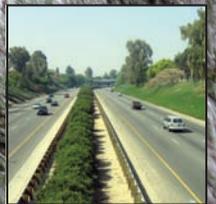
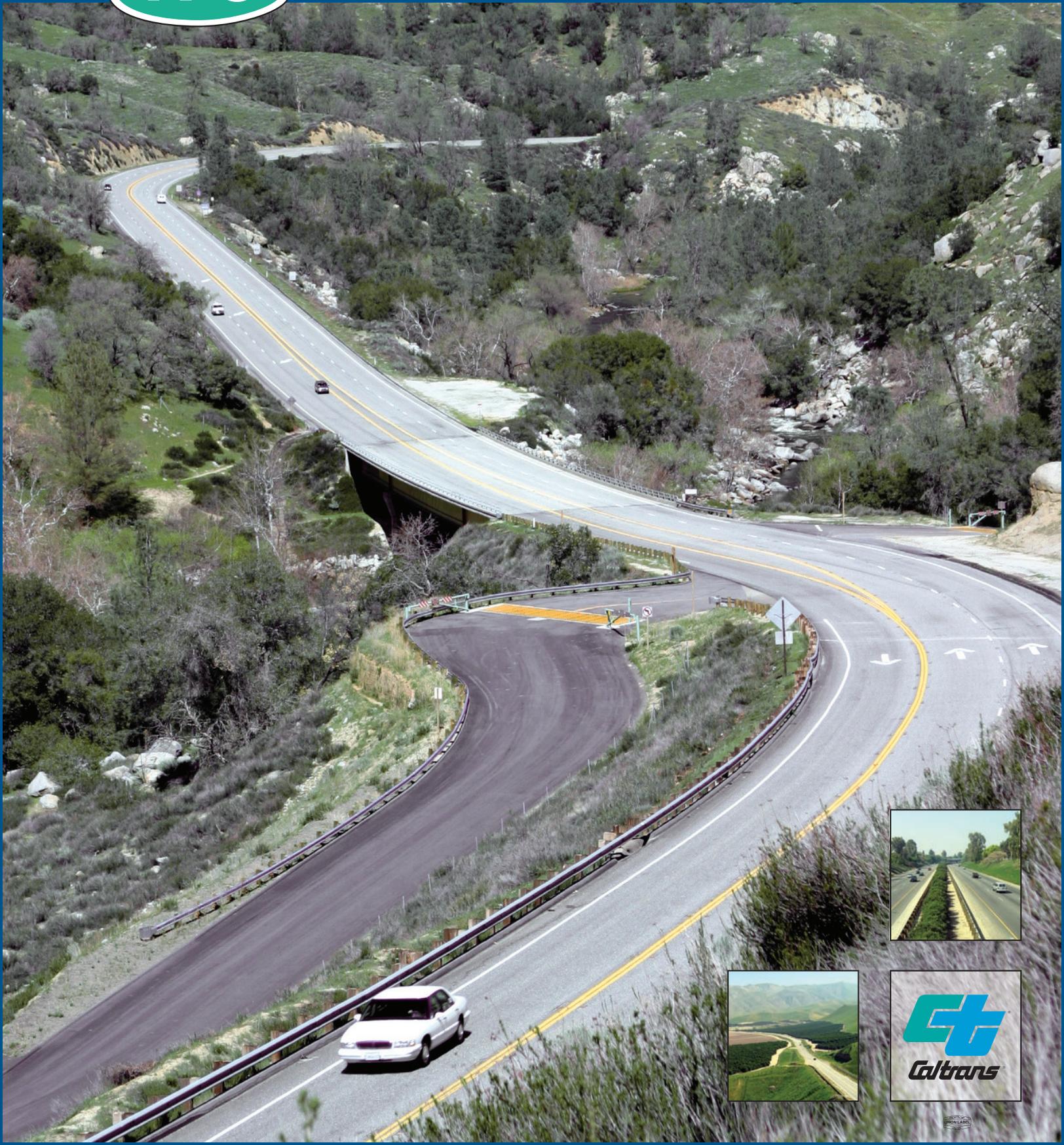


STATE ROUTE



TRANSPORTATION CONCEPT REPORT

OFFICE OF SYSTEM PLANNING · DISTRICT 6 · NOVEMBER 2010



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Route 178 Transportation Concept Report

Route 178: In Kern County from State Route 99 to the Kelso Valley Road

Caltrans District 6 – Postmile: (KER-178-PM-0.00 through PM-57.07)

Approval Recommended:



Christine Cox-Kovacevich
Acting Deputy District Director
Planning and Local Assistance
Caltrans - District 6



Sharri Bender Ehlert
Interim District Director
Caltrans - District 6

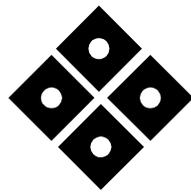


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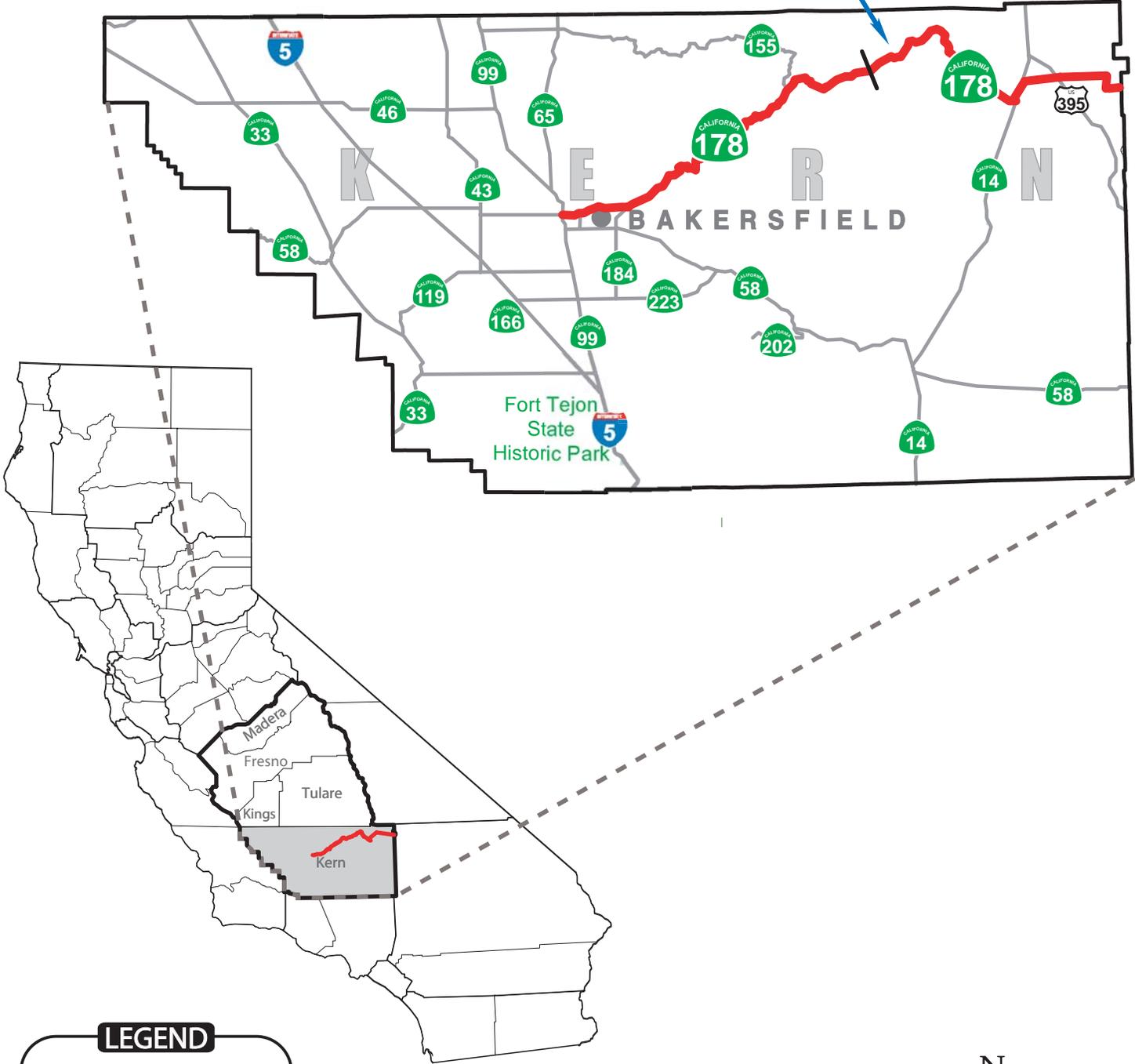
STATE ROUTE

TRANSPORTATION CONCEPT REPORT

LOCATION MAP



Note: The remainder of SR 178 in Kern County is maintained by Caltrans District 9, and is not a part of this TCR.



LEGEND

Counties within District 6 which SR 178 traverses
 Caltrans District 6 Boundary



Not To Scale

Transportation Concept Report

State Route 178

I. INTRODUCTION

A. Purpose and Need

The Transportation Concept Report (TCR) is a long-range system-planning document that establishes a planning concept for the corridor through the year 2035. The TCR provides route data and information, as well as current and projected year (2009, 2020, and 2035 respectively) operating characteristics.

Considering reasonable financial and physical constraints, the TCR defines the appropriate Concept Level of Service (Concept LOS) and facility type(s) for each route. It also broadly identifies the nature and extent of improvements needed to attain the Concept LOS. Capacity-enhancing improvements, such as lane additions, are the primary focus for LOS attainment.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities, or whichever LOS is feasible to attain. For the purpose of this document the Concept LOS is a “target” LOS determined by the importance of the route and environmental factors. A deficiency (need for improvement) is triggered when the actual LOS falls below the Concept LOS.

Operational improvements, such as intersection modifications, are discussed as interim measures. The TCR also identifies transit, the proposed High Speed Rail, and the deployment of Intelligent Transportation Systems (ITS) as integral to route corridor development. The Ultimate Transportation Corridor (UTC), as identified in this TCR, ensures that adequate right-of-way (ROW) is preserved for ultimate facility projects beyond 2035. However, the UTC does not consider funding as a constraint. Caltrans District 6 System Planning staff should be consulted for the interim ROW (prior to ultimate construction) for a specific location along the corridor.

Please note: The number of lanes needed to meet the UTC for this route is only a guideline. The minimum ROW is "subject to change" in urban and suburban areas where a route also serves local circulation needs. The need to widen the roadway beyond the UTC may be necessary to maintain the target LOS. The local jurisdictions should endeavor to maintain adequate ROW to maintain the target LOS, which in an urban setting could exceed the UTC number of lanes. Where the State legislature has designated the route as part of the Freeway and Expressway System, interchange and freeway ROW should be part of the General Plan so as to not adversely affect development.

This document identifies the initial and conceptual planning phases that lead to subsequent programming and the project development process. Consequently, the specific nature of proposed improvements such as roadway width, number of lanes, and access control might change in later project development stages. Final determinations are normally made during the project report and design phases. Therefore, a TCR is a “living document,” subject to amendments as conditions change and projects are completed. The TCR for Route 178 was prepared and completed by District 6 Office of System Planning staff in cooperation with District 9, Tribal representatives, local and regional agencies, and other Caltrans functional units. As such, the TCR will serve as a guide in cooperative planning and implementation of transportation and land use decisions. Caltrans District 6 System Planning staff will update the TCR as needed to keep the information up-to-date and relevant.

B. Route 178 Background

Many California roads and highways originated along Tribal hunting and trading routes. Current day Route 178 was a traditional trade route of the Tubatulabals (Bankalachi, Palagewan, and Pakanapul bands) and the Yokuts. The Tubatulabals describe the west end of Kern Canyon, now in the City of Bakersfield, as “paluntanakamapan,” meaning “water where it falls.” Located on the east end of Kern Canyon, at what is now Democrat Hot Springs, was the Tubatulabal village known as “pasgestap,” occupied by the Palagewan up to the 1920’s. Along the north and south forks of the Kern River, and under what is now Lake Isabella, many Tubatulabal villages existed.

In 1919, Route 178, formerly known as Route 57, was added to the State Highway System. The section from Route 99 to the San Bernardino County line was added to the California Freeway and Expressway System in 1959. On April 27, 1960, Route 178 was adopted on a new alignment (currently unconstructed) between west of Morning Drive to Route 155 at Lake Isabella. The adopted alignment lies northerly of the existing Route 178 and generally follows Rancheria Road until it reaches the Lake Isabella area. Should this new alignment be constructed, the existing Route 178 would be relinquished to Kern County and would be maintained as a County road.

II. ROUTE DESCRIPTION

A. Route Limits:

Begins: At Route 99/58/178 Junction in Bakersfield in Kern County

Ends: At the Nevada State line

Length: 208-mile highway in Kern, San Bernardino, and Inyo Counties

The route is located in Caltrans’ Districts 6, 8, and 9, which include Kern, San Bernardino, and Inyo Counties. This Transportation Concept Report covers the 58 miles of Route 178, from the Route 99/58/178 junction (KER PM 0.00) in Bakersfield to Kelso Valley Road (near Weldon

KER PM 57.07) in Kern County. The segment from Weldon to the San Bernardino County line is not covered in this TCR as it is maintained by District 9 Maintenance and Operations. District 9's TCR for Route 178 is located on the internet at: <http://www.dot.ca.gov/dist9/planning/>.

On Page i at the beginning of this document is the Location Map showing the portion of Route 178 covered by this TCR.

Proposed Relinquishment: The City of Bakersfield has requested Caltrans to relinquish the portion of Route 178 east of Route 99, from the Kern River Bridge to "M" Street. District 6 Planning has an approved Transportation System Analysis and Evaluation Report (TSAE), the first step in the relinquishment process. If the relinquishment is completed, Route 178 would begin at "M" Street, with the portion from the Kern River Bridge to M Street becoming a City street. The City of Bakersfield is required to install and maintain signs on the relinquished portion directing motorists to the continuation of Route 178.

B. Route Function:

1. Description of the Route

Table 1, Summary Chart, Pages 4, 5, 6, and 7, provides information on Route 178, dividing it into fifteen segments. Information includes the current and projected Level of Service (LOS), percent truck traffic, and functional classification, as well as other information. As can be seen in the Summary Chart, the route varies considerably throughout Kern County.

The Segment Map is presented on Page 8. The Map shows the 15 segments of Route 178 in Kern County. Each segment is discussed individually in the section following the Segment Map.

The east-west route begins in the urban area of Bakersfield. In District 6, Route 178 is functionally classified as a high volume Principal Arterial within Bakersfield and a low volume Minor Arterial for the remainder of its length. The route traverses generally flat terrain in and near the urban area, with mountainous terrain from the mouth of the Kern River Canyon and into the Sequoia National Forest. Small communities are situated in the mountainous regions. Route 178 is known as the Kern River Canyon Road from the mouth of the Kern Canyon to Route 155.

Route 178 serves many different purposes. It is a significant route for urban commuters in Bakersfield, connecting Bakersfield with East Bakersfield and Lake Isabella. The route is important as a Trans-Sierra route, providing access to Lake Isabella and the Sequoia National Forest. Lake Isabella is a recreational destination spot featuring fishing, boating, and white water rafting in the lake and Kern River.

State Route

LEGEND

Existing Lanes

Planned or Programmed by 2035

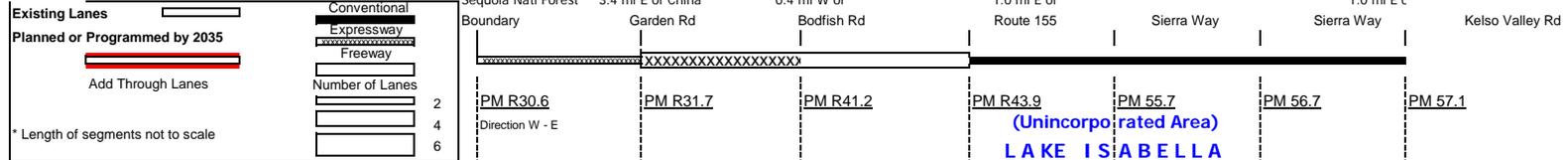
* Length of segments not to scale

N JCT ROUTE 99/58/178	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD	MOUTH KERN RIVER	2.6 MI W OF DEMOCRAT RD	SEQUOIA NATL FOREST
PM 0.0	PM 1.0 (Couplet)	PM 1.7	PM R4.1	PM R6.2	PM T9.6	PM R11.0	PM 13.7	PM 24.0	PM R30.6
Direction W - E									
B A K E R S F I E L D									

SEGMENT	1	2	3	4	5	6	7	8	9
County / Route	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178
Description Begin	N JCT ROUTE 99/58/178	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD	MOUTH OF KERN RIVER CANYON	2.6 MI W OF DEMOCRAT RD
Description End	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD	MOUTH OF KERN RIVER CANYON	2.6 MI W OF DEMOCRAT RD	SEQUOIA NATL FOREST BOUNDARY
Postmile Limits Begin / End (PM)	0.0 / 1.0	1.0 / 1.7	1.7 / R4.1	R4.1 / R6.2	R6.2 / T9.6	T9.6 / R11.0	R11.0 / 13.7	13.7 / 24.0	24.0 / R30.6
Length (MI)	1.0	0.7	2.4	2.1	3.4	1.4	2.7	10.3	6.6
Rural / Urban	Urban	Urban	Urban	Urban	Urban	Urban	Rural	Rural	Rural
Terrain	Flat	Flat	Flat	Flat	Flat	Flat	Rolling	Mountainous	Mountainous
ROW: Range Existing (FT)	83 / 140	83 / 275	83 / 300	200 / 300	80 / 250	80 / 250	80 / 100	60 / 140	132 / 132
Median Range (FT)	13 / 24	99P / 99P	31 / 99P	46 / 70	0 / 70	0 / 0	0 / 0	0 / 0	0 / 0
Shoulder Range (FT) - Treated	8 / 12	8 / 9	8 / 8	8 / 10	3 / 10	8 / 8	4 / 8	0 / 2	0 / 8
Lane Width (FT)	12	12	12	12	12	12	12	11	12
Ultimate ROW (FT)	+	+	240	240	214 (250 existing in some locations)	200 (250 existing in some locations)	118	110	+
Facility: Existing Alignment	4C	6C	6F	6F	4F to just W of Morning Drive; 2C for remainder	2C	2C	2C	4E
2035 Concept Existing Alignment	6C	6C	6F	6F	4F	4F	2C(I)**	2C(I)++	4E
UTC Existing Alignment	6C	6C	8F	8F	6F	4F	2C(I)**	2C(I)++	4E
Facility New Alignment UTC	8F	8F	8F	Returns to existing alignment near Baker Street	On existing alignment	6F	4E	4E	4E
Facility New Alignment ROW	240	240 (275 existing in some locations)	240 (300 existing in some locations)	NA	NA	214 (250 existing in some locations)	250	250	250
LOS: 2009	F	F	C	C	E	D	C	C	B
LOS: 2020	F	F	C	D	F	E	D	C	B
LOS: 2035	F	F	E	F	F	F	D	D	B
LOS: Concept 2035	D	D	D	D	D	D	C	C	C
Deficiency/Year Deficient	2009	2009	2035	2035	2009	2020	N/A	N/A	N/A
Project in STIP/RTP (Y/N)	Yes	No	No	No	Yes	Yes	No	No	No
LOS W/ Concept Improvement	F	N/A -	N/A -	N/A -	F	B*	N/A	N/A	N/A
Directional Split (Peak Hour)	57/43	57/43	57/43	60/40	60/40	60/40	70/30	70/30	70/30
AADT: 2009	66,000	64,000	67,000	60,000	26,500	12,300	5,200	4,600	5,700
AADT: 2020	77,900	81,300	83,000	82,600	46,000	18,400	7,200	5,800	7,100
AADT: 2035	96,100	83,700	108,500	123,200	91,600	30,300	11,000	7,600	9,500
Peak Hour: 2009	6,500	6,350	6,600	5,900	2,500	1,200	620	530	630
Peak Hour: 2020	7,330	7,490	8,470	8,810	4,390	1,770	830	630	750
Peak Hour: 2035	8,500	9,250	11,570	14,550	8,870	2,880	1,210	790	940
% Trucks: AADT	4%	4%	4%	5%	5%	7%	7%	7%	7%
% Trucks: Peak Hour	9%	9%	9%	9%	8%	8%	13%	13%	13%



LEGEND



Segment: Is self-explanatory except for several data sets:

Rural/Urban: Indicates whether the segment is in a rural area or city limits.

Terrain: Shows the general highway grade: minimal grade = level; moderate grade = rolling; and severe grade = mountainous.

ROW: Portrays Right-of-Way (ROW) and geometric data in feet.

Shoulder Range: Is a range of treated surface (8 standard), both inside and outside shoulders.

Ultimate Transportation Corridor (UTC): Is the typical ROW needed for the ultimate facility and will be updated upon corridor plan lining by specific sections of highway.

Facility: Shows the Existing Facility, the desired facility type (2035 Concept) by 2035- RTPAs and Caltrans, and the Ultimate Facility to preserve ROW and plan line beyond 2035. 2C(I) indicates that the highway has been improved in select locations with operational or safety improvements.

LOS: The current LOS (level of service), along with the expected calculated LOS in 2020 and 2035. The 2035 Concept is the target LOS desired, i.e., LOS C, for attainment by 2035.

Deficiency: Occurs when the target LOS is degraded, i.e., LOS D worse than LOS C, with the year of occurrence shown. It also shows whether a capacity improving project is in the STIP, and what the LOS would be with the 2035 Concept improvement.

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

+ The Ultimate ROW is generally the same as the existing ROW

** 2035 Route Concept: Extension of 4F is under discussion with Bakersfield; To be determined

AAADT: signifies Annual Average Daily Traffic.

Peak Hour: Indicates a representation of the maximum hour of traffic flow during the day.

N/A: Not deficient, no project recommended/not applicable.

N/A - : Deficient, no project recommended.

(I)++ : 2-lane conventional highway improvements, turn lanes, signals, passing lanes, etc.

* Concept Facility meets Concept LOS.

99P: Median width 100ft or greater with or without variance.

SEGMENT	10	11	12	13	14	15
County / Route	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178
Description Begin	SEQUOIA NATL FOREST BOUNDARY	3.4 MI E OF CHINA GARDEN RD	0.4 MI W OF BODFISH RD	1.0 MI E OF ROUTE 155	SIERRA WAY	1.0 MI E OF SIERRA WAY
Description End	3.4 MI E OF CHINA GARDEN RD	0.4 MI W OF BODFISH RD	1.0 MI E OF ROUTE 155	SIERRA WAY	1.0 MI E OF SIERRA WAY	KELSO VALLEY RD
Postmile Limits Begin/End (PM)	R30.6 / R31.7	R31.7 / R41.2	R41.2 / R43.9	R43.9 / 55.7	55.7 / 56.7	56.7 / 57.1
Length (MI)	1.0	9.5	2.7	11.8	1.0	0.4
Rural / Urban	Rural	Rural	Rural	Rural	Rural	Rural
Terrain	Mountainous	Mountainous	Mountainous	Rolling	Rolling	Rolling
ROW: Range Existing (FT)	240 / 240	175 / 240	160 / 200	110 / 200	170 / 170	60 / 170
Median Range (FT)	0 / 4	0 / 4	4 / 46	4 / 12	0 / 0	0 / 0
Shoulder Range (FT) - Treated	5 / 8	0 / 5	5 / 10	0 / 10	0 / 4	0 / 2
Lane Width (FT)	12	12	12	12	12	12
Ultimate ROW (FT)	+	+	+	+	+	+
Facility: Existing	2E	4E	4F	2C	2C	2C
2035 Concept	2E	4E	4F	2C(I)++	2C(I)++	2C(I)++
UTC	4E	4E	4F	2C(I)++	2C(I)++	2C(I)++
LOS: 2009	D	B	B	E	E	D
LOS: 2020	D	B	B	E	E	E
LOS: 2035	D	B	B	F	F	E
LOS: Concept 2035	C	C	C	C	C	C
Deficiency/Year Deficient	2009	N/A	N/A	2009	2009	2009
Project in STIP/RTP (Y/N)	No	No	No	No	No	No
LOS W/ Concept Improvement	N/A -	N/A	N/A	N/A -	N/A -	N/A -
Directional Split (Peak Hour)	70/30	70/30	70/30	60/40	60/40	60/40
AAADT: 2009	4,300	4,000	4,200	8,200	8,300	4,900
AAADT: 2020	5,400	5,000	5,400	11,000	12,100	7,100
AAADT: 2035	7,100	6,600	7,400	16,000	19,400	11,500
Peak Hour: 2009	480	360	380	1,350	1,500	540
Peak Hour: 2020	570	430	470	1,770	2,190	790
Peak Hour: 2035	720	540	600	2,490	3,510	1,260
% Trucks: AADT	7%	8%	8%	8%	8%	8%
% Trucks: Peak Hour	13%	13%	13%	13%	1%	1%



State Route

LEGEND

Existing Lanes **Conventional**
Planned or Programmed by 2035 **Expressway**
Freeway
Add Through Lanes **Number of Lanes**
 2
 4
 6

* Length of segments not to scale

N JCT ROUTE 99/58/178	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD RIVER	MOUTH OF KERN OF DEMOCRAT RD CYN	SEQUOIA NATL FOREST BOUNDARY
PM 0.0	PM 1.0	PM 1.7	PM R4.1	PM R6.2	PM T9.6	PM R11.0	PM 13.7	PM 24.0
Direction W - E		(Couplet)						
B	A	K	E	R	S	F	I	E
L	D							

Segment: Is self-explanatory except for several data sets:

Functional Classification: A process by which streets and highways are grouped into or classification systems.

Freeway/Expressway System: The Statewide system of highways declared to be essential to the future development of California.

Regionally Significant: Serves regional transportation needs including at a minimum all principal arterial highways and all fixed guideway transit facilities.

STRAHNET: A highway that provides defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war.

Lifeline: A route on the State highway system that is deemed so critical to emergency response/life-saving activities of a region or the state that it must remain open.

IRRS: (Interregional Road System): A series of State highway routes, outside the urbanized areas, that provide access to the State's economic centers, major recreational areas, and urban and rural regions.

STAA (Surface Transportation Assistance Act): This act required states to allow larger trucks on the National Network. "Terminal Access" routes are State highways that can accommodate STAA trucks. Other designations i.e., California Legal offer more limited access.

Scenic: A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers.

ICES (Intermodal Corridor of Economic Significance): Significant National Highway System Corridors that link intermodal facilities most directly, conveniently and efficiently to intrastate, interstate, and international markets.

NHS (National Highway System): Included is all interstate routes, a large percentage of urban and rural principal arterials, the defense strategic highway network, and strategic highway connectors.

SEGMENT	1	2	3	4	5	6	7	8	9
County / Route	KERN / 178	KERN / 178							
Description Begin	N JCT ROUTE 99/58/178	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD	MOUTH OF KERN RIVER CANYON	2.6 MI W OF DEMOCRAT RD
Description End	B ST	M ST	HALEY ST OC	0.6 MI E OF OSWELL ST OC	ROUTE 184	RANCHERIA RD	MOUTH OF KERN RIVER CANYON	DEMOCRAT RD	2.6 MI W OF SEQUOIA NATL FOREST BOUNDARY
Postmile Limits	0.0 / 1.0	1.0 / 1.7	1.7 / R4.1	R4.1 / R6.2	R6.2 / T9.6	T9.6 / R11.0	R11.0 / 13.7	13.7 / 24.0	24.0 / R30.6
Length (MI)	1.0	0.7	2.4	2.1	3.4	1.4	2.7	10.3	6.6
Functional Classification	Principal Arterial	Minor Arterial	Minor Arterial	Minor Arterial	Minor Arterial				
National Highway System (NHS) (Y/N)	No	No							
Freeway/Expressway System (Y/N)	Yes	Yes							
Regionally Significant (Y/N)	Yes	Yes							
STRAHNET (Y/N)	No	No							
Lifeline (Y/N)	No	No							
IRRS (Yes: HE=High Emphasis, F=Focus, G=Gateway or No)	No	No	No	No	No	No	Yes	Yes	Yes
TRUCK NETWORK, STAA: (NN=National Network, TA=Terminal Access, CL= California Legal, R= Special Restrictions, or A=Advisory)	TA	A	A						
Scenic (Yes: Officially Designated, Eligible or No)	No	No							
ICES (Intermodal Corridor of Economic Significance) (Y/N)	No	No							
Metropolitan Bakersfield General Plan Boundary LOS Standard	Metropolitan Bakersfield General Plan Boundary LOS C	Metro. Bakersfield Gen. Plan LOS C; Kern Co. General Plan D	Metropolitan Bakersfield General Plan Boundary LOS D						
General Plan/RTP Standard Highway Classification	Freeway	Freeway	Freeway	Freeway	Freeway	Freeway	Expressway	Expressway	Expressway
Passing Lanes (Y/N)	No	Yes							
Bike Use Allowed (Y/N)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes



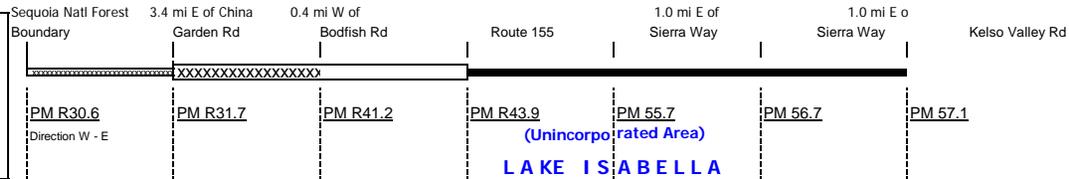
State Route

LEGEND

Existing Lanes

Planned or Programmed by 2035

* Length of segments not to scale

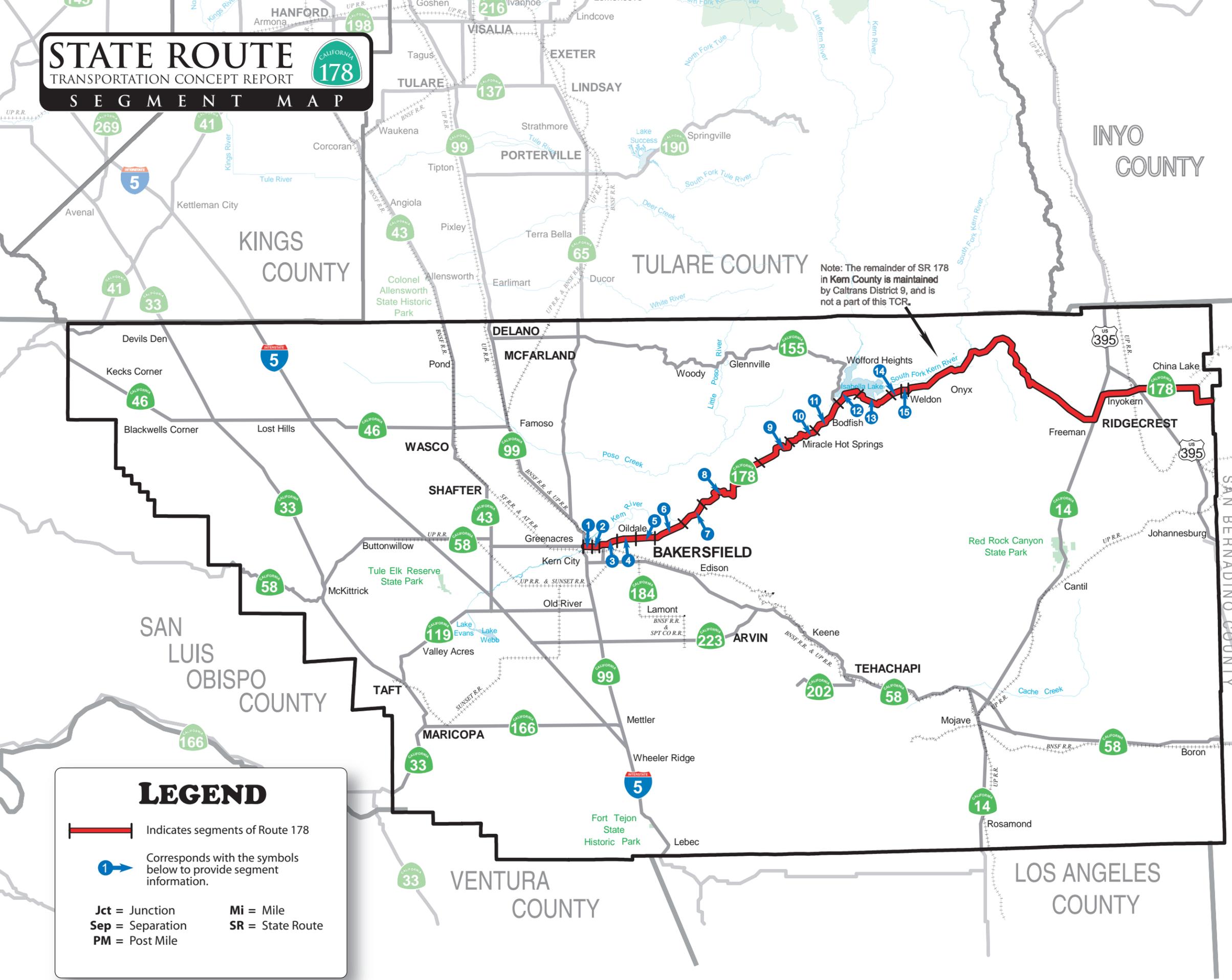


SEGMENT	10	11	12	13	14	15
County / Route	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178	KERN / 178
Description Begin	FOREST BOUNDARY 3.4 MI E OF CHINA	GARDEN RD 0.4 MI W OF	BODFISH RD 155 1.0 MI E OF ROUTE	155 SIERRA WAY	SIERRA WAY 1.0 MI E OF SIERRA WAY	1.0 MI E OF SIERRA WAY
Description End	GARDEN RD	BODFISH RD	155	SIERRA WAY	WAY	KELSO VALLEY RD
Postmile Limits						
Begin/End (PM)	R30.6 / R31.7	R31.7 / R41.2	R41.2 / R43.9	R43.9 / 55.7	55.7 / 56.7	56.7 / 57.1
Length (MI)	1.0	9.5	2.7	11.8	1.0	0.4
Functional Classification	Minor Arterial	Minor Arterial	Minor Arterial	Minor Arterial	Minor Arterial	Minor Arterial
National Highway System (NHS) (Y/N)	No	No	No	No	No	No
Freeway/Expressway System (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
Regionally Significant (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
STRAHNET (Y/N)	No	No	No	No	No	No
Lifeline (Y/N)	No	No	No	No	No	No
IRRS (Yes: HE=High Emphasis, F=Focus, G=Gateway or No)	Yes	Yes	Yes	Yes	Yes	Yes
TRUCK NETWORK, STAA: (NN=National Network, TA=Terminal Access, CL= California Legal, R= Special Restrictions, or A=Advisory)	CL	CL	CL	CL	CL	CL
Scenic (Yes: Officially Designated, Eligible or No)	No	No	No	No	No	No
ICES (Intermodal Corridor of Economic Significance) (Y/N)	No	No	No	No	No	No
Kern County General Plan LOS Standard	Kern Co General Plan LOS D	Kern Co General Plan LOS D	Kern Co General Plan LOS D	Kern Co General Plan LOS D	Kern Co General Plan LOS D	Kern Co General Plan LOS D
General Plan/RTP Standard Highway Classification	Expressway	Expressway	Expressway	Expressway	Expressway	Expressway
Passing Lanes (Y/N)	Yes	Yes	Yes	No	No	No
Bike Use Allowed (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes

STATE ROUTE 178

TRANSPORTATION CONCEPT REPORT

SEGMENT MAP



Note: The remainder of SR 178 in Kern County is maintained by Caltrans District 9, and is not a part of this TCR.



KERN COUNTY

- 1 **Segment 1:** SR 178 PM 0.0 / 1.0
N Jct SR 99/58/178 Sep / B St
- 2 **Segment 2:** SR 178 PM 1.0 / 1.7
B St / M St
- 3 **Segment 3:** SR 178 PM 1.7 / R4.1
M St / Haley St OC
- 4 **Segment 4:** SR 178 PM R4.1 / R6.2
Haley St OC / 0.6 Mi E of Oswell St OC
- 5 **Segment 5:** SR 178 PM R6.2 / T9.6
0.6 Mi E of Oswell St OC / SR 184
- 6 **Segment 6:** SR 178 PM T9.6 / R11.0
SR 184 / Rancheria Rd
- 7 **Segment 7:** SR 178 PM R11.0 / 13.7
Rancheria Rd / Mouth of Kern River Canyon
- 8 **Segment 8:** SR 178 PM 13.7 / 24.0
Mouth of Kern River Canyon / 2.6 Mi W of Democrat Rd
- 9 **Segment 9:** SR 178 PM 24.0 / R30.6
2.6 Mi W of Democrat Rd / Sequoia Natl. Forest boundary
- 10 **Segment 10:** SR 178 PM R30.6 / R31.7
Sequoia Natl. Forest boundary / 3.4 Mi E of China Garden Rd
- 11 **Segment 11:** SR 178 PM R31.7 / R41.2
3.4 Mi E of China Garden Rd / 0.4 Mi W of Bodfish Rd
- 12 **Segment 12:** SR 178 PM R41.2 / R43.9
0.4 Mi W of Bodfish Rd / 1.0 Mi E of SR 155
- 13 **Segment 13:** SR 178 PM R43.9 / 55.7
1.0 Mi E of SR 155 / Sierra Wy
- 14 **Segment 14:** SR 178 PM 55.7 / 56.7
Sierra Wy / 1.0 Mi E of Sierra Wy
- 15 **Segment 15:** SR 178 PM 56.7 / 57.1
1.0 Mi E of Sierra Wy / Kelso Valley Rd

LEGEND

Indicates segments of Route 178

Corresponds with the symbols below to provide segment information.

Jct = Junction	Mi = Mile
Sep = Separation	SR = State Route
PM = Post Mile	

- Route 178 intersects many city streets within Bakersfield. A majority of the intersected streets are signalized.
- Route 178 has an interchange with the North Junction of Route 204 (PM R2.00).
- There is an interchange at Beale Avenue (PM 3.40).
- There is an interchange at Mt. Vernon Avenue (PM 4.62).
- An interchange connection exists at Oswell Street (PM 5.60).
- An interchange connection at Fairfax Road has been completed (PM R6.10/R7.50).
- An interchange connection is proposed at Morning Drive.
- An interchange is proposed at Vineland Road between Morning Drive and Route 184 and would serve as the new north/south access route.
- Route 178 intersects with Route 184 (PM T9.61).

Metropolitan Bakersfield Freeway Beautification Master Plan Design Guidance: The City of Bakersfield, in collaboration with other agencies, interested parties, and the general public, developed the “Metropolitan Bakersfield Freeway Beautification Master Plan Design Guidance.” This Plan represents a long-range strategy to improve the aesthetics and ambience of some of the principal freeway corridors within the metropolitan area, with the basic goals to create a more positive image of the City and provide the best quality of life possible for the residents. The Plan includes guidelines for both hardscape (soundwalls, overpass & bridge treatments, fencing, etc.) and softscape (plantings) concepts. A section of Route 178, from Route 99 to approximately ¼-mile west of Morning Drive, is included as one of the listed corridors. The Plan identifies a number of aesthetic improvement opportunities along the Route, as well as an “arrival gateway” monument to be located at the site of the future Rancheria Road interchange.

Key to implementation of the Plan will be multi-agency cooperation between the City, County of Kern, and Caltrans. Redevelopment of adjacent land uses will also provide an opportunity for implementation. The Plan states that the City and County will use development agreements as a means of encouraging developments to incorporate concepts that provide for attractive urban environments.

Environmental/Historical Resources: Environmental concerns in the urban areas would include impacts from ROW acquisition, noise, and landscape removal. Route 178 traverses a primarily commercial area bordered by residential neighborhoods that contain many potentially historic homes and buildings. The San Joaquin kit fox is known to den in the Route 99/58/178 Interchange area. Context sensitive solutions must be considered in all improvements to the route.

b) Segments 6-10: Route 184 to 3.4 Miles east of China Garden Road

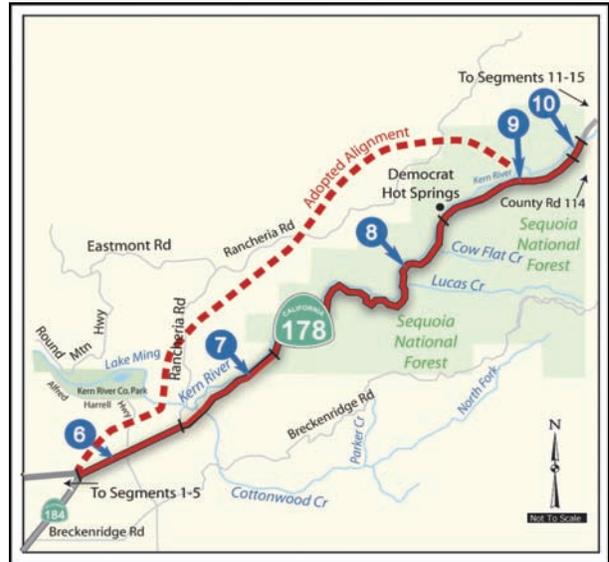
Begins: At Route 184 (PM 9.61)

Ends: At 3.4 miles east of China Garden Road (PM 33.27)

Land Use: Segments 6-10 begin with an urban segment with sprawling residential development toward the remaining rural segments. Route 178 then traverses the mouth of the Kern River Canyon to Sequoia National Forest.

Facility: The highway is a 2-lane conventional highway (PM 9.60) to 2.6 miles west of Democrat Road within the Sequoia National Forest. The route travels through a geologically unstable area.

Within Segments 8-10, the Kern River Canyon Road includes rock and boulder formations along the route with limited shoulders. Segments 9 and 10 are comprised of both a 2-lane conventional highway and a 4-lane expressway.



SR 178 is comprised of both a 2-lane conventional highway and a 4-lane expressway in the Kern River Canyon.

Through discussions with Bakersfield there is serious consideration of relocating a portion of Route 178 to the adopted alignment shown in the map above. The proposal consists of relocating that portion between west of the proposed Vineland Avenue to east of the intersection of Rancheria Road, utilizing an interim connection back to the existing Route 178 near the mouth of the Kern River Canyon.

Interchanges and other intersections with State highways:

- Route 178 intersects with Route 184 (PM T9.61).
- Route 178 intersects with Rancheria Road (PM R10.96), Democrat Springs Road (PM R26.63), and China Garden Road (PM 33.27).

Environmental/Historical Resources: From east of Oswell Street to the mouth of the Kern Canyon the main environmental issues are endangered species, primarily the kit fox and the Bakersfield cactus. Geological issues are a primary concern in and near the Sequoia National Forest Boundary. Other issues include archaeological sites, water, and sensitive resources near the Kern River.

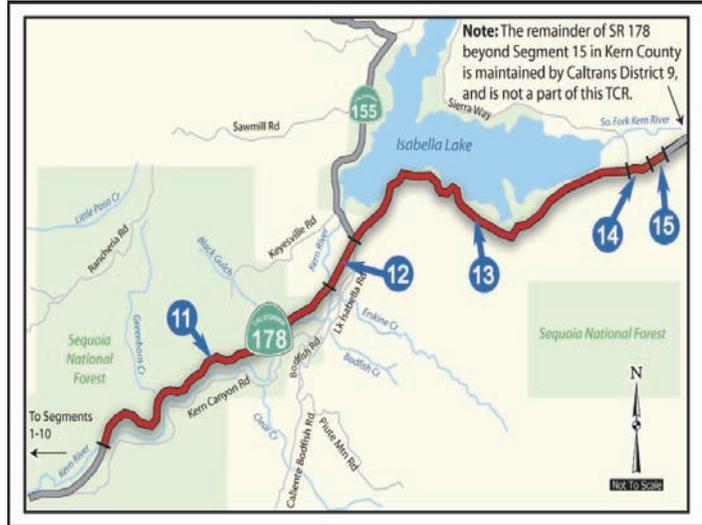
ROW acquisitions and preservation are important route adoption issues for the new alignment. ROW acquisition may be cost prohibitive and environmentally significant. The Edison powerhouse complex near Sidehill Viaduct is eligible for the National Historic Register.

c) Segments 11-15: 3.4 miles east of China Garden Road to Kelso Valley Road

Begins: At 3.4 miles east of the China Garden Road (PM 33.27)

Ends: At Kelso Valley Road (PM 57.07)

Land Use: Segments 11-15 traverse through recreational areas associated with the Lake Isabella Reservoir, as well as the communities of Bodfish, Lake Isabella, Mountain Mesa, and South Lake. A major point of interest is the Sequoia National Forest.



Facility: The route begins with a 4-lane expressway in Segment 11 and a 4-lane freeway in Segment 12. Segments 13-15 consist of a 2-lane conventional highway to Kelso Valley Road.

Interchanges and other intersections with State highways:

- There is an interchange connection is at Bodfish Road (PM R41.64);
- An interchange connection at Route 155 (PM 42.94); and
- The route intersects with Sierra Way (PM 55.55) and Kelso Valley Road (PM 57.07).

Environmental/Historical Resources: Issues include several recreation areas associated with the Lake Isabella reservoir and several archeological sites. Any future improvements to this section of Route 178 will need to consider these environmental issues. Riparian concerns are associated with the Kern River, canals, and creeks. Context sensitive solutions must be considered for the communities of Mountain Mesa and South Lake. ROW acquisition for future projects may be cost prohibitive and environmentally significant.

Segments 12 through 15 are within the area covered by the **Draft Kern Valley Specific Plan**. The Plan includes Draft Design Guidelines, for ultimate inclusion in the Zoning Ordinance that will provide guidance for future community development and conservation over the next 20 years.

C. Goods Movement

1. Trucking

In 2000, the counties of the San Joaquin Valley in conjunction with Caltrans, hired a consulting firm to conduct the “San Joaquin Valley Goods Movement Study.” This study found that trucking is the dominant mode for moving freight within the Valley, while rail accounted for only 11% of the total tonnage.

Per Streets and Highways Code Section 164.18, the portion of Route 178 from the eastern City Limits of Bakersfield to Route 14 is included as part of the Interregional Road System. In District 6, this portion runs from Rancheria Road to Kelso Valley Road near Weldon (Segments 7-15).

Tractor-semi-trailer combinations are limited to the National Network (Federal- Surface Transportation Assistance Act or STAA Network) and its Terminal Access (State-STAA Network) routes by a combination of length, kingpin to rear axle limit (KPRAs), and the number of axles. Road signs have been posted identifying Terminal Access routes, KPRAs Advisory routes, and routes with special restrictions. Route 178 has the following designations within District 6:

- Route 178 is designated as a State Highway Terminal Access Route for larger trucks under the STAA from the Route 99/58/178 interchange (PM 0.00) to near the mouth of the Kern Canyon (PM 13.70). The portion to be relinquished will also retain its STAA designation as part of the conditions of relinquishment.
- From the mouth of the Kern Canyon to Kern River Canyon Road, Route 178 (PM 30.00) is designated as a KPRAs Advisory route, which restricts KPRAs lengths on the route.
- A California Legal designation (40-foot KPRAs) exists from 20 miles east of the Route 184 junction (PM 30.00) to Chimney Creek Road (PM 70.70)

The transport of various types of commodity by truck connects the San Joaquin Valley to the rest of the state, with shipments to and from southern California and the Bay Area constituting the greatest percentage of the total tonnage (18 and 14 percent of the total, respectively). Caltrans and our local transportation partners will need to give special attention to the routes that serve as major goods movement corridors to ensure that they remain in serviceable condition and that major reconstruction costs are minimized.

2. Freight Rail

Trucking is the most commonly used mode for transporting freight in the San Joaquin Valley, providing flexibility, timely delivery, and efficiency, with only approximately 25% of shippers currently using rail. Rail is limited by travel speed and by fixed routes

that offer fewer choices. Rail, however, can provide an economical means of transporting bulk goods. While trains demand heavy fuel consumption, they can be less expensive than trucking for long-haul loads. Trains have the ability to haul large amounts of cargo, making the overall energy requirement per unit of weight less than with trucking or air transport.

Two major rail companies, Union Pacific (UP) and Burlington Northern Santa Fe (BNSF), serve Kern County. According to the *San Joaquin Valley Goods Movement Study, 2000*, UP operates an average of 19 trains per day through the San Joaquin Valley carrying food products, general freight, grain, and lumber. UP has teamed up with CSX Transportation, a transportation company providing rail, intermodal and rail-to-truck services for coast-to-coast intermodal transportation, linking customers to railroads via trucks and terminals. This provides perishable goods transport as well as refrigerated service from the San Joaquin Valley to New York and Boston. The San Joaquin Valley Railroad operates regional freight service between Tulare, Fresno, and Kern Counties on leased Union Pacific branch lines, providing a connection to mainline carriers for outlying areas throughout the Valley. They primarily move freight comprised of agricultural products.

Rail can also provide specialized transport with a variety of rail cars such as flatbeds, refrigerated boxcars, fuel tankers, and piggyback cars, allowing the transport of a large variety of goods. San Joaquin Valley food processors continue to show interest in rail as a preferred shipping mode for bulk products. It is expected that rail shipment volumes in the Valley will increase, although market share may continue to decline as demand for shorter-haul service increases and the quality of rail intermodal facilities improve.

3. Rail Intermodal Facilities

Intermodal terminals are starting and ending points for trains, and provide a central point for distribution of goods between various transportation modes. The railroads have consolidated their intermodal service networks into fewer, larger hubs, in part to provide sufficient volume at one location to justify lift machines. The UP Railroad has intermodal facilities in both Fresno and Lathrop. BNSF has Intermodal facilities in Bakersfield, Fresno, Modesto, and Stockton. These intermodal facilities, while improving goods movement coordination, do have a potential to cause truck congestion and access issues on local roads.

4. Air Freight Service

Air freight service provides fast shipment of small items of high value over long distances. Typically, this is at a high cost. Air freight service is an emerging element of freight movement in the San Joaquin Valley. Air freight represents a specialized transportation mode, with its major advantages being dependability and a very short in-

transit time. Air carriers depend heavily on truck transportation for the delivery of the goods they transport. Air freight has not played a large role in the Kern County area, but it is feasible that air freight carriers would consider Kern County a favorable alternative location as the Los Angeles basin continues to grow and operations at Meadows Field expand.

5. Inland Port

Foreign Trade Zone and/or Enterprise Zone designations provide “Inland Ports” serving as cargo facilitation centers, where a number of import, export, manufacturing, packing, warehousing, forwarding, customs, and other activities could take place in close proximity or at the same site. Such a facility could function as an inland sorting and depository center for ocean containers transported to the inland port via truck or rail.

The City of Shafter has an inland port status facility at its International Trade and Transportation Center. The facility has a container hub allowing distributors to drop empty trailers at the site for pick up by other drivers, thus eliminating a large number of truck trips over the Grapevine and through the Los Angeles basin. While the City of Shafter is north of Route 178, the inland port still has the potential to benefit regional air quality, in addition to creating jobs.

The Port of Stockton has expanded its Foreign Trade Zone designation to include the nearly 475-acre Opus Logistics Center in East Stockton. This is the eighth such site approved for Stockton. The new facility is strategically located next to the BNSF railroads intermodal facility, and presents a number of benefits to shippers, including direct transfer from ship to rail. While this facility is also north of Route 178, improvement in such strategies could benefit all goods movement corridors.

Additionally, the City of Fresno has “Port of Entry” status. A port of entry is any designated place at which a U.S. Customs and Border Protection officer is authorized to accept entries of merchandise, to collect duties, and to enforce the various provisions of the customs and navigation laws.

D. Alternative Modes of Transportation

1. 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 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 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.

The Amtrak line known as the "San Joaquins" runs north-south, linking Bakersfield and the Bay Area with stops in Fresno, Madera, Stockton, and Sacramento. The San Joaquins is the fourth busiest route in the Amtrak national system, and operates six times in each direction, 365 days per year. At the present time, four round trips daily 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. Adding trains to the existing San Joaquins line has been considered.

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.

2. High Speed Rail

The California High Speed Rail Authority (HSRA) has developed a plan to build a high-speed rail line that would service the major metropolitan centers of California. Stretching initially from Anaheim/Los Angeles through the Central Valley to San Francisco, and later to Sacramento and San Diego, the system is capable of reaching speeds of 220 miles per hour.

The system will interconnect with and complement other modes of transportation, such as commercial airports, mass transit, the state's highway network, as well as bike paths and foot traffic. The California high-speed train will operate primarily on exclusive tracks, although some portions of the route will be shared with other existing passenger rail operations. Extensive portions of the system will lie within, or adjacent to, existing rail or highway ROW (rather than on a new alignment) to reduce potential environmental impacts and minimize land acquisition.

A bond measure to fund at least a portion of the High-Speed Rail was passed in November 2008. The bond measure authorizes \$9 billion in spending for high-speed rail improvements and other rail services. Then, in 2009, \$8 billion in funding within

the American Recovery and Reinvestment Act (ARRA) was directed to high-speed train projects throughout the country, of which the HSRA received \$2,250,000. With passage of the bond, and the additional ARRA funds, construction could begin as early as 2012.

The HSRA has recommended alignments through the Valley that include both the UP/SP and BNSF railroad corridors, both running generally parallel to Route 99. Several stations have been proposed in the San Joaquin Valley.

3. Transit Services

Both fixed-route and dial-a-ride buses serve the local traveler in Kern County. Common transit carriers include Greyhound Bus Lines, Orange Belt Stages, the Airport Bus of Bakersfield, and the Amtrak bus. Golden Empire Transit is the local transit carrier within Bakersfield. Kern Regional Transit operates along the “Bakersfield to Lake Isabella” corridor. Kern River Valley Fixed Route and Dial-a-Ride serves the communities of Lake Isabella, Onyx, and Kernville.

4. Bicycles and Pedestrians

Route 178 contains both open and closed segments for bicycle and pedestrian travel. For the most part, all non-freeway segments of this highway are open for bicycling and walking. However, while many segments are open, they often lack adequate shoulders, such as the section through the narrow Kern River Canyon. Bicycle traffic is therefore not recommended on these narrow segments. Future plans call for upgrading numerous segments of this highway.

The 2002 Metropolitan Bakersfield General Plan contains similar policies to those in the Bikeway Master Plan and includes maps of existing and future bike facilities from the Bikeway Master Plan. These include the bike path along the Kern River as well as over 30 miles of existing bike facilities throughout the Metropolitan Bakersfield area. Please refer to the “Bicycle Routes/Pedestrian Access” section of the Appendices B and C, Pages 29-31, located at the end of this report for more detailed information.

5. Aviation

The regional airport system in Kern County includes seven airports operated by the Kern County Department of Airports, four municipally owned airports, three airport districts, two privately owned public-use airports, and two major military facilities. Of these, the following are within, or near, the Route 178 corridor in District 6:

a) Kern Valley Airport

Kern Valley Airport serves commercial, recreational, and occasional fire suppression activities in the Lake Isabella/Kern River Valley area, and is on lease from the U.S. Forest Service. The airport is located south and east of the community of Kernville, with other nearby communities, including Wofford Heights, Lake Isabella, Bodfish, Mountain Mesa, Onyx, and Weldon. Outdoor recreation is the prime attraction in this region, and aviation activity continues to increase. The airport has a fixed-base operator. The airport is situated on 51.5 acres leased from the National Forest Service; a Forest Service fire-fighting base is adjacent to the airport on 3.5 acres.

b) Democrat Heliport

Democrat Heliport is a U.S. Forest Service facility located near the Democrat Hot Springs fire station in the lower Kern River Canyon, west of Lake Isabella. The heliport is open year-round, and, while a U.S. Forest Service facility, is used by other agencies, including the Kern County Fire Department.

E. Route Inventory:

Current AADT, Level of Service, % Trucks, Peak-Hour AADT, 10 and 25-year AADT forecasts, are presented in Table 1, Summary Chart, Pages 4, 5, 6, and 7.

1. Traffic Volumes and Type

The Average Annual Daily Traffic (AADT) ranges from 3,800 to 64,000, with trucks constituting up to 13% percent of the AADT. Tractor-semi-trailer combinations are limited to the National Network (Federal- Surface Transportation Assistance Act or STAA Network) and its Terminal Access (State-STAA Network) routes by a combination of length, kingpin to rear axle limit (KPRA) and the number of axles. Road signs have been posted identifying Terminal Access routes, KPRA Advisory routes, and routes with special restrictions. Route 178 has several related designations within District 6; please see the section on Goods Movement, Trucking, on Page 13 of this TCR.

2. Characteristics

a) Park and Ride lots

A park and ride lot with eleven spaces is located at the junction of Route 178 and Route 155.

3. Intelligent Transportation Systems:

Intelligent Transportation Systems (ITS) consist of the electronics, communications, or information technology processing that improves the safety and efficiency of the route's operations. ITS elements include detection, traffic control, incident management, advanced traveler information systems, transportation management centers, 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. The Caltrans Central Valley Transportation Management Center (TMC) monitors specific traffic locations from its headquarters at the District Office in Fresno.

Transmitting ITS data requires an integrated fiber optic network along Route 178 and other corridors in the urbanized area. With such a fiber optic network in place, the Caltrans Central Valley Traffic Management Center (TMC) at the District Office in Fresno would be able to relay this data, monitor conditions, and provide for rapid response when conditions deteriorate. Numerous applications of ITS exist or are proposed throughout the Route 178 corridor. Please see Table 2, Page 20, for a list the existing elements. Proposed ITS elements are presented in Table 3 on Pages 21 and 22.

Operational and safety efficiency will be enhanced by the deployment of Intelligent Transportation System technology. 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. The goal is that the transportation system, as a whole, including highways,



Call Boxes located along Route 178 are one aspect of the ITS network provided to motorists in Kern County.

**TABLE 2
EXISTING ITS ELEMENTS ON ROUTE 178**

Postmile	Location	Element Type
0.350	178 (24th Street) @ Oak Street	Signal
1.250	178 (24th Street) @ F Street	Signal
1.260	178 (23rd Street) @ F Street	Signal
1.340	178 (23rd Street) @ H Street	Signal
1.370	178 (24th Street) @ H Street	Signal
1.460	178 (23rd Street) @ Chester	Signal
1.510	178 (24th Street) @ Chester Avenue	Signal
1.610	WB 178(24th St)@L Street	Signal
1.620	24th Street @ L Street	Signal
1.620	178 (23rd Street) @ L Street	Signal
1.700	EB East of M Street	Traffic Count Station
1.700	WB East of M Street	Traffic Count Station
1.710	178 (24th Street) @ M Street	Signal
1.720	178 (23rd Street) @ M Street	Signal
2.000	178 (24th Street) @ Q Street	Signal
2.420	Niles Street @ Union Avenue	Signal
2.420	Monterey Street @ Union Avenue	Signal
4.100	WB @ Haley Street OC	Changeable Message Sign
4.640	178 (EB) @ Mt. Vernon	Signal
4.640	178 @ Mt Vernon West	Signal
5.640	178 (WB) @ Oswell Street	Signal
5.640	EB/WB East of Oswell Street	Traffic Count Station
5.680	178 (EB) @ Oswell Street	Signal
6.770	178 @ Fairfax Road	Signal
8.540	EB/WB West of Jct. Route 184	Traffic Count Station
9.024	178 @ Canteria	Signal
T9.70	EB just E/O Jct Route 184	Changeable Message Sign
9.260	@ Comanche Rd/Alfred Harrel Hwy	Signal
10.910	178@ Miramonte Drive	Signal
13.600	EB/WB East of Rancheria Road	Traffic Count Station
43.700	WB @ Bodfish	Changeable Message Sign
57.080	EB/WB E. of Kelso Valley Road	Traffic Count Station

**TABLE 3
PROPOSED ITS ELEMENTS ON ROUTE 178**

Postmile	Location	Element Type
0.000	EB/WB East of Jct. Routes 99/58	Traffic Count Station
0.360	EB/WB East of Oak Street	Traffic Count Station
1.220	EB on 23rd Street West of F Street	Traffic Count Station
1.220	WB on 24th Street East of F Street	Traffic Count Station
1.238	EB on 23rd Street East of F Street	Traffic Count Station
1.238	WB on 24th Street West of F Street	Traffic Count Station
1.500	Chester Avenue	Vehicle Detection System
1.504	EB on 23rd Street West of Chester	Traffic Count Station
1.704	EB West of M Street	Traffic Count Station
1.704	WB West of M Street	Traffic Count Station
1.889	EB off to Union Avenue	Traffic Count Station
1.947	EB West of Q Street	Traffic Count Station
1.959	WB Q Street	Traffic Count Station
2.000	W of Route 184	Changeable Message Sign
2.071	WB on from Union Avenue	Traffic Count Station
2.220	EB on from SB Route 204	Traffic Count Station
2.220	At Route 204	Vehicle Detection System
2.266	WB off to NB Route 204	Traffic Count Station
2.410	EB Monterey St/Union Avenue	Ramp Metering System
2.450	EB/WB Route 204	Closed Circuit Television
2.615	EB on from Union Avenue	Traffic Count Station
2.643	WB off to Union Avenue	Traffic Count Station
3.270	WB on from Beale Avenue	Traffic Count Station
3.374	EB off to Owens Street	Traffic Count Station
3.571	EB on from Owens Street	Traffic Count Station
3.595	WB off to Beale Ave	Traffic Count Station
4.062	EB off to Haley Street	Traffic Count Station
4.126	WB on from Height/Haley	Traffic Count Station
4.511	EB off to Mt. Vernon Avenue	Traffic Count Station
4.553	WB on from Mt. Vernon Avenue	Traffic Count Station
4.718	EB on from Mt Vernon Avenue	Traffic Count Station
4.754	WB off to Mt Vernon Avenue	Traffic Count Station
5.451	EB off to Oswell Street	Traffic Count Station
5.479	WB on from Oswell Street	Traffic Count Station
5.599	EB on from SB Oswell Street	Traffic Count Station
5.640	EB Oswell Street	Ramp Metering System
5.650	Oswell Street	Closed Circuit Television
5.767	EB on from NB Oswell Street	Traffic Count Station
5.781	WB off to Oswell Street	Traffic Count Station
9.460	Route 184	Closed Circuit Television
9.610	East of Jct. Route 184	Traffic Count Station

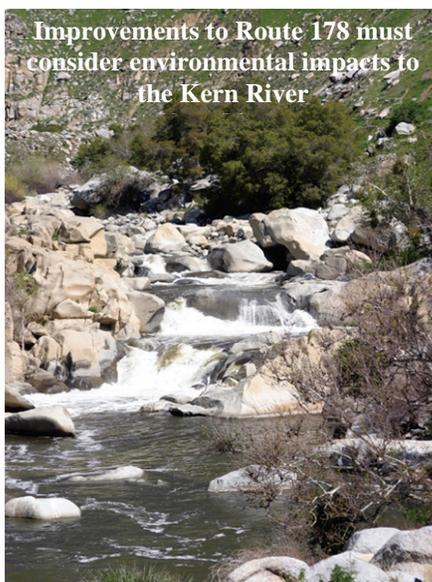
TABLE 3 CONTINUED NEXT PAGE

**TABLE 3, CONTINUED
PROPOSED ITS ELEMENTS ON ROUTE 178**

Postmile	Location	Element Type
9.800	JEO Route 184	Roadside Weather Info System
13.500	Kern River Canyon	Highway Advisory Radio
30.010	Democrat Hot Springs Road (O)	Traffic Count Station
41.441	EB off to Bodfish Road	Traffic Count Station
41.641	West of Caliente-Bodfish Road	Traffic Count Station
41.700	At Bodfish	Roadside Weather Info System
41.741	WB on from Bodfish Road	Traffic Count Station
41.783	EB on from Bodfish Road	Traffic Count Station
41.982	WB off to Bodfish Road	Traffic Count Station
42.774	EB off to Route 155	Traffic Count Station
42.775	WB on from Route 155	Traffic Count Station
42.940	East of Jct. Route 155	Traffic Count Station
42.980	Lake Isabella (Route 155)	Closed Circuit Television
43.031	EB on from Route 155	Traffic Count Station
43.100	WB off to Route 155	Traffic Count Station
55.557	West of Kernville Road	Traffic Count Station

local roads, and alternative modes of transportation, operate as one seamless network. Appendix D, Pages 32 -35, offers additional information on ITS elements.

F. General Environmental Considerations



Specific sensitive biological species include, but are not limited to, the following flora and fauna:

Flora-wetland areas, Bakersfield cactus, California Jewel Flower, Kern Mallow, Alkali Mariposa lily plants, San Joaquin Woolly-threads;

Fauna-San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, blunt-nosed leopard lizard, burrowing owl, Kern Canyon salamander, and migratory birds.

In addition, there are historical and archeological sites that will need to be investigated. Geologic considerations need to be identified in the mountainous area of the route. Environmental considerations to improvements include the Kern River, several canals, and archaeological sites that exist along the route.

III. CONCEPT RATIONALE

A. Route Concept LOS:

Rural: LOS C has been assigned to most of the rural portions of Route 178. The route is a major highway providing recreational access to Lake Isabella and the Sequoia National Forest. LOS C is cost effective for adopted alignment improvements in rolling to mountainous terrain.

Urban: LOS D has been assigned to the urban areas due to the heavy traffic volumes from the interchange at Route 99/58/178, the geometric configurations of the couplets in the urban area, and the urbanized nature of these segments. LOS D signifies the greater LOS flexibility when capacity improvements are needed, particularly in Segments 1 and 2.

Concept Facility: The Concept Facility for Route 178 varies according to the facility type. The following list shows the facility for the year 2035, beginning with the segment at the Route 99/58/178 Interchange and proceeding eastward.

- **6-lane conventional highway (Segments 1 and 2):** There will only be improvements for a 6-lane conventional highway in this section of the existing alignment. The City of Bakersfield has a project to add one lane in each direction from Oak Street to M Street.
- **6-lane freeway (Segments 3-6):** While Segments 3 and 4 are existing freeway portions, Segments 5 and 6 are part of a new route adoption, providing a new alignment for the freeway. This will serve the Bakersfield area as the City expands eastward.
- **2-lane conventional highway – improved (Segments 7 and 8):** These are segments primarily within the Kern River Canyon. Only operational and safety improvements are expected. The expressway on a new alignment around the Kern River Canyon is not expected to be built during this TCR period. A portion of Segment 7 may be expanded to a 4-lane freeway on an adopted 6-lane ROW (see discussion in the previous Section II, Segments 6-10, Page 10).



Mountainous terrain along many segments of SR 178 make widening difficult.

- **2 to 4-lane expressway/freeway (Segments 9-12):** No other capacity improvements are expected on this stretch of highway.
- **2-lane conventional highway (improved)-(Segments 13-15):** Only operational and safety improvements are expected on this stretch of highway.

The Ultimate Transportation Corridor (UTC-beyond 2035) in the Bakersfield metropolitan area (Segments 1-6) is essentially a 6 to 8-lane freeway, with the exception of the Segments 1 and 2 that will continue to be conventional highway. On the new alignment north of the Kern River Canyon to Route 155, the UTC will be a 4-lane expressway or freeway (Segments 7-12). In the Lake Isabella area, only a 2-lane conventional highway with operational and safety improvements is projected for the UTC (Segments 13-15).

IV. ROUTE 178 PERFORMANCE: CURRENT AND FUTURE

As of the year 2009, Route 178 was operating at a range of LOS B in the rural area to LOS F in the urban area of Bakersfield. Eight of the 15 segments are currently operating at a LOS D, E, or F. By the years 2020 and 2035, the LOS will deteriorate on all segments due to the growth of urban, recreational, and holiday travel on Route 178.

Twelve of 15 segments will operate at an LOS D, E, or F by the year 2035. Planned Regional Improvement Program (RIP) capacity improvements will improve the LOS level on some segments. Without improvements, the Route Concept LOS will not be met in the majority of the segments by the year 2035. Segments 1- 6 show an LOS F without improvements. Without improvements, by the year 2035 Segments 7 and 8 will have an LOS D. Segments 10 and 13-15 will most likely be at an LOS D, E, or F by the year 2035. Segments 11 and 12 will likely maintain an acceptable LOS without improvements by the year 2035.

Congested traffic may be expected in Bakersfield at the Route 178/99/58 Interchange. Two future construction proposals may help to alleviate traffic congestion at the Route 178/99/58 Interchange and Route 178 at Segments 1 and 2. They consist of 1) improving the Route 178/Oak Street intersection and 2) adding one lane in each direction from Oak Street to M Street. The improvement to 6 lanes will not attain the Concept LOS of D; it will be at LOS F. In downtown Bakersfield, historical preservation, ROW costs and restrictions will be a consideration for facility improvements.

A route adoption and environmental study are planned for Route 178, beginning at Route 184 and traversing on a new alignment to the northeast at Rancheria Road. This is Phase 1 of 2, and it is proposed to be a 4-lane freeway, on ROW encompassing Segments 5 and 6.

Discussions are in progress to extend the freeway beyond Rancheria Road and then to connect back to the present route (Segment 7). The City of Bakersfield has proposed a specific plan line for the new Route 178, providing for the critical ROW preservation necessary to achieve

the extension of the freeway. The specific plan line will include future proposals for interchanges on the existing and new freeway alignment; these would be located at Morning Drive, Vineland Road, Route 184, and Rancheria Road. Vineland Road is a proposed new road connection to Route 178 between Morning Drive and Route 184 and will serve as the new north/south access route.

A decision and timeline on Phase 2, a new 4-lane expressway on a new alignment traversing northerly around the Kern River Canyon to Lake Isabella, has not been resolved. It is expected to be an alternative for travel in the Canyon, but perhaps not within the 2035 time horizon. Other operational problems exist from the mouth of the Kern River Canyon to the Sequoia National Forest. For one, the highway travels through a geologically unstable area in the National Forest. In addition, this is a culturally sensitive area. Early consultation with and involvement of Tribal representatives will be essential. Caltrans would also consult with the U.S. Forest Service. Moving forward with this concept would require additional environmental review.

The Kern River Canyon Highway from approximately PM 13.7/30.6 is narrow with little or no shoulders, many short radius curves, and few passing opportunities. The planned realignment of the route to the northeast of the present alignment will help to eliminate problems associated with travel in this section of the route.

Residential development in the corridor and population increases will require transportation improvements in the near future. New residential and commercial development in the urban and rural valley portion of the route will necessitate traffic congestion mitigation. Acquiring funding sources for Route 178 improvements will be a continuing challenge for all agencies. The Kern Council of Governments (Kern COG is the Metropolitan Planning Organization or MPO), City of Bakersfield, County of Kern, and local communities would need to determine how Route 178 should develop with available regional funding. Other than Regional Improvement Program funds, other funds such as local measure funds may be available for projects identified in the Regional Transportation Plan (RTP).

The Livable Communities and Context Sensitive Solutions concepts should be considered and possibly implemented in future design and construction of improvements to the Route 178 Corridor, particularly in the urban area. The implementation of these concepts serves to scale down the magnitude of the impacts as well as increase the aesthetics of the system. Also, environmental justice should be considered in future development on Route 178. The environmental justice process will act to not overwhelm poor and minority communities in transportation planning.

Caltrans will need to continue emphasizing the further rehabilitation, operational, and capacity improvements of Route 178 due to its regional importance. In addition to the regular maintenance and periodic operations and safety improvements completed on Route 178 (State Highway Operations Protection Program or SHOPP projects), Caltrans will continue to work on ITS improvements, such as ramp metering, changeable message signs, highway advisory

radio, and other strategies to more effectively sustain and improve traffic flow, particularly in the urbanized areas. With the projected growth in statewide, interregional, and local commuter traffic, the congestion on Route 178 will continue to increase. Over the next 25 years and beyond, Caltrans and local agencies will continue to work on solving the problems associated with the projected traffic increases.

V. PLANNED AND PROGRAMMED IMPROVEMENTS FOR ROUTE 178

The following table shows both the planned and programmed projects for Route 178 over the next 25 years. The planned projects include *candidate* projects for the STIP and SHOPP, or ITSP and RTP projects. The programmed projects include *actual* projects in the STIP, SHOPP that are partially or fully funded. STIP projects are primarily capacity-increasing, while SHOPP projects focus on maintenance, safety, and operational improvements. Table 4 presents the location of the project, the project description, the estimated construction dates, the funding source (RTP, ITSP, STIP Candidate, or SHOPP Candidate, and the estimated construction costs.

TABLE 4 Route 178 Proposed and Planned Projects					
Kern Post Mile	Location	Description	Est. Const. Year	Funding	2010 Est. Capital Cost (x \$1,000s)
Various	At various locations, ramp improvements	Ramp improvements	2033	Local	\$37,000
0.00/0.60	From Route 99 to Elm Street (includes Oak Street)	Construct intersection improvements	2011/2012	Demo and local	\$20.9
2.0	At Route 204	Construct interchange	2025	Local	\$25,700
2.0	Route 204	Ramp Improvements	2033	Local	\$50,000
0.30/1.10	Between Oak St and M St	Widen from 4 to 6 lanes to 6/8 lanes	2012/2013	Demo and local	\$34,094
R1.70/R6.90	Various locations "M" St to just east of Fairfax Rd	Freeway maintenance access	2014	SHOPP	\$1,540
5.64	Existing west terminus to Oswell Street	Widen to 8 lanes	2026	Local	\$140,500
R6.90/T9.20	West of Fairfax Rd to West of Morning Drive	Widen to 6 lanes	2020	Demo and local	\$806
R6.70/T9.20	Between Fairfax Rd & Canteria Rd & on Morning Dr	Construct new interchange	2011/2012	Demo and local	\$58,833
T9.20/8.20	From West of Morning Drive to Vineland Road	Widen to 6 lanes	2020	Local	\$806

TABLE 4 CONTINUED NEXT PAGE

TABLE 4, CONTINUED
Route 178 Proposed and Planned Projects

8.20/10.19	From Vineland Rd to Miramonte	New interchange; widen from 2 to 4/6 lanes	2028	Local	\$231,000
10.19/10.96	From Miramonte to Rancheria	Widen to 4 lanes	2025	Local	\$11,700
8.70/30.40	From Bakersfield to Lake Isabella	Route adoption study on new alignment	Unknown	RIP	NA
9.60	Intersection of SR 178 and SR 184	Install signals	Unknown	SHOPP	\$1,000
13.70/27.20	Just east of the Sidehill Viaduct to east of Democrat Springs	AC Overlay	2011	SHOPP	\$4,798
41.60	Bodfish Maintenance Station	Construct new office building	2012	Minor A	\$1,000
45.50/47.70	Just west of Lake Isabella Blvd launching area #16 intersection	AC Overlay and widen shoulders	2015	SHOPP	\$9,860
52.60/57.00	Near Lake Isabella, from Entrada Blvd to Kelso Valley Rd	AC Overlay and widen shoulders	Unknown	SHOPP	\$5,020

APPENDIX A

References

Local Jurisdictions

Kern Council of Governments (Kern COG)

1401 19th St, Suite 300
Bakersfield, CA 93301
(661) 861-2191

City of Bakersfield

1600 Truxtun Avenue
Bakersfield, CA 93301
(661) 326-3000

County of Kern

Roads Department
2700 M Street, Suite 400
Bakersfield, CA 93301
(661) 862-8850

Air Quality District:

San Joaquin Valley Air Pollution Control
District
1990 E Gettysburg Ave
Fresno, CA 93726
(559) 230-6000

Air Basin: San Joaquin Valley**Air Basin Determination:**

Adequate for PM2.5;
Extreme for Ozone.

Transit Services:

For inquiries on transit services, please contact the MPO or local agency (listed above) for more information or refer to the Transit Services sheet in the Appendix for an overview of various transit services.

Traffic Accident Data:

Caltrans District 6
Office of Traffic Investigations
(559) 488-4123

APPENDIX B
Bicycle Facilities
Route 178 Kern County

Segment # PM From / To	Bicycle Facilities by Segment ^{(1) (2)}
1-2 KER PM 0.00 – 1.7 (Bakersfield) Rte 99 to M Street	<p>Conventional 4-lane roadway segments - open to bicycle travel. Level terrain. Shoulder width varies between 6-8 feet. Numerous alternate routes also exist for these segments.**</p> <p>Designation: Neither of these two segments are identified within either the 2001 Kern County Regional Bike Plan or the City of Bakersfield's General Plan 2004 Updated Circulation Element as a Class I, II or III bikeway or proposed Class I, II or III bikeway.</p>
3-4 KER PM PM 1.7 / R6.2 M St To 0.6 Mi E of Oswell St OC	<p>Freeway segments - closed to bicycle travel. Level terrain. Shoulder width 8' but closed to bicycle travel. Numerous alternate routes available for these two segments.**</p> <p>Designation: None of these segments are identified within either the 2001 Kern County Regional Bike Plan or the City of Bakersfield's General Plan 2004 Updated Circulation Element as a Class I, II or III bikeway or proposed bikeway.</p>
5 KERN PM R6.2 / T9.6 0.6 Mi E of Oswell St OC / SR 184	<p>Freeway segment from R6.2 to Fairfax Ave. - closed to bicycle travel. Fairfax Ave. to SR 184 conventional 2-4 lanes - open to bicycle travel. Level terrain. Shoulder width 6'. Alternate routes available from R6.2 to Fairfax Rd. No alternate route is currently available between Fairfax Rd. to SR 184.**</p> <p>Designation: R6.2 to Fairfax Rd. not identified within either the 2001 Kern County Regional Bike Plan or the City of Bakersfield's General Plan 2004 Updated Circulation Element, as existing or proposed Class I, II or III bikeway. Fairfax Rd. to SR 184 is identified as a future Class II facility in both plans.</p>
6 KERN PM T9.6 / R11.0 SR 184 / Rancheria Rd	<p>Conventional 2-lane roadway segment - open to bicycle travel. Level to steep terrain. <i>No paved shoulder.</i> No alternate route currently exists for this segment.**</p> <p>Designation: This segment is identified within the City of Bakersfield's General Plan 2004 Updated Circulation Element, as a planned Class II bikeway.</p>
7 KERN PM R11.0 / 13.7 Rancheria Rd / Mouth of Kern River Canyon	<p>Conventional 2-lane roadway segment - open to bicycle travel. Level terrain. Shoulder width varies from no paved shoulder to 8'. No alternate route currently exists for this segment.**</p> <p>Designation: This segment is identified within the City of Bakersfield's General Plan 2004 Updated Circulation Element, as a planned Class II bikeway.</p>
8-9 KERN PM 13.7 / R30.6 Mouth of Kern River Canyon/ Sequoia Natl. Forest boundary	<p>Conventional 2-lane roadway segments - open to bicycle travel. Moderately steep grade. Very narrow roadway. No paved shoulder. Bicycle travel not recommended. Very scenic. No alternate route currently exists for these two segments.**</p> <p>Designation: No portion of these segments are currently identified within the 2001 Kern County Regional Bike Plan as a Class I, II or III bikeway or proposed Class I, II, or III bikeway.</p>
TABLE CONTINUED, NEXT PAGE	

Segment # PM From / To	Bicycle Facilities by Segment ^{(1) (2)}
10-11 KERN PM R30.6 / R41.2 Sequoia Natl. Forest boundary / 0.4 mi W of Bodfish Rd.	Conventional 4-lane divided roadway segments - open to bicycle travel. Level to moderately steep undulating terrain. Shoulder varies from 3' to 6'. Very scenic. No acceptable alternate route currently exists for these segments.** Designation: No portion of these segments are currently identified within the 2001 Kern County Regional Bike Plan as a Class I, II or III bikeway or proposed Class I, II or III bikeway.
12 KERN PM R41.1 / R43.9 0.4 Mi W of Bodfish Rd / 1.0 Mi E of SR 155	Freeway segments - open to bicycle travel. Level terrain. Shoulder width 8'. An alternate route is currently available.** Designation: No portion of this segment is currently identified within the 2001 Kern County Regional Bike Plan as a Class I, II or III bikeway or a proposed Class I, II or III bikeway.
13-15 KERN PM R43.9 to 57.1 1.0 Mi E of SR 155 / Kelso Valley Rd (End District 6)	Conventional 2-lane roadway segments - open to bicycle travel. Level to moderately steep undulating terrain. <i>Shoulder varies from 0' to 8'</i> . Scenic. No acceptable alternate route currently exists within these two segments.** Designation: No portion of these segments are currently identified within the 2001 Kern County Regional Bike Plan as a Class I, II or III bikeway or proposed Class I, II or III bikeway.

Future plans call for upgrading numerous segments of this highway. When these planned upgrades are in place shoulders of 6-10 feet, and in some places sidewalks, will be installed which will greatly add to the safety of bicyclists and pedestrians desiring to use this highway's open segments.

** **Streets and Highway Code - Section 888** - "The department (i.e. Caltrans) shall not construct a state highway as a freeway that will result in the severance or destruction of an existing major route for nonmotorized transportation traffic and light motorcycles, unless it provides a reasonable, safe, and convenient alternate route, or unless such a route already exists."

⁽¹⁾ **Deputy Directive 64-R1 (DD-64-R1) - (Policy)** The Department provides for the needs of travelers of all ages and abilities in all programming, planning, design, construction, operations and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycles, pedestrians and transit modes as integral elements of the transportation system."

⁽²⁾ **PDPM - Chapter 31** (Non-motorized Transportation Facilities) Section 1 - General - Introduction
"... State and federal laws require Caltrans to promote and facilitate increased use of non-motorized transportation. The purpose of this chapter is to outline pertinent statutory requirements, planning policies, and implementing procedures regarding non-motorized transportation facilities."

⁽³⁾ **Streets and Highway Code - Section 888** - "The department shall not construct a state highway as a freeway that will result in the severance or destruction of an existing major route for non-motorized transportation traffic and light motorcycles, unless it provides a reasonable, safe, and convenient alternate route, or such a route already exists."

⁽⁴⁾ **California Vehicle Code - Section 21960 (Bikes & Pedestrians on Freeways)** (a) The Department of Transportation and local authorities [i.e. acting together - not separately], [may] by order, ordinance, or resolution, with respect to freeways, expressways ... prohibit or restrict the use of the freeways, expressways, or any portion thereof by pedestrians, bicycles or other non-motorized traffic..."

APPENDIX C

Pedestrian Facilities Route 178 Kern County

Segment (s) PM From / To	Pedestrian Facilities by Segment ^{(1) (2)}
Kern County All Segments - All Postmiles	<p>Sections of Route 178 are access-controlled freeway and pedestrians are prohibited. In the sections where pedestrians are allowed, there is a potential for pedestrian and ADA concerns, such as the installation and maintenance of crosswalks, sidewalks, ramps, curb cuts, hand railings and pedestrian activated signal heads etc.</p> <p>Much of this route is rural with few, if any, pedestrian or ADA concerns needing to be addressed <u>at this time</u>. Nonetheless, additional ADA and pedestrian concern may occur anywhere along this route should any form of urban development occur in the future.</p>

⁽¹⁾ **Deputy Directive 64-R1 (DD-64-R1) - (Policy)** The Department provides for the needs of travelers of all ages and abilities in all programming, planning, design, construction, operations and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycles, pedestrians and transit modes as integral elements of the transportation system.”

⁽²⁾ **PDPM - Chapter 31** (Non-motorized Transportation Facilities) Section 1 - General - Introduction - “... State and federal laws require Caltrans to promote and facilitate increased use of non-motorized transportation. The purpose of this chapter is to outline pertinent statutory requirements, planning policies, and implementing procedures regarding non-motorized transportation facilities.”

APPENDIX D

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

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.

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>.

511 Traveler Information System

On July 21, 2000, the Federal Communications Commission (FCC) designated 511 as the single travel information telephone number to be made available to states and local jurisdictions across the country. The 511 system provides information about travel conditions, allowing travelers to make better choices: choice of time, choice of route, and choice of mode of transportation. It can also be expanded to provide transit information and rideshare options. SAFETEA-LU mentions provisions for the 511 system to be implemented at the regional level as the urban metropolitan areas convert their existing traveler systems or establish enhanced 511 services.

The initial development proposal for the central valley 511 Traveler Information System will include the eight counties in the San Joaquin Valley (Kern, Kings, Tulare, Fresno, Madera, Merced, Stanislaus, and San Joaquin). A “baseline” 511 system for the San Joaquin Valley has been defined. It consists of wireless access in the Caltrans Highway Information Network (CHIN) with each county having the option to add additional “features” for users within their respective counties. This “baseline” is in the process of being deployed now, with a possible winter 2009 launch date. The San Joaquin Valley 511 System may be hosted in Fresno County, but no decision has yet been made.

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 that 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 201 within the limits of this CSMP does not currently include a sufficient detection system to fully optimize these strategies. Improvement projects are typically planned to include detection units as part of the construction. Caltrans commitment to the installation of detection units includes installing wireless radar units at the first available opportunity. Even though these wireless units would be part of the project, they can be installed before construction, without the effort and cost of disturbing a more traditional system when the road construction begins.

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.

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, California Highway Patrol (CHP) pace vehicles] and the estimated amount of delay. CMS systems are also used to warn of high winds and accidents.

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.

Transportation Management Centers

Effective ITS implementation requires coordination of all components. Transportation 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, 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:

1. Installing simple, adaptive-scheme ramp metering;
2. Optimizing the meter rates;
3. Implementing a corridor adaptive ramp-metering scheme within urbanized areas;
4. Advanced arterial signal actuation strategies and improved incident management; and
5. 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.

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 E

DOCUMENTS USED IN THE PREPARATION OF THIS TCR

- 1) 2002 Global Gateways Development Program, Caltrans
- 2) 2002 Metropolitan Bakersfield General Plan, City of Bakersfield
- 3) 2011 Regional Transportation Plan; Kern Council of Governments, July 2010
- 4) California State Rail Plan; Caltrans, March 2008
- 5) Central California Regional Aviation System Plan, Phase I, Kern Council of Governments, September 1994
- 6) County of Kern General Plan; Kern County, March 2007
- 7) County of Kern Draft Kern Valley Specific Plan, October 2006
- 8) Goods Movement Action Plan; Business, Transportation and Housing Agency and California Environmental Protection Agency, January 2007
- 9) Interregional Transportation Strategic Plan; Caltrans, June 1998
- 10) Kern County Bicycle Facilities Plan, Kern Council of Governments, October 2001
- 11) Mainstreaming ITS and Use in the Planning and Programming Environment, Caltrans; November 2002
- 12) Metropolitan Bakersfield Freeway Beautification Master Plan Design Guidelines, City of Bakersfield, March 2003
- 13) Route 178 Corridor Study, Kern COG, Caltrans, City of Bakersfield, December 1986.
- 14) San Joaquin Valley Goods Movement Study, Counties of the San Joaquin Valley and Caltrans
- 15) State Highway Operations and Protection Program (SHOPP), February 2010
- 16) State Transportation Improvement Program (STIP), 2000, 2002, 2004, 2005
- 17) Transportation Concept Report, Caltrans, April 2005
- 18) Transportation Management System (TMS) Master Plan; Caltrans, February 2004
- 19) Traffic Operations Strategic Plan, Caltrans, September 1999
- 20) Interregional Improvement Track-Interregional Road System Plan (ITSP), 1998, 2000
- 21) District 6 Bicycle Route Inventory for California State Highways (District 6 Edition), Caltrans, May 2004

APPENDIX F

ACRONYMS

AADT - Average Annual Daily Traffic
ADA - Americans with Disabilities Act
ATIS - Advanced Traveler Information System
ATMIS - Advanced Transportation Management Information Systems
BNSF - Burlington Northern Santa Fe
BRT - Bus rapid transit
CAPM - Capital Preventive Maintenance
CCTV - Closed Circuit Television Cameras
CHP - California Highway Patrol
CMAQ - Congestion Mitigation and Air Quality
CMS - Changeable Message Sign
CT - Caltrans
CTC - California Transportation Commission
HAR - Highway Advisory Radio
HOV - High-Occupancy Vehicle Lanes
HSRA - High Speed Rail Authority
IIP - Interregional Improvement Program
ITS - Intelligent Transportation System
ITSP - Interregional Transportation Strategic Plan
KCOG - Kern Council of Governments
LOS - Level of Service
ND - Not Determined
OC - Overcrossing
OH - Overhead
PM - Postmile
RIP - Regional Improvement Program
ROW - Right-of-Way
RWIS - Remote Weather information Station
SHOPP - State Highway Operation Protection Program
SJV - San Joaquin Valley
SJUAPCD - San Joaquin Unified Air Pollution Control District
STAA - Surface Transportation Assistance Act
STIP - State Transportation Improvement Program
TCM - Transportation Control Measure
TCRP - Transportation Congestion Relief Program
TIM - Traffic Incident Management
TMC - Transportation Management Center
TMS - Transportation Management System
UC - Undercrossing
UPRR - Union Pacific Railroad
UTC - Ultimate Transportation Concept
VHT - Vehicle Hours Traveled
VMT - Vehicle Miles Traveled