.
  - Explore rail intermodal, transfer facility, and alternative transfer options for the region.
- Maintain liaison with Southern California Association of Governments and all San Joaquin Valley Councils of Government for efficient coordination of freight movement between regions and counties.
- Construct truck climbing lanes on eastbound SR 58 from General Beale Road to the Bena Road overcrossing.
- Program infrastructure improvements such as widening of Seventh Standard Road in response to proposed freight movement activities in the area.
- Continue development of Paramount Logistics Park for intermodal freight transfer activities.
- Continue development of the Delano RailEx Facility for intermodal freight shipping to the East Coast.

Long Term (2021-2040)

- Widen State Route 184 to four lanes to respond to increasing agricultural trucking activity.
- Widen Wheeler Ridge Road to four lanes as a gap-closure measure to tie I-5 to SR 58 via SR 184.
- Construct new SR 58 freeway through Metropolitan Bakersfield from existing SR 58 at Union Avenue to SR 99 near Golden State Avenue (SR 204), continuing west to I-5. This freeway component would relieve some of the congested truck movement on SR 99.
- Expand rail service to existing distribution centers throughout the County.

Primary Goods (intraregional distribution) Movement Corridors in Figure A.4 (Figure 5-28 from RTP document).

- For future planned truck facilities see Figure A.5 (Figure 5-29 from RTP document).

Secondary Goods (regional distribution) Movement Facilities in Figure A.6 (Figure 5-30 from RTP document).

Tertiary Goods (local distribution) Movement Nodes in Figure A.7 (Figure 5-31 from RTP document).

Table A.3 Summary of Freight Policies, Programs, and Performance Metrics
Kings County 2014 Regional Transportation Plan

Discussion of goods movements is mainly focused on truck and rail facilities, with mention that the county anticipates low demand for air cargo transportation.

Action Element (Chapter 5, Page 12)

- To ensure that regional system operation and maintenance costs are held to a minimum and that safety requirements are met the county seeks to enforce Federal and state truck weight and size regulations.
- The county and each city should adopt consistent Oversize Truck Ordinances compatible with the state ordinance(s) to identify acceptable oversize truck routes, terminals, and servicing areas and to set fees for infrastructure improvements.
- To facilitate more efficient movement of goods through California's ports, encourage Caltrans and private entities to carry out the following:
  - Reduce congestion on port access roads.
  - Reduce conflicts between port rail traffic and non-port transportation.
  - Encourage the development and improvement of intermodal freight transfer facilities at ports.
- Implement the goals and objectives identified in the San Joaquin Valley Interregional Goods Movement Plan to maintain and improve the goods movement transportation system.
- Minimize distance of hazardous waste facilities to heavy truck routes.
- Attempt to repurpose to-be-abandoned railroad corridors for other transportation purposes
- Support the continuation of freight rail on existing rail lines to preserve rail corridors and to reduce truck travel by encouraging the shipment of goods by rail.
- Continue to implement various planning strategies to preserve the existing rail corridors for future transportation uses.
- Participate in statewide and regional Freight Advisory Committees to address inter- and intraregional goods movement issues.
- Coordinate with various public and private stakeholders, agencies, and organizations to develop information to better understand the movement of goods within and through the Valley, to assess the efficiency of the transportation network in handling goods movement, and to recommend improvements.
- Support the programming of capacity, operational, safety, and network improvements on the Interregional Road System (IRRS), as recommended in Caltrans' most recent October 2013 Interregional Transportation Strategic Plan, and program improvements on the local transportation system that facilitate interregional movement of people and goods in the Transportation Improvement Programs.

Kings County railroad network shown in Figure A.8 (Figure 5-4 from RTP document)

Kings County oversized truck network shown in Figure A.9 (Figure -5-5 from RTP document)

City truck routes shown in subsequent Figures in RTP document; not included in this document.

Table A.4 Summary of Freight Policies, Programs and Performance Metrics
Madera CTC 2014 Interregional Transportation Improvement Program (ITIP)

Six Primary Objectives:

1. Complete a trunk system of higher standard (usually expressway/freeway) state highways.
2. Connect all urbanized areas, major metropolitan centers, and gateways to the freeway and expressway system to ensure a complete statewide system for the highest volume and most critical trip movements.
3. Ensure a dependable level of service for movement into and through major gateways of statewide significance and ensure connectivity to key intermodal transfer facilities, seaports, air cargo terminals, and freight distribution facilities.
4. Connect urbanizing centers and high growth areas to the trunk system to ensure future connectivity, mobility, and access for the State's expanding population.
5. Link rural and smaller urban centers to the trunk system.
6. Implement an intercity passenger rail program (including interregional commuter rail) that complies with Federal and state laws, improves service reliability, decreases running times, and reduces the per-passenger operating subsidy.

Discussion of projects which include the construction and widening of various state highways on priority goods movement gateways that carry a high percentage of truck traffic. Highways include:

- SR 46 from U.S. 101 to I-5
- SR 70 between Butte and Yuba
- SR 99 (countywide)
- U.S. 101 along the Eureka-Arcata Corridor
- U.S. 395 in Inyo county between Olancha and Cartago

There is no discussion of the rail freight system; only intercity passenger rail.

Performance indicators are a series of questions listed on page 19 of the ITIP.

Table A.5 Summary of Freight Policies, Programs, and Performance Metrics
Merced COG 2014 Regional Transportation Plan

Seven "Vision Themes" provide the foundation for the plan

- Vision 1 – Provide a good system of roads that are well maintained, safe, efficient, and meet the transportation demands of people and freight.
- Vision 2 – Provide a transit system that is a viable choice.
- Vision 3 – Support full-time employment with livable wages – i.e., support job creation & economic vitality.
- Vision 4 – Preserve productive agricultural land/maintain strong agricultural economy and the quality of life that goes with it.
- Vision 5 – Support orderly and planned growth that enhances the integration and connectivity of various modes of transportation.
- Vision 6 – Support clean air and water and avoid, minimize or mitigate negative impacts to the environment.
- Vision 7 – Identify and allocate funding and resources for building, operating and maintaining the existing and future regional transportation system. Ensure that transportation investments are cost-effective.

Goal: Provide a transportation system that enables safe movement of goods in and through Merced County.

4.1. Provide an adequate regional road system for goods movement.

- 4.1.1. Support and participate in the Valley-wide Goods Movement Study.
- 4.1.2. Work with the Freight Advisory Committee to enhance and maintain a viable transportation system for freight and goods movement.

Discussion of goods movement via trucking (94%), rail (6%), air freight (<0.1%), and pipelines.

- **Trucks:** Viewed as the most economical and for having the widest network for tranloading between distribution centers and for regional deliveries. There are realized adverse effects on pavement deterioration and air quality. County seeks to improve intermodal freight transfer facilities and to create regulatory guidelines for trucks in urban areas.

- **Rail:** Considered the most feasible for longer out-of-region transport. County seeks to build more grade-separations so that future growth in rail services don't lead to worse congestion in other modes.
- **Air:** Briefly mentioned for its use in transporting costly, long-range fast delivery of higher-cost merchandise.

Table A.6 Summary of Freight Policies, Programs and Performance Metrics

San Joaquin COG 2014 Regional Transportation Plan

Policy and Supportive Strategies

Policy: Support Economic Vitality

- Strategy #16: Improve Freight Access to Key Strategic Economic Centers
- Strategy #17: Promote Safe and Efficient Strategies to Improve the Movement of Goods by Water, Air, Rail, and Truck.

Introduction

Brief discussion of existing Goods Movement via truck, water, air, and rail.

- **Truck:** Vast highway infrastructure serves as a cost-effective location for large companies interested in operating west coast distribution centers
- **Water:** Port of Stockton is situated in the hub of four major freeways, two transcontinental railroads, an international waterway, and a regional airport. All these components place the port in an ideal position for domestic and international distribution.
- **Air:** The Stockton Metropolitan Airport supports air cargo operations.
- **Rail:** 200 miles of Class I railroad owned by URPR and BNSF and 50 miles of short-line railroads, the Stockton Terminal and Eastern Railroad and the Central California Traction Company.

Considers the MAP-21 eight Federal planning factors.

- Factor 4: Increase the accessibility and mobility of people and for freight.

County aims to improve port access to increase port economic viability by:

- Deepening the channel in order to bring fully loaded ships into the port;
- Prioritizing highway improvements that bolster the economic centers to provide truck connections to the port;
- Strengthening connectivity of key regional arterials and interchanges for goods movement;
- Exploring the potential of Stockton Metropolitan Airport for increase passenger and commercial service; and
- Integrating and expanding railroads to meet good movement needs, improving the region's economic competitiveness.

Discussion of improving rail corridors by acquiring dedicated right-of-way to avoid passenger rail conflicts with freight rail and to extend passenger rail services into neighboring counties.

County Good Movement Network shown in Figure A.10. (Figure 6.7 in RTP Document)

Table A.7 Summary of Freight Policies, Programs and Performance Metrics
Stanislaus COG 2014 Regional Transportation Plan

Goals and Objectives

- Objective – Focus not only on vehicular mobility but improve goods movement too; support the enhancement of goods movement by land and air.
- Objective – Protect the region's transportation investments by prioritizing the preservation of the existing transportation system over additions to the system.
- Objective – Emphasize system maintenance and operation improvements prior to capacity increasing projects.

Discussion of utilizing intermodal freight facilities to provide improved information to commercial vehicles via ITS.

Discussion of Goods Movement Priorities

- Identified operational conflicts between trucks and passenger vehicles as a key issue to be addressed via improvements to roadways.
- Recognition of impacts of trucks on pavement deterioration. The RTP addresses this concern through projects that add to roadway restoration and preservation.
- The county plans to conduct a feasibility study to determine if a passenger rail can be integrated into the existing rail system. There is little discussion of goods movement via rail.
- Aviation is recognized as a means of goods transport. The county plans to improve airport ground access in order to keep aviation a viable mode of interregional travel for people and freight to and from the county.

Project List in Appendix K

Table A.8 Summary of Freight Policies, Programs and Performance Metrics
Tulare CAG 2014 Regional Transportation Plan

Goal: Provide an efficient, integrated multimodal transportation system for the movement of people and goods that enhances the physical, economic, and social environment in the Tulare County Region.

Objective: Coordinate with transportation agencies across county borders to ensure an efficient flow of people and goods along key trade and interregional corridors.

Policies:

- Support coordinated transportation planning and programming.
- Participate in multi-regional efforts and organizations such as the California Association of Councils of Governments (CALCOG) and the Self-Help Counties Coalition.

Goal: Support development of a regional system of airports that meets the air commerce and general aviation needs of the County.

Objective: Include aviation connectivity in planning for regionwide transportation.

Policies:

- Encourage efforts to ensure that compatible land uses adjacent to airports are consistent with the Tulare County Comprehensive Airport Land Use Plan or the respective city's certified Airport Master Plan.
- Coordinate airport planning with other components of the circulation system.

Goal: Promote safe, economical, convenient rail systems and schedules that meet the needs of passenger and freight service in the region.

Objective: Support the maintenance, preservation, and expansion of freight rail systems in Tulare County.

Policies:

- Support continued improvement of freight rail service and freight transfer points within Tulare County.
- Coordinate with the Public Utilities Commission to notify Tulare County of any rail line abandonment proposals in order to evaluate possible impacts on the transportation system and consider preservation possibilities or alternative uses for such facilities.
- Assist in upgrading goods movement rail track to a minimum of 125 pounds as possible.
- Advocate for maintaining freight rail lines in the Tulare County region and prevent rail abandonments when feasible.
- Participate in the Central California Rail Authority.

- Utilize Cap and Trade funds available for goods movement rail projects, if available, for projects supporting freight rail systems that benefit Tulare County.
- Partner with owners and operators of all types of rail systems in order to result in safe, efficient, and beneficial rail systems for all users.

Goal: Provide a transportation system that efficiently and effectively transports goods to, from, within, and through Tulare County.

Objective: Encourage the interaction of truck, rail, and air freight transportation.

Policies:

- Work with Caltrans and adjacent regions in the development of intermodal corridors.
- Include comprehensive goods movement planning in the RTP.
- Implement the San Joaquin Valley Goods Movement Plan.

Goal: Improve goods movement within the region to increase economic vitality, meet the growing needs of freight and passenger services, and improve traffic safety, air quality, and overall mobility.

Objective: Increase the use of freight rail transportation.

Policy:

- Restore and maintain freight rail service in Tulare County as a significant transportation mode, providing service to commerce and industry.

Objective: Support and efficient truck transportation system.

Policy:

- Give special consideration to transportation projects that improve air quality and the operational efficiency of goods movement.

Sustainable Community Strategies (Refer to Table SCS-5)

Reinforces and restates aforementioned goals and policies.

Goods Movement Chapter

- Discussion of pavement deterioration, air quality concerns, and at-grade rail crossing safety concerns.
- Discussion of desire to increase truck load capacity in order to lower fuel costs and emissions.
- Recognizing SR 99 as a critical corridor for goods movement in the county. Conversion of SR 99 from an expressway to a freeway is desired; widening projects on Table 5-6 in the RTP.
- **Truck:** A number of projects to improve goods movement via trucks are planned. These projects include the following:
  - Widening of Road 80;
  - Widening of Avenue 416;
  - Widening of SR 65 south of Porterville; and the
  - Conversion of Spruce Road into a two-lane expressway.
- **Rail:** Short Line rail lines are in need of upgraded facilities and improvements in order for the system to accommodate future growth increases. To encourage the use of rail and to prevent further rail abandonment the county discusses designating nearby land-use near rail lines for industrial use in order to encourage business to expand and use rail to distribute their goods. Future goals include:
  - Identifying and preserving rail in areas critical to goods movement;
  - Encouraging businesses to use rail to transport goods;
  - Identify potential industrial areas along railways which could provide businesses easier access to railways; and
  - Improve and upgrade tracks when feasible.
- **Air:** The Tulare County Comprehensive Airport Land Use Plan is in the process of being updated.

Figure A.1 High Truck Volume in Fresno County

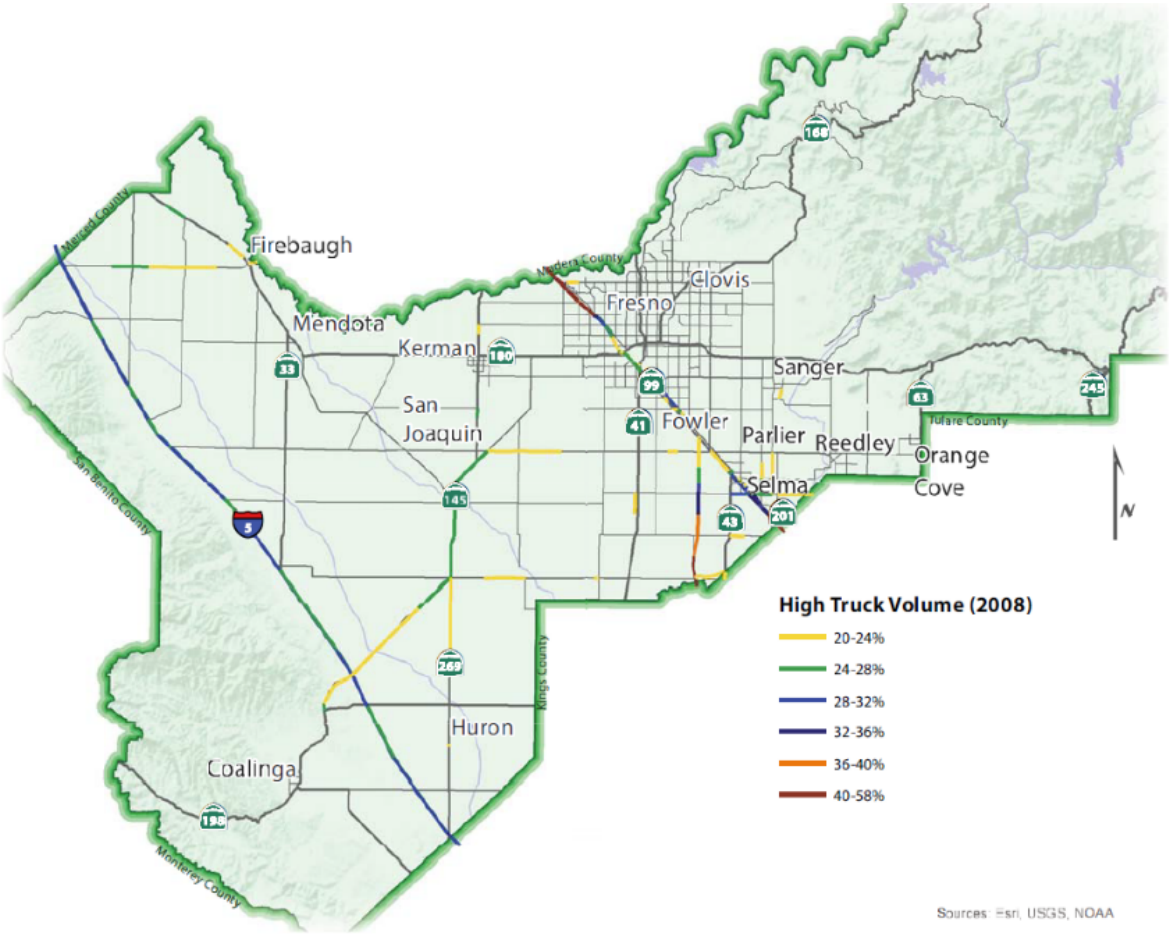


Figure A.2 Fresno Rail Network (Metro Area)

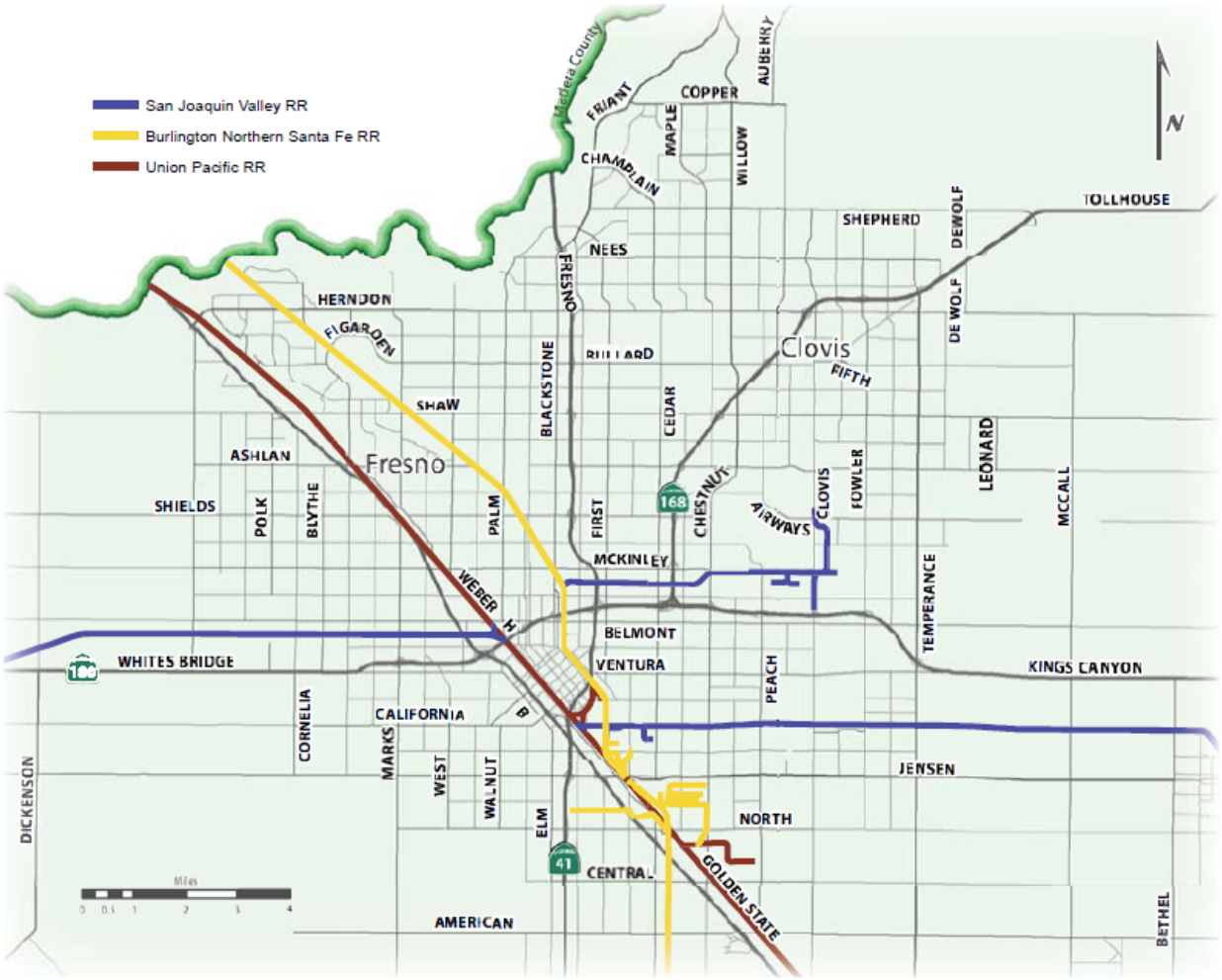


Figure A.3 Fresno Rail Network (Rural Area)

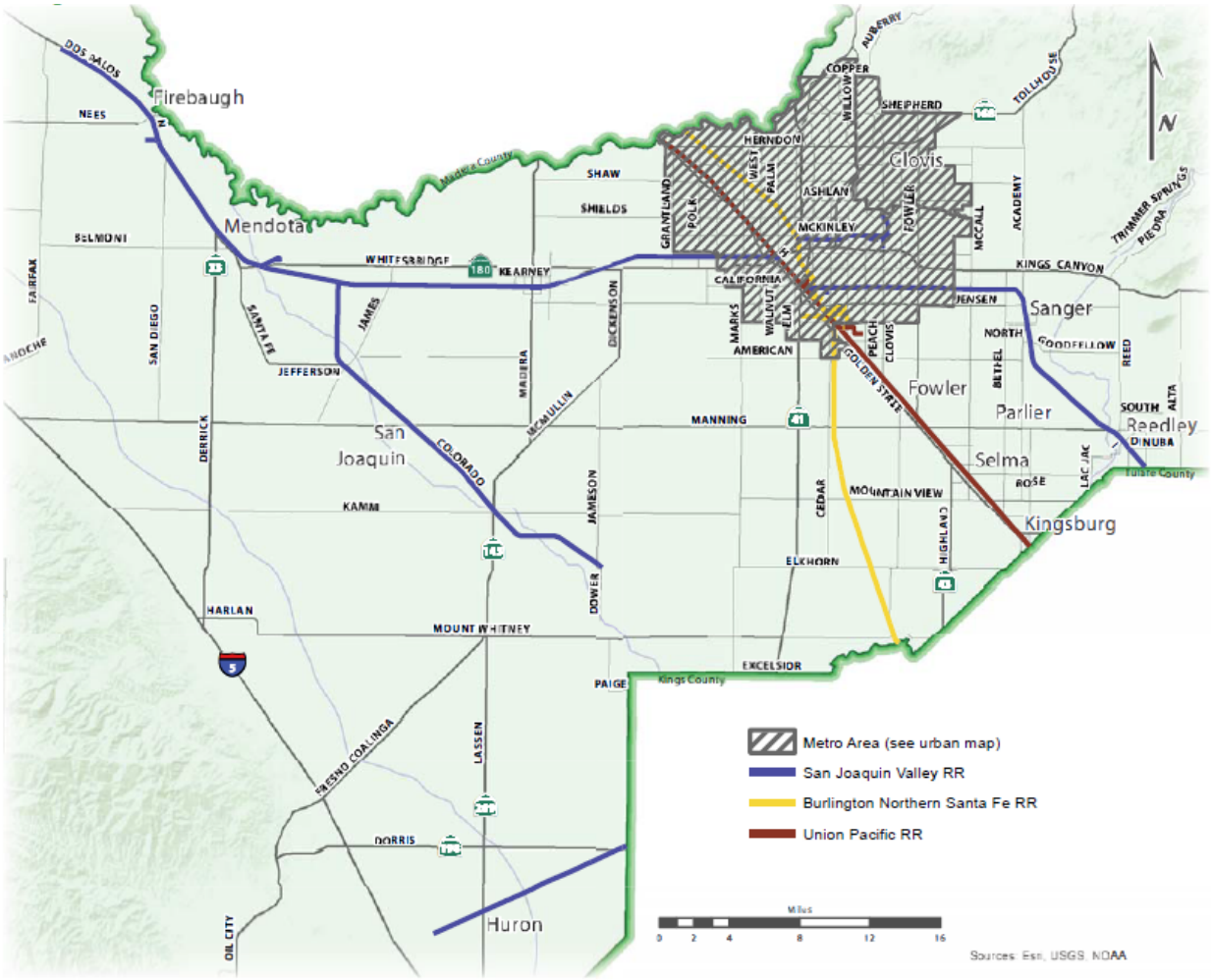


Figure A.4 Kern Primary Goods Movement Corridors

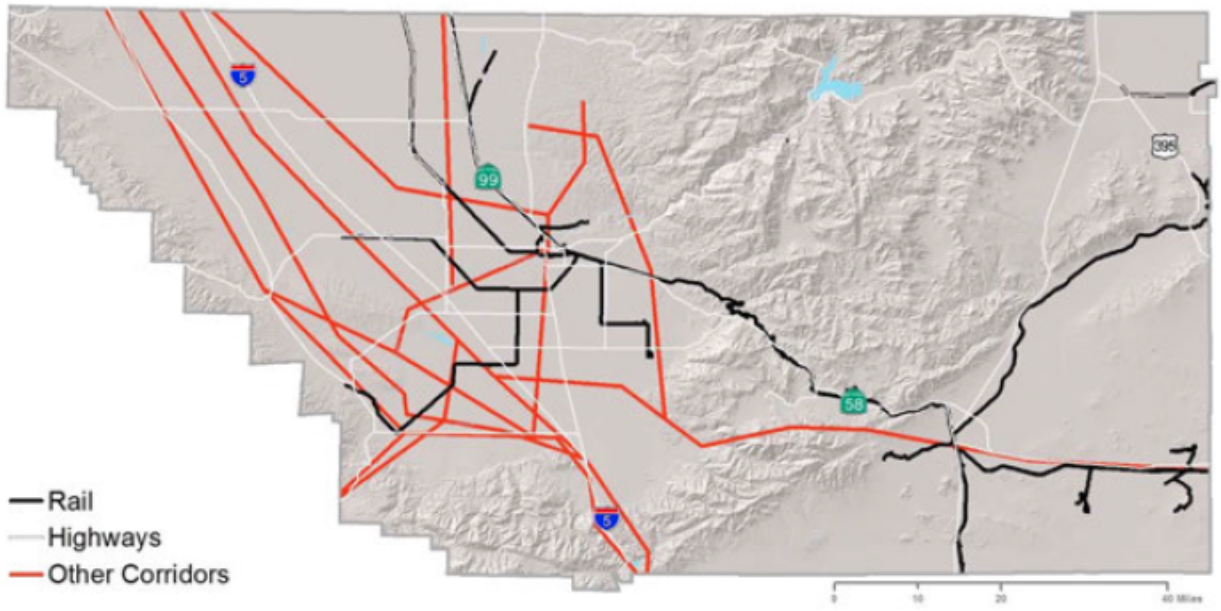


Figure A.5 Kern Primary Truck Goods Movement Facilities

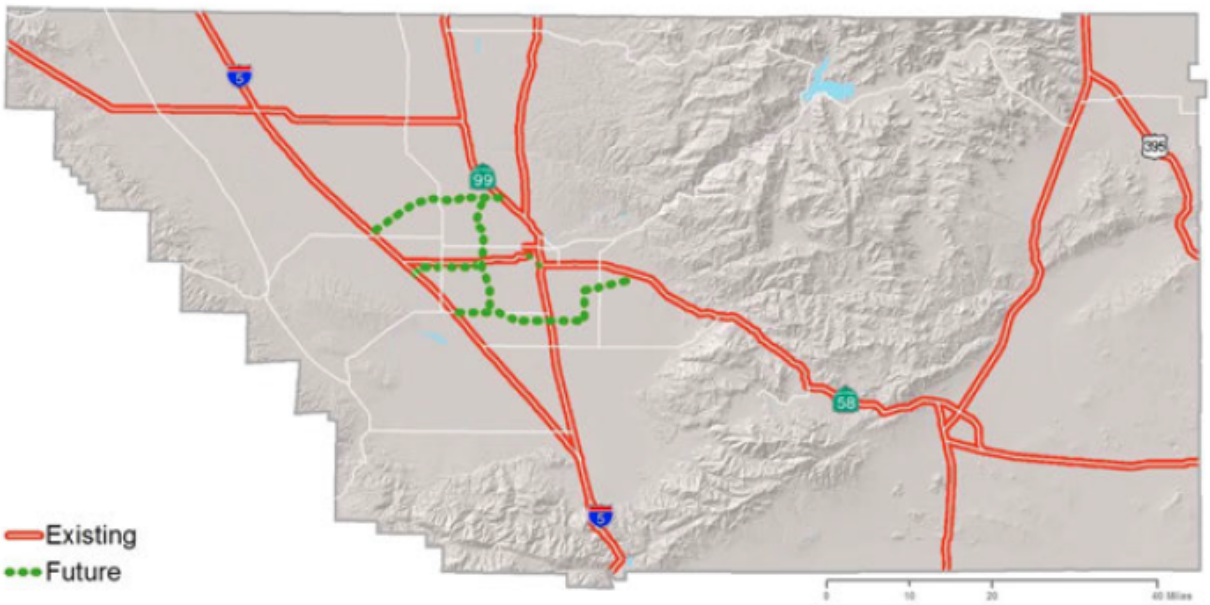


Figure A.6 Kern Secondary Goods Movement Facilities

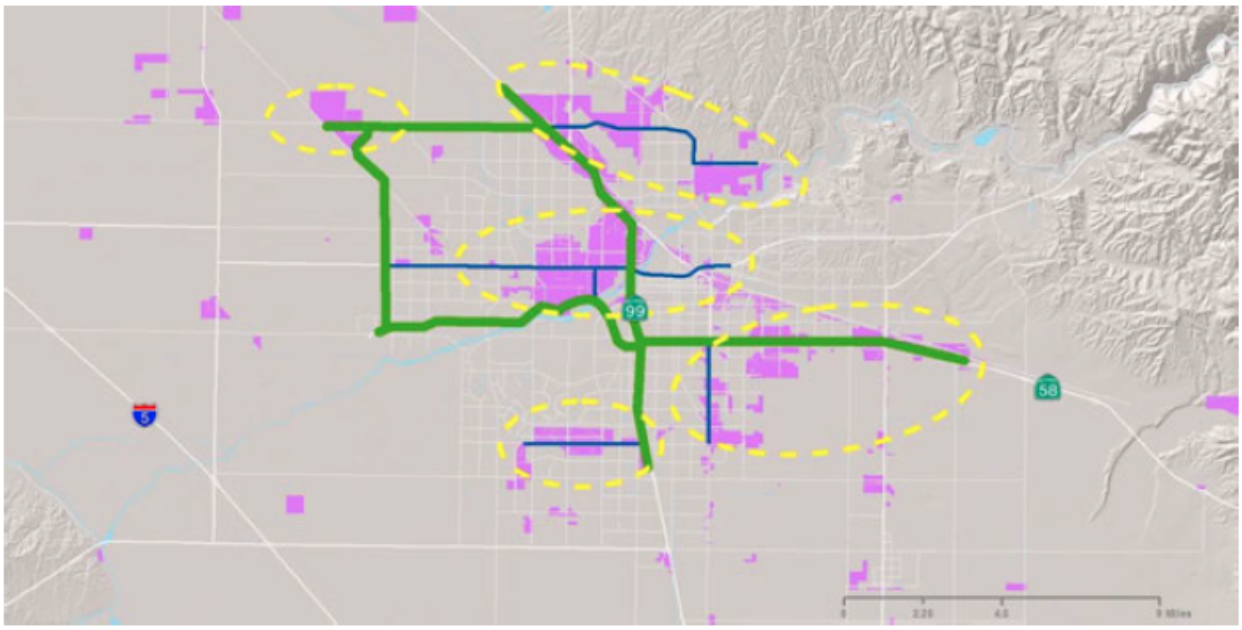


Figure A.7 Kern Tertiary Goods Movement Nodes

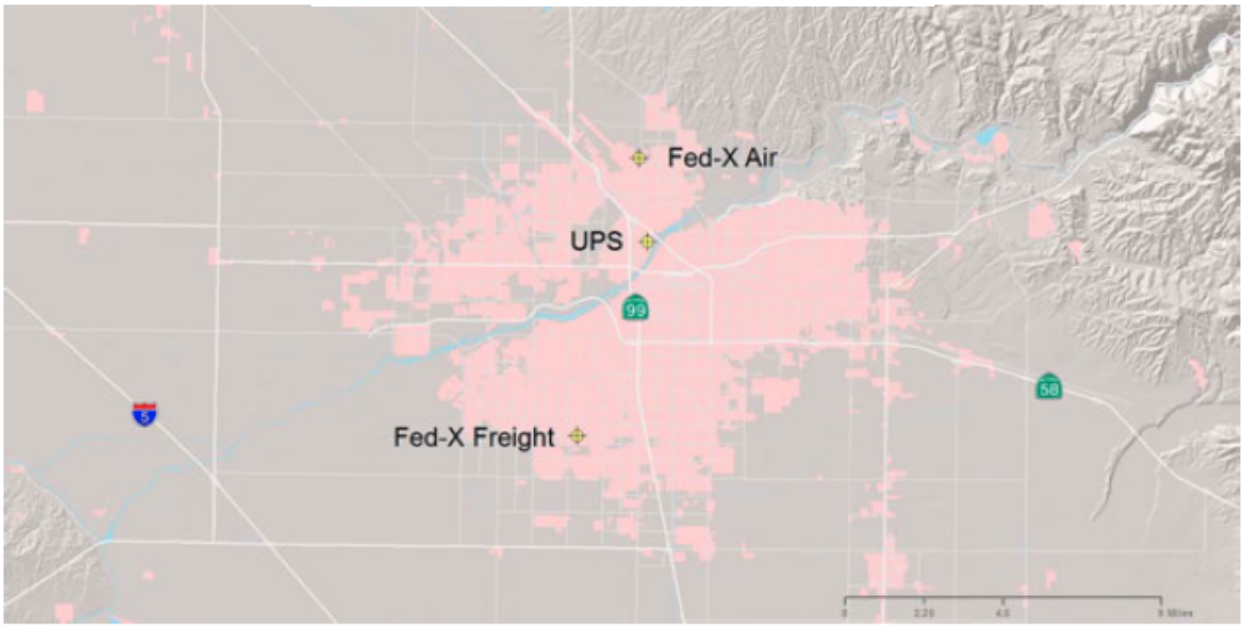
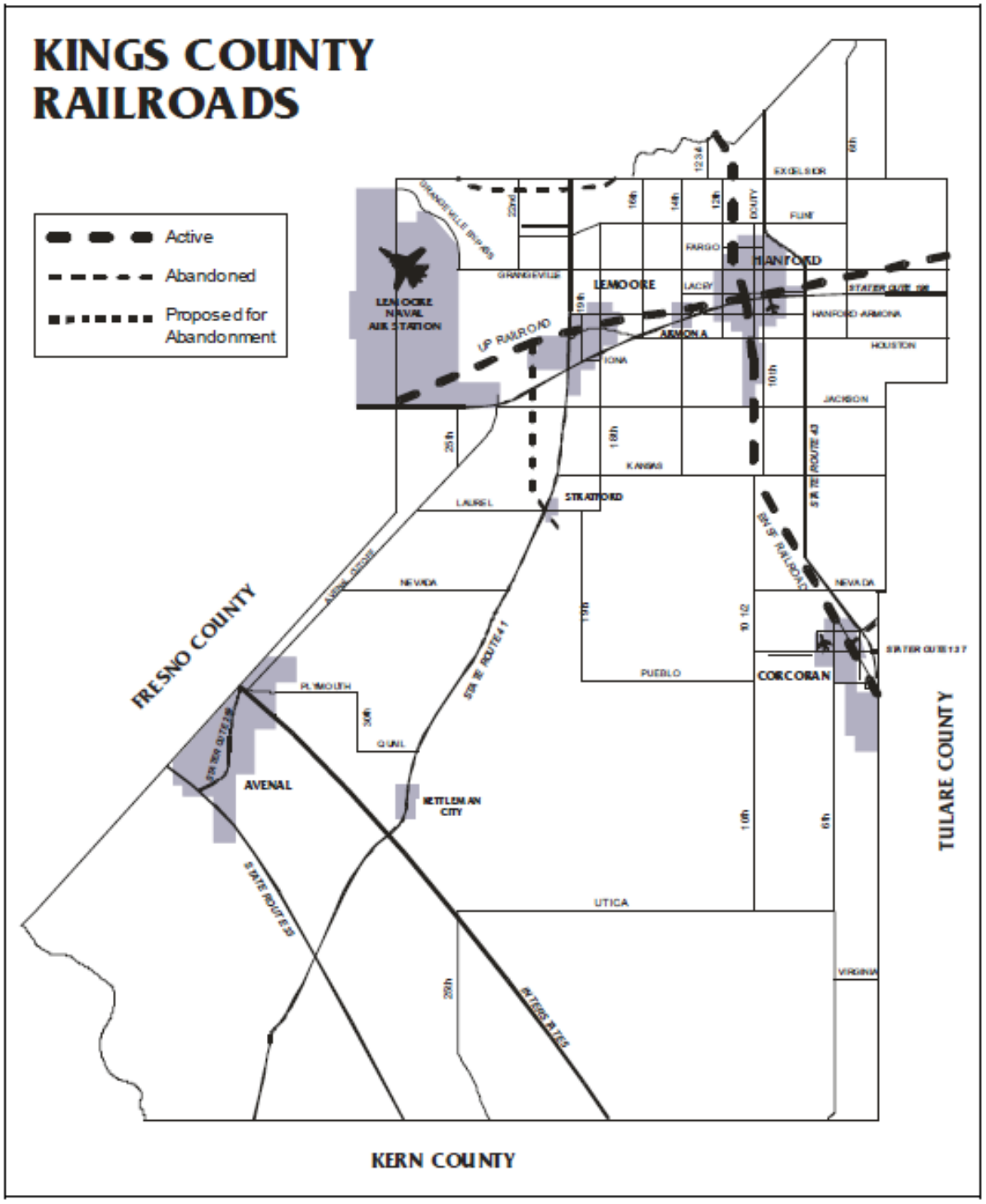
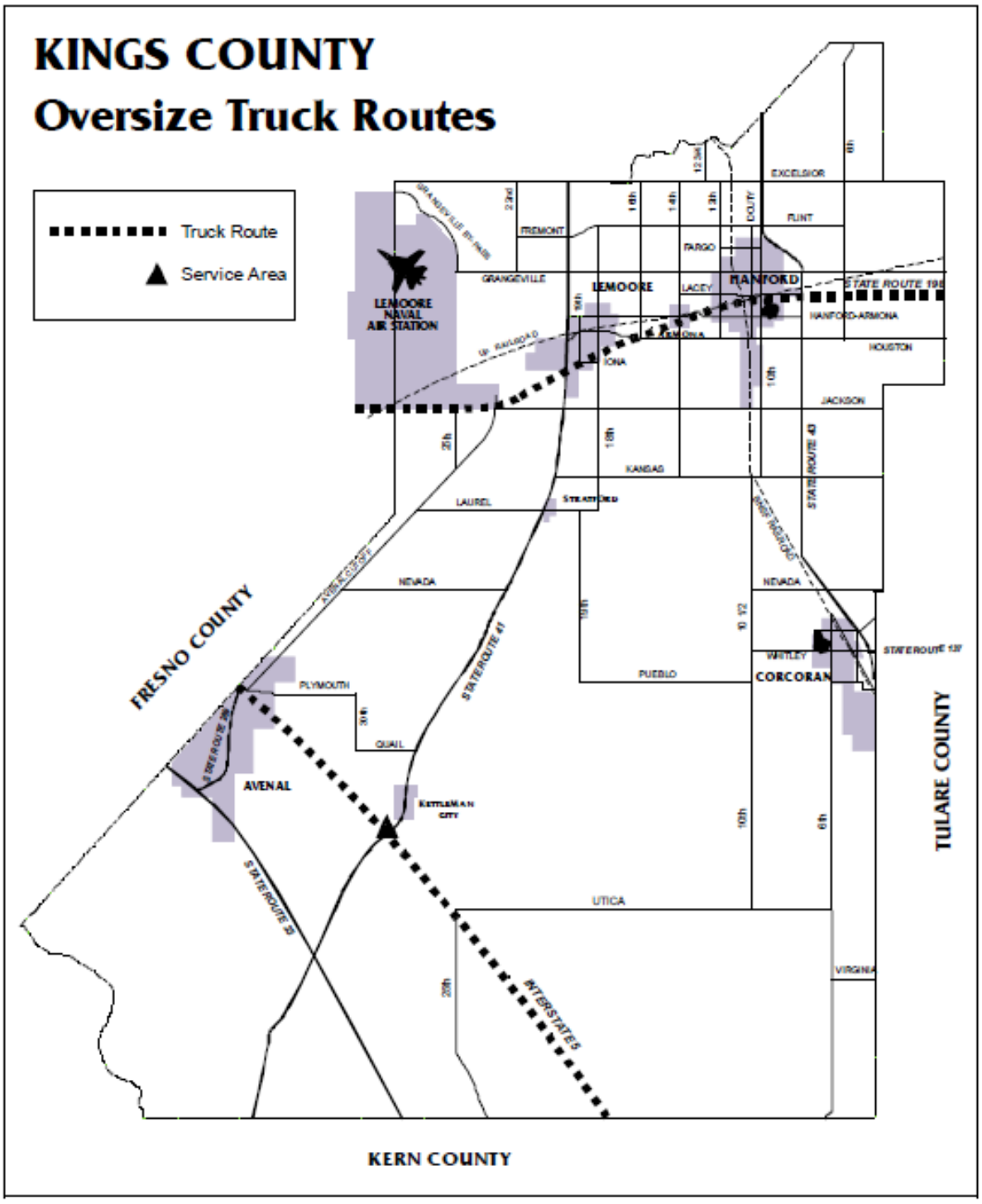


Figure A.8 Kings County Railroads



Source: KCAG

Figure A.9 Kings County Oversize Truck Routes



Source: KCAG

Figure A.10 San Joaquin County Goods Movement Network

Source: Business Forecasting Center, University of the Pacific

Table A.9 Planned or Programmed Projects

I-5/SR-99 Projects

Connectors	Roadway	From	To	Status
Merced	Healy Road	Doppler Road	Sandy Mush Road	Planned
Merced	Cooper Avenue	Ashby Road	CA 59	Planned
Merced	Volta/Ingomar/Husman	SR 33	SR 33	Planned
Merced	Ortigalita Road/Sunset Avenue	SR 152	Canyon Road	Planned
Merced	Meadow Drive/ Shaffer Road	Jones Road	Oakdale Road	Planned
Merced	Shaffer Road	Oakdale Road	end of road	Planned
Merced	Collier Road	SR 99	end of road	Planned
Merced	River Road/Vinewood Avenue/ B Street.	Winton Pkwy	Griffith Avenue	Planned
Merced	Magnolia Avenue	Sultana Blvd	Robin Avenue	Planned
Merced	Westside Blvd	Robin Avenue	Gipson Street	Planned
Merced	Applegate Road	SR 99	Atwater Jordan Road	Planned
Merced	N Buhach Road/Green Sands Avenue/Atwater-Merced Expressway	Hospital Avenue	SR 99	Planned
Merced	Vassar Avenue/Henry Street/E Mission Avenue	Healy Road	SR 99	Planned
Merced	White Rock Road/ Le Grand Road	S Santa Fe Avenue	Quarry	Planned
Merced, Madera	SR 152	SR 99	Santa Clara border	Planned (Los Banos Bypass previously programmed)
Stanislaus, Merced	Santa Fe Ave/Dr	SR 132	SR 59	Planned
Kern	SR 58 (Centennial Connector)	SR 99 at existing SR 58 freeway to freeway interchange	Westside Pkwy (west edge of urbanized Bakersfield)	
Kern	7th Standard Road	Route 43	Sante Fe Way	
All	SR 99			Programmed (Livingston Median Widening)

Table A.10

County	Project Title	Project Description	Source	Time in Years
Fresno	California High-Speed Rail Project-SR 99 Re-Alignment	State Route 99 from Clinton Avenue to Ashlan Avenue; Westerly shift/realignment. Reconstruction of Clinton Avenue Interchange including the Clinton Avenue overcrossing, the two rail grade separations over UPRR tracks, and replacement of Clinton Avenue and Ashlan Avenue...	2014 Fresno COG RTP	0-5
Fresno	Extend SR 180 from Mendota to I-5		California Freight Mobility Plan *December 2014*	6-15
Fresno	Herndon @ SR 99- Widen Undercrossing	Widen Undercrossing to 5 LN	2014 Fresno COG RTP	6-15
Fresno	Mountain View and SR 99 Overcrossing: Widen Overcrossing and Improve Ramps	Widen Overcrossing 2 L to 4 L and Improve on/off ramps	2014 Fresno COG RTP	0-5
Fresno	NB SR 99 Herndon Off Ramp: Signalize & Widen Ramp	Widen Ramp for NB dual rights, install traffic signal.	Fresno COG RTP 2014	0-5
Fresno	SR 99 & SR 43/Floral Rd Interchange: Widen and Replace Bridge	Replace bridge structures and widen Floral	2014 Fresno COG RTP	16-24
Fresno	SR 99 @ American Avenue Interchange	American Ave @ SR 99-Interchange Improvements	2014 Fresno COG RTP	6-15
Fresno	SR 99 Interchange at Shaw: Improvements	Improve interchange	2014 Fresno COG RTP	16-24
Fresno	SR 99 InterchangeNorth & Cedar	North/Cedar/SR 99-Improve Interchange	2014 Fresno COG RTP	6-15
Fresno	SR 99-Central and Chestnut: Upgrade Interchange	Upgrade Interchange	2014 Fresno COG RTP	6-15
Fresno	Veterans Blvd Barstow to BullardBryan-New 6 LD Super Arterial, Freeway Interchange & Grade Separation @ SR 99	Veterans Blvd Barstow to Bullard-Bryan. New 6 LD Super Arterial, Freeway Interchange & Grade Separation @ SR 99	2014 Fresno COG RTP	6-15
Fresno	Widen I-5 between Kings County and Merced County lines		2014 California Freight Mobility Plan	0-5
Fresno	Widen SR 198 from 2 to 4 lanes from Lemoore Naval Air Station to I-5 (Fresno County Portion).		California Freight Mobility Plan *December 2014*	6-15

Fresno	Widen SR 99 from 6 to 8 lanes from Central Ave to Bullard Ave.		2014 California Freight Mobility Plan	0-5
Kern	Centennial Connector - SR 58/Cottonwood Rd to Westside Parkway	Phase of Centennial Corridor (future SR 58)	CA Freight Mobility Plan, Kern COG 2017 STIP, 2014 RTP	0-5
Kern	Widen 7th Standard Road from I-5 to Sante Fe Way.	Extend existing 4 lane expressway to I-5	2014 Kern COG RTP	6-15
Kern	Widen I-5 between L.A. County Line and SR 99.	Truck climbing lanes	CA Freight Mobility Plan, 2014 RTP	25 or more years
Kern	Widen SR 99 between SR 223 and SR 119.		CA Freight Mobility Plan, 99 Business Plan	25 or more years
Kern	Widen SR 99 from Beardsley Canal to 7th Standard Road.	Kern 99 North Widening:Widen SR 99 from 6 to 8 lanes between the SR 99/SR 204 overhead to Beardsley. Canal in and near the City of Bakers-field. In construction; about 30% complete. Paul Pineda, Project Manager, (661) 326-3416.	CA Freight Mobility Plan, 2014 RTP	16-24
Kern	7th Standard Rd Interchange - reconstruct	Combine split interchange at one location.	2014 Kern COG RTP	25 or more years
Kern	Rt 99 - w iden bridge to four lanes; reconstruct ramps		2014 Kern COG RTP	25 or more years
Kern	At various locations - ramp improvements (HOV - ramp metering)	Interchange Locations:Hwy 119, Hosking Avenue (completed 2016),Panama Lane,White Lane,Ming Avenue (in construction),California Avenue, Rosedale Highway, Hageman Flyover, Olive Drive, Snow Road (New Interchange), 7th Standard Road	2014 Kern COG RTP	16-24
Kern	SR-99 & Hwy 119	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & Hosking Avenue (completed 2016)	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	0-5
Kern	SR-99 & Panama Lane	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & White Lane	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & Ming Avenue	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & California Avenue	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24

Kern	SR-99 & Rosedale Highway	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	Hageman Flyover	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & Olive Drive	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & Snow Road (New Interchange)	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	16-24
Kern	SR-99 & 7th Standard Road	ramp improvements (HOV - ramp metering)	2014 Kern COG RTP	6-15
Kern	At Snow Rd - construct new interchange	new interchange	2014 Kern COG RTP	16-24
Kern	Construct new interchange at Hanawalt	new interchange	2014 Kern COG RTP	25 or more years
Kern	Reconstruct interchange at Pond Rd	interchange improvements	2016 Kern COG CIP	25 or more years
Kern	Reconstruct interchange at Whisler	interchange improvements	2016 Kern COG CIP	25 or more years
Kern	Rosedale Hwy to Westside Parkway - construct new facility	West Beltway - New Facility	2014 Kern COG RTP	6-15
Kern	Brown Material Rd to I-5 - interchange upgrade at 1-5 - Phase 4B	Route 46 Interchange Upgrade	CA Freight Mobility Plan, 2014 RTP	16-24
Kern	I-5 to Westside Parkway at Heath Rd	Extend existing freeway - Phase of Centennial Corridor	CA Freight Mobility Plan, 2014 RTP	25 or more years
Kern	Widen SR 58 (Rosedale Hwy) - I-5 to Rt 43	Existing Route 58 Widening	CA Freight Mobility Plan, 2014 RTP	0-5, 6-15
Kern	Taft Hwy to I-5 - extend freeway	West Beltway - New Facility	2014 Kern COG RTP	25 or more years
Kern	7th Standard Rd to Rt 99 -extend freeway	West Beltway - New Facility	2014 Kern COG RTP	25 or more years
Kern	Rosedale Hwy - Rt 43 to Allen Rd - widen existing highway	Existing Route 58 Widening	2014 Kern COG RTP	6-15
Kern	Taft Hwy to Pacheco Rd - construct new facillity	West Beltway - New Facility	2014 Kern COG RTP	16-24

Kern	Rosedale Hwy to 7th Standard Rd - construct new facility	West Beltway - New Facility	2014 Kern COG RTP	6-15
Kern	Pacheco Rd. Westside Parkway - construct new facility	West Beltway - New Facility	2014 Kern COG RTP	16-24
Kern	I-5 to SR 65 - Burbank Street Alignment - construct new highway	North Beltway - New Facility - connecting West Beltway to Rt 99	2014 Kern COG RTP	25 or more years
Kings	Widen I-5 from 2 to 4 lanes between Kern and Fresno Counties.		2014 California Freight Mobility Plan	6-15
Kings	Widen SR 198 from 2 to 4 lanes from Lemoore Naval Air Station to I-5 (Kings County Portion).		California Freight Mobility Plan *December 2014*	6-15
Kings	Widen SR 41 from 2 to 4 lanes from SR 198 to I-5.		2014 California Freight Mobility Plan	6-15
Madera	SR99: 4-Lane Freeway to 6-Lane Freeway Ave 12 to Ave 17	Ave 12 to Ave 17	2013 MCTC FTIP	0-5
Madera	SR99: 4-Lane Freeway to 6-Lane Freeway, Ave 7 to Ave 12	Ave 7 to Ave 12	2013 MCTC FTIP	16-24
Madera	4th Street/SR 99 Interchange Improvements		MCTC 2013 FTIP	
Madera	Madera 6 Lane	In the city of Madera - from Avenue 12 to Avenue 17. Widen from 4 to 6 lanes.	2014 STIP	0-5
Madera	Reconstruct Interchange	Ave 12 Interchange, On Route 99 from .5 miles south of Avenue 12 overcrossing to .5 miles north of Avenue 12 overcrossing. PM R7.1 - R7.9	MCTC 2013 FTIP	0-5
Madera	South Madera 6 Lane	Near the city of Madera - from 0.7 mile north of Avenue 7 to Avenue 12. Widen from 4 to 6 lanes.	2014 STIP	0-5
Madera	Widen SR99: In Fresno & Madera Counties, from south of Grantland Ave UC to north of Avenue 7	In Fresno & Madera Counties, From 0.2 miles south of Grantland Ave UC to 0.6 miles north of Avenue 7 Widen 4-Lane Freeway to 6-Lanes	2013 MCTC FTIP	0-5
Madera	Widen SR 99 from 4 to 6 lanes from Avenue 17 to Avenue 21		2014 California Freight Mobility Plan	Unknown
Madera	Widen SR 99 from 4 to 6 lanes from Avenue 23 to Madera County Line		2014 California Freight Mobility Plan	Unknown

Merced	Atwater-Merced Expressway, Phase 1B: Green Sands Ave to Santa Fe Drive (Access to Castle Development & Airport)	Construct new expressway from Green Sands Ave north to Santa Fe Drive overcrossing structure.	MCAG	6-15
Merced	Atwater-Merced Expressway, Phase 3: New Hwy 99 Interchange to Hwy 140	Construct new expressway from new Hwy 99 interchange south to connection with Hwy 140.	MCAG	6-15
Merced	Highway 99: Livingston Widening Northbound	In Livingston - Widen 8.5 miles of Hwy 99 from 4 to 6 lanes from Stanislaus/Merced County line to Hammatt Avenue. In the northbound direction only.	MCAG	0-5
Merced	Highway 99: Livingston Widening Southbound	In Livingston - from 0.8 mile south of Hammatt Avenue to Merced/Stanislau county line. Widen freeway from two lanes to three lanes in the southbound direction only.	2014 California STIP	0-5
Merced	Los Banos Bypass, Segment 1: Btwn. Hwy 165 and E. Hwy 152 with signalized intersections	Construct a new 4 lane expressway bypassing around the City of Los Banos to relieve inner-city congestion and improve flow of interregional traffic.	MCAG	6-15
Merced	Los Banos Bypass, Segment 2: Btwn. Hwy 165 and W. Hwy 152 with signalized intersections	Construct a new 4 lane expressway bypassing around the City of Los Banos to relieve inner-city congestion and improve flow of interregional traffic.	MCAG	25 or more
Merced	Los Banos Bypass, Segment 3: Construct 3 interchanges at W. Hwy 152, Hwy 165 and E. Hwy 152	Construct a new 4 lane expressway bypassing around the City of Los Banos to relieve inner-city congestion and improve flow of interregional traffic.	MCAG	25 or more
Merced	Widen I 5 from 4 to 6 lanes in Merced County		2014 California Freight Mobility Plan	25 or more
Merced	Widen SR 152 between SR 99 and US 101 (in Merced County)		2014 California Freight Mobility Plan	0-5
San Joaquin	I-580 Westbound Truck Climbing Lanes		2014 California Freight Mobility Plan	6-15
San Joaquin	I-5 at Eight Mile Road Interchange	Modification of interchange (P.M. 34.7/35.9)	2014 SJCOG RTP	6-15
San Joaquin	I-5 at Hammer Lane Intercahnge	Interchange Modification and auxiliary lanes (PM 32.6)	2014 SJCOG RTP	6-15
San Joaquin	I-5 at Louise Avenue Intechnage	Reconstruct interchange (PM 16.4- 16.8)	2014 SJCOG RTP	0-5
San Joaquin	I-5 at Otto Drive Interchange	Construction of a new interchange and auxiliary lanes (PM 33.3/34.2)	2014 SJCOG RTP	6-15
San Joaquin	I-5 at Roth Road Interchange	Relocation of intersection at Roth/Harlan Road inclusive of signalization; relocation of intersection at Roth/Manthey Road inclusive of signalization. Widen from 2 to 5 lanes from Roth/Harlan road intersection to Roth/Manthey Road Intersection	SJCOG RTP 2014	0-5

San Joaquin	Widen I-5 between SR 120 and I-205		2014 California Freight Mobility Plan	0-5
San Joaquin	Widen I-5 from 1 mile north of SR-12 to SR-120		2014 California Freight Mobility Plan	0-5
San Joaquin	Widen I-5 from 4 to 6 lanes from 1 mile north of SR-12 to Sacramento County line		2014 California Freight Mobility Plan	6-15
San Joaquin	Widen SR 99 from French Camp Rd to Mariposa Rd 6 to 8 lanes, with new interchange		2014 California Freight Mobility Plan	0-5
San Joaquin	Widen SR 12 between I-5 and SR 99		2014 California Freight Mobility Plan	0-5
San Joaquin	Widen SR 120 between I-5 and SR 99, with new interchange at SR 99		2014 California Freight Mobility Plan	0-5
San Joaquin	SR-99 at Austin Road Interchange	Modify Existing Interchange	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at Eight Mile Road Interchange	Reconstruct Interchange (PM 35.1- 35.5)	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at Gateway Boulevard Interchange	Construction of new interchange - ENVIRONMENTAL ONLY	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at Harney Lane Interchange	Reconstruct interchange to provide 6 through lanes on SR 99, 4 lanes on Harney and modify on-ramps and off-ramps	2014 SJCOG RTP	16-24
San Joaquin	SR-99 at Main Street/UPRR Interchange (Ripon)	Reconstruct interchange of SR-99 and Main Street including reconstruction of Main Street overcrossing of UPRR and intersection improvements	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at Morada Interchange	Reconstruct interchange (PM 23.5- 24.5)	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at Raymus Expressway Interchange	Construction of new interchange - ENVIRONMENTAL ONLY. Funding will be used for the replacement of the existing Austin Road/SR99 interchange with the new Antone Raymus Expressway/SR99.Interchange between the cities of Manteca and Ripon…	2014 SJCOG RTP	0-5
San Joaquin	SR-99 at SR-12 West (Kettleman Lane) Interchange	Reconstruct interchange and widen to free flowing interchange	2014 SJCOG RTP	6-15
San Joaquin	SR-99 Widening	Widen 4 to 6 lanes (inside) - ENVIRONMENTAL ONLY, Harney Lane to Turner Road	2014 SJCOG RTP	Unknown
San Joaquin	Turner Road Interchange Operational Improvements	In Lodi - at the SR99/Turner Road intersection. Realign the existing southbound off- and on-ramps and construct a roundabout.	2014 California STIP	0-5

San Joaquin	Widen SR 99 From Lodi to Sacramento County Line		2014 California Freight Mobility Plan	6-15
Stanislaus	State Route 132 West Freeway/Expressway	Project Limits: State Route 99 to Dakota Ave. Description: Construct a two-lane expressway from N. Dakota Ave to the Needham St. Overcrossing (Phase 1 of ultimate build-out of SR 132 West Freeway/Expressway Project)	2014 Stanislaus RTP	2020 Open to traffic Year
Stanislaus	Keyes Rd to Taylor Rd	Construct Auxillary Lane	2014 Stanislaus RTP	6-15
Stanislaus	Fulkerth Rd to West Main Street	Construct Auxillary Lane	2014 Stanislaus RTP	6-15
Stanislaus	Monte Vista Ave to Fulkerth Rd	Construct Auxillary Lane	2014 Stanislaus RTP	6-15
Stanislaus	Taylor Rd to Monte Vista Ave	Construct Auxillary Lane	2014 Stanislaus RTP	6-15
Stanislaus	W. Main St Interchange	Construct New Interchange at W. Main St	2014 Stanislaus RTP	6-15
Stanislaus	SR-99, Lander Ave (SR-165) to S. City Limits	Construct new interchange	2014 Stanislaus RTP	6-15
Stanislaus	Mitchell Rd/Service Rd Interchange Phase 2	Construct New Interchange - Phase 2	2014 Stanislaus RTP	6-15
Stanislaus	Mitchell Rd/Service Rd Interchange Phase 1	Construct New Interchange - Phase I	2014 Stanislaus RTP	6-15
Stanislaus	Expressway connector between SR 99 and I-5 from Turlock to Patterson		2014 California Freight Mobility Plan	6-15
Stanislaus	Mitchell Rd to Merced County Line	Install Ramp Metering Improvements including Intelligent Transportation Systems (ITS)	2014 Stanislaus RTP	16-24
Stanislaus	San Joaquin County Line to Mitchell Rd	Install Ramp Metering Improvements including Intelligent Transportation Systems (ITS)	2014 Stanislaus RTP	6-15
Stanislaus	Interchange Ramp and Auxiliary Lane Improvements		2014 Stanislaus RTP	0-5
Stanislaus	SR-99 & Hammett Rd	Interchange Replacement	2014 Stanislaus RTP	0-5
Stanislaus	Golden State to Youngstown Road	New interchange and realignment or new road connection to Golden State Blvd.	2014 Stanislaus RTP	6-15
Stanislaus	SR-99 & Briggsmore Interchange	PE and ROW (reconstruction to 8-lane Interchange). Note: Brigsmore turns into Carpenter Rd.	2014 Stanislaus RTP	0-5
Stanislaus	Taylor Rd & SR 99: Reconstruct Interchange	Reconstruct existing Interchange	2014 Stanislaus RTP	6-15
Stanislaus	Hatch Rd & SR-99: Reconstruct Interchange	Reconstruct Interchange	2014 Stanislaus RTP	16-24

Stanislaus	Reconstruct Interchange at Fulkerth Road	Reconstruct Interchange at Fulkerth Road	2014 California Freight Mobility Plan	0-5
Stanislaus	SR-99 & Standiford Ave: Reconstruct Interchange	Reconstruct to 8-lane Interchange. Note: Standiford Ave is Beckwith Rd.	2014 Stanislaus RTP	16-24
Stanislaus	Reconstruct to 8-lane Interchange - Phase II		2014 Stanislaus RTP	0-5
Stanislaus	Replace Interchange at SR-99 and Hammett Road		California Freight Mobility Plan *December 2014*	25 or more
Stanislaus	I-5 to Rogers Road: Interchange Improvements and Widen Sperry Ave	Signal and Off-Ramp Improvements at interchange. Widen Sperry Ave to 4 Lanes between Rogers Road and I-5	2014 Stanislaus RTP	0-5
Stanislaus	SR 99: Kansas Ave to Carpenter Rd	Widen 6 to 8 lanes	2014 California Freight Mobility Plan	6-15
Stanislaus	Carpenter Rd to San Joaquin County Line	Widen 6 to 8 lanes	2014 Stanislaus RTP	6-15
Stanislaus	Widen SR99 from Hatch Rd to Tuolumne Rd	Widen 6 to 8 lanes	2014 California Freight Mobility Plan	6-15
Stanislaus	Widen SR99 from Tuolumne Rd to Kansas Ave	Widen 6 to 8 lanes	2014 California Freight Mobility Plan	6-15
Stanislaus	Widen SR99 from Mitchen Rd to Hatch Rd	Widen 6 to 8 lanes	2014 Stanislaus RTP	6-15
Stanislaus	Widen from 6 to 8 lanes		2014 Stanislaus RTP	0-5
Stanislaus	Widen I-5 from 4 to 6 lanes SJ County line to Sperry Ave		2014 California Freight Mobility Plan	16-24
Stanislaus	Widen SR 132 connecting SR 99 and I-580		2014 California Freight Mobility Plan	0-5
Stanislaus	Widen SR 99 from 6 to 8 lanes in Stanislaus County		2014 California Freight Mobility Plan	0-5
Stanislaus	Widen STA-99 between Carpenter Road and the SJ County line to eight lanes		California Freight Mobility Plan *December 2014*	25 or more
Stanislaus	Widen STA-99 between Hatch and Tuolumne Road to eight lanes		California Freight Mobility Plan *December 2014*	25 or more
Stanislaus	Widen STA-99 between Kansas Ave. and Carpenter Road to eight lanes		California Freight Mobility Plan *December 2014*	25 or more

Stanislaus	Widen STA-99 between Mitchell and Hatch Road to eight lanes		California Freight Mobility Plan *December 2014*	
Stanislaus	Widen STA-99 between Tuolumne Road and Kansas Ave. to eight lanes		California Freight Mobility Plan *December 2014*	25 or more
Stanislaus	SR 132 West Freeway/Exressway	Project Limits: State Route 99 to Dakota Ave. Description: Construct a four-lane freeway on a new alignment from N. Dakota Ave. to the Needham Street Overcrossing with SR132/SR99 interchange (Phase 2 of ultimate build-out of SR-132 West Freeway/Expressway Project)	2014 Stanislaus RTP	2028 Open to traffic year
Tulare	Widen SR 99 from Avenue 200 to 1.2m south of Avenue 280.	On State Route 99 between Avenue 200 to 1.2 miles south of Avenue 280; widen highway from 4 to 6 lanes	2014 California Freight Mobility Plan	6-15
Tulare	Widen SR 99 from Kern County line to Avenue 200.	On State Route 99 between Tulare/Kern County Line to Avenue 200; widen highway from 4 to 6 lanes	2014 California Freight Mobility Plan	25 or more
Tulare	State Route 99/Betty Drive Interchange	Widen on/off ramps and bridge structure	2014 Tulare County RTP	0-5
Tulare	State Route 99/Caldwell Avenue Interchange	Widen on/off ramps and bridge structure	2014 Tulare County RTP	6-15
Tulare	State Route 99/Commercial Interchange	Construct new interchange	2014 Tulare County RTP	6-15
Tulare	State Route 99/Paige Avenue interchange	Widen on/off ramps and bridge structure	2014 Tulare County RTP	6-15