CAMBRIDGE SYSTEMATICS

San Joaquin Valley Goods Movement Sustainable Implementation Plan

Task 1 Memo

prepared for

San Joaquin Council of Governments

prepared by

Cambridge Systematics, Inc.

technical memorandum

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1.0 Introduction

Task 1 of San Joaquin Valley Goods Movement Sustainable Implementation Plan focuses on the issue of first and last-mile connectors. Connectors are an oft-overlooked component of the freight system as the focus has traditionally been on highway corridors and the broader roadway system. *For the purposes of this study, connectors are defined as a roadway that connects a major truck route to/ within the vicinity of freight activity centers in the region.* Primary highways and primary through-routes are not considered connectors, though they are accounted for in other tasks of this study, which evaluate rural corridors and truck routes.

The purpose of identifying important local freight connectors is to increase focus on connector needs and importance in the system; position the San Joaquin Valley for potential state and Federal funding opportunities; identify connections from the San Joaquin Valley to the broader goods movement network; and, perhaps most importantly, improve the San Joaquin Valley's competitiveness with more efficient freight system connections.

Connectors, however, are only one component of the goods movement roadway system. This system also includes urban and rural freight highways that allow for intercity, interregional, and interstate truck movements; and these other components of the goods movement roadway system are discuss in later task reports. For purposes of this analysis, state routes were not included as potential connectors; even though they can act as last-mile connectors, their primary function is to collect and serve long-distance travel. *State Routes in rural areas are identified as Proposed Rural Corridors in Task 3; State Routes in Urbanized Areas are included in the Truck Route analysis in Task 2*.

This technical memorandum summarizes Task 1 findings in the following order:

- Study Background;
- Description of Industry and Freight Clusters;
- Identification of First and Last Mile Freight Connectors:
  - Condition and Performance Analysis of First and Last Mile Connectors, and
  - Connector Needs Assessment; and
- Funding Needs and Implementation Discussion.

2.0 Background

As previously noted, the role of 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 project, the project team used all of the major clusters of goods movement facilities, industrial parks 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 Study. The roadways connecting to these clusters were the initial list of connectors. Subsequently, this initial list of connectors was supplemented with feedback from the Technical Advisory Committee (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 team used methods that were developed by Cambridge Systematics and the Federal Highway Administration (FHWA) in the ongoing national Intermodal Connectors condition and performance study to establish key performance metrics and data sources for assessing the condition and performance of the connectors. The process focuses on issues, such as travel times, safety, intersection geometry issues, pavement conditions, and other relevant metrics, to identify capacity and operational and maintenance issues. 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 2.1. 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 2.1 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 twenty-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 2.1 and Table 2.2 provide an overview of NHS infrastructure in the region. One of the goals of Tasks 1 to 3 of this project is to complement this infrastructure, as well as add another level of detail to connectors and corridors that are important locally and regionally.

Figure 2.1 NHS System in the San Joaquin Valley

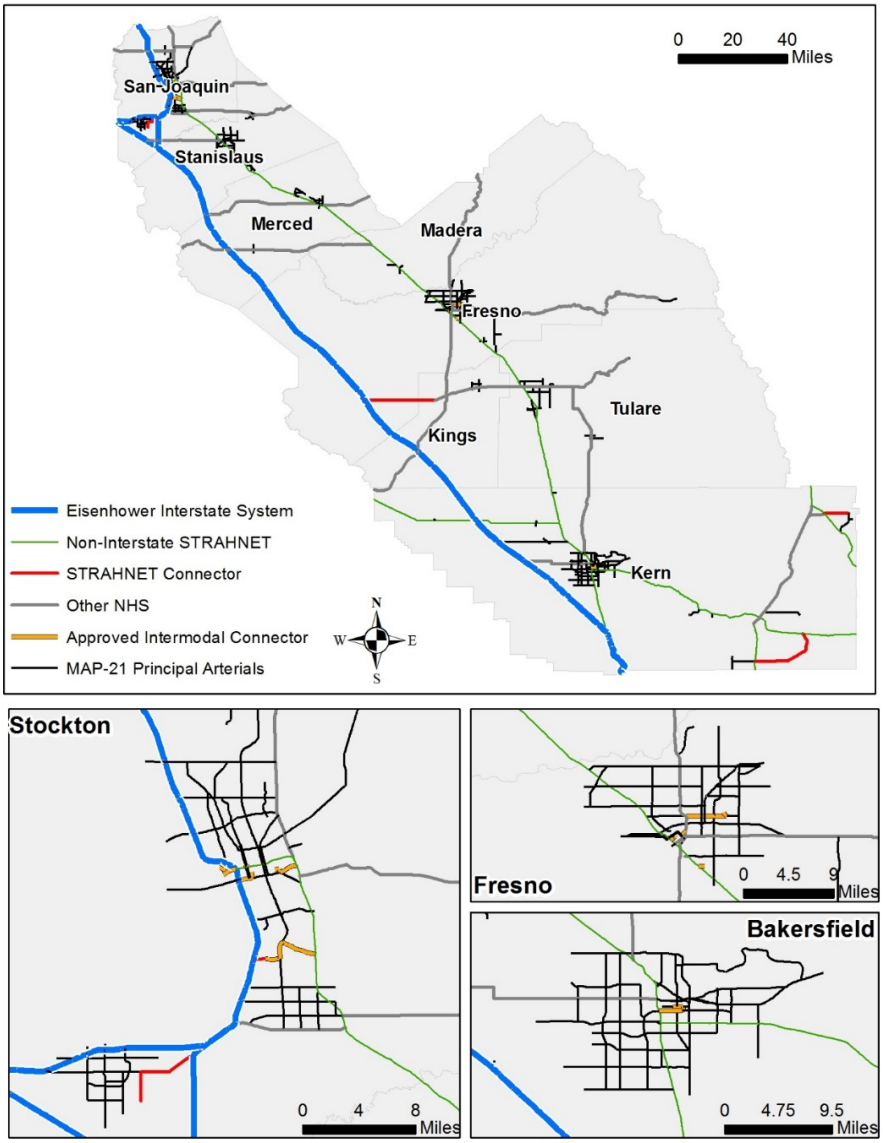


Table 2.2 San Joaquin Valley Federally-Designated Connectors

Connector Description	Type	Mode	Connector ID
Anderson St (Facility to Diamond St), Diamond St (Anderson to Mariposa Rd), Mariposa Rd (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 Rd N to 11th St, 11 St E to I-5	STRAHNET	Freight/ Passenger	MIL_CA28P2
Clinton Way (Airport to McKinley), McKinley Av. (Clinton to Rt 41)	NHS	Airport	CA2A
E Roth Rd (Lathrop Rlyd IFC Airport Wy to I-5), Airport Wy (E Roth Rd to French Camp Rd), French Camp Rd (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 Ave (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 Rd 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

3.0 Clusters

One of the first steps in identifying first- and last-mile connectors 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 **Error! Reference source not found.** 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 TAC. The subsequent steps that were taken to expand this list of freight activity centers and the critical connectors linking them to the major freight highway routes are described in the next section.

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

Figure 3.1 San Joaquin Valley Clusters

Source: San Joaquin Valley I-5/ SR-99 Study, 2016.

4.0 First and Last Mile Connectors

First and last mile connectors are key parts of the goods movement system connecting the major through routes in the San Joaquin Valley to freight generators and receivers, such as warehousing and manufacturing land uses; wholesale or retail clusters; and industrial, agricultural, logging, mining, or other resource extraction and processing facilities. The connector routes identified in Figure 4.1 below are part of the local road network. The team used the procedures described below to identify first and last mile connectors in the region.

Key steps included:

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 4.1. 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.

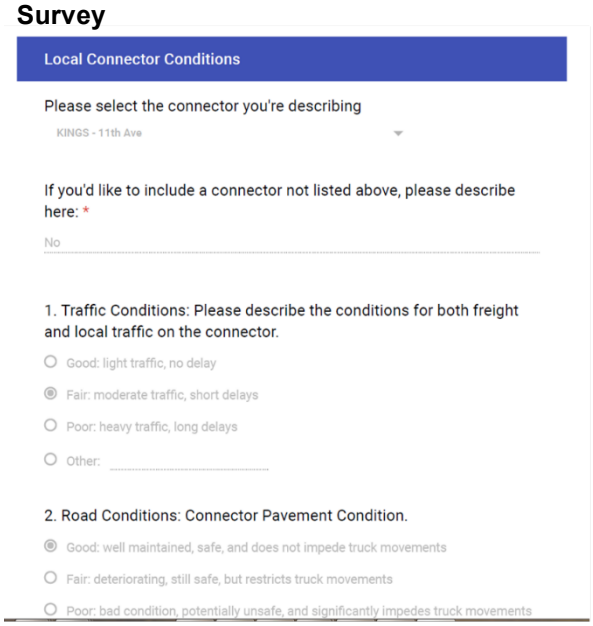
Figure 4.1 Preliminary Connector Identification – Excerpt

	Name	City	COUNT	Address	Econor	EDA (o	Cluster	Key Local Routes	Connects to	Notes
2	Gap Distribution Center	Fresno	Fresno	3685 Gap Drive, Fresno, CA 9372	Economic Developme		Fresno	N Clovis Ave/E Airways Blvd	SR180	
3	Merry X-Ray Chemical Corp	Fresno	Fresno	5971 East Harvard Avenue, Fresn	Economic Developme		Fresno	N Fowler Ave	SR180	
4	Napa	Fresno	Fresno	56, Fresno, CA 93727	Economic Developme		Fresno	N Clovis Ave	SR180	
5	Ikea Wholesale Inc	Lebec	Kern	4104 Industrial Parkway Drive, Le	Kern EDC		Tejon	Laval Rd/Tejon Industrial Dr	I5	Collector routes for multiple DCs
6	Paramount Logistics Park near St	Shafter	Kern	4805 Centennial Plaza Way, Suit	Kern EDC		Shafter	7th Standard Road	SR99	
7	Tejon Ranch	Tejo Ranch	Kern	Tejon Ranch	Kern EDC		Tejon	Laval Rd/Tejon Industrial Dr	I5	Collector routes for multiple DCs
8	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	
9	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	
10	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	
11	Safeway's Distribution Center, Tra	Tracy	San Joaqu	16900 W Schulte Rd, Tracy, Calif	San Joaquin County E		Tracy	W Schulte Rd	I580	
12	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	
13	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	
14	Toys R US Distribution Center, St	Stockton	San Joaqu	1624 Army Ct, Stockton, CA 95206	San Joaquin County E		Stockton	Army Ct	SR4	
16	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
17	WALMART DISTRIBUTION CTR	Porterville	Tulare	1300 S F ST PORTERVILLE, CA	Tulare County Econor		Poterville	Poplar Ave	S Jaye St/SR190	
18	BNSF-FRESNO-CA	FRESNO	Fresno	2599 Sunland Ave, Fresno, CA 93	Economic Developme		Fresno	E Jensen Ave (Bypass) - NHS Pr	SR 99	
19	BUDWAY ENTERPRISES, INC.-F	FRESNO	Fresno	221 Cardinal Ave, Stockton, CA 9	Economic Developme		Fresno	Cardinal Ave	SR26 to SR99	
21	FRESNO YOSEMITE INTERNATI	FRESNO	Fresno	5175 E Clinton Way, Fresno, CA	Economic Developme		Fresno	N Clovis Ave	SR 180	
24	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
28	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)	
31	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)
32	BNSF-BAKERSFIELD-CA	BAKERSFIEL	Kern	1501 F St, Bakersfield, CA 93301	Kern EDC		Bakersfield	H St.	SR 58, SR99	
33	FORDCO FOODS COMPANY, IN	BAKERSFIEL	Kern		Kern EDC		Bakersfield	South H St	SR 58, SR99	
34	RailEx	Delano	Kern	2121 S Browning Rd, Delano, CA	Kern EDC		none	S. Lexington St	Connects to Woolhomes Ave and SR99	
35	YELLOW-BAKERSFIELD-CA TE	BAKERSFIEL	Kern	4901 Lisa Marie Ct, Bakersfield, C	Kern EDC		Bakersfield	Stine Road	Connects to White Lane to SR99	
37	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)	
40	Merced Regional Airport	MERCED	Merced	20 Macready Dr, Merced, CA 953	Merced County Econ		Merced	Thornton Rd	SR140 to SR99	
44	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	
45	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	
47	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	
52	LATHROP TERMINAL	FRENCH CA	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
53	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	
54	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	
60	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	
65	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 4.2 below. Direct input included county-specific identification of major trucking sources in addition to those in the initial connector 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.

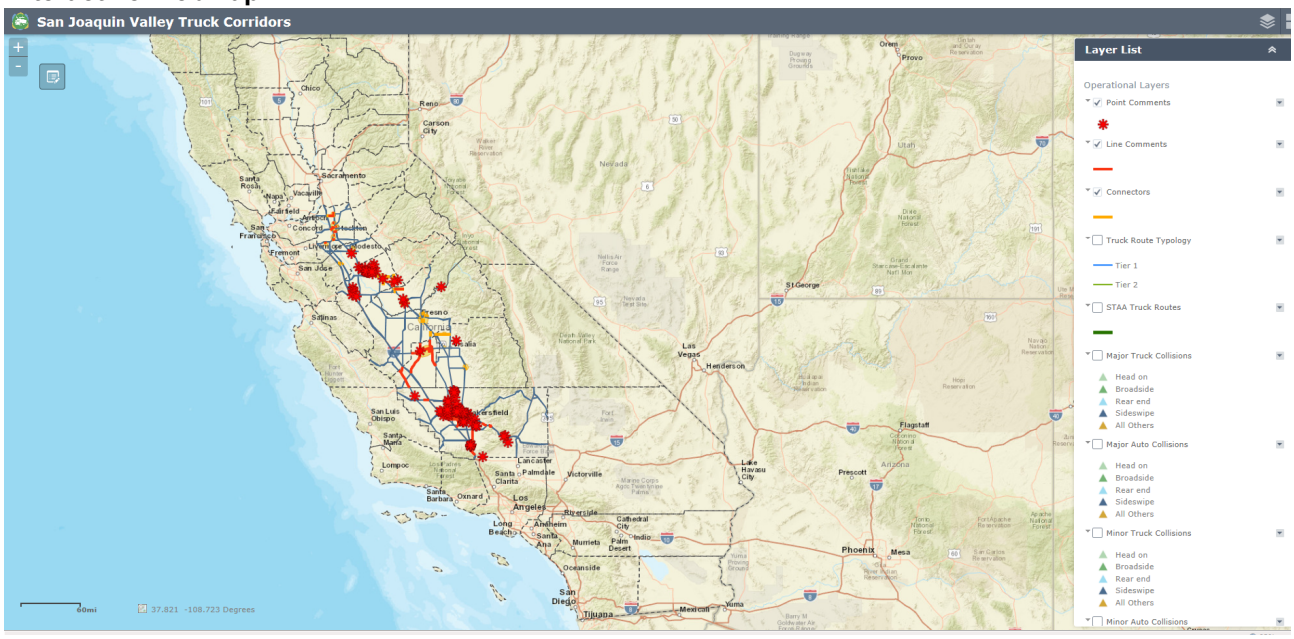
Figure 4.2 Draft Connector Input

Survey



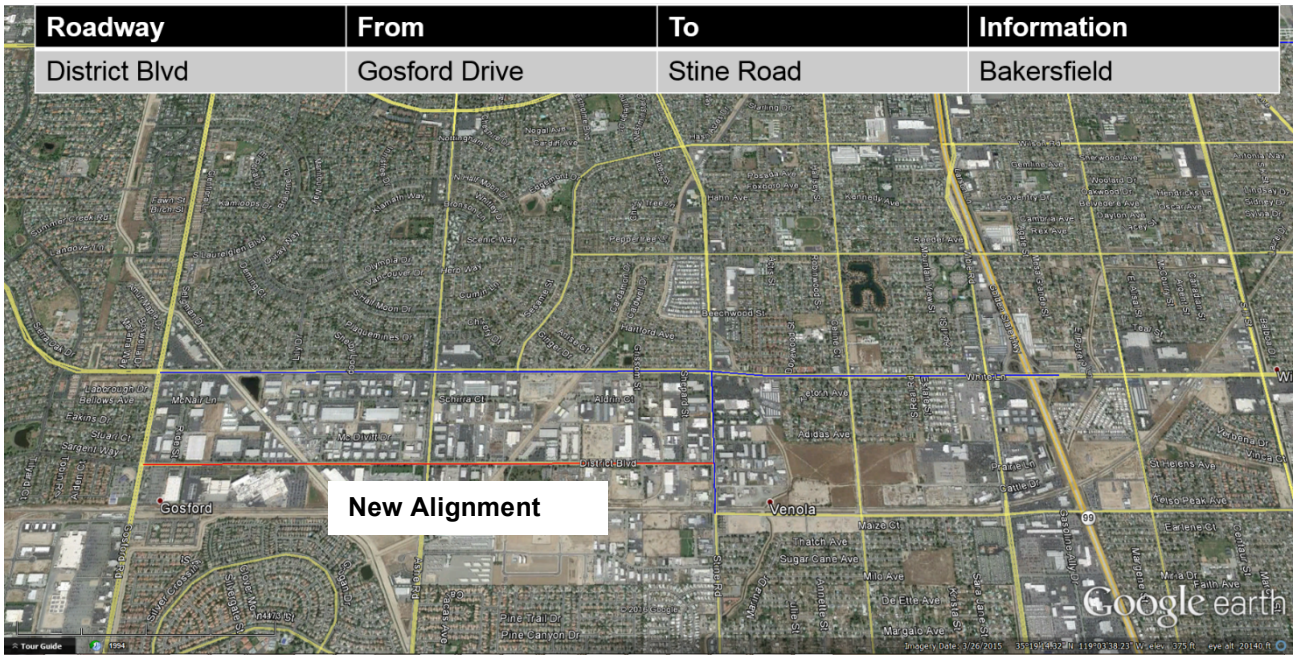
Detailed Feedback

Interactive Webmap



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. This led to a number of additions and revisions to the initial list of connectors. An example of Kern County recommendations is shown in Figure 4.3 below. Note the red roadway was added based on Kern County feedback.

Figure 4.3 Example Connector Edit, Bakersfield



4. **Evaluated data availability on selected connectors to reduce total number of connectors.** Available data and information on the connector were evaluated in concert with additional designation criteria outlined in the Fixing America's Surface Transportation (FAST) Act. The final proposed list of connectors is shown in Table 4.1.

Table 4.1 San Joaquin Valley Connectors

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Fresno County			
Fowler Avenue	Shields Avenue	CA 180	Manufacturing/ Industrial Land
H Street	Belmont Avenue	Calaveras Street	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 Street	Railroad Avenue	Major freight generation
Kern County			
Brown Material Road	SR 33	SR 46	
Browning Road	Pond Road	Schuster Road	Major freight generation (multiple), intermodal (Railex, airport)

Street Name	From	To	FAST Act Criteria Met (If Applicable)
Cherry Avenue	7th Standard Road	Lerdo Highway	
China Grade Loop	Manor Street	Round Mountain Road	Petroleum Production
Delano – Woollomes Ave	Lexington Ave	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 Street (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 Street	Major freight generation (caterpillar)
S Lexington Avenue	Schuster Road	Balboa Avenue	Major freight generation (multiple), intermodal (rail, airport)
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

Street Name	From	To	FAST Act Criteria Met (If Applicable)
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 Street	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 Street	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 Street	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 Street	W Hanford Armona Road	W Bush Street	Serves Leprino Foods
Bush Street	Belle Haven Drive/ Industrial Way	18th Ave	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)
Avenue 14/ Howard Road/ W Olive Road	Road 23	CA 99	Major freight generation

Street Name	From	To	FAST Act Criteria Met (If Applicable)
West Almond Avenue/ S Pine Street/ 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 Street	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 is also on Corridor List
Shaffer Road	Oakdale Road	end of road	Serves Aggregate Mine-Oakdale Road is also on Corridor List
Collier Road	SR 99	end of road	Foster Feed Farm and agriculture -some transloading
River Road/ Vinewood Avenue/ B Street	Winton Pkwy	Griffith Avenue	Gallo Winery, agriculture
Magnolia Avenue	Sultana Blvd	Robin Avenue	Multiple small businesses, freight, packaging
Westside Blvd	Robin Avenue	Gipson Street	Garcia Farms and Dole
Applegate Road	SR 99	Atwater Jordan Road	Atwater Packing Company
N Buhach Road/ Green Sands Avenue/ Atwater-Merced Expressway	Hospital Avenue	SR 99	Connection to airport, limited freight
Vassar Avenue/ Henry Street/ 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 Street	E Yosemite Avenue	Manufacturing and Distribution companies
French Camp Road	SR 99	S Airport Way	Major freight generation, agricultural and forestry processing, access to intermodal

Street Name	From	To	FAST Act Criteria Met (If Applicable)
			(Air)
Hammer Lane	West Lane	CA 99	Major freight generation
Diamond Street	E Charter Way	E Worth Street	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 Street	SR 99	Access to Stockton Intermodal
E Anderson Road	Facility	Diamond Street	Access to Stockton Intermodal
Harbor Street	Terminal	Fresno Avenue	Access to Port of Stockton
Fresno Avenue	Harbor Street	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 Street	Navy Drive	Fresno Avenue	Access to Port of Stockton
MacArthur Drive	I 205	I 205 Bus (W 11th Street)	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 Street	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	SR219	SR108 (SR99-SR120)	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
Sperry Avenue	I 5	Baldwin Road	Amazon/ CVS Warehouses/ Logistics,

Street Name	From	To	FAST Act Criteria Met (If Applicable)
			Major Freight generation
Kansas Avenue/ Needham Street	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 Street	E Bardsley Avenue	Industrial Avenue	Major freight generation, logistics/ warehouse/ manufacturing
E Bardsley Avenue	South I Street	SR 99	Major freight generation, logistics/ warehouse/ manufacturing
E Paige Avenue	South K Street	SR 99	Major freight generation, logistics/ warehouse/ manufacturing
Industrial Avenue (Future SR 99 IC)	South K Street	S Blackstone St	Major freight generation, logistics/ warehouse/ manufacturing
K Street	SR 99	E Owens Avenue	Major freight generation, logistics/ warehouse/ manufacturing
Road 80 (Plaza Dr)	W Airport Dr	W Riggin Avenue	Intermodal (airport), major freight generation, warehousing
W Goshen Avenue	SR 99	N Shirk Street	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 Street	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

4.1 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. Given data availability, the team collected data on a representative sample of connectors across the valley.

Using data on traffic conditions/ bottlenecks, pavement and bridge conditions, geometric constraints, and safety conditions, the team built on an analytical approach that Cambridge Systematics is using in the FHWA intermodal connector study to provide a profile of conditions on the critical connectors identified above.

4.1.1 Connector Evaluation Methodology

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.

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.

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.

Pavement Assessment

The analysis includes a qualitative pavement assessment. This evaluation measures the pavement quality according to the categories in Table 4.2.

Table 4.2 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

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.

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.

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.

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.

Sidewalks

Sidewalk availability on each connector is also 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.

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.

4.2 County specific Assessments

4.2.1 Fresno County First/ Last Mile Connector Highlights

Jensen Avenue [FR_3], between CA-99 and Willow Avenue is a 4-lane road providing east-west connections from CA-99 as well as CA-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 Ave 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 Ave 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 CA-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 2-lane road, with a 4-lane segment between CA-99 and CA-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 CA-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 CA-99 and connecting with CA-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 2-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 4.3 Fresno County Connector Information

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

ID	Number Intersections/ Signalized	Number 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 & 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.

4.2.2 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 1-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 CA-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 CA-99 in the Shafter area. The portion from CA-99 west to Driver Road is a truck route. The connector

serves industries and the Shafter Airport. Lerdo Highway is a 4-lane road west of CA-99 and a 2-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 CA-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 CA-99. Although only a 2-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 Street. 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 4.4 Kern County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
KE_1	District Blvd	Gosford Dr		Stine Rd	Major freight gen
KE_2	Lerdo Highway	N Driver Rd	SR 99 NB ramps	Kyte Ave (change)	Access to ag, intermodal facility (airport), major freight gen (GAF)
KE_4	Pegasus Dr	Merle Haggard Dr		Norris Rd	Alt to SR99, major freight gen, intermodal (airport)
KE_5	S Wheeler Ridge Rd	I5		1st St	Major freight gen (Caterpillar)
KE_6	S. Lexington St	Schuster Rd	Woollomes Ave	Balboa Ave	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 Ave/ J St	Poso Ave	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

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
KE_12	Zachary Ave	7th Standard Rd	NE corner of Ross Distribution Center	Burbank St	Major freight gen, logistics/ warehouse center
KE_13	Mt Vernon Ave	Virginia Ave	SR 58	Gateway Ave	Major freight gen (warehouse and manu)
KE_14	7th Standard Rd	Santa Fe Way	Galpin St	I-5	Serves multiple manu/ ind clusters
KE_15	Fruitvale Ave	Hageman Rd	SR 58	end	Multiple freight generators
KE_16	Mountain View Rd	S Fairfax Rd		SR 184	Serves Grimmway Farms (weak candidate)
KE_17	Di Giorgio Rd	SR 184		Tejon Hwy	Access to Ag (Grimmway, Kern Ridge, Heck Cellars)

ID	Number 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

ID	Number Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s)	Shoulder	Bicycle Lane	Sidewalk
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 CA-99. The corridor serves a large industrial zone between White Lane and District Boulevard to the south. Surrounding land uses also include residential and commercial. The busy 6-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 5-year period.

Zachary Avenue [KE_12] is a north-south connector just under two miles long, extending from 7th Standard Road to Burbank Street. 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 4-lane road through the

industrial area and narrows to two lanes about one half-mile south of Burbank Street. 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 CA-58. The route also provides access to residential areas north of Virginia Avenue from CA-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 CA-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 CA-58. The surrounding land use is primarily industrial, transitioning to residential at the north end. The 1.1-mile connector is a 2-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 CA-184 and Tejon Highway. CA-184 is a STAA truck route. The 2-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.

4.2.3 Kings County First/ Last Mile Connector Highlights

11th Avenue [KI_1] between W. Lacey Boulevard and Jackson Avenue is a 5-mile connector from either side of CA-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 4-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 4.5 Kings County Connector Information

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

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
KI_5	10th Ave	Jackson Ave		Hanford Armona Rd	Agriculture, some manu
KI_6	Fox Dr/ Fox Avenue	W Hanford Armona Rd		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 2-mile route serving either side of CA-198. The 2-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 3-mile segment between Jackson Avenue and Hanford Armona Road, connecting industrial uses on either side of CA-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 2-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 is also 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 CA-198 (east-west) or CA-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.

4.2.4 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 CA-99. Except for the portion of Olive Avenue between CA-99 and Howard Road, the connector is a truck route. The connector is approximately four miles long and is four lanes wide between CA-99 and Autumn Road, where it narrows to two lanes. Much of the 4-lane portion is separated by a landscaped median. There are six signalized intersections, or about 1.5 signals per mile, mostly concentrated near CA-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 CA-99. The route is approximately ¾ 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 CA-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 & Avenue 17, which is a relatively wide, 2-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 CA-99. The 2-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 4.6 Madera County Connector Information

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

ID	Number 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

4.2.5 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 CA-99 to the east. The connector is approximately 5.6 miles long with no signalized intersections. It is a 2-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 CA-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 CA-99. The area nearest to CA-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 mph and the intersection is a 2-way stop for traffic on Atwater Jordan Road.

Table 4.7 Merced County Connector Information

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

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

4.2.6 San Joaquin County First/ Last Mile Connector Highlights

French Camp Road [SJ_5] is a connector between Airport Way and CA-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 CA-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 CA-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 4.8 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 Rd	Alt to SR 99/ I5, intermodal connection, warehouse/ logistics
SJ_2	Arch Airport Rd/ Arch Rd	I-5	Airport Way	Mariposa Rail Yard	Intermodal facility (airport and rail), warehouse/ industrial land
SJ_5	French Camp Rd	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 Ln	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	

4.2.7 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 un-signalized.

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 is also 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 is likely also 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 4.9 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 Rd	Zacharias Rd	Rogers Ct	Sperry Ave	3 major warehouses
ST_6	Kansas Ave/ Needham St	N Carpenter Rd	Franklin St	McHenry Ave (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	

4.2.8 Tulare County First/ Last Mile Connector Highlights

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

Blackstone Street [TU_2] is a north-south route parallel to CA-99 that serves a commercial-industrial area between Bardsley Avenue and Industrial Avenue, located between the Union Pacific railroad and CA-99. The connector is 1.4 miles long with no signalized intersections, and direct access to CA-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 2-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 CA-99 southbound on-/ off-ramp that approaches the Paige Avenue intersection at a steep angle. The Paige Avenue intersection itself has 3-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 non-commercial 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 CA-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 CA-99, providing access to a large industrial zone to the south between the UPRR and CA-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 CA-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 CA-99. North-south access is also 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 CA-198 to CA-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 CA-65 and CA-198 that eliminates the need to travel a mile further west to follow CA-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 CA-99 in Earlimart extending east to CA-65. The majority of the surrounding land use is agricultural, except nearest to CA-99 where the residential neighborhoods of Earlimart lie. The 2-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 CA-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 CA-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 4.10 Tulare County Connector Information

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
TU_1	Avenue 416/ E Mountain View Ave	SR 99	Rd 72	Road 88	Access to ag, major freight gen (Best Buy Dist)
TU_2	S Blackstone Street	E Bardsley Ave	Continental Ave	Industrial Ave	Major freight gen, logistics/ warehouse/ manu
TU_3	E Bardsley Ave	South I St		SR 99	Major freight gen, logistics/ warehouse/ manu
TU_6	K Street	SR 99	Paige Ave	E Owens Ave	Major freight gen, logistics/ warehouse/ man

ID	Street Name	Intermediate Point	From	To	FAST Act Criteria Met (If Applicable)
					u
TU_7	Road 80 (Plaza Dr)	W Airport Dr	Neeley Rd/ Hurley Ave	W Riggin Ave	Intermodal (airport), major freight gen, warehousing
TU_8	W Goshen Ave	SR 99	Rd 76	N Shirk St	Major freight gen, warehouse/ logistics/ indu
TU_12	Ave 368	SR 99		Road 132	Serves multiple large dairy farms, Ventura Coastal
TU_13	Spruce Rd/ 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/ Ave 96/ Ave 95	SR 65		Road 236	Multiple Freight gen (ag and forestry)
TU_16	Ave 56	SR 99		SR 65	Weak candidate – serves a few trucking/ ag facilities, but limited
TU_17	Ave 0/ Reed Road/ Ave 8	SR 99		Richgrove Dr	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,	Yes	No	No

ID	Number of Intersections/ Signalized	Number of Lanes	Pavement Assessment	Surrounding Land Use(s) (Greatest to Least)	Shoulder	Bicycle Lane	Sidewalk
				Retail			
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	

4.2.9 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's 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 non-signalized 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.

4.3 Funding Needs and Implementation Options

For the last element of this task, the team reviewed the status of existing and proposed funding resources for making improvements and how these funding resources can be used to implement necessary improvements. The team assembled potential funding sources for improvements, including potential funding under the National Highway System connectors program, as well as other innovative funding opportunities such as public-private partnerships. The team also reviewed existing programs in the COG long range plans for which the local streets and roads projects would be eligible.

At the present time, there is no specially designated funding for first/ last mile freight connectors in any Federal or state program. Even though the Federal government has designated NHS intermodal connectors, they are only eligible for the same general Federal-aid funding that other NHS routes are eligible for. The freight connectors identified in this task, also go well beyond the intermodal connector definition in Federal legislation to include connectors that are not intermodal in nature. One goal of designating goods movement connectors in the local road system and assessing their condition and performance is to call attention to the important role of these local roads for freight transportation and to help make the case for designated funding. There is continuing discussion at the state level about a new transportation funding package and efforts to include funding for a new Trade Corridor Improvement Fund (TCIF) program as part of this package. This may represent an opportunity to create a new connector program and representatives of the

Valley COGs can use the information developed in this task to help make the case for such a state level program.

In the foreseeable future, the primary source of funding for a goods movement connector program will be the traditional sources of local roads improvement programs that the COGs use today, including: state fuel excise tax, Federal and state aid, fuel tax swap, local general funds, and county sales tax measures (only three counties in the Valley have sales tax measures – Fresno, Madera, and Tulare). The COGs with the greatest connector improvement needs (as demonstrated in the condition and performance evaluations conducted for this task) may wish to created set-aside programs for freight connector improvement and maintenance and use the information from the evaluation to help prioritize individual projects.

The only remaining opportunity to immediately address funding needs for goods movement connectors is to try to get some of the connectors identified on this list designated as Critical Urban or Rural Corridors under the FAST Act. Critical Urban and Rural Corridors will be designated by state DOTs based on criteria included in the FAST Act and will then be eligible for FASTLANE grants as well as for apportioned funds for freight transportation that Caltrans will receive. While this approach is theoretically possible, it should be noted that the number of roadway miles that Caltrans can designate as Critical Urban and Rural Corridors is severely limited by statute and it is likely that Caltrans will give priority to state highways when designating these corridors. Further, the Valley COGs may have higher priority goods movement projects on non-connector routes and may want to ensure that these non-connector routes are designated among the limited Critical Urban and Rural Corridors that Caltrans can designate. The criteria for Critical Urban and Rural Corridors and the applicability of this program to the designation of priority rural corridors is discussed and evaluated in more detail in Task 3 of this study, Priority Rural Corridors. Priority urban corridors are also discussed as part of Task 2, the designation of a Valleywide truck route system

4.3.1 Federal Funding Resources

In the fall of 2015, Congress passed and the President signed the Fixing America's Surface Transportation (FAST) Act, ending the period of extensions of the past Federal surface transportation act and creating a new, long term funding program for the nation's transportation system. 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 5 years that will be apportioned between the states by formula based on the number of Primary Highway Freight Network miles in the state. States may spend up to 10% 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:

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

The second potential source for Federal freight-specific funding is the Nationally Significant Freight and Highway Projects (NSFHP) Program. Retitled the Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) Grant Program by U.S. DOT, the NSFHP Program is a $4.5 billion program over five years that consists of competitive grants. Projects can

receive up to $500 million total and eligible projects must be anticipated to equal or exceed $100 million in cost, with a grant request of at least $25 million.

Funds can be used for projects on the National Highway System even if they are not on the National Highway Freight Network, provided the U.S. DOT with discretion in selecting projects with significant national or regional impacts. Projects must be "shovel ready" when the state applies for a grant; funds for large projects should be reasonably expected to reach construction within 18 months of obligation.[2]

As discussed above, even though some of the connector routes identified in this task may satisfy the criteria for selection as Critical Urban or Critical Rural Freight Corridors, the limited number of miles available to Caltrans makes it unlikely that these local connectors will be eligible to receive freight funding from the FAST Act.

However, goods movement can also be enhanced by projects funded through non-freight specific sources in the FAST Act, many of which are a continuation of MAP-21 programs. Projects on local and state roads that are not explicitly freight-related 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 ITS and Freight Parking, though competition will be high. HSIP funding could be used to advance connected vehicle programs including vehicle-to-vehicle or vehicle-to-infrastructure communications which trucks can take part in.

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. Again, the national scope of this programs will be a challenge for local roads seeking funding, but there may be opportunities to combine needs and seek funding from multiple sources. 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 4.11 below shows California's share of Federal FAST Act money in different programs over the next 5 years.

[2] https://www.transportation.gov/fastlanegrants/frequently-asked-questions

Table 4.11 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.

4.3.2 State Funding Resources

The last major statewide freight investment program was approved by voters in November 2006 as part of the Proposition 1B bond package. That program, the Trade Corridor Improvement Fund (TCIF), totaled $2.5 billion statewide. It provides funding for infrastructure improvements along Federally designated "Trade Corridors of National Significance" in California or other corridors with a high volume of freight movement. Most of the original TCIF funding has been allocated by the California Transportation Commission, with only small amounts available from project savings in the original allocations. The California legislature's First Extraordinary Session on Infrastructure ended without producing a funding package. However, the current legislative session is considering a transportation package that would funnel money to the TCIF. It may be appropriate for the Valley COGs to advocate that a portion of future funds be set aside for connector routes.

Other highway-related programs, specifically the State Highway Operations and Protection Program (SHOPP) and various funding programs through the State Transportation Improvement Program, can also be used to improve conditions in the region. Similar to Federal funding, these funding sources are not freight specific but non-freight projects that also benefit freight movement are eligible.

4.3.3 Regional/ Local Funding Resources

Regional and local freight transportation funding in the Central California Coast region is sparse. The largest local source of money for transportation projects comes through local sales tax measures passed at the county level. The Self-Help Counties Coalition (SHCC) is an organization representing the 20 local transportation agencies in counties where such a tax has passed. Table 4.12 below identifies counties in the study area that are members and relevant tax and revenue information.

Table 4.12 Local Sales Tax Measures for California SHCC Members

County	Sales Tax Name	Amount	Time Covered	Revenue	Funding Allocation (If Known)
San Joaquin	Measure K	Half-cent	Renewed in 2006 for 30 years	$2.552 billion	Local Street Repairs/ Safety (35%), Congestion Relief (32.5%), Rail Crossing Safety (2.5%), Passenger, Rail, Bus, Bicycles (30%)
Madera	Measure T	Half-cent	Passed in 2006 for 20 years	$197 million	Commute Corridors/ Farm to Market Program (51%), Safe Routes to Schools and Jobs (44%), Transit (2%), Environmental Enhancements (2%), Admin/ Planning (1%)
Fresno	Measure C	Half-cent	Renewed in 2007 for 20 years	$1.3 billion ($3.4 billion if leveraged for state/ Federal funds)	Local Transportation Programs ($593.6 million), Regional Transportation Programs ($520.8 million) Public Transit ($412 million), Alternative Transportation ($102.5 million), Environmental Enhancement ($59.8 million), Admin/ Planning ($25.6 million)
Stanislaus	Measure L	Half-cent	Passed in 2016 for 25 years	$480 million	A 25-year ½-cent tax funding $480 million for rail, transit, roadway, special transportation and bike/ ped improvements.
Tulare	Measure R	Half-cent	Passed in 2006 for 30 years	$652 million	Local Programs (35%), Regional Projects (50%), Transit/ Bike/ Environmental (14%), Admin/ Planning (1%)

Source: http:/ / www.selfhelpcounties.org/ members.html and component Council of Governments.

The vast majority of these projects are not freight-centric. However, trucks use state and local roads to reach origins and destinations so projects that maintain good road conditions, reduce safety issues, and improve congestion will also aid the flow of goods.