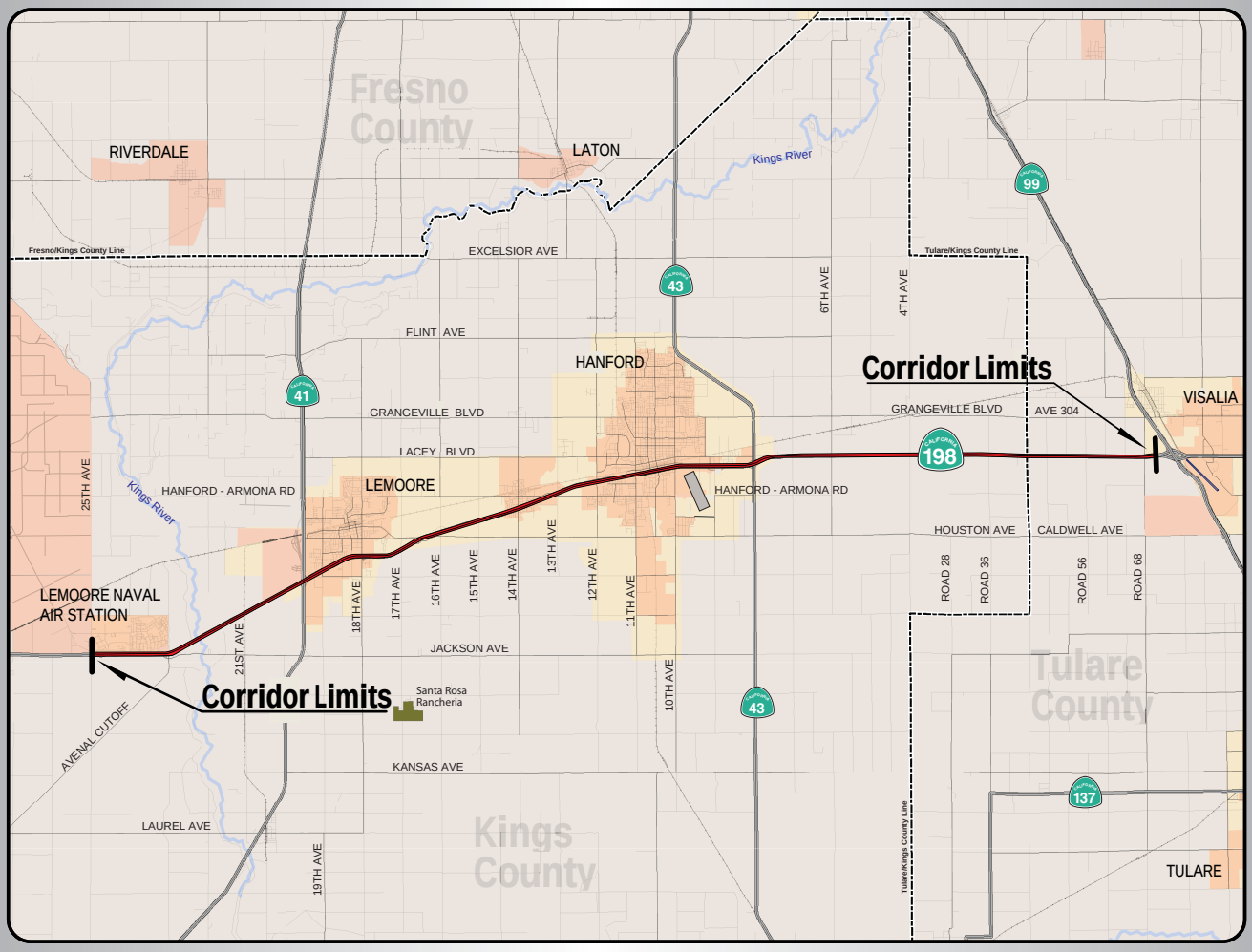
Corridor System Management Plan

Kings County 198 PM 3.0/28.3
Tulare County 198 PM 0.0/3.8



District 6 Central Planning Division
October 2008

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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KINGS / TULARE ROUTE 198 CORRIDOR SYSTEM MANAGEMENT PLAN

Route 198: From Lemoore Naval Air Station to Route 99 in Tulare County District 6 - Kings 198 PM 3.0/28.3, Tulare 198 PM 0.0/3.8

I approve this Corridor System Management Plan as the overall Policy Statement and Strategic Plan that will guide transportation decisions and investments for the Route 198 Corridor.

Recommend Approval:

Malcolm X. Dougherty
District Director
Caltrans - District 6

Joe Neves, Chairman
Kings County Association of Governments

Sharri Bender Ehlert
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Planning and Local Assistance
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Corridor System Management Plan
State Route 198
September 2008

I. INTRODUCTION

A. Purpose and Need

The preparation of a Corridor System Management Plan (CSMP) is a California Transportation Commission (CTC) requirement for the use of "Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006" funds, approved by the voters as Proposition 1B on November 7, 2006. In requiring CSMPs for Proposition 1B funds, the CTC was expressing its expectation that Caltrans and regional agencies would preserve the mobility gains of urban corridor capacity improvements after those improvements were in place. Proposition 1B funds have been allocated for a project within the corridor encompassed by this CSMP. This project, the "Route 198 Expressway" Project, is described on Page 26 of this document.

A transportation corridor is not limited to the highway but encompasses all transportation components, taken as a whole, through a geographical area, on a major travel path. The corridor includes the highway, major local parallel arterials, local road intersections, ramps and ramp meters, signal controls, transit, rail, bikes, and pedestrians. The CSMP provides one unified guide for managing, operating, improving, and preserving the corridor across all modes and jurisdictions for the highest productivity, mobility, reliability, accessibility, safety, and preservation outcomes. The CSMP allows the State, regional agencies, and local jurisdictions to manage and operate the transportation corridor for the highest sustained productivity and reliability based on the assessment and evaluation of performance measures. The strategies for managing the corridor are phased and include both operational and more traditional long-range capital expansion strategies. Phasing will ensure that the most-needed projects are constructed first and that construction proceeds in a logical progression, maximizing the limited transportation funds available. This represents a shift from the traditional approach of identifying localized freeway problems and finding solutions that are often expensive and focused on capital improvements. The CSMP approach places greater emphasis on performance assessments and operational strategies that yield higher benefit-to-cost results.

This CSMP identifies the recommended management strategies for the portion of the Route 198 transportation corridor extending from the Lemoore Naval Air Station (LNAS) in Kings County to Route 99, west of the City of Visalia in Tulare County. Corridor management includes a commitment by all partners to apply the principles and practices of system and corridor management and the use of performance measures to provide for sustained corridor performance. The CSMP assesses current performance, identifies causal factors for congestion, and, based on testing of alternative corridor management and improvement scenarios, will propose the best mix of improvements, strategies, and

actions to optimize corridor performance. This CSMP will also help with the appropriate phasing for identified improvements.

The Kings County Association of Governments (KCAG), Tulare County Association of Governments (TCAG), and Caltrans District 6 have all signed a Memorandum of Understanding (MOU), a copy of which is included in Appendix A, Pages 35 - 40. This MOU documents the commitment of all parties to manage the corridor through applying the principles and practices of system and corridor management and performance measurement for sustained corridor performance. The completed CSMP also requires adoption by these same partners. The adoption date is set for October 2008.

B. Route 198 Background

The Route 198 Corridor connects the central coast of California to the Sierra Nevada Mountains. It is a primary commuter route and links the cities of Lemoore, Hanford, and Visalia with the LNAS, a major strategic military installation and a major employer in the region.

The area encompassed by this CSMP is predominately rural, with urban development occurring at the City of Lemoore, the City of Hanford, and the community of Armona. The CSMP corridor ends at Route 99 in Tulare County, a heavily traveled goods movement corridor, and gateway into the City of Visalia. Traffic from the City of Visalia and Route 99 will likely impact Route 198. Additional development in the Cities of Lemoore and Hanford may impact the Route 198 corridor, although at this point, the extent of that development is unknown. The LNAS, which fulfills a critical role in the nation's defense, also depends on the Route 198 corridor. The base has a major impact on the local economy, contributing annually an estimated $750 million in wages and contracts to the economy and employs approximately 10,200 personnel. As the home to half of the Navy's air striking power, it hosts sixteen aircraft squadrons and all of the West Coast Carrier Air Groups.

The land use in the region is largely agricultural in nature. Several large dairy operations within the project limits rely heavily on Route 198 as a farm-to-market route for products. Additionally, Route 198 is the primary transportation or re-supply corridor supporting the LNAS military operations and military or civilian personnel living or working at the base. Conventional agricultural equipment, such as large tractors and combines, are allowed to travel on this route under the California Vehicle Code.

C. Corridor Team

The preparation and implementation of a CSMP requires coordination with local and regional agencies, Tribal governments, and other stakeholders. This coordination will be accomplished through the creation of a Project Development Team (PDT).

1. PDT Members:

City of Hanford: Lou Camara, Cathy Cain, John Doyel; City of Lemoore: Holly Smyth, David Wlaschin; City of Visalia: Andrew Benelli, Doug Damko, Richard

Noguera, Michael Olmos; City of Tulare: Mike Miller; County of Kings: Greg Gatzka, Kevin McAlister, Harry Verhuel, Bill Zumwalt, Ron Hughes; County of Tulare: Jean Brou, Mike Ellzey, Brit Fussel, Henry Hash, Bill Hayter, Teresa Szymanis; Kings County Association of Governments: Terri King; Lemoore Naval Air Station: Roman Benitez, Leilani Navarro; San Joaquin Valley Unified Air Pollution Control District: Tom Jordan; Santa Rosa Tachi Tribe: Lalo Franco; Tulare County Association of Governments: Ben Giuliani, Ted Smalley; Caltrans (CT) Central Region Environmental: Trais Norris, Kay Goshgarian; CT D6 Maintenance and Traffic Operations: Diana Gomez, Joel Aguilar, David Arias, Jose DeAlba, Joe Espinosa, Albert Lee, John Liu, Bill Moses, Marco Sanchez, Rene Sanchez, Duc Ken Ly; CT D6 Planning: Al Dias, Sharri Ehlert, Paul Marquez, Steven McDonald, Lorena Mendibles, Hector Rangel, Vernie Ratnam, Sandra Scherr, Mac Cavalli, Marta Frausto; San Joaquin Valley Coordination: Alan McCuen; CT D6 Project Management: Neil Bretz, Jim Heinen; CT D6 Graphics: Jeff Fowler; Headquarters Division of Transportation Planning: Kelly Eagan, Al Arana.

II. CORRIDOR DESCRIPTION

A. Corridor Limits

Map #1, Page 4, shows the corridor limits, which extend from LNAS to Route 99 (Kings 198 PM 3.0/28.3; Tulare 198 PM 0.0/3.835). Route 198 traverses Kings County to the Tulare County line. The LNAS is connected to the SR 41/198 interchange by an expressway/freeway. Route 198 serves the cities of Coalinga (in Fresno County), Lemoore, Hanford, and Visalia.

B. Corridor Width

The rural corridor of Route 198 from the LNAS to Visalia consists mostly of freeway or expressway sections for its 29.1-mile length. Route 198 from the Main Gate of the LNAS to 0.5 mile west of the Route 43/198 separation in Hanford, a distance of 18.5 miles, is a 4-lane facility. Route 198 is a 2-lane facility from 0.6 mile east of Route 43 to 0.3 mile east of Road 68 in Tulare County, a distance of 10 miles. However, a 10-mile portion is a 2-lane conventional highway, with numerous driveways and cultivated farmland along its length.

The existing corridor width between LNAS and 0.5 mile west of the Route 43/198 separation is between 142 and 166 feet. From here to the end of the corridor limits in Tulare County, the existing corridor is 80 to 90 feet in width. The Route 198 Expressway Project on the existing 2-lane facility increases the number of lanes to four and the corridor width to 211 feet for most of its limits.

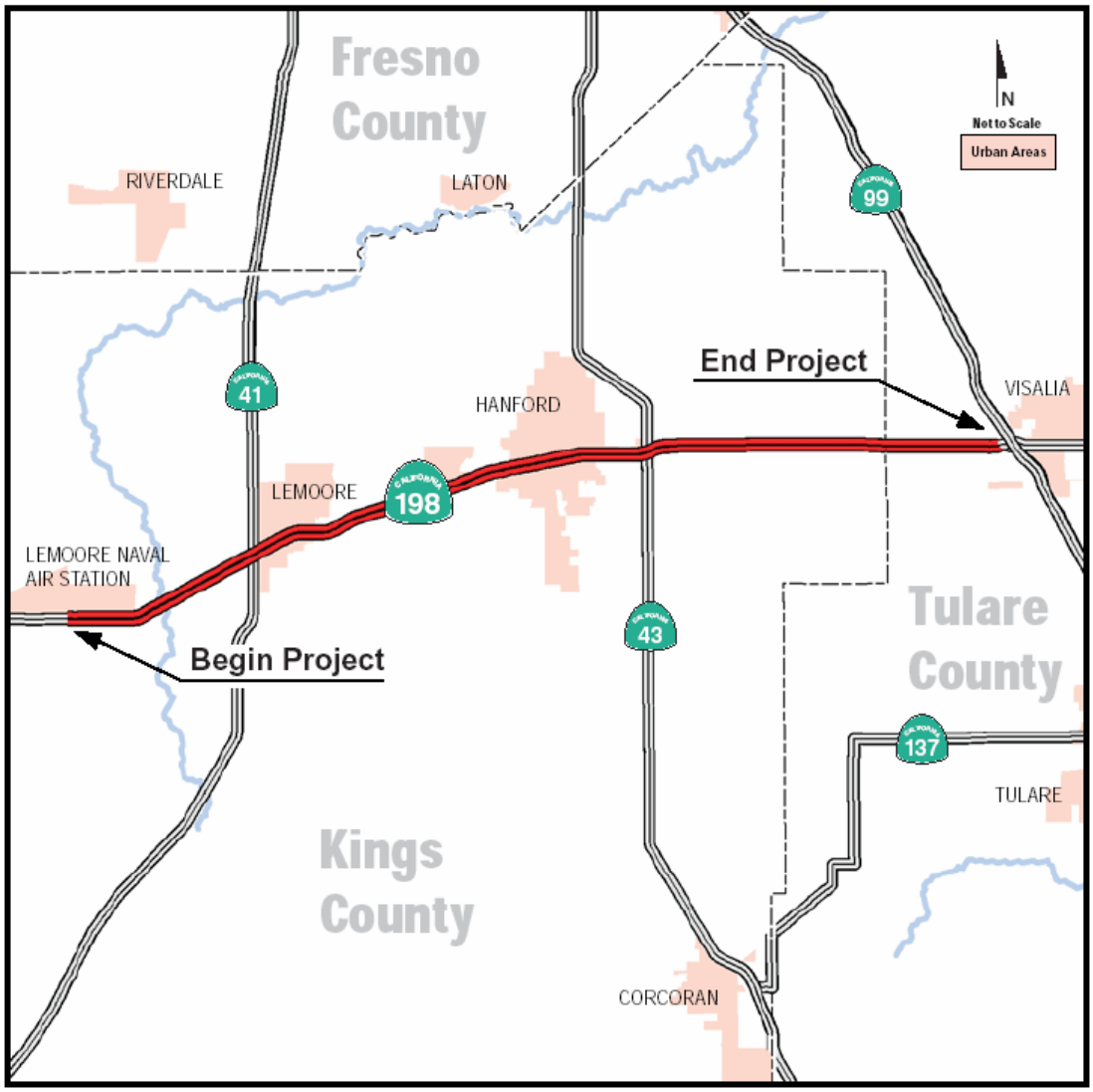
The shoulder widths vary from 0 to 5 feet. The highway is lined with mature walnut and eucalyptus trees for most of its length. While providing a significant scenic value to the corridor, the mature trees are located within several feet of the travel-way and do not allow for a clear recovery zone for errant vehicles.

C. Corridor Function

1. Description of the Corridor

Route 198 is part of the National Highway System serving the cities of Lemoore, Hanford, Visalia, and the LNAS. It is a designated large truck route between Interstate 5 and the Sequoia National Park boundary, per the Surface Transportation Authority Act of 1982. Route 198 is designated as a High Emphasis Focus Route in the State Interregional Transportation Strategic Plan (ITSP), and is on the National Network for STAA trucks (large trucks).

MAP #1
CSMP CORRIDOR LIMITS



Route 198 corridor is an essential highway that provides a vital east-west connection between the Sierra Nevada Mountains, the central coast of California, and through the San Joaquin Valley. Route 198 serves the commercial traffic along the corridor, which includes the transporting of agricultural products. It is the primary highway to and from LNAS, one of the Navy's essential aviation facilities in the western United States. Recreational traffic uses Route 198, particularly in the summer months, to reach Sequoia National Park and the central coast (via US 101). The mix of commuter traffic with slower moving trucks and recreational vehicles, agricultural equipment, and occasionally bicycles, can compromise safety, especially on the existing 2-lane highway portion.

2. Population Characteristics

Communities within the San Joaquin Valley are growing rapidly, and Kings and Tulare Counties are no exception. In 2000, Kings County had a population of 129,461, with the City of Hanford's population at 41,686 and the City of Lemoore's population at 19,712. The LNAS's population is approximately 15,765. Neighboring Tulare County to the east had a population of 369,873 in 2000. Kings County's population is expected to reach 250,516 by the year 2030, with much of this increase being accommodated by the Cities of Hanford and Lemoore. Tulare County is projected to have a population of 742,969 by 2030. The trend toward increasing population is anticipated to continue throughout the foreseeable future. Increases are due in large part to the availability of land, the proximity of the urban centers within this CSMP area to the cities of Visalia and Tulare in neighboring Tulare County. The anticipated growth necessitates a new approach to managing the corridor.

3. Goods Movement

Various modes are used in California to move goods, including seaports, airports, railways, dedicated truck lanes, logistics centers, and border crossings. California's economy relies heavily on the efficient and safe delivery of goods to and from our ports and borders, as well as distribution within the State. This includes the movement of raw materials to manufacturing and processing plants, as well as the movement of finished products to market.

The San Joaquin Valley region is one of four major international trade regions in California, designated in the 2002 Global Gateways Development Program. The San Joaquin Valley (SJV) Goods Movement Study, prepared for Caltrans and the eight counties of the San Joaquin Valley (Kern, Fresno, Tulare, Kings, Madera, San Joaquin, Stanislaus, and Merced), determined that trucking is the dominant mode for moving freight (see truck percentages, Table 1, Page 6). Rail accounted for approximately 11% of the total tonnage. The increase in freight movement by trucks on State highways is growing faster than can be accommodated by the existing capacity. Route 198's Annual Average Daily Traffic (AADT) ranges from 17,000 to 30,000, with trucks constituting up to 16% of the AADT in some sections, even though the State average is only 9%.

TABLE 1

ROUTE 198 CSMP SUMMARY CHART

LEGEND

Planned or Programmed by 2030

Convert 2-lane con. (2C) to 4-lane (4E) exp.

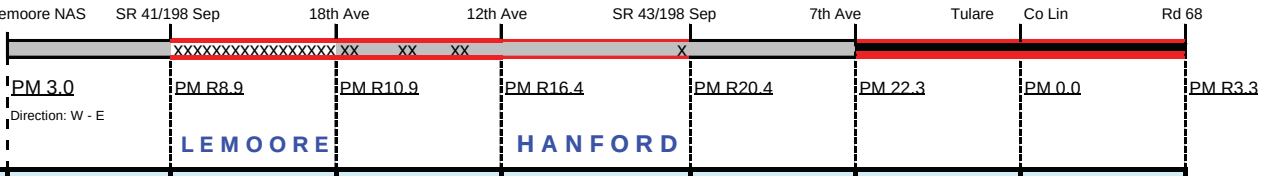
Convert 4-lane exp. (4E) to 4-lane (4F) fre.

Conventional

Expressway

Freeway

Number of Lanes 2 4



SEGMENT	6	7	8	9	10	11	12
County / Route	KINGS / 198	KINGS / 198	KINGS / 198	KINGS / 198	KINGS / 198	KINGS / 198	TULARE / 198
Description Begin	LEMOORE NAVAL AIR STATION	SR 41/198 SEPARATION	0.3 MI E OF 18TH AVENUE	0.5 MI W OF 12TH AVENUE	0.5 MI W OF SR43/198 SEP	7TH AVENUE	TULARE COUNTY LINE
Description End	SR 41/198 SEPARATION	0.3 MI E OF 18TH AVENUE	0.5 MI W OF 12TH AVENUE	0.5 MI W OF SR43/198 SEP	7TH AVENUE	TULARE COUNTY LINE	0.3 MI E OF ROAD 68
Postmile Limits Begin/End (PM)	3.0 / R8.9	R8.9 / R10.9	R10.9 / R16.4	R16.4 / R20.4	R20.4 / 22.3	22.3 / 28.3	0.0 / R3.3
Length (MI)	5.9	2.0	5.5	4.0	1.9	6.0	3.3
Rural / Urban	Rural	Urban	Rural*	Urban	Rural	Rural	Rural
Terrain	Flat	Flat	Flat	Flat	Flat	Flat	Flat
Facility: Existing	4F	4E	4E/4F	4E/4F	4F	2C	2C
2030 Concept	4F	4F	4F	4F	4F	4E	4E
UTC	4F	4F	4F	4F	4F	4F	4F
LOS: 2006	B	B	C	C	B	D	D
LOS: 2020	B	C	D	C	C	E	E
LOS: 2030	C	D	F	F	D	F	F
LOS: Concept	C	D	D	D	D	D	D
Deficiency/Year Deficient	No	No	2030	2030	2030	2006	2006
Project in STIP/RTP (Y/N)	No	No	No	No	No	Yes	Yes
LOS W/ Concept Improvement	N/A	N/A	N/A	N/A	N/A	C	C
Directional Split (Peak Hour)	76/24	76/24	57/43	57/43	57/43	57/43	57/43
AADT: 2006	17,800	21,000	30,000	27,000	19,300	19,300	19,300
AADT: 2020	26,540	33,201	48,810	42,066	27,541	25,978	26,364
AADT: 2030	34,657	45,045	67,560	56,538	34,914	31,671	32,443
Peak Hour: 2006	2,000	2,100	2,850	2,550	1,750	1,750	1,750
Peak Hour: 2020	2,982	3,320	4,637	3,973	2,497	2,356	2,391
Peak Hour: 2030	3,894	4,505	6,418	5,340	3,166	2,872	2,942
Truck AADT 5+ axle: 2006	636	736	1,485	1,014	1,014	1,045	1,126
Truck AADT 5+ axle: 2020	950	1160	2420	1580	1450	1410	1540
Truck AADT 5+ axle: 2030	1240	1580	3340	2120	1840	1710	1890

Directional Split: Denotes the split in the peak hour traffic flow on a directional basis (NB/SB or WB/EB) in either the morning or evening.

***Anticipated to change from Rural to Urban**

Goods Movement is critical to the economy and represents an increasingly important employment sector for Californians. It is vital to our quality of life and to our economy to improve the essential infrastructure needed to enhance the transport of goods. Improving the goods movement infrastructure, and thereby providing alternatives to the reliance on trucking, will also aid in relieving congestion on freeways and will increase mobility for everyone in California.

4. Alternative Modes of Transportation

Map #2, Page 8, shows the various alternative modes of transportation within this CSMP area.

a) Freight Rail

The rail network consists of 67 miles of main line and branch line railroads operated by two different railroad companies. The Burlington Northern Santa Fe (BNSF) mainline runs north-south through Kings County and the San Joaquin Valley Railroad runs east-west on the leased Union Pacific (UP) Railroad Coalinga Branch line. This branch line runs along Route 198 within the CSMP project limits.

The use of rail for goods movement is growing as the number of small rail operators improves efficiency and supply. The San Joaquin Valley Railroad (SJVR) is one rail operator that serves short-line rail transport needs of the region. It utilizes the UP Coalinga Branch line along the Route 198 corridor. SJVR carries a diversified range of goods including citrus, recycled glass, fertilizer, paper products, lumber, and many other products. This service benefits the region by reducing congestion, helping to reduce air pollution and making safe, efficient use of transportation corridors.

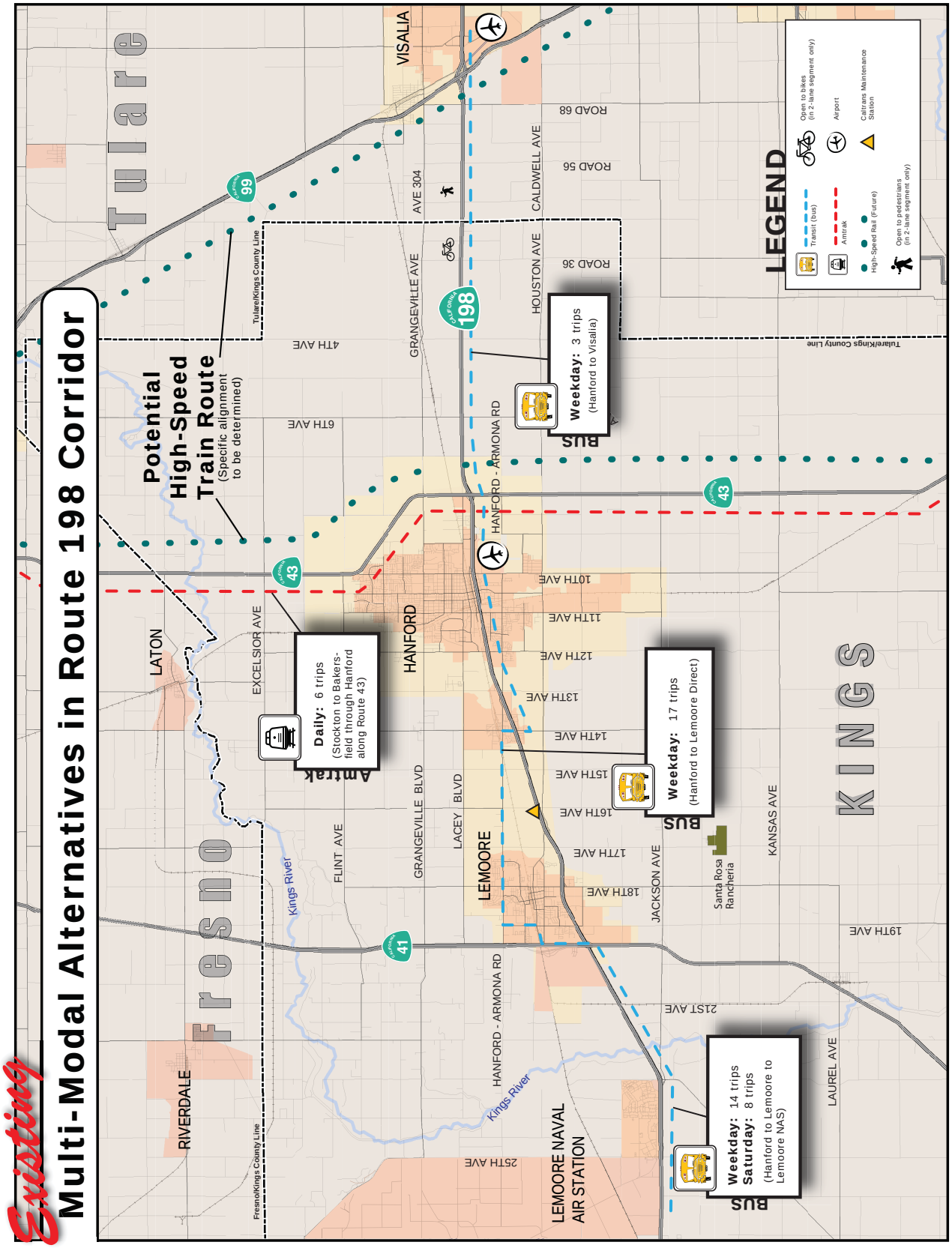
Within this corridor, the Cross Valley Rail Corridor Project was completed in 2003. The project restored and upgraded 47 miles of track between the cities of Visalia and Huron to accommodate 286,000-pound railcars and facilitate the growth of industrial development in the area. A Joint Powers Authority, comprised of the partnering cities of Lemoore, Huron, and Visalia, the San Joaquin Valley Railroad, and 11 other funding agencies led the project. It is anticipated that this short-line railroad service would ultimately take approximately 100 heavy trucks per day off the roadways.

Kings County's agricultural economy will continue to generate a strong demand for adequate truck and rail facilities to move farm products to processing plants, markets and ports.

b) Passenger Rail

In most states, inter-city passenger train service is provided solely by Amtrak. This service is provided with no assistance of any sort from state or local governments. California, through Caltrans, is one state that has been assisting

MAP #2


Existing
Multi-Modal Alternatives in Route 198 Corridor
Potential High-Speed Train Route
(Specific alignment to be determined)
Amtrak
Daily: 6 trips
(Stockton to Bakersfield through Hanford along Route 43)
BUS
Weekday: 3 trips
(Hanford to Visalia)
BUS
Weekday: 17 trips
(Hanford to Lemoore Direct)
BUS
Weekday: 14 trips
Saturday: 8 trips
(Hanford to Lemoore to Lemoore NAS)
LEGEND
Transit (bus)
Amtrak
High-Speed Rail (Future)
Open to bikes (in 2-lane segment only)
Airport
Caltrans Maintenance Station
Open to pedestrians (in 2-lane segment only)
Tulare
Fresno
KINGS
VISALIA
HANFORD
LEMOORE
LATON
RIVERDALE
LEMOORE NAVAL AIR STATION
Santa Rosa Rancheria
Kings River
Tulare/Kings County Line
Fresno/Kings County Line
HANFORD - ARMONA RD
GRANGEVILLE BLVD
LACEY BLVD
EXCELSIOR AVE
FLINT AVE
JACKSON AVE
KANSAS AVE
LAUREL AVE
GRANGEVILLE AVE
AVE 304
CALDWELL AVE
HOUSTON AVE
ROAD 68
ROAD 56
ROAD 36
4TH AVE
6TH AVE
10TH AVE
11TH AVE
12TH AVE
13TH AVE
14TH AVE
15TH AVE
16TH AVE
17TH AVE
18TH AVE
19TH AVE
21ST AVE
25TH AVE
99
198
43
41

Amtrak in order to allow Amtrak to provide more than just the basic service. Capital grants and support for station and track improvements (including signaling), locomotives and cars, and connecting Amtrak bus service have been provided. The *Pacific Surfliner*, *San Joaquins*, and *Capitol Corridor* Amtrak lines are funded primarily by the State of California, with Amtrak and Caltrans operating as partners, helping to reduce ticket fares. These trains operate in addition to Amtrak's own interstate trains: the *Coast Starlight,* the *California Zephyr*, the *Southwest Chief*, and the *Sunset Limited,* that provide a passenger rail connection for California to the rest of the country.

Amtrak provides accessible Thruway Motorcoach (bus) service on some routes. Portions of the trip may be by bus, depending on the line. Amtrak Motorcoaches also extend Amtrak's services, providing connectivity to other areas not served by passenger rail. When disruptions to train service occur, arrangements may be made to provide alternative accessible accommodations via motorcoach or other means of transportation.

Route 198 links the City of Lemoore, the City of Hanford, and the LNAS to alternative modes of transportation, including the Amtrak station located in the City of Hanford. The Amtrak line known as the "San Joaquins" runs north-south, linking Bakersfield and the Bay Area with stops in the Valley including Corcoran, Hanford, Fresno, Stockton and Sacramento. The San Joaquin trains operate six times daily. At the present time, four daily round trips operate between the Bay Area and Bakersfield, and two round trips operate directly between Sacramento (no bus to Stockton) and Bakersfield. Some portions of the trip may be by Amtrak Motorcoach. Ridership for fiscal year 2003 – 04 was 750,000. The most recent figures indicate that the 2007 numbers have increased to nearly 805,000. The addition of trains to the existing San Joaquin line will be considered as demand warrants.

In November 2006, Proposition 1B, the "Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006" was passed by voters and will provide up to $400 million dollars in new funds to expand passenger services. These funds are to provide all passenger and freight services the ability to operate more efficiently by improving capacities, sidings, and track signals.

There is potential for passenger rail service that would connect the most densely populated urban areas along the Route 198 corridor, including LNAS, and the cities of Lemoore, Hanford and Visalia. However, the cost of upgrading the existing Coalinga Branch line is not feasible at this time according to the Cross Valley Passenger Rail Feasibility Study as there is not enough population to support operating and maintenance cost. If high-speed rail becomes a reality, then passenger service of this east-west corridor could become more viable.

c) High-Speed Rail

The California High Speed Rail Authority (HSRA) has developed a plan to build a high-speed rail line, capable of reaching speeds of 220 miles per hour, that

would service the major metropolitan centers of California. The rail line would eventually run from San Diego to as far north as Sacramento, with several proposed stations in the San Joaquin Valley. It is projected that 32 million inter-city passengers and another 10 million commuters would use the system per year. Traveling through Kings and Tulare Counties, the HSRA is considering two alternative routes. The UP rail line/Route 99 traveling through Tulare and Visalia is one route, and the BNSF rail line traveling through Hanford (Kings County) is the other route. Both routes would tie into the Fresno Station (Fresno County). Potential station sites within the San Joaquin Valley include areas near the Route 43/198 separation and the Route 99/198 separation. It is anticipated that the high-speed route through the fast-growing San Joaquin Valley would produce the highest ridership and revenue. However, its impact on traffic on Route 198 will not be known until some time in the future. A bond measure to fund at least a portion of the High-Speed Rail will be on the November 2008 ballot. Total cost of the high-speed rail is estimated to be $40 billion. The bond measure will authorize $9.95 billion in spending for high-speed rail improvements and other rail services. With passage of the bond, construction could begin as early as 2011.

d) Transit

For the interregional travelers on SR 198, the existing transit service consists of Orange Belt Stages. Orange Belt provides connections to Tulare County and the Central Coast via Paso Robles, with stops in Hanford and Lemoore. Orange Belt coordinates with Amtrak for bus connections at the Hanford Intermodal Station.

At the local level, the largest single provider of public transportation within Kings County is the Kings Area Rural Transit System (KART), under the auspices of the Kings County Area Public Transit Agency. This is a joint powers agency comprised of Kings County and the cities of Hanford, Lemoore, and Avenal. The City of Corcoran does not participate in the KART system. Transit along the Route 198 corridor also involves a combination of demand/response and fixed-route service to the LNAS, and between Hanford and Visalia.

KART provides 14 round trips on the weekdays and eight round trips on Saturdays between Hanford, Lemoore, and LNAS, and 17 round trips on weekdays between Hanford and Lemoore (direct service). In addition, KART provides round trip service from the Hanford Amtrak Station to San Joaquin Valley College, Galen College, Chapman College, and College of the Sequoias in Visalia three times a day, Monday through Friday. The service is spaced early morning, midday, and late afternoon. If this service continues to flourish, and there is demand for Visalia residents to access activity centers in Hanford or Lemoore, Visalia City Coach and Tulare County Area Transit should consider adding new service.

e) Bicycles

Bicycle travel is permitted on conventional state highways within California, as well as many of the state's freeways and expressways. Bicycle travel is currently

permitted on Route 198 between US 101 in Monterey County and the Main Gate at LNAS. It is again permitted between Route 43 and Route 99, and again east of Route 65 in Tulare County (beyond the boundaries of this CSMP). Under Streets and Highway Code Section 888, the Department is not permitted to create an expressway or freeway if it serves an existing bike route unless it creates a safe and convenient alternate route. Likewise, under section 21960 of the Vehicle Code, the Department cannot close an expressway or freeway to bicycles without the concurrence of local authorities, and only after a public meeting.

f) Aviation

Aviation services are limited within the CSMP boundaries. The Hanford Municipal Airport, located at 9-1/2 Avenue and Hanford-Armona Road, is the only general aviation airport within the CSMP project limits. The general aviation services include small recreational and business aircraft. The Visalia Airport, east of the CSMP boundaries, provides limited air passenger service.

D. Corridor Inventory

1. Traffic Volumes and Types

Route 198 within the CSMP limits is a 4-lane expressway/freeway from its western termini at Avenue 25 (PM 3.011) to just east of Route 43 (PM TO 21.5). From Kin-198-T21.5/T28.3 to Tul-198-R0.0/R3.3, Route 198 is 2-lane conventional highway. And from Tul-198-R3.3 to R3.835 (Junction Route 99/198), Route 198 is an existing 4-lane expressway. Bicycle travel, although infrequent, is currently permitted on this route between Route 43 and Route 99.

The high rate of growth in the San Joaquin Valley is quickly using and exceeding the capacity of the Route 198 corridor. In the next 20 years, Goods Movement is expected to increase, creating even greater pressure on this primary east-west route. The existing facility does not have the capacity to accommodate the growth in population or the increase in goods movement. To maintain the corridor's ability to support ongoing development, facilitate efficient goods movement, and improve the quality of life, a substantial investment is needed to maintain and improve the corridor. Creative solutions to deal with this impact will be needed, solutions beyond simply increasing capacity. This CSMP is the first step in this process.

During typical commute times with heavy traffic, bottlenecks often develop at each end of the project limits due to the transition from 4 to 2 lanes. Additional causes of congestion will be identified through input by the local jurisdictions. This will assist in prioritizing projects. Various transportation improvement alternatives, including capacity-enhancing projects, will be analyzed to ensure that the best solution for a given section of the corridor is chosen. In the past, capacity-enhancing projects were the first solution, designed to accommodate the additional traffic and reduce congestion. Implementation of capacity-enhancing projects may be hampered in the urban areas by existing development adjacent to the freeway, where construction will require additional right-of-way.

The corridor is an important farm-to-market route. The economic vitality of this region is dependent on the efficient flow of goods and services to and from this area and a reduction in traffic delays. Truck volumes range from 8% to 16%, while the State average is only 9%. Efficient goods movement also plays a role in efforts to reduce the region's high unemployment rate.

Commuter traffic in Tulare and Kings Counties is very dependent on Route 198. There are an increasing number of commuters who travel this corridor regularly between the Cities of Lemoore, Hanford, Visalia, and LNAS. The mix of commuter traffic with slower moving trucks, recreational vehicles, farm equipment and an occasional bicycle can compromise safety on the existing 2-lane highway portion.

Information on the current AADT, Level of Service, % Trucks, Peak-Hour AADT, 15 and 25 Year AADT forecasts, by segment of the Route 198 Corridor, are provided in Table 1 on Page 6.

2. Geometrics

The corridor includes connections at Routes 41, 43, and 99. Many of the ramps and bridges do not meet current freeway standards.

Currently, the right-of-way (ROW) width of the 4-lane freeway/expressway from LNAS to 0.5 mile west of the Route 43/198 separation is between 142 and 166 feet. From the separation to 0.3 mile east of Road 68, the ROW width of this 2-lane conventional highway portion is between 80 and 142 feet. The ROW width of the 4-lane expressway portion to Route 99 is between 140 and 300 feet. The Route 198 4-Lane Expressway Project on the existing 2-lane facility increases the corridor width to 211 feet for most of its limits. Treated shoulders vary from 0 to 13 feet. The lane width is 12 feet with no passing lanes.

The ultimate corridor concept for this segment of Route 198 is a continuous 4-lane freeway. The amount of urban development adjacent to the freeway in the cities of Lemoore and Hanford, and the community of Armona, poses an obstacle to future widening. Developed land increases both the cost of ROW acquisition and the impact on those businesses and residences that must be relocated. Table 1, Page 6, identifies the Ultimate Transportation Corridor (UTC) Concept. Identification of the UTC and subsequent preservation of the ROW will ensure adequate ROW will be preserved to accommodate facility improvement projects beyond 2030. This will also ensure that facility improvement projects can be implemented with a minimum cost to taxpayers and minimal impact to the community.

Extensive development has occurred that will impact expansion of the freeway due to the heightened cost of ROW acquisition. Caltrans and local agencies should work together to establish plan lines and interchange “footprints,” and to have these plan lines adopted into the local agencies’ General Plan circulation element so that local agencies can use their land-use authority to preserve the necessary ROW for the corridor. This will also accelerate the necessary environmental clearances, and reduces the costs associated with ROW acquisition when freeway expansion occurs.

3. Characteristics

a) Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) consists of the electronics, communications, or information technology processing that communicates information to the traveler, improving safety and efficiency. ITS elements include detection, traffic control, incident management, advanced traveler information systems, and transportation management centers. ITS can take the form of traffic signals, closed-circuit televisions, changeable message signs, ramp meters, weigh-in-motion devices, roadway service patrols, weather stations, and highway advisory radio stations. Also included is the centralization of controls for many of these components at traffic or transit management centers. Traveler information broadcast systems, traffic signal priority for emergency or transit vehicles, ITS data archive management, and vehicle safety warning systems are all a part of ITS. These elements are further explained in detail in Appendix B, Page 41.

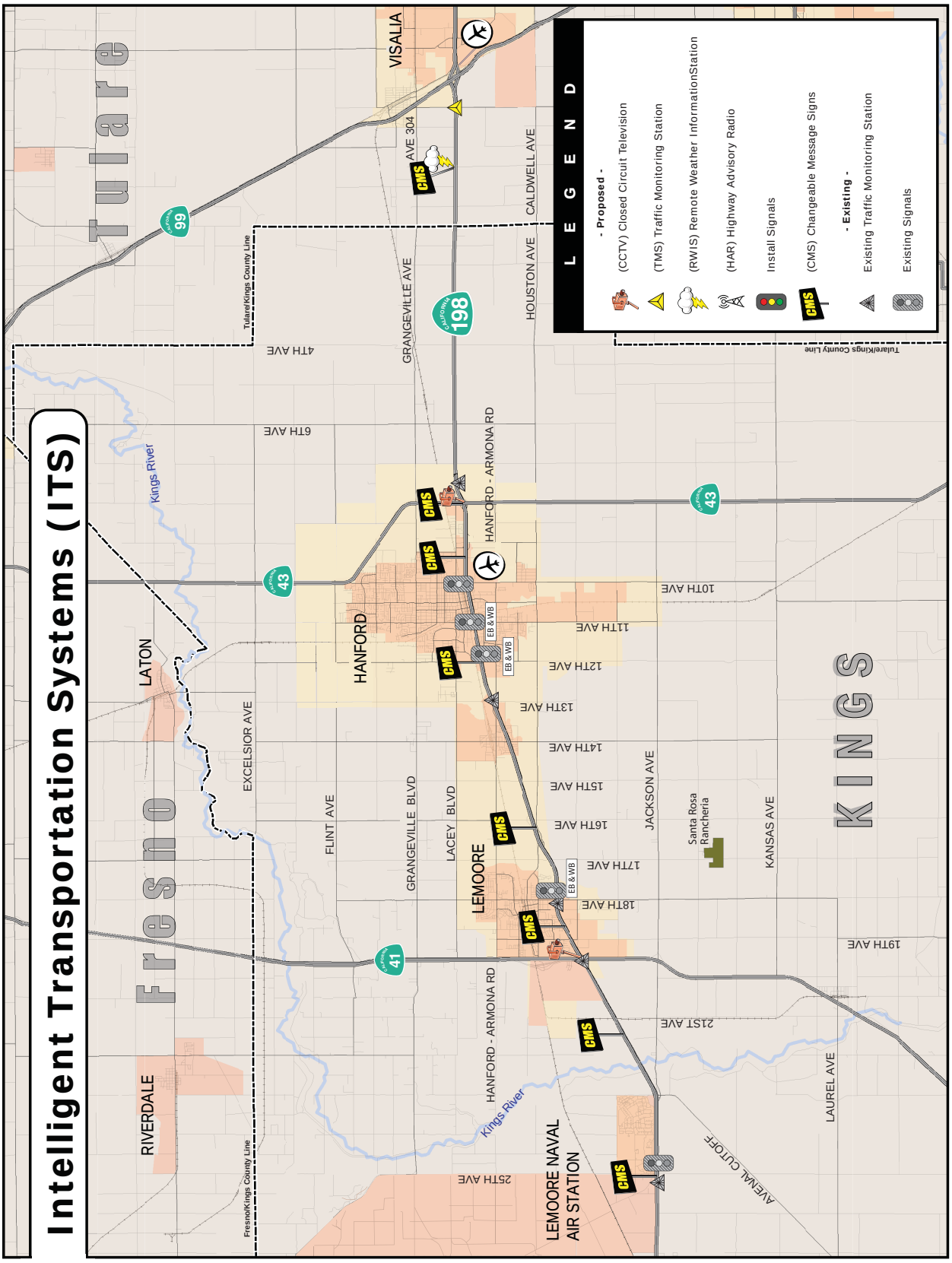
Deployment of ITS technology will enhance traveler information services, as well as the operational and safety efficiency of the Route by informing motorists of traffic congestion, inclement weather such as fog, dust, highway construction and/or closings. System monitoring and evaluation are the foundations for sound management of the corridor. Monitoring and evaluation will help to identify the optimum strategies to improve the transportation corridor. Strategies range from maintenance and preservation to system expansion, but will focus on optimization of the existing system by fully incorporating operational strategies into the management plan. Implementation of ITS strategies will complement other improvements, including those improvements that may be implemented by our partner agencies such as transit, light rail, and improvements on the local road system. The goal is that the transportation system, as a whole, including highways, local roads, and alternative modes of transportation, operate as one seamless network.

There are several existing ITS elements within the boundaries of the CSMP. More specifically, traffic monitoring stations are located at:

- LNAS Main Gate
- Junction Route 41/Route 198
- Westbound onramp from 18th Avenue
- Hanford-Armona Road UC
- Eastbound onramp from southbound Route 43

There are a number of planned ITS projects within the CSMP area, including closed circuit television systems, traffic monitoring stations, changeable message signs, and highway advisory radios. These are displayed on Map #3, Page 14, and in Table 4 (Page 26), Table 5 (Page 29), and Table 6 (Page 30). Caltrans District 6 is committed to the implementation of ITS strategies. The Route 198 Expressway project, contained within this CSMP area and funded by Proposition

MAP #3


Intelligent Transportation Systems (ITS)
LEGEND
- Proposed -
(CCTV) Closed Circuit Television
(TMS) Traffic Monitoring Station
(RWIS) Remote Weather InformationStation
(HAR) Highway Advisory Radio
Install Signals
(CMS) Changeable Message Signs
- Existing -
Existing Traffic Monitoring Station
Existing Signals
Tulare
Fresno
KINGS
VISALIA
HANFORD
LEMOORE
LEMOORE NAVAL AIR STATION
LATON
RIVERDALE
Kings River
HANFORD - ARMONA RD
GRANGEVILLE BLVD
LACEY BLVD
FLINT AVE
EXCELSIOR AVE
JACKSON AVE
KANSAS AVE
LAUREL AVE
CALDWELL AVE
HOUSTON AVE
AVE 304
AVENAL CUTOFF
Santa Rosa Rancheria
Tulare/Kings County Line
Fresno/Kings County Line
99
198
43
41
CMS
EB & WB

1B, includes a number of ITS components. The project will install two Changeable Message Signs (CMS), one at Route 198/7th Avenue, and another at Route 198/Road 56. In addition, a traffic monitoring station will be installed at Route 198/7th Avenue and a roadside weather information system will be installed at Route 198/Road 56.

4. Parallel Roadways

The State highway functions primarily to move interregional traffic between regions. For example, Route 198 moves traffic through Tulare County, Kings County and Fresno County, between Route 99 and Interstate 5. State highways also provide access to population centers for employment and distribution of goods to local markets. The local and regional road system (including arterial and collector roads) functions to move people and goods between neighboring communities or within a community. To insure a seamless transportation system, it is important to assess the entire transportation system with regard to how traffic moves and transitions from origin to destination.

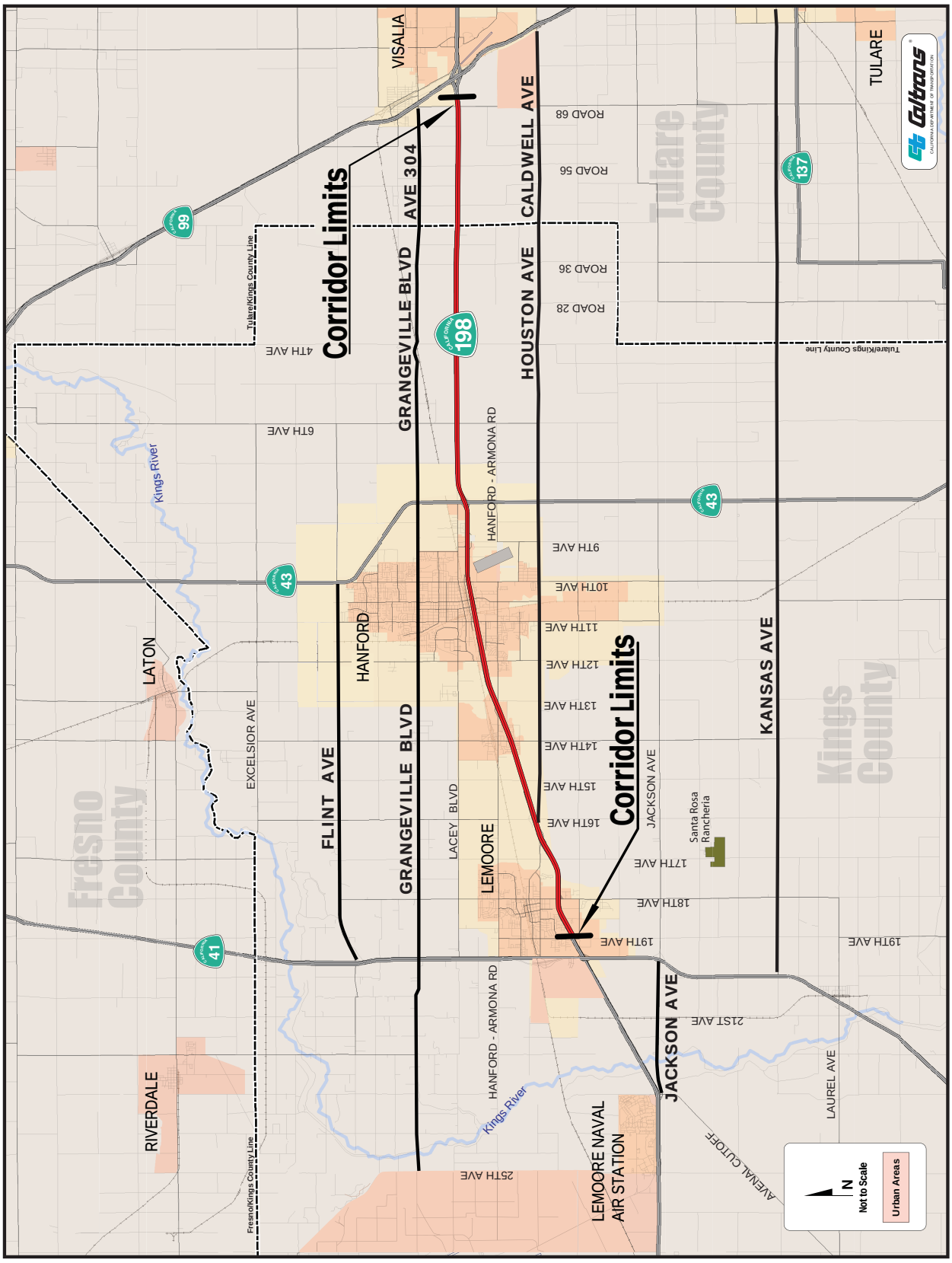
The local parallel road to a State highway is an essential component of the transportation network. With growth in population and traffic, it is inherent that traffic will increase. The increase in traffic along with occasional traffic incidents would slow traffic on the existing State highway. This, in turn, causes the need for alternative routes to move people and goods through the communities and the region.

The local and regional agencies helped Caltrans identify suitable major local parallel roads. Major local parallel roads should be readily accessible to travelers (including bicyclists) using the State Highway and provide alternative routes during times of congestion and other traffic incidents. The CSMP does not impose new requirements for the cities and counties to collect data or make road improvements. The local jurisdictions or the regional planning agencies are already collecting traffic information on the local roads when developing the Regional Transportation Plans, the regional transportation improvement programs, and the circulation elements of local general plans.

a) Recommendations

In two working group meetings with local and regional transportation planning agency partners (one for Kings County and the other for Tulare County), there was consensus that Houston Avenue/Caldwell Avenue and Grangeville Boulevard/Avenue 304 should be considered as local parallel roadways to relieve traffic on Route 198 (refer to Map #4, Page 16). Houston Avenue/Caldwell Avenue was chosen as the preferred parallel route. Caldwell Avenue extends to east of Route 99 and provides better connectivity between the population centers in the cities of Lemoore, Hanford, Visalia, and Tulare. Houston Avenue/Caldwell Avenue runs east-west uninterrupted between the Route 198/16th Avenue Interchange and Route 99, a distance of approximately 21 miles. It passes through

MAP #4


VISALIA
TULARE
Corridor Limits
AVE 304
GRANGEVILLE BLVD
CALDWELL AVE
HOUSTON AVE
ROAD 68
ROAD 56
ROAD 36
ROAD 28
Tulare/Kings County Line
Tulare County
99
198
137
47TH AVE
61H AVE
Kings River
HANFORD - ARMONA RD
43
9TH AVE
10TH AVE
11TH AVE
12TH AVE
13TH AVE
14TH AVE
15TH AVE
16TH AVE
17TH AVE
18TH AVE
19TH AVE
HANFORD
LATON
EXCELSIOR AVE
FLINT AVE
GRANGEVILLE BLVD
LACEY BLVD
LEMOORE
JACKSON AVE
KANSAS AVE
Santa Rosa Rancheria
Fresno County
Kings County
41
RIVERDALE
Fresno/Kings County Line
25TH AVE
21ST AVE
LEMOORE NAVAL AIR STATION
AVENAL CUTOFF
LAUREL AVE
N
Not to Scale
Urban Areas

the industrial area in the southern part of the City of Hanford and through Route 43. Currently, Houston Avenue/Caldwell Avenue would function more appropriately as the major east-west parallel road to Route 198.

b) Future Considerations

Grangeville Boulevard/Avenue 304 extends from LNAS to Route 99, a distance of approximately 27 miles. It passes through Route 41, the City of Hanford's residential and commercial development and high school in the northern part of the City, and Route 43. Because Grangeville Boulevard passes through developed urban areas, there may be mobility issues with local traffic. Grangeville is also a bike route. Nonetheless, Grangeville Boulevard/Avenue 304 is an east-west parallel road to Route 198, and its viability would be enhanced with improvements to the Route 99/Betty Drive Interchange. This would provide access east of Route 99, and would make the road comparable to Houston Avenue/Caldwell Avenue. Because it extends further west through the City of Lemoore and into LNAS, it would provide access to additional population centers.

Flint Avenue between Route 41 and Route 43 is another east-west parallel road for future consideration. It runs approximately 9.5 miles in length, and is located 2 miles north of Grangeville Boulevard. Flint Avenue currently avoids urban development in the cities of Lemoore and Hanford. In addition, Flint Avenue would serve traffic to and from population centers to the north in Fresno County, including the cities of Fresno and Selma. With its connectivity to two state highways running parallel to Route 198, and part of the regional road system, Flint Avenue may be considered as a potential parallel route to Route 198 in the future.

Jackson Avenue between LNAS and Route 43 is approximately 15 miles in length. It provides a potential southern parallel road to Route 198 serving the population of the LNAS, the City of Lemoore, the Santa Rosa Rancheria, and the City of Hanford. From Route 43, vehicles can travel northerly to Houston Avenue and then easterly to Route 99 in Tulare County. However, Jackson Avenue has two bridges on the Kings River which would not carry all permitted loads and are substandard in the width.

Kansas Avenue/Tulare Avenue was also discussed as a potential parallel road for Route 198 because of its direct connection between Route 99 in the City of Tulare. It provides a choice route for Corcoran and Avenal Prison employees coming from Tulare. In addition, it does not encroach upon urban development. However, it is quite a distance from Route 198 (approximately 8 miles), and is therefore less desirable as a parallel road.

The roads identified above would serve as parallel roadways primarily in cases of occasional congestion and for incident management. Shoulder width would be of concern in using a local road as a parallel route to the freeway on a regular basis. The width of local arterial roads should be adequate to accommodate a four-lane road with a median for dual left-turn lanes, shoulders, and bicycle lanes/routes. In addition, there may be inadequate right-of-way for the local arterial roads as they

transition to the State highway facility. It should also be noted that both Grangeville and Avenue 304 may have inadequate shoulder widths.

III. COMPREHENSIVE CORRIDOR PERFORMANCE ASSESSMENT

A. Choosing Performance Measures

Appropriate performance measures and analysis tools must be selected for the Corridor, based in large part on the quantity and quality of data available. The following performance measures have been chosen for this Corridor, as the technology for implementing them is available. These are the same measures included within the "Freeway Performance Initiative Traffic Analysis" report prepared for Metropolitan Transportation Commission (MTC), ensuring consistency across all corridors and consistency also across different transportation modes. The measures will provide a means for prioritizing the planned improvements within the Corridor, helping to select the most appropriate improvement projects and operational strategies based on performance and cost-effectiveness. These strategies may take the form of capacity-enhancing construction projects, maintenance and operations projects, or ITS elements, whatever is needed to optimize the transportation corridor. The measures will also serve the function of demonstrating that the mobility gains of corridor capacity improvements have been maintained after those improvements are in place.

B. Existing Conditions

Current AADT, Level of Service, % Trucks, Peak-Hour AADT, 10 and 20-year AADT forecasts, by segment of the Route 198 Corridor, are presented in Table 1, Page 6.

The information necessary to understand existing traffic conditions in the study area, and identify specific causes of problems, has been collected. This information includes traffic counts, Tach runs, pavement condition, and accident data. These are discussed in more detail in the section on Operations Assessment.

C. Develop Mitigation Strategies and Projects

Viable measures, ranging from system management strategies to maximize the efficient use of existing corridor capacity, to more traditional capital improvement projects that will increase corridor capacity, will be evaluated and prioritized. The highest priority projects for this corridor address areas of safety, connectivity, mobility, goods movement, and congestion relief. Prioritization will include separating the strategies into short-term and long-term implementation timeframes. The highest priority projects for this corridor address areas of safety, connectivity, mobility, goods movement, and operational improvements. For identified mitigation strategies, performance measures will be identified, and planning-level cost estimates will be prepared.

The proposed performance measures will provide a sound technical basis for describing traffic performance on each corridor. In this CSMP, the focus has been placed on a few key measures because of the limited resources available to collect detailed data.

1. Safety – Assessment and Performance Measure (Accident Rates)

For the safety performance measure, the number of accidents and accident rates from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) will be used. TASAS specifically contains data for accidents on state highways. Three years of safety data will be analyzed and input into Caltrans' Benefit/Cost ratio calculation to provide a measure of Accident Cost Savings in dollars. Caltrans will also use the expected accident rate for the current facility, as compared to the expected rate for the proposed facility. This data will be used to evaluate the degree to which the strategies within the CSMP improve safety within the corridor.

Reduced speeds and bottlenecks are indications that the current capacity of Route 198 is no longer adequate. The number and width of lanes; the location, spacing, and type of interchanges; the presence and width of shoulders; the condition of the pavement; and inclement weather can all impact capacity and can create conditions that reduce traffic flow.

Traffic flow can be hampered by an inadequate number of lanes on the mainline. Increasing capacity could be achieved by widening the route to add lanes; however, the ability to widen the route is hampered by the available right-of-way and adjacent development. Development adjacent to the Route increased both the costs of the widening and the impact to the community.

Inadequate spacing between interchanges can also impact capacity. Insufficient distances for vehicles to safely and efficiently merge on and off the highway may lead to congestion and a subsequent increase in accidents. Where substandard spacing exists, interchange spacing should be increased, auxiliary lanes added, or other operational solutions constructed to decrease the merging conflicts and improve

TABLE 2
ACCIDENT RATES

	Actual			Average - Statewide		
KIN 198 –	**Total**	**F & I**	**Fatal**	**Total**	**F & I**	**Fatal**
PM 3.011-RO8.897	0.61	0.28	0.00	0.49	0.22	0.02
PM RO8.897-RO11.176	0.93	0.33	0.00	1.01	0.42	0.02
PM RO11.176-R16.400	0.58	0.27	0.00	0.57	0.25	0.02
PM R16.400-RO20.980	0.71	0.24	0.02	0.82	0.32	0.01
PM RO20.980-22.315	0.41	0.32	0.04	0.82	0.41	0.02
PM 22.315-28.324	0.74	0.26	0.07	0.92	0.45	0.03
TUL 198 –						
PM 0.000-3.010	0.71	0.28	0.02	0.92	0.45	0.03
PM 3.010-RO3.256	1.89	0.76	0.00	0.92	0.45	0.35
PM RO3.257L-RO3.835L	1.00	0.14	0.00	0.52	0.24	0.02
PM RO3.457R-RO3.835R	0.48	0.16	0.00	0.51	0.24	0.02
CSMP Corridor Limits	0.67	0.27	0.02	0.75	0.34	0.02

operations. In the non-freeway portions of the corridor where there are a number of access points for local traffic, consideration should be given to discouraging the number of driveways accessing the corridor. Caltrans should work with the local partners to manage land use to encourage the development of an improved interconnected local road system and frontage roads.

This segment of Route 198 experiences severe fog conditions in the winter months. Fog is a frequent cause of accidents and delay during the winter months, occasionally requiring the use of CHP pace cars. Interregional traffic as well as local traffic is delayed, impeding the efficient movement of people and goods.

The Traffic Accident Surveillance and Analysis System (TASAS) provides the accident history on Route 198 within the CSMP project limits for the three-year period from October 1, 2003 to September 30, 2006. The accident rates are based on collisions per million vehicle-miles. The accident rate for the CSMP project limits mirrors the State Average. During this three-year reporting period, there were 13 fatalities within the corridor limits. Please see Table 2, Page 20.

2. Incident Management

Incident management is a significant component of ITS. Most studies in the United States suggest that incidents are responsible for about half the delays on our freeway system. Motorists are accustomed to normal delays. However, traffic incidents disrupt the motorist's normal routine, creating unplanned delays. This can create a negative impact to the traveling public. Unanticipated delays may also create frustration, aggressive driving, and the potential for "Road Rage." Such aggressive behavior poses a danger not only to other motorists but also to emergency response personnel. The goal of effective Traffic Incident Management (TIM) is to reduce the time it takes to clear traffic incidents from the roadway. The less time it takes to clear an incident, the less congestion and delay the motorist experiences. Safety for both the emergency response personnel and the traveling public is improved. Even small improvements in this process can yield significant benefits.

Effective TIM relies on advanced technologies to allow for expedited incident detection, verification, coordination among necessary emergency response agencies, and the subsequent clearance of the incident as rapidly as possible.

3. Operations – Assessment and Performance Measure (Level of Service)

a) Level of Service (LOS)

Table 1 on Page 6 provides information on current AADT, Level of Service, % Trucks, Peak-Hour AADT, 15 and 25-year AADT forecasts.

LOS describes operating conditions on a roadway. LOS is defined in categories ranging from A to F, with A representing the best traffic flow and F representing the worst. As a general rule, LOS C or D is the targets as they provide the highest traffic throughput with the least traveler disruption. Table 1, Page 6, shows the current LOS and current Average Annual Daily Traffic (AADT). Without any

project improvements, the LOS would deteriorate to LOS E or F by the year 2030. The current level of service (LOS) for the corridor is B and C from LNAS to 7th Avenue, just east of Hanford. The LOS then drops to D from 7th Avenue to Route 99 (See Table 1, Page 6). Current operating condition is adequate within the 4-lane freeway/expressway segment of the project limits. Constructing grade separations at major highway access locations would enhance operational and safety movement.

The percent volume of truck traffic is up to 16% within the CSMP corridor limits, and current operating condition within the 2-lane segment is poor and expected to deteriorate in the future. Safety and operational improvements are needed along this 2-lane segment. This 2-lane conventional highway segment will be upgraded to 4 lanes with the Route 198 Expressway Project. Other considerations would include constructing left-turn lanes at various intersections (2nd Ave., Ave 48, Ave 52, Ave 56) and closing any existing openings in the median barrier within the freeway segment in the City of Hanford in order to meet the median-gap criteria. This is a SHOPP project, fully funded and expected to be completed by the fall of 2009. A designation of Expressway would be the most logical improvement in terms of both safety and operations. Where applicable, guardrails and bridge rails may need to be upgraded.

b) Operational Analysis

The information necessary to understand existing traffic conditions in the study area, and identify specific causes of problems, has been collected. This information included traffic counts, Tach runs, and accident data. The data was analyzed to determine the cause of existing recurrent traffic congestion and the locations of bottlenecks (if any). Existing conditions for a portion of the corridor will be modeled using regional traffic models. Operations may be measured in two ways: travel time and delay.

i. Travel Time

Travel time is a measurement of the time it takes for a vehicle to traverse between two points on a corridor. This may be defined as the time to travel the entire study corridor length, or a measurement of the time between intermediate starting and ending points. The free flow and maximum travel times should be collected.

Travel time can be obtained using Tach runs, PeMS, or 511. There are benefits and disadvantages to any of the approaches. While the PeMS system can automatically compute travel times using speed data from freeway detectors, many places, including most of this section of the Route 198 corridor, Caltrans has very limited detection units within this segment of Route 198. Because of this, Caltrans has primarily relied on Tach runs. Tach runs provide the most direct measurement of speeds and travel times; however, they are resource-intensive. The number of samples for a given corridor will therefore be lower with Tach runs than with the other two automated systems. Also, Tach runs occur on a schedule of every 10 to 30

minutes, while PeMS continuously collects data at 30-second intervals. With any of the measurement systems, consideration must be given for the exclusion of data collected when unusual conditions occurred (e.g., accidents, weather, special events).

ii. Delay

Delay can be defined as the difference in travel time between actual congested conditions and the free-flow speed at the freeway speed limit and is reported as vehicle-hours of delay. Caltrans defines the congested speed threshold as 35 mph. This is the speed range at which traffic flow becomes stop and go. Speeds above 35 mph are not considered delay.

There are two types of delay: recurrent and nonrecurrent. Caltrans provides the following definitions:

- Recurrent delay occurs when travel demand exceeds freeway design capacity, and speeds are 35 mph or less during peak-commute periods on a typical incident-free weekday. The delay condition must last for 15 minutes or longer.
- Nonrecurrent delay is caused by irregular events, such as accidents, events, maintenance, or short-term construction.

The recommended process for determining existing delay is to calculate this performance measure from actual data sources. In the case of this section of Route 198, travel time data has been obtained from Tach runs, recently conducted during the AM and PM peak periods. The Tach runs measured the actual traffic speeds and it was determined that Route 198 is not currently experiencing delay.

Caltrans' standard Benefit/Cost Ratio (B/C Ratio) will also be used to provide a measure of Person Hours of Delay Saved in dollars. The B/C Ratio analyses will be used to calculate delay during peak period, and will be used to evaluate the degree to which the strategies within the CSMP improve delay within the corridor.

Caltrans anticipates that, with the planned development in the area and the emphasis on Route 198 as a major east-west corridor for goods movement and farm-to-market travel, delay will become an issue in the future if steps are not taken to increase capacity and/or increase efficiency.

4. Maintenance - Assessment and Performance Measure (Preservation)

a) Pavement Condition

The pavement condition for Route 198 in Kings County and Tulare County is acceptable throughout most of the paved area (see Table 3, Page 23). The segments with the highest percentage of distressed areas were from LNAS

TABLE 3
PAVEMENT CONDITION

Kings 198 - Postmile	**Priority Distressed Areas[1]**
PM 3.01 - RO8.90	10.67%
PM RO8.90 - RO11.18	13.97%
PM RO11.18 - RO16.780	20.54%
PM RO16.78 - T22.01	2.87%
PM T22.01 - 28.32	0.00%
Tulare 198 - Postmile	
PM 0.00 - 3.03	0.00%
PM RO3.03 - RO3.83	11.20%
Cumulative	***9.29%***

Note[1]: Percent of roadway with major structural distress, minor structural distress, or poor ride quality.

to just west of the City of Hanford, and west of Road 68 to Route 99 in Tulare County. The areas with major structural distress included a high level of alligator cracking or third stage cracking and faulting. Minor structural distress areas included low and moderate alligator cracking, slab cracking, patched areas and faulting. Poor ride quality areas included slab cracking.

The State Highway Operations and Protection Program (SHOPP) includes projects which address distressed pavement. The removal and replacement of pavement on the eastbound number 2 lane from 21st Avenue to 19th Avenue (PM 7.2/9.4) helped alleviate some of the distressed pavement in this segment. The pavement condition between 11th Avenue and the Tulare County Line (PM 17.9/28.3) is very good, and has been enhanced with the micro-surfacing of this segment of highway. The Lemoore/Hanford Overlay Project from 19th Avenue to 11th Avenue (PM 9.2/17.9) will address the distressed pavement on this segment of highway. It is currently scheduled for construction in May 2009.

The overall State of California goal is to maintain the existing level of pavement distress, per the 2007 Pavement Asset Management document, which is 12,998 lane miles or 26% of the system.

b) Corridor Maintenance and Preservation

The current rehabilitation strategy is to maintain and rehabilitate the existing facility with plans to improve various interchanges and widen the roadway where

feasible. Projects from the SHOPP are prioritized by the needs of the State Highway. These projects maintain or improve the condition, safety, and operation of the highway, and protect the investment that has been made on the facility. The SHOPP program includes six types of projects that would affect Route 198: 1) Collision Reduction, 2) Roadway Preservation, 3) Bridge Preservation, 4) Roadside Preservation, 5) Mobility Improvements, and 6) Mandates (storm water requirements and emergency type projects).

Nominated projects for each category compete for available dollars with other projects on a statewide basis. Safety improvements that meet certain thresholds of cost-benefit criteria are funded off the top of the SHOPP before other needs are addressed. They do not need to compete for funding on a statewide basis.

Maintenance costs including roadsides, pavement, bridges, guardrail, median barrier, signs, and delineation, have increased an average of 4 percent per year over the last five years. Maintaining adequate appearance and condition ratings is becoming increasingly difficult. The 10-year SHOPP includes investments for projects in both the rehabilitation and preventive maintenance categories. This investment is expected to provide highway appearance and condition ratings similar to current conditions, which are less than Caltrans performance targets and desires of the communities served by Route 198. Please refer to Table 4 Page 26 for a list of all planned projects within this CSMP project limits for the next ten years. A twenty-year plan is presented in Table 5, Page 29, and a beyond twenty-year plan in Table 6 on Page 30.

The District is developing strategies to work with the local jurisdictions and the regional transportation planning agencies on developing valuable information, for planning purposes, regarding conceptual alignments of corridors and footprints of interchanges that will require expansion in the foreseeable future. It is our hope that preserving and protecting the needed right-of-way for future expansion of State facilities will greatly benefit the State, local communities and the public with regard to a logical and orderly process for subsequent project delivery in terms of reducing time and cost savings. Identification of the right-of-way needed to accommodate the ultimate corridor will allow the needed land to be preserved, reducing the time and costs associated with improvement projects. Caltrans District 6 is working on plan lines that will identify the needed property to acquire dedications of right-of-way provided by local development projects via the Local Development-Intergovernmental Review program.

c) Management and Agreements

Caltrans District 6 has entered a Memorandum of Understanding (MOU) with KCAG and TCAG for the development and implementation of this CSMP. The purpose of the MOU is to document the commitment of all parties to manage the corridor through applying principles and practices of system and corridor management and performance measurement for sustained corridor performance. The transportation partners will meet on a regular basis for the following activities and decisions:

- Agreement to a work plan, time line, roles and responsibilities for development of the CSMP, including resources.
- Review draft products, including initial performance assessments and technical documents.
- Coordinate corridor planning and evaluation efforts and share information on related topics to corridor performance measurement and improvement.
- Identify opportunities for heightened understanding by local jurisdictions and the public on the mobility benefits of system and corridor management.

d) Other Performance Measures

Other Performance Measures, such as Productivity (example: lost lane miles) and Reliability (example: Buffer Index) were not applied to the Route 198 Corridor because of its predominately rural nature and lack of traffic congestion and bottlenecks. On a periodic basis, Caltrans District 6 Traffic Operations and Planning will measure the traffic conditions along Route 198 and re-evaluate the necessary application of these and other performance measures.

IV. FUTURE CORRIDOR PERFORMANCE AND IMPROVEMENT

A. 10 and 20 Year Corridor Performance

Table 1 on Page 6 provides information on current AADT, Level of Service, % Trucks, Peak-Hour AADT, 15 and 25-year AADT forecasts. Without any project improvements, the LOS would deteriorate to LOS E or F by the year 2030.

Based on the planned improvements to this corridor (4-lane expressway or 4-lane freeway), the level of service will vary from "B" to "D" in 2020. However, the segments between the cities of Lemoore and the Route 43/198 separation in the City of Hanford will be at LOS "F" in 2030.

The Route 198 Expressway project would meet the Concept level of service at the C/D cusp for the affected segments, with LOS B/C in 2020 and LOS C/D in 2030.

B. Ten-Year Improvement Plan

Clearly identifying long-term goals for the Corridor and developing a corresponding list of prioritized projects to achieve those goals will make the funding decisions much easier and will ensure that improvements proceed in a logical and efficient manner. This approach will also reduce overall costs and time in the project development process. The CSMP will help Caltrans, regional and local partners identify and prioritize major projects that will improve safety, reduce congestion, and facilitate efficient goods movement along the Route 198 corridor.

Recognizing the importance of the Route 198 corridor for the movement of people and goods, high priority must be placed on both completion of planned capacity-enhancing improvements, completion of planned SHOPP projects, and instituting innovative ITS

solutions. Table 4, Page 26, lists the planned projects in this section of the corridor for the next ten years.

TABLE 4
TEN-YEAR IMPROVEMENT PLAN

Kin/Tul Postmile	Project Description	Location	Target Date	Funding Source	2008 Total Cost
Kin PM 3.0/R10.5	Construct Concrete Median Barrier	LNAS to 18th Avenue	2013/2014	SHOPP	$6 million
Kin PM 8.68 & 20.92	Closed Circuit TV and Traffic Monitoring Station	Eastbound 198 off-ramp to SR 41 & southbound SR 43 ramp	2010/2011	SHOPP	$4.7 million
Kin PM 9.2/17.9	Rubberized Asphalt Overlay	W of 19th Avenue to 11th Avenue	2008/2009	SHOPP	$1.7 million
Kin PM 9.2/17.9	Pavement Rehab	W of 19th Avenue to 11th Avenue	2014/2015	SHOPP	$9 million
Kin PM 9.47	Construct Interchange	19th Avenue	2012/2013	RIP	$36.2 million
Kin PM R14.77/ R17.91	Rehab 3 bridge decks	14th Avenue – 11th Avenue	2011/2012	SHOPP	$6.4 million
Kin PM 16.9	Improve Interchange	12th Avenue	2013/2014	RIP & Local	$24 million
Kin PM 18.5	Install Concrete Median Barrier	Douty OC to 10th Ave OC	September 2009	SHOPP	$827,000
Kin PM 21.5/28.3-Tul PM 0.00/3.3	4-Lane Expressway	0.6 mi east of SR 43 to Road 68	August 2009	STIP, SAFETEA-LU Demo, CMIA, TCRP	$124.5 million
Kin/Tul: Various*	Install CCTV & TMS	*Multi-county; same dollar amount in each co.	2009/2010	SHOPP	$4.7 million

1. Planned Capacity-Enhancing Projects

a) Route 198 Expressway Project

The "Route 198 Expressway" Project is funded primarily by the Corridor Mobility Improvement Account (CMIA) Bond Program, in the amount of $71.6 million. It is supplemented with STIP Regional (RIP), Interregional (IIP), IIP Augmentation, Transportation Congestion Relief Program (TCRP), and SAFETEA-LU

Demonstration funds for a total of $124.5 million. The Project is located on Route 198 extending from 0.6 mile east of Route 43 east of the City of Hanford to Road 68 in Tulare County, approximately 0.5 mile west of Route 99. This capacity-increasing project will improve operations and enhance safety on Route 198 by widening this 2-lane conventional highway to a 4-lane expressway. The Project will move the existing alignment slightly to the north and provide 2 additional lanes to the north of the newly realigned lanes. The realignment of the existing lanes will allow for the preservation of approximately 50 mature walnut and eucalyptus trees along the south side of the highway. The project will also provide a utility easement outside of the state right-of-way, thus providing safer access for utility maintenance vehicles and reducing potential conflicts with the traveling public. An overcrossing will be constructed at Road 68, a heavily traveled county road to reduce the conflict of cross traffic at the intersection. Access from Road 68 to Route 198 will be maintained with the addition of new frontage roads.

This project will improve mobility and connectivity in Kings and Tulare counties. The current LOS D is expected to decline to LOS E within 15 years if no improvements are made. This project will improve the LOS to "B" for the 20-year design of the project. The increased capacity and access control included in this project should help reduce delays currently being experienced along this segment of the corridor. It is anticipated this project will save an estimated 456,000 vehicle-hours of delay annually.

Safety will improve significantly along this portion of the Route 198 corridor with the completion of this project. With the addition of the wide median to separate opposing directions of travel, the potential for head-on collisions will be reduced significantly. The wide medians will also provide refuge for slow-moving farm equipment and large trucks crossing the highway. With controlled access along this route, vehicles will only be able to enter the highway at controlled intersections. This will especially be beneficial during the winter months with the onset of the severe fog conditions. Providing a utility corridor outside of the state right-of-way will remove potential conflicts between utility maintenance vehicles and the traveling public. This project will provide clear recovery zones in excess of 30 feet, which currently do not exist because mature trees line on both sides of the highway. It is anticipated that this project will reduce the accident rate.

b) Interchange Projects

There are two interchange projects in the 10-Year Improvements Plan: the 19th Avenue Interchange Project and the 12th Avenue Interchange Project. Please see Table 4, Page 26.

i. 19th Avenue Interchange Project

The 19th Avenue Interchange Project would close a one-mile gap between freeway sections on Route 198 by closing two at-grade intersections and providing a new interchange at 19th Avenue for local access, improved circulation, safety, and improved economic development. The project will also improve safety within the project limits where accident rates are above

the expected levels for this road segment. By eliminating the at-grade intersections, this project will improve mobility and connectivity in Kings County. The project is needed because accident rates for this segment are above the state average, mainly from vehicles turning at 19th Avenue and 18-½ Avenue failing to yield to through traffic on Route 198. The installation and subsequent modification of six-inch high concrete traffic diverters reduced broadside accidents on 18 ½ Avenue/Vine Street, but did not reduce the accident rate on 19th Avenue to a level below the state average for a road of similar design. The project would provide approximately 12 miles of continuous freeway along Route 198 in the Lemoore-Hanford urbanized area.

ii. 12th Avenue Interchange Project

The 12th Avenue Interchange Project would upgrade an existing interchange within the City of Hanford to alleviate future congestion and improve safety and traffic operations of the facility. The existing interchange is a diamond configuration challenged by the cumulative impacts of residential and commercial growth currently in progress or planned. 12th Avenue is a major north/south collector street that serves the rapidly developing community of Hanford. Based on traffic analysis, the traffic operations at the interchange are expected to deteriorate to LOS F by 2034. The accident history for the 12th Avenue Interchange shows an accident rate higher than the statewide average. Safety will be improved at the off-ramps by providing additional storage and traffic movements to help clear the deceleration area on the ramps and move traffic onto 12th Avenue out of the freeway mainline.

2. SHOPP

The State Highway Operations Protection Program (SHOPP) projects are improvement needs that are completed as warranted throughout Route 198. Improvements planned for the corridor in the 10-Year SHOPP Plan include: installing a concrete median barrier (Douty Street OC to 10th Avenue OC), rubberized asphalt overlay (11th Avenue to 19th Avenue), rehabilitating three bridge decks at Hanford Armona Road, and installing median barrier (10th Avenue to 0.7 mile east of Route 43/198 separation (see Table 4, Page 26). The SHOPP projects are funded on a priority basis, with safety projects taking precedence over operational improvements. In addition, there are several different categories of SHOPP projects. Historically, about one-third of the planned improvements in the SHOPP Plan are completed within the 10-year timeframe. SHOPP funding limits may reduce the percentage of projects completed within the 10-year time-frame; projects are implemented as funding becomes available. The SHOPP projects not completed within the 10-year horizon will likely be constructed within the 20-year planning horizon of the CSMP.

3. ITS

The application of Intelligent Transportation Systems (ITS) is Caltrans commitment to operational strategies to improve performance. The existing ITS elements within the corridor include traffic monitoring stations (TMS) at five locations: LNAS Main gate, junction 41/198, Westbound on 18th Avenue, Hanford-Armona Road

UC, and Eastbound on from Southbound SR 43. The table below contains the list of planned improvements within the CSMP boundaries. They include installation of changeable message signs (CMS), traffic monitoring stations (TMS), closed circuit television (CCTV) system, and highway advisory radio (HAR) at various locations. These improvements are intended to improve performance along the corridor. Please see Map #3, Page 15, for the location of planned ITS elements. Table 4, Page 26, presents those elements that are in the ten-year improvement plan, with Table 5, Page 29 and Table 6, Page 30 presenting those elements in the twenty-year and beyond twenty-year, respectively.

CMS systems will be installed at or near the existing TMS locations. Basic corridor operations information can be provided through ITS elements. This includes incident management for collisions, closures for natural causes, use of remote weather sensors, and CMS for collision and/or other natural causes that require lane or road closures. CMS systems are used to inform roadway users of the road closure, and if applicable, existing traffic control (e.g. one-way controlled traffic, CHP pace vehicles) and estimated amount of delay time. CMS systems are also used to warn of high winds and accidents.

C. Twenty – Year Improvement Plan

The 20-year improvement plan (2021-2030) would be comprised of funding primarily from the State Transportation Improvement Program (STIP) Regional Improvement

Program (RIP) funds. As funding from other local, state, or federal sources becomes available, this funding should be applied to the planned projects to insure that they are funded through construction. Please see Table 5, Page 29, for a list of proposed projects.

TABLE 5
IMPROVEMENT PROJECTS TWENTY-YEAR PLAN

Kin/Tul Postmile	Project Description	Location	Target Date	Funding Source	2008 Total Cost
Kin PM 7.16	Construct Interchange	21st Street Alignment	>2025	STIP-RIP	Not Determined
Kin PM 10.6	Modify Interchange	18th Avenue	>2021	STIP-RIP	Not Determined
Kin PM 15.5/15.9	Construct Interchange	Hanford-Armona 13th Avenue	>2025	STIP-RIP, Local Development	Not Determined
Kin PM 19.7	Construct Interchange	9th Avenue	>2021	STIP-RIP	Not Determined

D. Beyond 20-Year Improvement Plan

The Beyond 20-Year improvement plan will most likely be funded by a variety of sources.

Over the next twenty-five years and beyond, Caltrans and local agencies will need to balance the question of expanding Route 198 to add more capacity with the impacts on the environment and local communities. This will include consideration of alternate parallel highway routes, such as whether a potential new Route 65 (metro rural loop project) to the east will be adequate to divert traffic, as well as the northward expansion of Route 65. The proposed High Speed Rail Corridor will be another consideration, as would the diversion of goods movement through bypasses, particularly around the urban areas. Measures to increase efficiency, as outlined in the section on ITS, will be an important part of improving performance on the freeway.

TABLE 6
IMPROVEMENT PROJECTS BEYOND TWENTY-YEAR PLAN

Kin/Tul Postmile	Project Description	Location	Target Date	Funding Source	Total Cost
Kin PM 0.0/2.8	Construct Passing Lanes	Fresno Co Line to LNAS	>2030	Not Determined	Not Determined
Kin PM 3.01, 6.7, 9.87, 12.5, 16.9, 19.6, & 21.5	Install Changeable Message Signs	At LNAS main Gate, west & east of Route 41, east of Houston, west of Route 43 and on westbound route 43	>2030	Not Determined	Not Determined
Kin PM 8.9	Modify Interchange	Route 198/Route 41	>2030	Not Determined	Not Determined
Kin PM 10.0 – 17.5	Widen and/or add auxiliary lane	From Lemoore to Hanford	>2030	Not Determined	Not Determined
Kin PM 12,7	Construct Overcrossing	12th Avenue	>2030	Not Determined	Not Determined
Kin PM 23	Install Highway Advisory Radio	6th Avenue	>2030	Not Determined	Not Determined
Kin PM 23.0	Construct Interchange	6th Avenue	>2030	Not Determined	Not Determined
Kin PM 27	Construct Interchange	2nd Avenue	>2030	Not Determined	Not Determined

Caltrans has identified a number of improvements along this corridor that may be necessary, based on a continuation of the past pattern and direction of development. These improvements are presented in Table 6, Page 30. Projects identified in this Table will be subject to change, with modifications to cost inevitable and modifications in scope possible. New priorities may emerge that will cause these projects to be delayed in order to meet the demands identified at another location.

Through grants from the California Partnership for the San Joaquin Valley and the Caltrans Transportation Planning Grants program, the five counties area of Fresno, Madera, Kings, and Tulare are studying a 2110 Metro Rural Loop concept. As part of the San Joaquin Valley Regional Blueprint, the form of the region envisions a system of high capacity multi-modal transportation corridors that interconnect the metro area with rural areas and the state. The Metro Rural Loop concept would be a regional development approach that envisions a multi-modal, multi-city and multi-county transit-oriented transportation corridor system that would directly link the development of cities and counties. The Metro Rural Loop project would include representatives from local, regional and state jurisdictions, business, agriculture, environmental, and civic organizations in the region.

Caltrans will be participating in the discussions with the local and regional agencies on a proposed Metro Rural Loop being considered to potentially service the five counties. This would help provide a framework for right-of-way needed for future expansion of State facilities. The Metro-Rural Loop also would provide connections to the existing State Highway System, and possibly with the proposed extension of Route 65 to the east. It should be noted that this concept does not currently include funding for Project Study Report development or construction.

V. CONCLUSION

This CSMP identifies transportation-related needs along the corridor for transportation mobility, improvement in the movement of goods, and the promotion and enhancement of economic development. This CSMP will also determine appropriate phasing for identified improvements, ensuring the most-needed projects are constructed first and that construction proceeds in a logical progression, maximizing the limited transportation funds available.

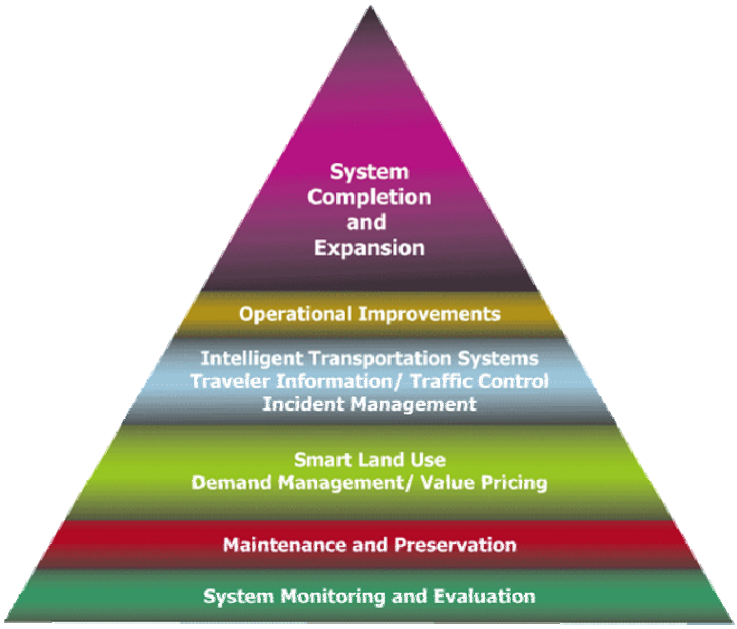
The initial phase is development and implementation of a CSMP, across all jurisdictions and modes, for the highest mobility benefits to travelers in the corridor. The CSMP will assess current performance, identify causal factors for congestion, and, based on testing of alternative corridor management improvements scenarios (typically through traffic analysis), propose the best mix of improvements, strategies, and actions to restore throughput, improve travel times, reliability, safety, and preserve the corridor. The CSMP is a guide for managing the corridor among all partners. Moreover, the CSMP is a living document that will be updated as technology changes and conditions warrant.

A. The System Management Pyramid

Corridor productivity can only be restored and maintained through a coordinated planning and management effort of all transportation partners. This CSMP identifies a

number of elements essential this goal. The "System Management Pyramid" can best visualize these elements. Each element, while represented separately, works as an essential part of the whole. The elements may be summarized as follows:

THE SYSTEM MANAGEMENT PYRAMID



1. System Monitoring and Evaluation

The basic foundation of successful system management is System Monitoring and Evaluation. This is accomplished through comprehensive performance assessment and analysis. Understanding how a corridor performs and why it performs the way it does is critical to developing appropriate strategies.

The first step in this effort is analysis of the system that is now have available. This will include the identification of current bottlenecks, their causes, and the impact that these individual bottlenecks have on the whole of the corridor.

The next step will be to prioritize the improvements planned on the corridor based on need and the ability to maximize performance of the system as a whole. This prioritization will be a joint effort of the PDT and will be based on a methodology agreed to by the whole.

A list of performance measures will be developed to evaluate how effective the system improvements have been. These performance measures will represent the best measurement of system performance for this individual section of the corridor with its unique characteristics and challenges. The current technology available to make a determination of performance will also be a factor. The current detection system is sparse, and future planning for the expansion of the detection network will be a critical step to optimizing our ability to measure performance.

2. Maintenance and Preservation

Maintaining the system in as optimum a condition as possible will require all partners' participation. The corridor does not operate in isolation, but is part of an overall network. We must work together to determine the best strategies to maximize operations of the entire system. Planned SHOPP projects within the CSMP area are listed in three tables, depending on the timeframe for implementation. Table 4, Page 26, presents the planned improvements for the next ten years. Table 5, Page 29, presents the twenty-year plan, while Table 6, Page 30, includes those projects proposed to be implemented in a time period greater than twenty years.

3. Smart Land Use, Demand Management/Value Pricing

Land use decisions are the prerogative of local government. These decisions impact the transportation system. Appropriate planning can reduce this impact. Preserving right-of-way to allow for future, planned, capacity-enhancing projects will reduce the time to deliver projects and their overall cost. Approving only those developments that are compatible with an adjacent or nearby transportation system, be it a freeway, airport, or transit station, will help to protect the system.

The extent of the usefulness of demand management strategies, and which ones will be most effective, will be part of the process of describing the current system and the current ITS components available on the system. Demand Management strategies may be more available to the corridor in the future, depending on the priority placed on ITS by Caltrans and the partner agencies. These elements are described in more detail elsewhere in this document. Planned ITS elements are shown on Map #3, Page 14, Table 4, Page 26, presents the ten year plan; Table 5, Page 29, presents the twenty-year plan; Table 6, Page 30, the beyond twenty year plan. ITS components are described in Appendix B, Page 41.

Value pricing may be a part of the efforts to prioritize planned improvements by the PDT. In prioritizing projects, one key component is often a cost-benefit assessment. This assessment provides a measure of how much good comes from the project versus its cost. This will be determined later as part of this ongoing CSMP effort. The various components of Intelligent Transportation Systems, including traveler information, traffic control, and incident management, are described in Appendix B, Page 41. All of these strategies play a key part in optimizing the performance of the system. The PDT will provide input into the prioritization of the planned improvements, which may include these elements.

4. ITS/Traveler Information/Traffic Control/Incident Management

The various components of Intelligent Transportation Systems, Traveler Information, Traffic Control, and Incident Management have been described elsewhere in this document. Some elements exist today along the corridor (Map 3, Page 14); others have been proposed and are listed in Tables 4, 5, and 6 Pages 26, 30, and 31, respectively. All of these strategies offer a means of optimizing the performance of the system, without the need for capacity-enhancing construction projects, and for perhaps a greater return on investment.

5. Operational Elements

Numerous operational improvements have been proposed and are presented in Tables 4, 5, and 6 (Pages 26, 30, and 31, respectively). The PDT will provide input into the prioritization of these planned improvements as well. Operational Improvements: These are higher cost measures in the SHOPP program that can improve the traffic flow at an intersection, interchange or short portions of the mainline system.

6. System Completion and Expansion

Tables 4, 5, and 6 (Pages 26, 30, and 31, respectively) list a variety of planned improvements for this CSMP area. These include ITS, maintenance, and capacity enhancing improvements. The PDT will provide input into the prioritization of these planned improvements. Funding for many of these improvements has not yet been identified. Caltrans and partner agencies will need to work together, to be diligent and creative, in locating appropriate funding for priority projects.

While this item is at the top of the pyramid, the process of system management does not stop here. Effective system management will be an ongoing process, and may in fact begin all over again at the bottom of the pyramid. New needs will be identified; new technology available; and Caltrans and the local partners will need to remain flexible and responsive. The CSMP must also remain flexible and responsive, with updates as necessary. The CSMP is intended to be a living document.

APPENDIX A

SIGNATORIES

MEMORANDUM OF UNDERSTANDING
FOR
STATE ROUTE 198 CORRIDOR
(KIN PM 3.011/28.325 to TUL 0.000/3.835)

Malcolm X. Dougherty — Date: 7/17/07
California Department of Transportation, District 6
District Director
1352 W. Olive Avenue
Fresno, CA 93728

Terri King — Date: 7-2-07
Kings County Association of Governments
Executive Director
339 W. "D" Street, Suite B
Lemoore, CA 93245

George Finney — Date: 7/16/07
Tulare County Association of Governments
Executive Director
5961 S. Mooney Boulevard
Visalia, CA 93277

California Department of Transportation
District 6
Corridor System Management Plan (CSMP)

State Route 198
(KIN PM 3.011/28.325 to TUL 0.000/3.835)
Charter for Development and Implementation

The Development and Implementation of a Corridor System Management Plan (CSMP) for State Route 198 between Lemoore Naval Air Station and SR 99

This Charter or Memorandum of Understanding (MOU) is between the California Department of Transportation, District 6 (hereinafter, District 6), the Kings County Association of Governments (KCAG), and the Tulare County Association of Governments (TCAG). This MOU constitutes solely as a guide to the respective obligations, intentions and policies of the partners and District 6 to identify the development and management of the State Route 198 corridor between Lemoore Naval Air Station and State Route 99. This MOU addresses the principles and practices, system management process, roles and responsibilities and commitment of the responsible partners. This MOU is not designed to authorize funding for the project effort, nor is it a legally binding contract. It is the intent of this MOU to establish a mutual policy leading to a cooperative effort between District 6 and partners for the improvement of State Route 198.

Purpose

The purpose of this charter is to document the commitment of all parties to manage the corridor through applying the principles and practices of system and corridor management and performance measurement for sustained corridor performance. The initial phase is development and implementation of a CSMP, across all jurisdictions and modes, for highest mobility benefits to travelers in the corridor. The CSMP will assess current performance, identify causal factors for congestion, and based on testing of alternative corridor management improvements scenarios (typically through traffic analysis) propose the best mix of improvements, strategies and actions to restore throughput, improve travel times, reliability, safety, and preserve the corridor. The CSMP is a guide for managing the corridor among all partners.

Principles and Practices

The following principles and practices will guide development and implementation of the CSMP.

- Corridor productivity can only be restored and maintained through a coordinated planning and management effort of all transportation partners. Restoring productivity is vital to the state, regional and local economy and quality of life and safety for travelers.
- The department, regional agencies, local jurisdictions, and modal operators are partners in developing an effective CSMP to guide corridor management for highest productivity, reliability, safety and preservation based on performance assessment and measurement.
- Development of the CSMP is complementary to and consistent with federal provisions for a continuing, cooperative, and comprehensive planning process among transportation partners.
- Supports state Congestion Management Program and SAFETEA-LU provisions for increased emphasis on system and corridor management and performance measurement in regional transportation plans as well as for real-time traveler information.
- Improvements identified in the CSMP to restore corridor productivity should be candidates for all categories of regional and local funding as applicable.

Role and Responsibilities

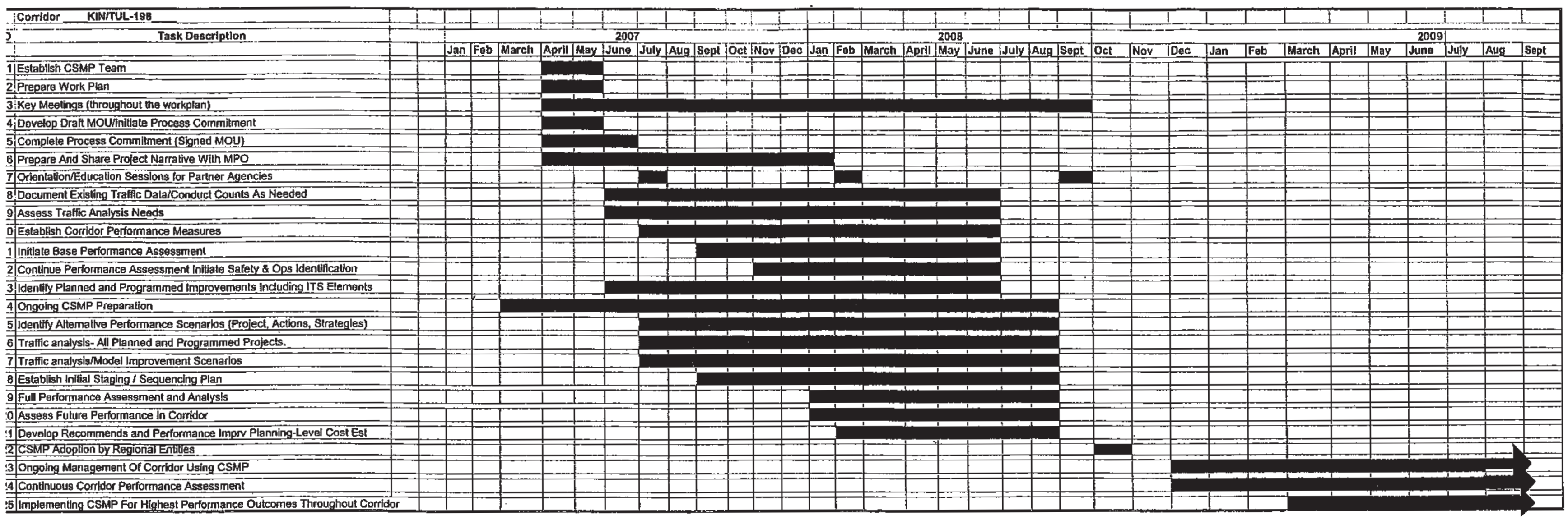
The transportation partners (and other applicable partners) will meet on a regular basis for the following activities and decisions:

- Agreement to a work plan, time line, roles and responsibilities for development of the CSMP, including resources.
- Review draft products, including initial performance assessments and technical documents.
- Coordinate corridor planning and evaluation efforts and share information on related topics to corridor performance measurement and improvement.
- Identify opportunities for heightened understanding by local jurisdictions and the public on the mobility benefits of system and corridor management.

Appendices:

- Draft Corridor System Management Plan Development Work Plan (Attachment 1)
- Map of State Route 198 corridor from Kings Post Mile (PM) 3.011/28.325, Tulare PM 0.000/3.835 (Attachment 2)

Corridor System Management Plan (CSMP) Development
Work Plan (DRAFT)

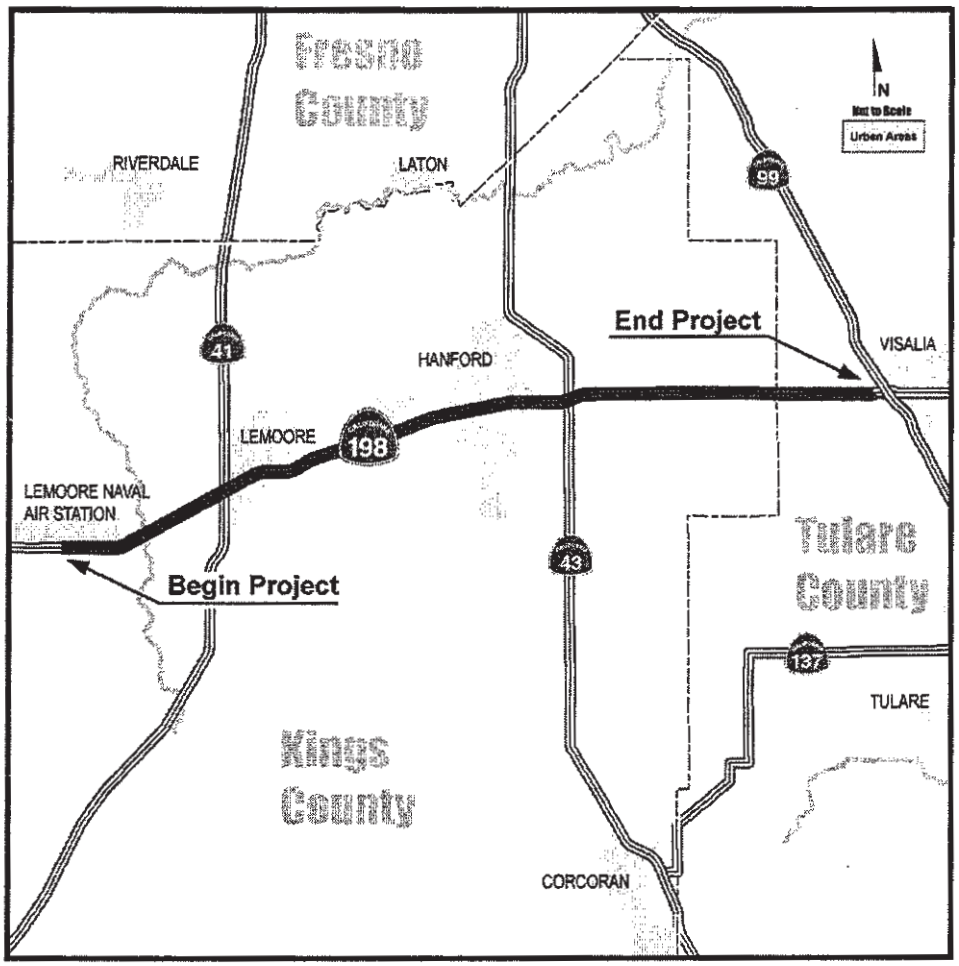

Corridor KIN/TUL-198
Task Description
2007
2008
2009
Jan Feb March April May June July Aug Sept Oct Nov Dec Jan Feb March April May June July Aug Sept Oct Nov Dec Jan Feb March April May June July Aug Sept
1 Establish CSMP Team
2 Prepare Work Plan
3 Key Meetings (throughout the workplan)
4 Develop Draft MOU/Initiate Process Commitment
5 Complete Process Commitment (Signed MOU)
6 Prepare And Share Project Narrative With MPO
7 Orientation/Education Sessions for Partner Agencies
8 Document Existing Traffic Data/Conduct Counts As Needed
9 Assess Traffic Analysis Needs
0 Establish Corridor Performance Measures
1 Initiate Base Performance Assessment
2 Continue Performance Assessment Initiate Safety & Ops Identification
3 Identify Planned and Programmed Improvements Including ITS Elements
4 Ongoing CSMP Preparation
5 Identify Alternative Performance Scenarios (Project, Actions, Strategies)
6 Traffic analysis- All Planned and Programmed Projects.
7 Traffic analysis/Model Improvement Scenarios
8 Establish Initial Staging / Sequencing Plan
9 Full Performance Assessment and Analysis
0 Assess Future Performance in Corridor
1 Develop Recommends and Performance Imprv Planning-Level Cost Est
2 CSMP Adoption by Regional Entities
3 Ongoing Management Of Corridor Using CSMP
4 Continuous Corridor Performance Assessment
5 Implementing CSMP For Highest Performance Outcomes Throughout Corridor

Executive Steering Committee
District 6 Director
District 6 Deputy Director, Planning and Local Programs
District 6 Deputy Director, Maintenance and Operations
District 6 Deputy Director, Program/Project Management

CSMP Development Team
District 6 Central Region Planning
District 6 Technical Planning
District 6 Program/Project Management
District 6 Traffic Operations
District 6 Traffic Engineering
Kings County Association of Governments
Kings County Planning Agency
Kings County Public Works
City of Hanford Community Development
City of Hanford Public Works
Kings Area Rural Transit Agency
City of Lemoore Planning
City of Lemoore Public Works
Tulare County Association of Governments
Tulare County Resource Management Agency

KIN-TUL-198CSMP- Wk Plan.xls

Attachment 2



APPENDIX B
INTELLIGENT TRANSPORTATION SYSTEMS

ITS is any electronic transportation system that communicates information to the traveler that will improve safety and efficiency. ITS includes traffic signals, closed-circuit televisions, changeable message signs, ramp meters, weigh-in-motion devices, roadway service patrols, weather stations, highway advisory radio stations, and transportation management centers. Traveler Information Broadcast Systems, traffic signal priority for emergency or transit vehicles, ITS data archive management, and vehicle safety warning systems are all a part of ITS. Also included is centralizing the control of many of these components from traffic or transit management centers.

One Traveler Information Broadcast System is the "511" system. The 511 system is a new three-digit phone number program to access traveler information that is being implemented throughout various areas of the country. 511 is not available in our area at this time. However, some San Joaquin Valley Metropolitan Planning Organizations have committed to implementing a version of the 511 in some counties. This scaled down version should be up and running by the end of 2008.

Deployment of ITS technology will enhance traveler information services, as well as the operational and safety efficiency of the Route by informing motorists of traffic congestion, inclement weather such as fog, dust, highway construction and/or closings. Currently, there is a regional architecture in existence called the "San Joaquin Valley ITS." This architecture covers the 8 counties within the San Joaquin Valley (San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern). This Plan is available at: http://www.kimleyhorn.com/Caarchitecture/task9/sjintro.htm.

i. Detection

Detection is one of the most important components of ITS. Detection refers to the real-time measurement of transportation movements and conditions. In the past, measurements have been conducted periodically (such as once per year) and those measurements were used to determine the need for infrastructure expansion.

Optimizing management strategies will require accurate, on-going data collection be provided by detection systems placed throughout the corridor. Without detection systems, transportation agencies cannot implement advanced traffic control strategies, cannot inform the public about traffic conditions, expected delays and options, and cannot detect and react to incidents quickly enough to minimize the impacts created by those incidents. Route 198 within the limits of this CSMP does not currently include a sufficient detection system to fully optimize these strategies. Because of this, numerous projects to install these systems are proposed, and Caltrans District 6 has made a commitment to increasing the level of detection as quickly as possible. In addition, improvement projects are typically planned to include detection units as part of the construction. Caltrans commitment to the installation of detection units includes the installation of a Traffic Monitoring Station at Route 198 and 7th Avenue.

ii. Traffic Control

Traffic control, another element of ITS, includes signal strategies for managing traffic flows on arterials as well as ramp metering on the freeway system. These strategies offer great promise to improve the productivity of the transportation system. There are, however, challenges for Caltrans in utilizing some of these options. Local agencies are often concerned that traffic control devices will cause additional traffic to choose local streets as an alternative. Caltrans will need to work with local partners to reach solutions that will be agreeable to all parties.

iii. Incident Management

Incident Management is a significant component of ITS. Most studies in the United States suggest that incidents such as accidents, special events, and severe weather conditions are responsible for about half of the delay on our freeway system.

Motorists are accustomed to normal delays. However, traffic incidents disrupt the motorist's normal routine, creating unplanned delays. Such delays can cause negative impacts to motorists. Unanticipated delays may also create frustration, aggressive driving, and the potential for "Road Rage." Such aggressive behavior poses a danger not only to other motorists but also to emergency response personnel. The goal of effective Traffic Incident Management (TIM) is to reduce the time it takes to clear traffic incidents from the roadway. The less time it takes to clear an incident, the less congestion and delay the motorist experiences. Safety for both the emergency response personnel and the traveling public is improved. Even small improvements in this process can yield significant benefits. Effective TIM relies on advanced technologies to allow for expedited incident detection, verification, coordination among necessary emergency response agencies, and the subsequent clearance of an incident as rapidly as possible.

Collision and/or natural causes will often require lane or road closures. Changeable Message Signs (CMS) systems are used to inform travelers of the road closure, and, if applicable, existing traffic control (such as one-way controlled traffic, CHP pace vehicles) and the estimated amount of delay. CMS systems are also used to warn of high winds and accidents. The Route 198 Expressway project includes the installation of two CMS systems; one at Route 198/7th Avenue and another at Route 198/Road 56.

iv. Advanced Traveler Information Systems

One of the more progressive components of ITS is the Advanced Traveler Information System (ATIS). Most commuters get information about traffic conditions from the media; for instance, radio stations. ATIS will provide modal-specific, time-of-day demand data that will allow travelers to get the most out of the transportation system. The system would allow travelers to manage their trips in the most efficient manner. Implementing advanced traveler information systems requires a partnership between transportation agencies and the public. However, it is clear that the framework is not yet fully developed and that, at this time, current detection systems are not adequate for real-time, tailored information.

v. Traffic Management Centers

Effective ITS implementation requires coordination of all components. Traffic Management Centers (TMC) play an important role in day-to-day system management, providing coordinated incident responses, as well as integration of various systems. An example of integration would be the coordination of ramp metering and arterial signal management. Traveler information also requires sharing data with both public and private partners. Different agencies, such as Caltrans, the California Highway Patrol (CHP), and the media, play different roles and have different systems for incident management. The TMC integrates these roles and systems in one location to optimize performance. TMCs are used in emergencies, Amber Alerts, and provide an Emergency Operations Center function during natural disasters, such as earthquakes. TMCs also serve a security preparedness function; staff can monitor the urban freeway system, quickly activate response strategies (such as changeable message signs), or notify the proper authorities when security risks are identified.

Logical phasing for implementing the components of an effective Traffic Management System would be:

- Installing simple, adaptive-scheme ramp metering;
- Optimizing the meter rates;
- Implementing a corridor adaptive ramp-metering scheme;
- Advanced arterial signal actuation strategies and improved incident management; and
- With all of these in place, a comprehensive traveler information system as the final goal.

Monitoring and evaluation are the foundations for sound management of the corridor and will help to identify the optimum strategies to improve the transportation corridor. Strategies range from maintenance and preservation to system expansion, but will focus on optimization of the existing system by fully incorporating operational strategies into the management plan. Implementation of ITS strategies will complement other improvements, including those improvements that may be implemented by partner agencies such as transit, light rail, and improvements on the local road system. The goal is that the whole of the transportation system, including highways, local roads, and alternative means of transportation, operate as one seamless network.

vi. Transportation Demand Management

Transportation Demand Management is designed to reduce vehicle trips during peak hours. Transportation Demand Management is specifically targeted at the work force, as commuters generate the majority of peak hour traffic. Incorporating these strategies is a part of land use decisions, the prerogative of local government. Strategies include:

- Rideshare programs
- Transit usage
- Flex hours
- Vanpools
- Bicycling and walking

- Telecommuting
- Mixed land uses (jobs – housing balance)

Transportation Demand Management programs could be required by local jurisdictions for any large commercial or office project and could be tied to incentives of some sort to encourage the development of such programs.

APPENDIX C

DOCUMENTS USED IN THE PREPARATION OF THIS CSMP

1) Transportation Management System (TMS) Master Plan; Caltrans
2) Traffic Operations Strategic Plan; Caltrans
3) I-880 Corridor System Management Plan; Caltrans District 4
4) State Route 198 TCR; Caltrans District 6
5) Mainstreaming ITS and Use in the Planning and Programming Environment; Caltrans
6) Interregional Transportation Strategic Plan; Caltrans
7) Regional Transportation Plan; Tulare County Association of Governments
8) Regional Transportation Plan; Kings County Association of Governments
9) Bay Area/California High-Speed Rail Ridership and revenue Forecasting Study; California High-Speed Rail Authority
10) Goods Movement Action Plan; Business, Transportation and Housing Agency and California Environmental Protection Agency
11) 2002 Global Gateways Development Program; Caltrans
12) Demographic Research Unit, California State Census Data Center, Census 2000 PL94-171, California Department of Finance
13) California State Rail Plan; Caltrans
14) San Joaquin Valley Goods Movement Study; Counties of the San Joaquin Valley and Caltrans
15) County of Tulare General Plan; Tulare County
16) County of Kings General Plan; Kings County
17) City of Hanford General Plan; City of Hanford
18) City of Tulare General Plan; City of Tulare
19) Freeway Performance Initiative Traffic Analysis; Metropolitan Transportation Commission, Final Report, October 2007
20) Goods Movement Action Plan; Business, Transportation and Housing Agency And California Environmental Protection Agency, January 2007

APPENDIX D
ACRONYMS

AADT - Average Annual Daily Traffic
ATIS - Advanced Traveler Information System
BNSF - Burlington Northern Santa Fe
CAPM - Capital Preventive Maintenance
CHP - California Highway Patrol
CMIA - Corridor Mobility Improvement Account
CMS - Changeable Message Sign
CSMP - Corridor System Management Plan
CT - Caltrans
CTC - California Transportation Commission
HSRA - High Speed Rail Authority
IIP- Interregional Improvement Program
IRI - International Ride Index
ITS - Intelligent Transportation System
ITSP - Interregional Transportation Strategic Plan
KART - Kings Area Rural Transit System
KCAG - Kings County Association of Governments
LNAS - Lemoore Naval Air Station
LOS - Level of Service
MOU - Memorandum of Understanding
MSL - Maintenance Service Level
MTC - Metropolitan Transportation Commission
OH - Overhead
PCR - Pavement Condition Report
PCS - Pavement Condition Survey
PDT - Project Development Team
PeMS - Performance Measurement System
PM - Postmile
RIP - Regional Improvement Program
ROW - Right-of-Way
RWIS - Remote Weather information Station
SAFETEA-LU - Safe Accountable Flexible Efficient Transportation Equity Act- Legacy for Users
SHOPP - State Highway Operation Protection Program
SJV - San Joaquin Valley
SJVR - San Joaquin Valley Railroad
STAA - Surface Transportation Assistance Act
TASAS - Traffic Accident Surveillance and Analysis System
TCAG - Tulare County Association of Governments
TCRP - Transportation Congestion Relief Program
TIM - Traffic Incident Management
TMC - Transportation Management Center
TMS - Transportation Management System
UC - Undercrossing
UP - Union Pacific
UTC - Ultimate Transportation Concept