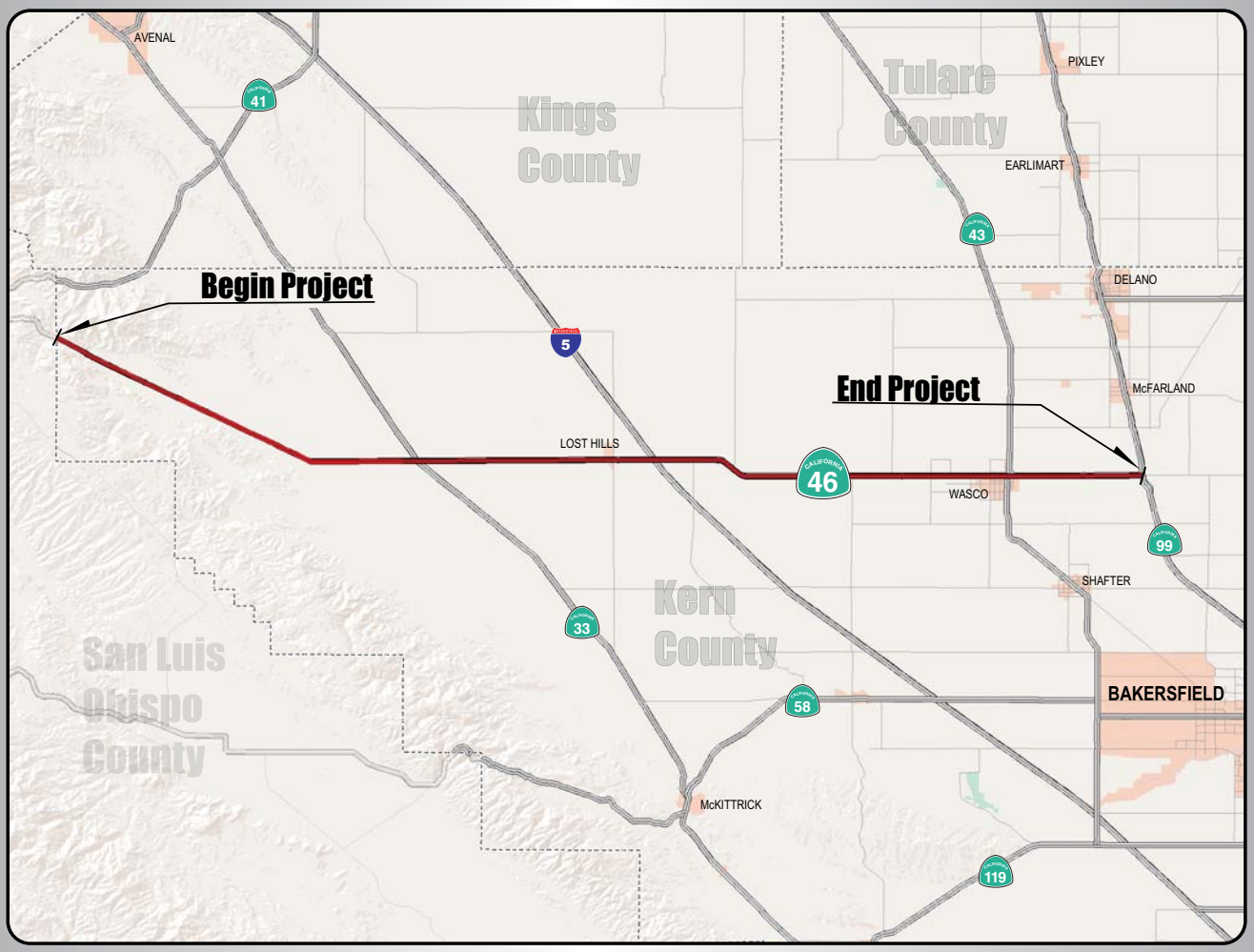
Corridor System Management Plan

CALIFORNIA 46

State Route 46 Kern County PM 0.0/57.8



District 6 Planning Division
South Planning Branch
October 2008

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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CORRIDOR SYSTEM MANAGEMENT PLAN

ROUTE 46

Route 46: From San Luis Obispo County Line to Route 99 in Kern County
District 6 - Kern 46 PM 0.0/57.8

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 46 Corridor.

Recommend Approval:

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Corridor System Management Plan
State Route 46
October 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 Proposition 1B (Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006) funds, approved by the voters as 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. The project is on State Route 46 from postmile 7.3 to 19.3, Keck's Road to Route 33, for a 4-lane expressway. The funding is $45 million from the Corridor Mobility Improvement Account (CMIA).

The CSMP identifies the recommended management strategies for a given transportation corridor. A corridor is not limited to the highway, but encompasses all transportation components through a geographical area. This can include the highway, major local parallel arterials, local road intersections, ramps and ramp meters, signal control, transit, and rail. The CSMP will provide one unified concept for managing, operating, improving, and preserving a corridor across all modes and jurisdictions for the highest productivity, mobility, reliability, accessibility, safety, and preservation outcomes. The plan will allow the State, along with the regional agencies and local jurisdictions, to manage and operate the transportation corridors for the highest sustained productivity and reliability based on the assessment and evaluation of performance measures. The strategies are phased and include both operational and more traditional long-range capital expansion strategies. This represents a shift from the traditional approach of identifying localized highway problem areas and finding solutions that are often expensive with a focus on capital improvements. The CSMP approach places greater emphasis on performance assessments and operational strategies that yield higher benefit to cost results.

The purpose of this document is to show 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 improvement scenarios (typically through traffic analysis), propose the best mix of improvements,

strategies, and actions to restore throughput, improve travel times, increase reliability and safety to preserve the corridor. The CSMP is a guide for managing the corridor among all partners.

B. Corridor Team

The following is a list of Corridor Team Members that met regularly in 2007/2008 for the CSMP preparation.

Caltrans members:
Albert Lee, Traffic Operations
Joe O. Espinosa, Traffic Engineering
Joel Aguilar, Traffic Investigations
Marco Sanchez, Maintenance
Mehran Akhavan, Project Management
Claudia Espino, District 5
Pedro Ramirez, Planning
Randy Treece, Planning

Kern Council of Governments
Joe Stramaglia

Kern County (Planning & Roads)
Barry Nienke
Cheryl Casdorph
Pat Ebel

City of Wasco
Bob Wren

Office of Senator Florez
Rudy Salas

II. CORRIDOR DESCRIPTION

A. Corridor Limits

The corridor limits are from the San Luis Obispo County line to Route 99 (Kern 46 PM 0.0/57.8). This is the entire length within Kern County. The Kern Council of Governments (Kern COG) has a cooperative agreement with San Luis Obispo Council of Governments (SLOCOG) and Caltrans to widen Route 46 to 4 lanes.

Route 46 begins at the junction of Route 1 in San Luis Obispo County and continues east for 118 miles through the Counties of San Luis Obispo and Kern. It terminates at its junction with State Route 99 in Kern County.

B. Corridor Width

Route 46 is currently a 2-lane conventional highway with no passing lanes. The paved shoulders vary from 0 to 8 feet, but they are largely not to current standards. The corridor is 60 to 100 feet in right-of-way (ROW) width, but the new expressway projects will bring Route 46 to over 200 feet in width. The exception is in Wasco, where the width will be 108 feet for a 4-lane conventional highway.

Route 46 intersects with Route 33, Interstate 5, Route 43 and Route 99. The local and regional economies depend on these highway linkages for shipment of agricultural products and traffic diversions when incidents occur. The City of Wasco also depends on recreational traffic and commerce that travel on the highway.

There are no continuous parallel roads within five miles of Route 46 that could establish a "corridor". Lerdo Highway, which is approximately seven miles south, appears to be the nearest continuous parallel road. The nearest continuous parallel road north of the route is Avenue 56/Utica Avenue, which is over twenty miles away. Since there are no continuous parallel roadways, acceptable operations of Route 46 is critical for the movement of goods east west across Kern County.

C. Corridor Function

1. Corridor Characteristics

- Route 46 is a designated Terminal Access (TA) route between the San Luis Obispo County Line and Route 99, per the Surface Transportation Authority Act (STAA) of 1982. This route functions as a major route for agricultural products with truck traffic consisting of up to 40% of the traffic.

- It is part of the National Highway System.

- This route is designated as a High Emphasis Focus route from Route 101 in San Luis Obispo County to Interstate 5.

- There is also a considerable amount of recreational traffic from the Central Valley to the coast through Wasco, particularly during peak summer months. The mix of higher speed traffic with trucks and RVs create potential safety and operational concerns.

- The City of Wasco is a developed urban area, with a mix of commercial and residential land uses. The area can be expected to grow at an average of approximately 2.5 percent annually, coinciding with Bakersfield's population growth. Wasco serves as a transportation/ warehousing site for rail and trucking.

- The Kern National Wildlife Refuge is located north of Route 46 at the junction of Garces Highway and Corcoran Road. The 11,249-acre refuge is a wintering area for migration waterfowl, shorebirds and waterbirds in the southern San Joaquin Valley.

- The Corridor intersects at Route 33, Interstate 5, Route 43 and Route 99.

2. Multi-modal Alternatives

Transit:
Kern Regional Transit provides intercity service to Lost Hills, Wasco, Delano, McFarland, Shafter and Bakersfield. Passengers are able to transfer onto other carriers in Wasco/Shafter to bring them to the metro Bakersfield area. There is not a fixed transit schedule to San Luis Obispo. Please refer to the Multi-modal Alternatives Map in the Appendix, page A-10 for trip and route information.

Amtrak:
This route also links these cities to alternative modes of transportation. The Amtrak San Joaquin Valley line has a train station in the City of Wasco. The Amtrak train line runs north to Sacramento and the Bay Area and south to the City of Bakersfield, with connecting service to the Southern California. Please refer to the Multi-modal Alternatives Map in the Appendix, page A-10 for trip information.

High-Speed Train (Future):
Bakersfield and Fresno would be the nearest proposed stations to the future High-Speed Train (HST) from Wasco and from Route 46. Travel time on the HST from Bakersfield to Los Angeles would be just under an hour and to the Bay Area it would be an hour and a half. The proposed HST would stretch from the Bay Area and Sacramento through the Central Valley to Southern California. The maximum speed of the HST would reach approximately 220 mph. Please refer to the Multi-modal Alternatives Map in the Appendix, page A-10 for proposed alignment information.

Bicycle Routes & Facilities:
The entire length of Route 46, being a conventional state highway, is open to bicycle travel under a "share-the-road" basis. However, from the San Luis Obispo County Line (PM 0.00) to the middle of segment 4 (PM 37.20), this road lacks treated shoulders. This route does offer standard 8-foot shoulders from PM 37.20 to its terminus at Route 99. The terrain from PM 0.00 to PM 7.30 is slightly hilly (1-2%), but is mostly level for the remainder of the route. Winter "tule fog" often presents a problem to bicyclists along this route between November and late February.

Pedestrian Needs / Facilities:
Pedestrian and Americans with Disabilities Act (ADA) considerations for this route are primarily to be found around the area of Blackwell's Corner (approximately PM 20.5 to approximately PM 20.6), in the areas around Lost

Hills and the junction of Interstate 5 (approximate PM 30.0 to approximate PM 33.0) and within the community of Wasco (approximately PM 49.0 to PM 52.0) where there are concentrations of residential, retail and commercial properties adjacent this route's right-of-way. The remainder of this route is very rural with few pedestrian or ADA concerns at this time.

Airports:
The Wasco Airport, a small County of Kern airport, is located just north of the city limits. The airport has a 3,380-foot runway, 36 aircraft tiedowns, six shelters, 11 T-hangers and four hanger spaces. Fourteen based aircraft are located at the airport; 9,030 aircraft operations were performed during the past year.

Lost Hills Airport, also known as Lost Hills-Kern County Airport, is a public airport located one mile northeast of Lost Hills in Kern County. The airport is mainly used for general aviation. It covers 390 acres and has one runway. Please refer to the map showing "Multi-modal Alternatives in the Route 46 Corridor" in the Appendix, page A-10.

3. Population Growth

In the City of Wasco and the surrounding area, the population has steadily increased. The forecast annual average population growth has increased at a rate of 2.5 percent. The current population is approximately 30,000. In the year 2015, the population forecast is 33,000 and for 2030 the projection is 45,000.

D. Corridor Inventory

1. Traffic

a. Current Traffic

Currently, the annual average daily traffic (AADT) ranges from 7,000 to 10,000 vehicle trips. Truck AADT for 5+ axle trucks varies from 1,900 to 2,200 trips. Weekend summer traffic (Friday thru Sunday) increases approximately 30 percent in comparison to weekday traffic (Monday thru Thursday). Many travel to San Luis Obispo County for recreational activity in the Central Coast. State and private beaches are large attractors for Central Valley travelers, along with State parks. Mild coastal temperatures, especially during summer months, are a huge draw for visitors from the valley's high temperatures.

b. Trip Producers

The majority of trip generation is along the commerical corridors and state highway interchanges and intersections. Located at the I-5 interchange are trucking oriented businesses, commercial businesses and restaurants. Located at Scofield Avenue is an almond processing plant and the Wasco State Prison, which is planned to be expanded. Within the City of Wasco is a mix of

commercial and residential land uses. Wasco serves as a transportation/ warehousing site for rail and trucking. The Rose City Industrial Park is a proposed 1,640 acre development on the southeast corner of Route 46 and Route 43.

2. Geometrics

Route 46 is presently a 2-lane conventional highway. The paved shoulders vary from 0 to 8 feet and the lane width is 12 feet.

Route 46 is designated as a High Emphasis and Focus Route in the State Interregional Transportation Strategic Plan (ITSP). It is classified as a principal arterial and is part of the National Highway System. The route is also a Terminal Access for STAA trucks (large trucks). This highway crosses terrain that transitions from rolling rangeland to flat agriculture land and smaller urban areas.

The most immediate obstacles to widening are: acquiring right-of-way (ROW) within oil fields at Lost Hills, ROW constraints within the City of Wasco and a two lane railroad underpass in Wasco.

3. Intelligent Transportation Systems (ITS)/Traffic Signals

a. Intelligent Transportation Systems

ITS consists of the electronics, communications, or information technology processing. 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. Also included are centralized controls from traffic or transit management centers of many of these components. 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.

Numerous applications of ITS are proposed throughout the Route 46 corridor. The Caltrans, District 6 Central Valley Transportation Management Center (TMC) monitors specific traffic locations from its headquarters at the District Office in Fresno. Additionally, the 511 system is a new three-digit phone number program to access travel information that is being implemented throughout various areas of the country. Deployment of ITS technology will enhance traveler information services in the future, 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 road closures.

Intelligent Transportation Systems include proposed stations at various locations (see map of Intelligent Transportation Systems (ITS) in the Appendix, page A-9 and the list below). One existing Changeable Message Sign (CMS) is located at PM 34.50. Closed Circuit Television (CCTV), Highway Advisory Radio (HAR), Weather Station (WS), Roadside Weather Information System (RWIS), and CMS are components proposed at various locations.

Proposed ITS	Location - Postmile	Cost approximate - each
RWIS	PM 7.8, 11.3, 15.8, 19.8, 27.5, 29.7, 33.5, 51.1	$70,000
CMS	PM 18.0, 21.3, 30.1, 31.4, 48.3, 51.1	$300,000
TMS	PM 7.3, 10.1, 11.3, 12.5, 13.7, 14.9, 16.1, 17.3, 18.5, 27.2, 31.9, 33.5	$25,000
CCTV	PM 20.5, 32.5	$75,000
HAR	PM 20.5, 32.5, 51.1	$75,000

b. Traffic Signals

Traffic signals may be installed in the future where needed and warranted on a case-by-case basis. They are planned at the following intersections: Kecks Road (PM 7.3); Route 33 (PM 20.5); and just west of Halloway Road (PM 27.5). There are other locations, as in the City of Wasco, where signals may be warranted in the future. The traffic signal at Warren Street (PM 32.2) is in the design stage.

Existing signals are located at the following intersections: Lost Hills Road (PM 30.5); at the Interstate 5 interchange (PM 32.72); Palm Avenue (PM 50.0); Griffith Avenue (PM 50.5); and F Street (PM 50.9).

Please refer to map of Intelligent Transportation Systems (ITS) in the Appendix, page A-9, for the existing and proposed traffic signals.

III. COMPREHENSIVE CORRIDOR PERFORMANCE ASSESSMENT

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

1. Performance Measure – Accident Rates

One of the performance measures to appraise how safely the Route 46 corridor is operating now, and in the future, is "Accident Rates."

The accident history for the corridor was derived for the most recent three years (April 1, 2003 to March 31, 2006). The total actual accident rates (actual rate per million vehicle miles), including the actual "Fatal + Injury" accident rates and actual "Fatal" rates were derived. These actual rates were then compared to the expected statewide rates for the same indicators.

Below is an "Accident Rate" chart that compares the "Actual" rates to "Statewide" rates for seven segments of the corridor.

Accident Rates

Kern 46 - Postmile	Actual Total	Actual F + I	Actual Fatal	Average - Statewide Total	Average - Statewide F + I	Average - Statewide Fatal
PM 0.00 - 7.30	0.33	0.15	0.033	1.30	0.62	0.035
PM 7.30 - 19.8	0.40	0.18	0.043	1.30	0.62	0.035
PM 19.8 - 27.5	0.45	0.23	0.042	1.30	0.62	0.035
PM 27.5 - 32.5	1.54	0.44	0.00	1.30	0.62	0.035
PM 32.5 - 46.0	0.66	0.32	0.068	0.95	0.46	0.036
PM 46.0 - 51.2	1.10	0.45	0.029	1.59	0.70	0.025
PM 51.2 - 57.8	0.73	0.23	0.00	0.97	0.46	0.035

Most of the "Actual" Accident Rates are less than the "Statewide Average" Rates. The exceptions that exceed the "Statewide Average" are:

- PM 7.3 – 19.8: Fatal
- PM 19.8 – 27.5: Fatal
- PM 27.5 – 32.5: Total
- PM 32.5 – 46.0: Fatal
- PM 46.0 – 51.2: Fatal

The performance measure of "Accident Rates" will be measured and evaluated periodically to maintain safety on the Route 46 corridor, which is the Department's primary goal.

2. Incident Management

Rural highways have different safety and operational challenges from that of the urban highways. With the exception of the section through Wasco, rural roadways make up the entirety of the route through District 6. Narrow lanes and narrow shoulders are more evident in rural roadways, along with limited communication infrastructure. Rural routes often include undivided highways to which head-on collisions are a main concern. Weather conditions such as fog or snow can adversely affect State highways.

On Route 46, from San Luis Obispo to I-5 (PM 0.0 – 32.5), there are no paved shoulders or passing lanes. Throughout the route, heavy truck and recreational vehicle traffic can amount to 30 percent or more. Due to a lack of alternative routes, redirecting traffic after a traffic incident can be challenging, expecially in rolling terrain. Because of these factors it is important for the

maintenance crews to respond to non-recurring traffic incidents as efficiently as possible. Maintenance stations are located in Lost Hills and Wasco, which are in convenient locations along the route. District 6 is responsible for maintaining Route 46 from Route 33 to Route 99, and District 5 is responsible for the portion from Route 33 to the San Luis Obispo county line. The nearest "call out" contact to the proximity of the incident would most likely be dispatched to the incident location.

Non-recurring incidents like traffic collisions on a typical two-lane conventional highway, such as this portion of Route 46, typically require a complete closure of the highway until the vehicles involved can be moved and the highway be cleared of debris. On average, the highway can be closed for a minimum of two hours for major incidents or inclement weather. The section of highway is prone to foggy conditions during the winter months. In the past 5 years, the highway has been closed on average 3 times per year. When the highway is closed, parallel county roads are used to detour traffic. Route 41 to Interstate 5 is an east-west detour and Route 33, west of I-5, is a north-south detour. Currently there is one ITS element in place on this route, which is the changeable message sign (CMS), located at Main Drain Drive, (Post Mile 34.5).

The Transportation Management Center is dedicated to improve response time to clear incidents on Route 46. A recent California Highway Incident Management Summit was held last year with partners to discuss a goal of clearing highway incidents within 90 minutes. Some of the top solutions were to implement technical interoperable communication systems, establishing Caltrans/CHP communication centers, training with consistent terminology within departments, and revisions of laws to allow quick clearing activities.

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

1. Performance Measure - Level of Service (LOS)

Another performance measure for the Route 46 corridor is Level of Service (LOS). For the mainline, level of service measures the flow of traffic, based on the geometrics (i.e. 2-lanes) of a road and its capacity. The LOS describes operating conditions a typical driver will experience on a typical day while driving on a particular facility. Like a report card, the LOS is defined in categories ranging from A-F. "A" represents the best traffic flow through "F", which represents the worst congestion.

The current level of service (LOS) for the 2-lane highway of Route 46 is D, except for the section from I-5 to Route 99. By the year 2020 the LOS is projected to range between D and E. Half of the route would not meet the Concept LOS (LOS "C"). The LOS is projected to reach E and F by 2030; the entire route in District 6 would not meet the Concept LOS.

With the improvement of Route 46 to a 4-lane expressway/conventional highway throughout its extent, the LOS will improve to "B". Caltrans will continue to monitor the level of service throughout the corridor (intersections,

interchanges and route segments) as projects are planned or constructed. As the LOS worsens, Caltrans will seek to mitigate traffic impacts through the State Transportation Improvement Program (STIP), the State Highway Operation Protection Program (SHOPP) or local projects.

2. Tachometer Data

The Caltrans Traffic Operations Branch conducted a tachometer (tach) run using the floating car method for both westbound and eastbound traffic on Route 46 on August 29, 2007. The tach run is intended to show points/ segments where recurrent traffic congestion or delays occur. Results showed that there are no traffic delays outside of signalized intersections such as at Lost Hills, Interstate 5 and within the City of Wasco.

C. Maintenance – Assessment and Performance Measure (Preservation)

1. Performance Measure: Preservation – Pavement Condition

The pavement condition for Route 46 is in various state of pavement distress ranging from "No (0%) Distress Observed" to "High Alligator "B" Cracking (ABC)" (78%) cracking. The distressed areas average approximately 20% of the total pavement area for this route. Percentages shown below are average for each segment. Some areas are in good condition, and some areas are in major distress; however, the overall average does not exceed the State level (26%). A Route 46 Pavement Condition Survey contains detailed information of each area within each segment. Other forms of pavement distress are contractor and state maintenance force digouts or patched areas.

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.

PAVEMENT CONDITION

Kern 46 - Postmile	Sub-Total Area Distressed
PM 0.00 - 7.30	17.4%
PM 7.30 - 19.8	19.0%
PM 19.8 - 27.5	10.0%
PM 27.5 - 32.5	28.0%
PM 32.5 - 46.0	21.0%
PM 46.0 - 51.2	12.9%
PM 51.2 - 57.8	3.4%

2. 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 46: 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, similar to current conditions, which are less than Caltrans performance targets and desires of the communities served by Route 46.

District 6 is developing strategies to work with the local jurisdictions and the regional transportation planning agencies on developing valuable information regarding conceptual alignments of corridors and footprints of interchanges (i.e. Route 99, Interstate 5) for planning purposes that will require expansion in the foreseeable future. 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 to produce cost savings.

Maintenance contracts for this section over the last 10 years include pavement rehabilitation from PM 0.0 to 20.5 (in 1998, a five year design life), pavement overlay & widening from PM 20.5 to 32.5 (in 2001, 10 year design life and a preservation project from PM 32.5 to 49.4 (in 2002, Chip Seal). Maintenance funding is separated into “Family” categories.

Maintenance activities within this portion of Route 46 on an annualized basis by state forces include:

A Family (i.e. Crack seal, pothole patch & digouts)	$189,500
C Family (i.e. Fence repair, clean culvert/ditch, etc.)	$ 48,500
D Family (i.e. Litter, Graffiti Removal, etc.)	$ 7,700
F Family (i.e. NPDES Permit Activity, sweeping, etc.)	$ 39,300
K Family (i.e. Accident damage sign/hwy lighting)	$ 2,100
M Family (i.e. Striping, Markers, signs, etc)	$ 48,800
S Family (i.e. Storm patrol, emergency repair, etc.)	$ 4,700

3. Other Performance Measures

Other Performance Measures, such as Mobility (examples: delay, travel time – PEMS), Productivity (example: lost lane miles) and Reliability (example: Buffer Index) were not applied to the Route 46 Corridor because of its predominately rural nature and lack of traffic congestion and bottlenecks. On a periodic basis, District 6 Traffic Operations and Planning will measure the traffic conditions along Route 46 and re-evaluate the necessary application of these and other performance measures.

D. Management and Agreements

Caltrans District 6 has entered into a Memorandum of Understanding (MOU) with the Kern Council of Governments for the 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. Please refer to the approved MOU under the Appendix (pages A-1 to A-6). In preparation of this document, the transportation partners met on a regular basis to discuss the following activities and to make 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.

IV. FUTURE CORRIDOR PERFORMANCE AND IMPROVEMENT PLANS

A. 10 and 20 -Year Corridor Performance

The Summary Chart for the Route 46 Corridor breaks it into seven columns (Appendix: page A-7). Primarily based on project delineation, each column gives

postmile, terrain, level of service, deficiency, annual average daily traffic, peak hour traffic and truck traffic information. See the Summary Chart for specific information.

For the years 2020 and 2030, the Summary Chart shows forecasts for LOS, AADT, Peak hour traffic and AADT for 5-axle trucks.

The plan for the Route 46 corridor is to ultimately convert the existing two-lane highway to a four-lane expressway/conventional highway throughout its extent. The performance of the future highway is anticipated to be LOS "B" (See Summary Chart).

Improvements for Route 46 by the year 2030 will be funded through the STIP – primarily Regional Improvement Program dollars, the Congestion Management Improvement Account (CMIA), SHOPP funds – for safety, rehabilitation, operations and ITS projects – when warranted, and through local development "fair-share" contributions as growth occurs along Route 46. Additional other local/State/ Federal sources may be available.

In the following, the proposed strategy for improvements along the corridor is illustrated. This strategy is shown as a 10-Year Improvement Plan, a 20-Year Improvement Plan, and an Improvement Plan Beyond 20-Years.

This is consistent with the 2007 Kern COG Regional Transportation Plan except, for the unconstrained portion beyond 20-Years or as noted. The 10-Year Plan generally aligns to the year 2020 and the 20-Year Plan to the year 2030.

The entire corridor of Route 46 is projected to be deficient by the year 2030. Segments 1 through 4, from the San Luis Obispo County Line to Interstate 5, are currently deficient (2008) as the LOS does not meet the LOS Concept of C.

Between Interstate 5 and Route 99, the Route 46 corridor performance is projected to reach deficiency in the future. From Interstate 5 to Jumper Avenue (PM 33.5 –46.0), the projected deficiency year is 2022. The year of deficiency for the Wasco area, Jumper Avenue to Route 43 (PM 46.0 – 51.2), would be 2020. From Route 43 to Route 99 (PM 51.2 – 57.8), performance deficiency is forecasted by 2013. The Concept LOS for these sections is D.

Improvement plans for 10 years, 20 years and beyond 20 years for Route 46 are shown in the following narrative. These plans are consistent with the 2007 Kern COG Regional Transportation Plan (RTP), unless noted otherwise.

Funding is contingent upon the size and availability of State and Federal fund sources, as well as local development contributions and a possible future sales tax measure for Kern County. Economic factors may erode project costs and schedules. Therefore, these plans are dynamic in nature and are subject to change.

B. 10 - Year Improvement Plan

The improvement plan for the next 10 years (2009 -2020) would encompass funding from a diversity of sources.

The STIP projects are comprised of the future capacity increasing projects that will convert the existing two-lane highway to a four-lane expressway in several different segments within ten years. Segment 2 (San Luis Obispo County to Kecks Road) is scheduled for start of construction on December 2009. The target start date for construction on Segment 1 (Route 33 to Brown Material Road) is forOctober 2009. For Segment 3 (Kecks Road to Route 33), there are several funding sources to fully fund the conversion of the existing two-lane highway to a four-lane expressway. These include: CMIA, Interregional Improvement Program (IIP), Regional Improvement Program (RIP), Traffic Congestion Relief Program (TCRP) and Demonstration funds (federal earmark from SAFETY-LU). The target date for construction is July 2010. The CMIA program includes an estimated amount of $45 million for improving mobility and safety, providing better connectivity, and for relieving congestion.

Please refer to "Route 46 Future Capacity Increasing Projects" Map in the Appendix, page A-8 for the location of all these projects, and the diagram below for more information.

FUTURE 4-LANE EXPRESSWAY PROJECTS - 10 YEAR PLAN

Kern 46 - Postmile	Location	Target Const. Date	Funding Source	Total Cost Est. (Current $)
PM 0.00 - 7.30	SLO Co Line to Kecks Rd - Segment 2	December 2009	2006 STIP	$79 million
PM 7.30 - 19.3	Kecks Rd to SR 33 - Segment 3	July 2010	2006 STIP, CMIA	$95 million
PM 19.3 - 27.5	SR 33 to Brown Material Rd - Segment 1	October 2009	2006 STIP	$55 million

The SHOPP projects are improvement needs that would be completed as warranted throughout Route 46. The improvements may include upgrading non-standard shoulder widths, constructing left turn channelizations, installing traffic signals, upgrading interchanges and ITS projects.

ITS elements planned for this segment are Changeable Message Signs (CMS), Remote Weather Stations (RWIS), Traffic Monitoring Stations (TMS), Highway Advisory Radios (HAR), and Closed Circuit TV (CCTV). These elements will help advise motorists of incidents and inclement weather as well as improve performance along the corridor.

The SHOPP/ITS projects may be funded and completed in conjunction with the completion of the four-lane projects and/or local development projects. Three (3) signals at Kecks Road (PM 7.3), at Route 33 (PM 20.5), and at Halloway Road (PM 27.5) are planned to be completed within this time period.

ITS elements are proposed within 10 years and would be added as funding becomes available. The following ITS elements are proposed at various locations: Several RWIS between Kecks Road and Browns Material Road; two CMS near Route 33; a number of TMS between Kecks Road and Lost Hills; a CCTV at Interstate 5; and HAR stations at Route 33 and Interstate 5.

Future ITS Projects - 10 Year Plan

Proposed ITS	Location - Postmile
RWIS	PM 7.3, 11.3, 15.8, 19.8, 27.5
CMS	PM 18.0, 21.3
TMS	PM 7.3, 11.3, 12.5, 13.7, 14.9, 16.1, 17.3, 31.9, 33.5
CCTV	PM 32.5
HAR	PM 20.5, 32.5

Please refer to the Intelligent Transportation Systems (ITS) Map in the Appendix, page A-9 for the ITS locations

C. 20 – Year Improvement Plan

The 20-year improvement plan (2021-2030) would also be comprised of funding from a diversity of sources.

Segment 4 (Brown Material Road to Interstate 5) does not have a scheduled start of construction date, and is not yet fully funded, but it is scheduled to start construction within the next twenty years. An updated cost estimate is required on Segment 4. The Kern COG Regional Transportation Plan (RTP) has scheduled this mainline project to be done separately from the SR 46/I-5 Interchange upgrade.

FUTURE 4-LANE EXPRESSWAY PROJECTS - 20 YEAR PLAN

Kern 46 - Postmile	Location	Target Const. Date	Funding Source	Total Cost Est (Current $)
PM 27.5 - 33.5	Brown Material Road to I-5 (Segment 4)	< 2030	RIP	$112 million

There are additional SHOPP improvements for preservation, safety and operations that are proposed for Route 46 in this period. Some may be done in conjunction with the 4-lane widening project on Segment 4. It is probable that developers

may complete project improvements when local development triggers warrants and other conditions.

Within 20 years, certain ITS elements are proposed and would be added as funding becomes available. The following ITS elements are proposed at various locations: two RWIS near Lost Hills and one at Route 43; two CMS near Lost Hills and two near Route 43; TMS near Kecks Road, Route 33 and Brown Material Road; a CCTV at Route 33; and a HAR station at Route 43.

Future ITS Projects - 20 Year Plan

Proposed ITS	Location - Postmile
RWIS	PM 29.7, 33.5, 50.9
CMS	PM 30.1, 31.4, 48.3, 51.0
TMS	PM 10.1, 18.5, 27.2
CCTV	PM 20.6
HAR	PM 51.1

Please refer to Intelligent Transportation System Map in the Appendix, page A-9 for the location of these projects.

D. Beyond 20 – Year Improvement Plan

The "Beyond 20–year" improvement plan (beyond year 2030) would be comprised of funding from a diversity of sources.

The I-5 interchange (PM 32.7) will be upgraded from a diamond type to a partial cloverleaf type to eliminate left turn movements for both directions of Route 46, thus improving both safety and operations at this interchange.

The current two-lane highway from Interstate 5 to Jumper Avenue is planned to improve to a four-lane expressway. This highway portion will be deficient by 2022. Therefore, if financially feasible with funding availability and programming, it should be funded within the 20-year plan.

Likewise, in the Wasco area, from Jumper Avenue to Route 43, the upgrade to a 4-lane conventional highway is needed by the year 2020, either in the 10 or 20 – year plan. Even though the funding may also be an issue, this project may be expedited as the City of Wasco conditions local development on Route 46 to contribute toward mainline improvements.

Route 46, from Route 43 to Route 99, will also be improved to a 4-lane expressway. It will be deficient by the year 2013. This project is eligible for the 10 - year plan, but it has not been identified as a regional need.

STIP CAPACITY INCREASING PROJECTS – BEYOND 20 YEAR PLAN

Kern 46 - Postmile	Location	Target Const. Date	Funding Source	Total Cost Est (Current $)
PM 32.7	SR 46/I-5 Interchange	> 2030	RIP	$51 million
PM 33.5 - 46.0	I-5 to Jumper Ave	> 2030	RIP	$82 million
PM 46.0 - 51.2	Jumper Ave to SR 43	> 2030	RIP	$54 million
PM 51.2 - 57.8	SR 43 to SR 99	> 2030	RIP	$67 million

E. Other Issues

1. Access Management
Caltrans will work together with the local agencies i.e. City of Wasco, Kern County to manage access along Route 46. Access management techniques include minimum spacing between driveways, use of frontage roads, decreasing the numbers of driveways and applying intersection spacing standards on the new expressway segments. The objective would be to preserve mobility along the corridor. Local agency management of land use to encourage internal connectivity would also be encouraged.

2. Assembly Bill (AB) 32
AB 32 mandates the green house gas emissions in the year 2020 to be reduced to the 1990 level or lower. AB 32 will likely increase costs and potentially delay construction. Construction projects in the San Joaquin Valley already must deal with air quality issues: CO (unlikely to be a problem); PM10 and PM2.5 (likely a moderate problem); mobile source air toxics (certainly a problem due to diesel construction equipment); ozone (potentially a problem); construction effects (construction methods will need to follow San Joaquin Valley APCD indirect source rule requirements). Rule 9210 from the San Joaquin Valley APCD will regulate the use of off-road vehicles, including construction vehicles. This could be a significant issue depending on when this must be implemented and how many contractors already have such equipment.

3. Wasco 4-lane Plan Line (PM 46.0/51.22)
The Environmental Document for the Wasco 4-lane project was approved in November, 2006. The ultimate right of way line and alignment for the 4-lane project has generally been established, and the City of Wasco wanted the alignment to be shown in the CSMP so the development community and other interested parties would know the expectation for right of way dedication from Caltrans. Right of way for the corridor has been set at 154 feet (54 additional feet to the south) for Segment 1(Jumper Avenue to Magnolia Avenue), 108 feet for Segment 2(Magnolia Avenue to Route 43 South), and as much as 210 feet for Segment 3 (Route 43 South to Route 43 North). (The Wasco corridor right-of-way has been divided into 3 segments (1 through 3); this is not to be confused with the funded segments 1 through 3 for the entire Route 46 corridor). The transition areas (lengths between segments), of course, are of variant widths. Accordingly, the right of way alignment for the Route 46 corridor is shown in the Appendix

(page A-11 to A-24). Please call (559) 230-3118 if there are any questions about the alignment or right of way dedication needs in a particular area of the Wasco corridor.

V. CONCLUSION

Corridor productivity can only be restored and maintained through a coordinated planning and management effort of all transportation partners. The System Management Strategies *Go California*—Mobility Action Plan is part of Governor Schwarzenegger's Strategic Growth Plan. The CSMP identifies a number of elements essential for 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, beginning at the bottom and working to the top of the pyramid:

1. System Monitoring and Evaluation: This basic foundation 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 is to analyze the system. The next step will be to prioritize the projects planned on the corridor based on the corridor need and the ability to maximize performance of the system as a whole. Prioritization is a joint effort of Caltrans and its partners. They will

develop a list of performance measures that will evaluate how effective the system improvements have been. The uniqueness of the corridor and the current technology available will be determining factors.

2. Maintenance and Preservation: Maintaining the system in as optimum a condition as possible will require all partners' participation. The best strategies must be determined to maximize operations of the entire system.
3. Smart Land Use, Demand Management/Value Pricing: Land use decisions by local government impact the transportation system. Appropriate planning can reduce this impact by preserving right of way for future projects. Also approving compatible developments to the transportation system will help to protect the system. The extent of the usefulness of demand management strategies will be part of the process of describing the current system and the current ITS components available on the system, as well as the future system. Finally, value pricing may be a part of the project prioritization efforts to be undertaken by the partners. One key component is a cost-benefit assessment.
4. Intelligent Transportation Systems, Traveler Information, Traffic Control and Incident Management: These will be an integral part of maximizing the operational performance of the system as lower cost, more expedient ways of addressing bottlenecks and other traffic problems.
5. 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: As the top of the pyramid, these are improvements that are capacity increasing or that help complete the system.

The process of System Management is an ongoing process. New needs will be identified, new technology available, and funding sources and revenue will be changing on a constant basis. Caltrans and the local partners will need to be flexible and responsive to the fluid transportation scenarios. Therefore, the CSMP for Route 46 must be a living document, subject to updates as the transportation picture for the corridor is altered.

According to the Work Plan in the MOU, Caltrans District 6 will manage the Route 46 corridor on an on-going basis. It will continue assessing the performance of the system with the current performance measures, but will evaluate other measures as conditions change along the corridor.

Appendix

Pages

Memorandum of Understanding . . . . . A-1 – A-6

Summary Chart A-7

Future Capacity Increasing Projects Map A-8

Intelligent Transportation Systems (ITS) Map A-9

Multi-modal Alternative Map A-10

Wasco 4-lane Plan Line Maps . . . . . A-11 – A-23

SIGNATORIES

MEMORANDUM OF UNDERSTANDING
FOR
STATE ROUTE 46 CORRIDOR
(KER PM 0.0 to KER PM 57.8)

9/24/07
Date

Malcolm X. Dougherty
California Department of Transportation, District 6
District Director
1352 W. Olive Avenue
Fresno, CA 93728

Sept 21, 2007
Date

Ronald Brummett
Kern Council of Governments
Executive Director
1401 19th Street, Suite 300
Bakersfield, CA 93301

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

State Route 46
(KER PM 0.0/57.8)
Charter for Development and Implementation

The Development and Implementation of a Corridor System Management Plan (CSMP) for State Route 46 between San Luis Obispo/Kern County Line and State Route 99

This Charter or Memorandum of Understanding (MOU) is between the California Department of Transportation, District 6 (hereinafter, District 6) and the Kern Council of Governments (KCOG). 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 46 corridor between San Luis Obispo/Kern County Line 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 46.

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 federal congestion management system requirements for Transportation Management Areas (TMAs), and 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

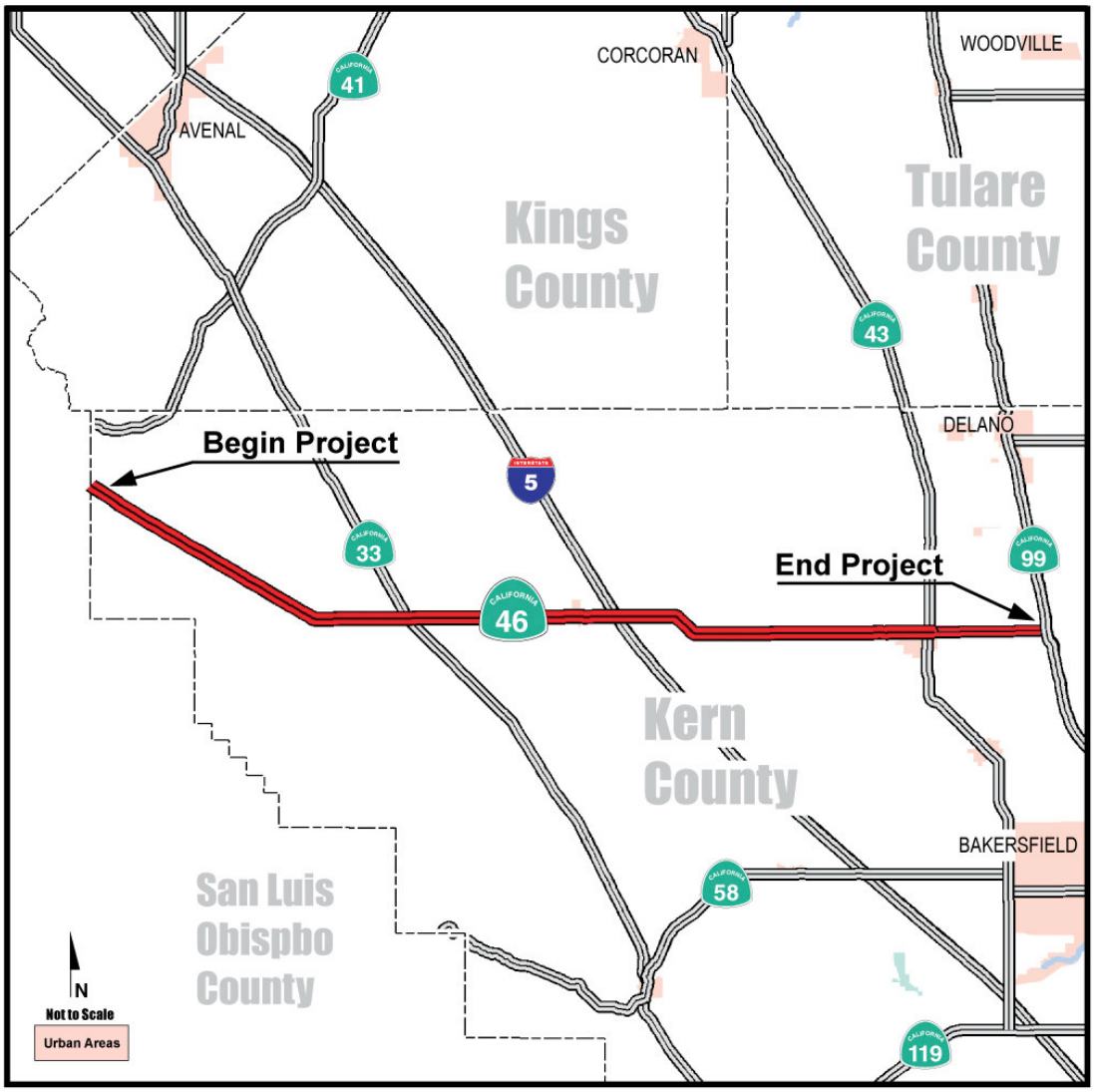
The Transportation partners (and other applicable partners) will meet on a regular basis for the following activities and decisions:

- Agreement to a work plan, time line, roles and responsibilities for development of the CSMP, including resources.
- Review draft products, including initial performances 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.

Appendix

- Map of State Route 46 Corridor from Kern Post Mile (PM) 0.0/57.8 (Attachment 1)
- Corridor System Management Plan Development Work Plan (Attachment 2)

Attachment 1



Corridor System Management Plan (CSMP) Development
Work Plan - Attachment 2

Corridor ____KER-46____

ID	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																																	
7	Orientation/Education Sessions for Partner Agencies																																	
8	Document Existing Traffic Data/Conduct Counts As Needed																																	
9	Assess Traffic Analysis Needs																																	
10	Establish Corridor Performance Measures																																	
11	Initiate Base Performance Assessment																																	
12	Continue Performance Assessment Initiate Safety & Ops Identification																																	
13	Identify Planned and Programmed Improvements Including ITS Elements																																	
14	Ongoing CSMP Preparation																																	
15	Identify Alternative Performance Scenarios (Project, Actions, Strategies)																																	
16	Traffic analysis- All Planned and Programmed Projects.																																	
17	Traffic analysis/Model Improvement Scenarios																																	
18	Establish Initial Staging / Sequencing Plan																																	
19	Full Performance Assessment and Analysis																																	
20	Assess Future Performance In Corridor																																	
21	Develop Recommends and Performance Imprv Planning-Level Cost Est																																	
22	Adoption by Regional Entities																																	
23	Ongoing Management Of Corridor Using CSMP																																	
24	Continuous Corridor Performance Assessment																																	
25	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 South Region Planning Staff
District 6 Technical Planning Staff
District 6 Program Project Management Staff
District 6 Traffic Operations Staff
District 6 Traffic Engineering Staff
District 6 Project Design Staff
Kern County Public Works & Planning
Kern County Association of Governments Staff
City of Wasco
District 5 Planning

State Route 46

LEGEND

Planned or Programmed by 2030

Convert existing 2-lane conv. (2C) to 4-lane conv. (4C)

Convert existing 2-lane conv. (2C) to 4-lane express. (4E)

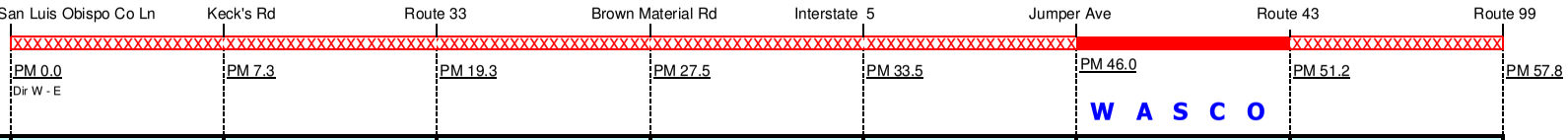
Conventional

Expressway

Number of Lanes 2 4

Dir = Direction

* not to scale



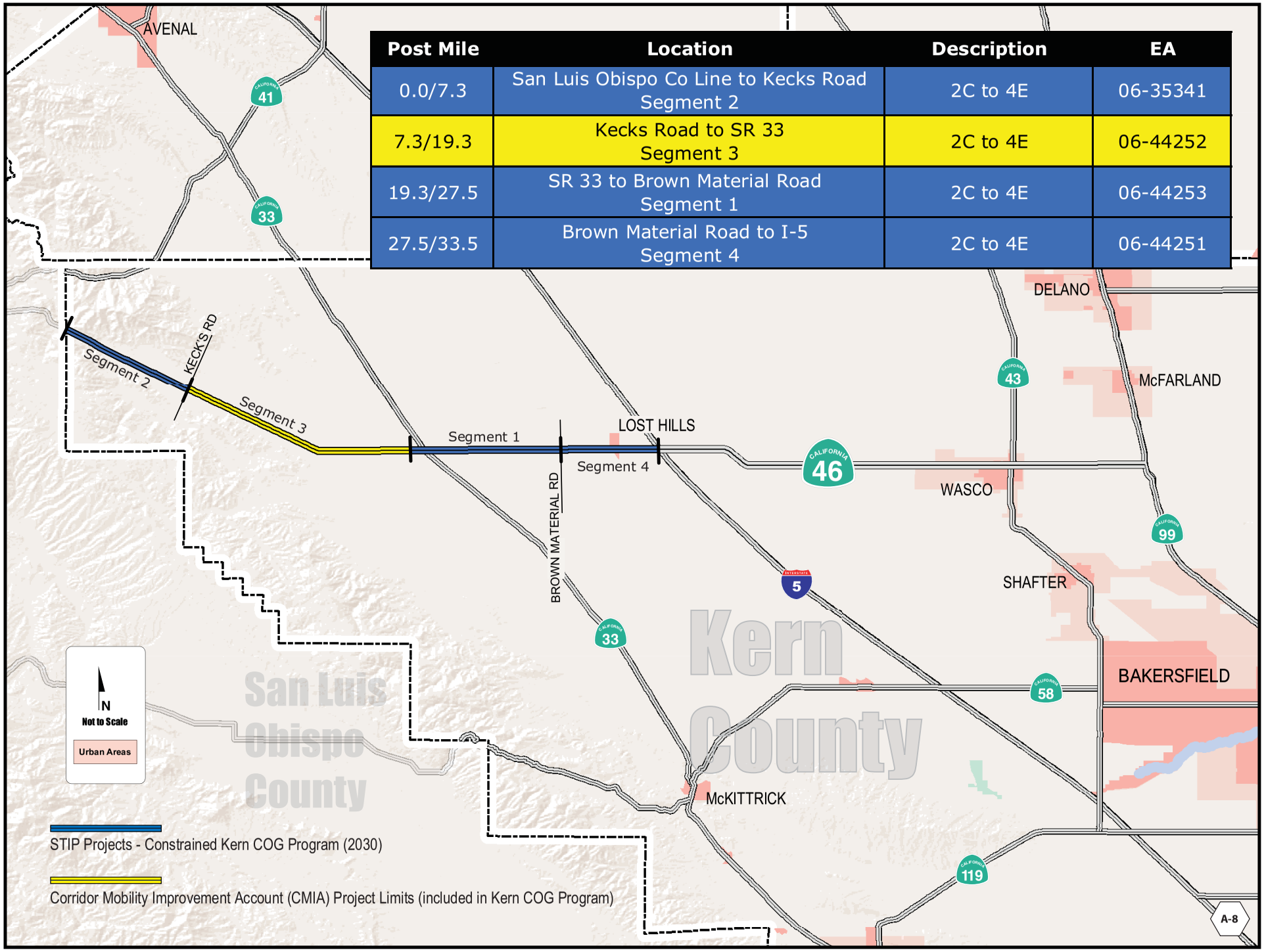
	Segment 2 *	Segment 3 *	Segment 1 *	Segment 4 *			
County / Route	KERN / 46	KERN / 46	KERN / 46	KERN / 46	KERN / 46	KERN / 46	KERN / 46
Description Begin	SAN LUIS OBISPO CO LINE	KECK'S ROAD	ROUTE 33	BROWN MATERIAL ROAD	INTERSTATE 5	JUMPER AVENUE	ROUTE 43 - N JUNCTION
Description End	KECK'S ROAD	ROUTE 33	BROWN MATERIAL ROAD	INTERSTATE 5	JUMPER AVENUE	ROUTE 43	ROUTE 99
Postmile Limits Begin/End (PM)	0.0 / 7.3	7.3 / 19.3	19.3 / 27.5	27.5 / 33.5	33.5 / 46.0	46.0 / 51.2	51.2 / 57.8
Length (MI)	7.3	12.0	8.2	6.0	12.5	5.2	6.6
Rural / Urban	Rural	Rural	Rural	Rural	Rural	Urban	Rural
Terrain	Rolling	Flat	Flat	Flat	Flat	Flat	Flat
Facility: Existing	2C	2C	2C	2C	2C	2C	2C
2030 Concept	4E	4E	4E	4E	4E	4C	4E
UTC	4E	4E	4E	4E	4E	4C	4E
LOS: 2008	D	D	D	D	C	D	D
LOS: 2020	E	D	D	D	D	D	E
LOS: 2030	F	E	E	E	E	E	F
LOS: Concept 2030	C	C	C	C	D	D	D
Deficiency/Year Deficient	2008	2008	2008	2008	2030	2030	2020
Project in STIP/RTP (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LOS W/ Concept Improvement	B	B	B	B	B	B	B
Directional Split (Peak Hour)	52/48	51/49	51/49	51/49	50/50	55/45	53/47
AADT: 2008	9,000	8,000	7,000	9,600	7,664	10,380	10,095
AADT: 2020	14,000	11,200	10,300	14,300	12,500	15,300	18,400
AADT: 2030	21,200	15,800	15,300	21,400	20,100	22,400	34,100
Peak Hour: 2008	840	840	760	880	660	800	800
Peak Hour: 2020	1,310	1,180	1,120	1,310	1,070	1,180	1,460
Peak Hour: 2030	1,970	1,660	1,660	1,960	1,730	1,730	2,700
Truck AADT 5+ axle: 2008	2,200	2,200	2,200	2,100	2,200	2,100	1,900
Truck AADT 5+ axle: 2020	3,400	3,100	3,200	3,100	3,600	3,100	3,500
Truck AADT 5+ axle: 2030	5,200	4,400	4,800	4,700	5,800	4,500	6,400

Shaded area - Corridor Mobility Improvement Account (CMIA) Project Limits

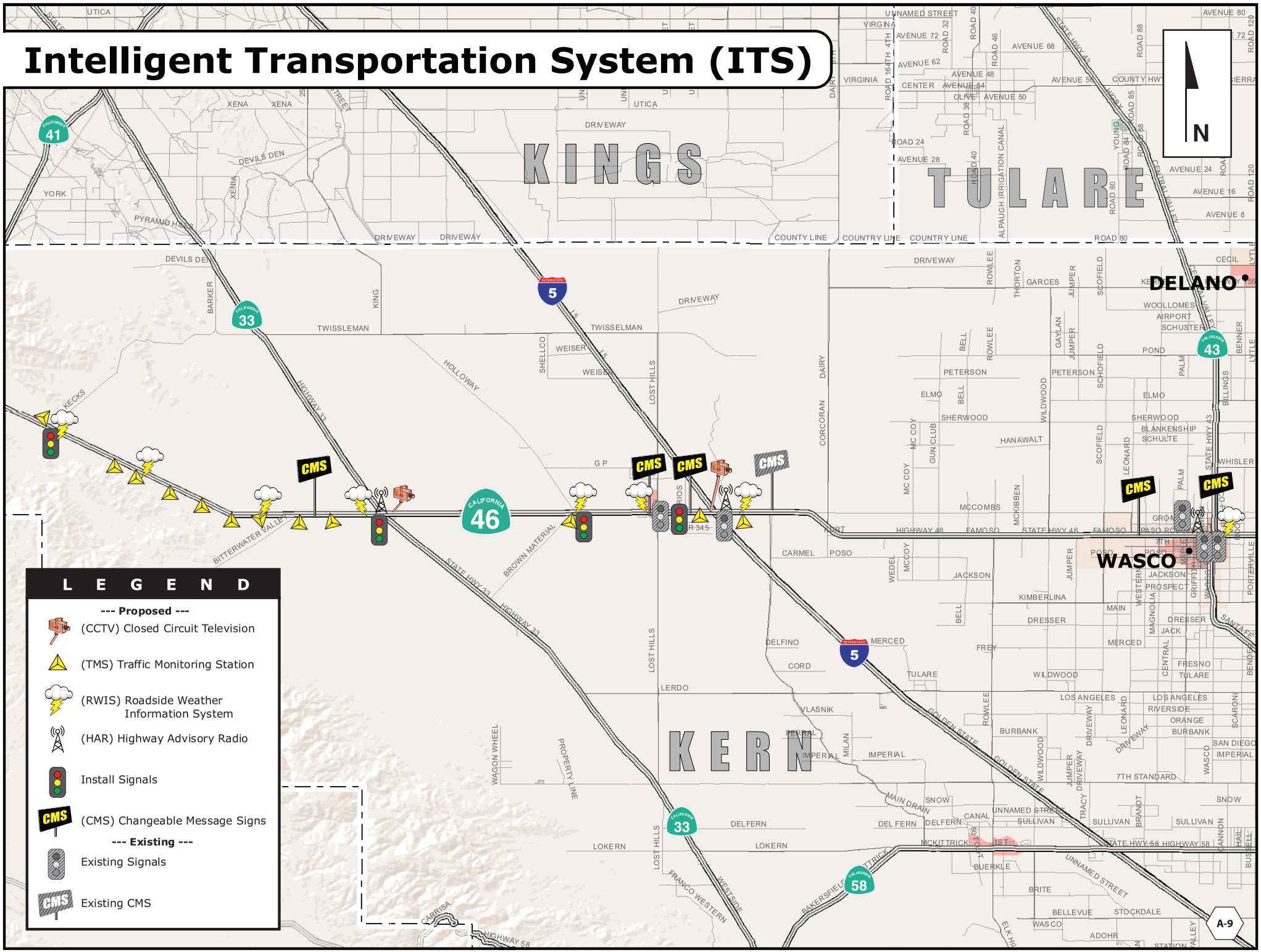
* Segments Funded (Fiscally Constrained)

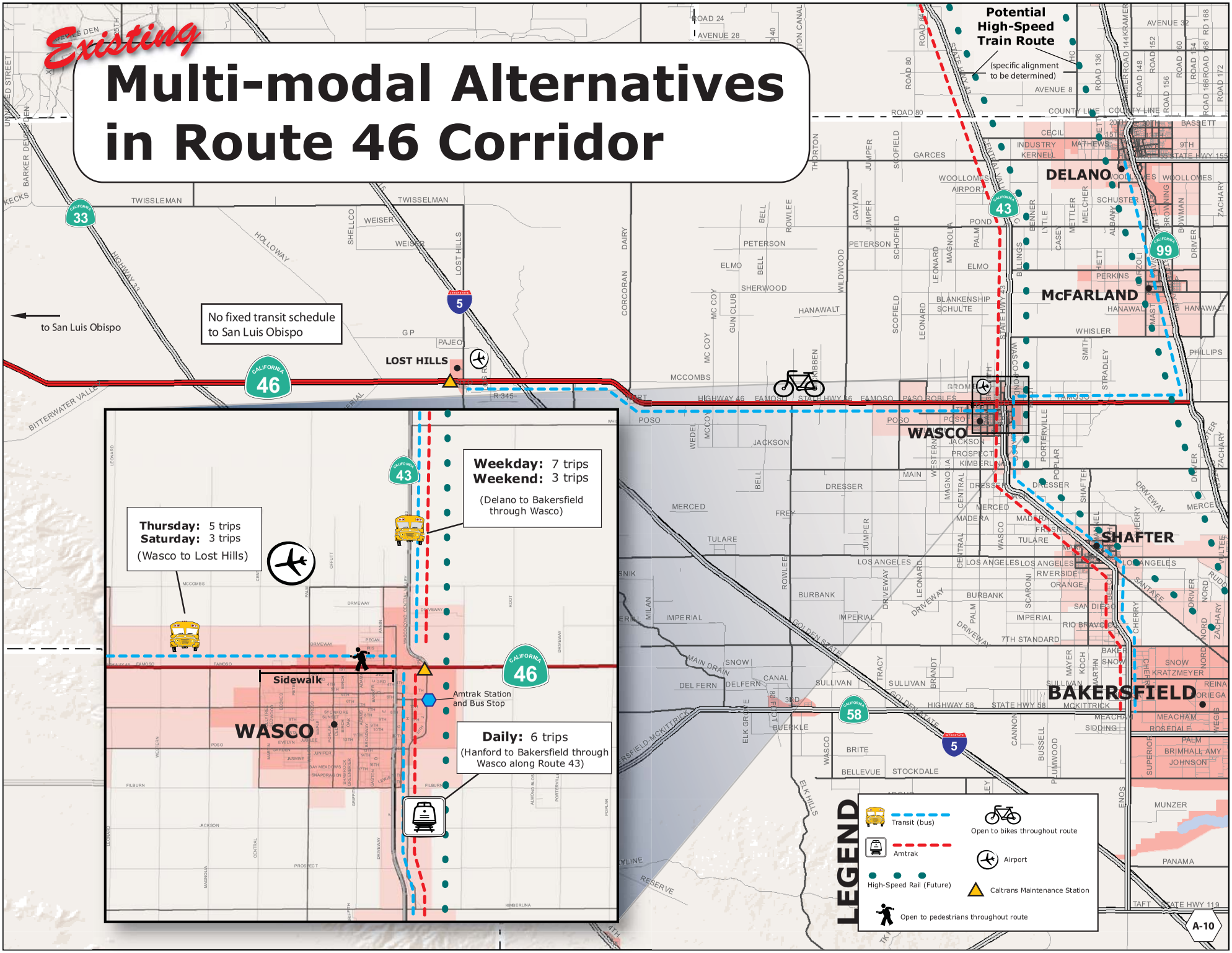
Route 46 Future Capacity Increasing Projects

Post Mile	Location	Description	EA
0.0/7.3	San Luis Obispo Co Line to Kecks Road Segment 2	2C to 4E	06-35341
7.3/19.3	Kecks Road to SR 33 Segment 3	2C to 4E	06-44252
19.3/27.5	SR 33 to Brown Material Road Segment 1	2C to 4E	06-44253
27.5/33.5	Brown Material Road to I-5 Segment 4	2C to 4E	06-44251



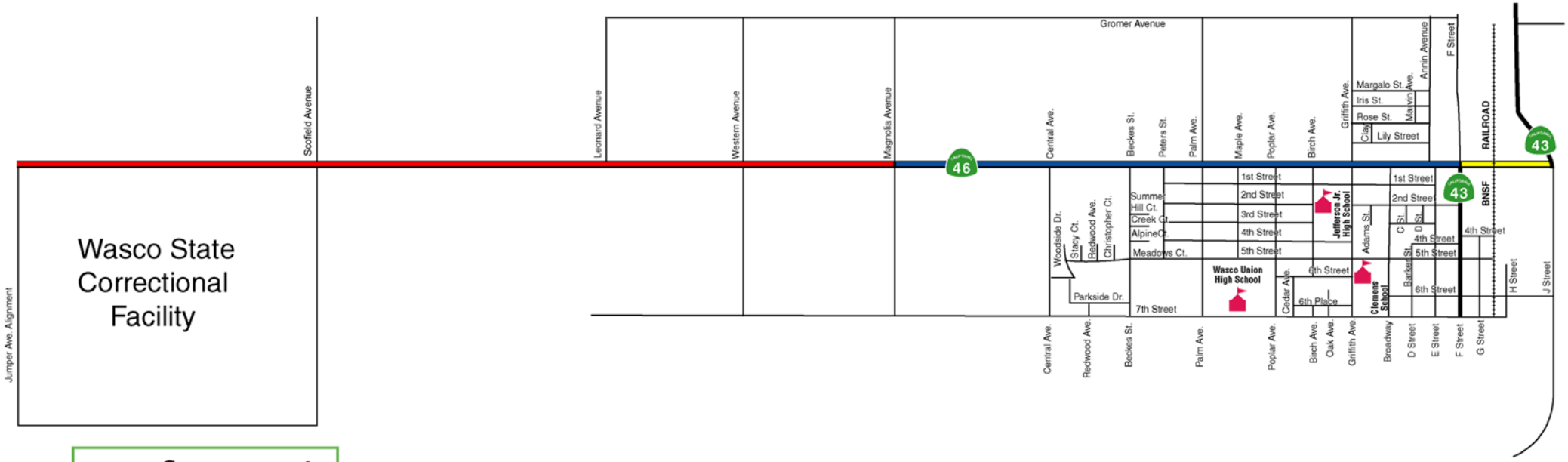
Intelligent Transportation System (ITS)




Existing
Multi-modal Alternatives in Route 46 Corridor
Potential High-Speed Train Route
(specific alignment to be determined)
DELANO
McFARLAND
WASCO
SHAFTER
BAKERSFIELD
LOST HILLS
to San Luis Obispo
No fixed transit schedule to San Luis Obispo
Weekday: 7 trips
Weekend: 3 trips
(Delano to Bakersfield through Wasco)
Thursday: 5 trips
Saturday: 3 trips
(Wasco to Lost Hills)
Sidewalk
Amtrak Station and Bus Stop
Daily: 6 trips
(Hanford to Bakersfield through Wasco along Route 43)
LEGEND
Transit (bus)
Amtrak
High-Speed Rail (Future)
Open to bikes throughout route
Airport
Caltrans Maintenance Station
Open to pedestrians throughout route
A-10

Project Segments
Wasco 4-Lane

06-KER 46
EA 06-418800
PM 46.00/51.22
KP 74.03/82.43



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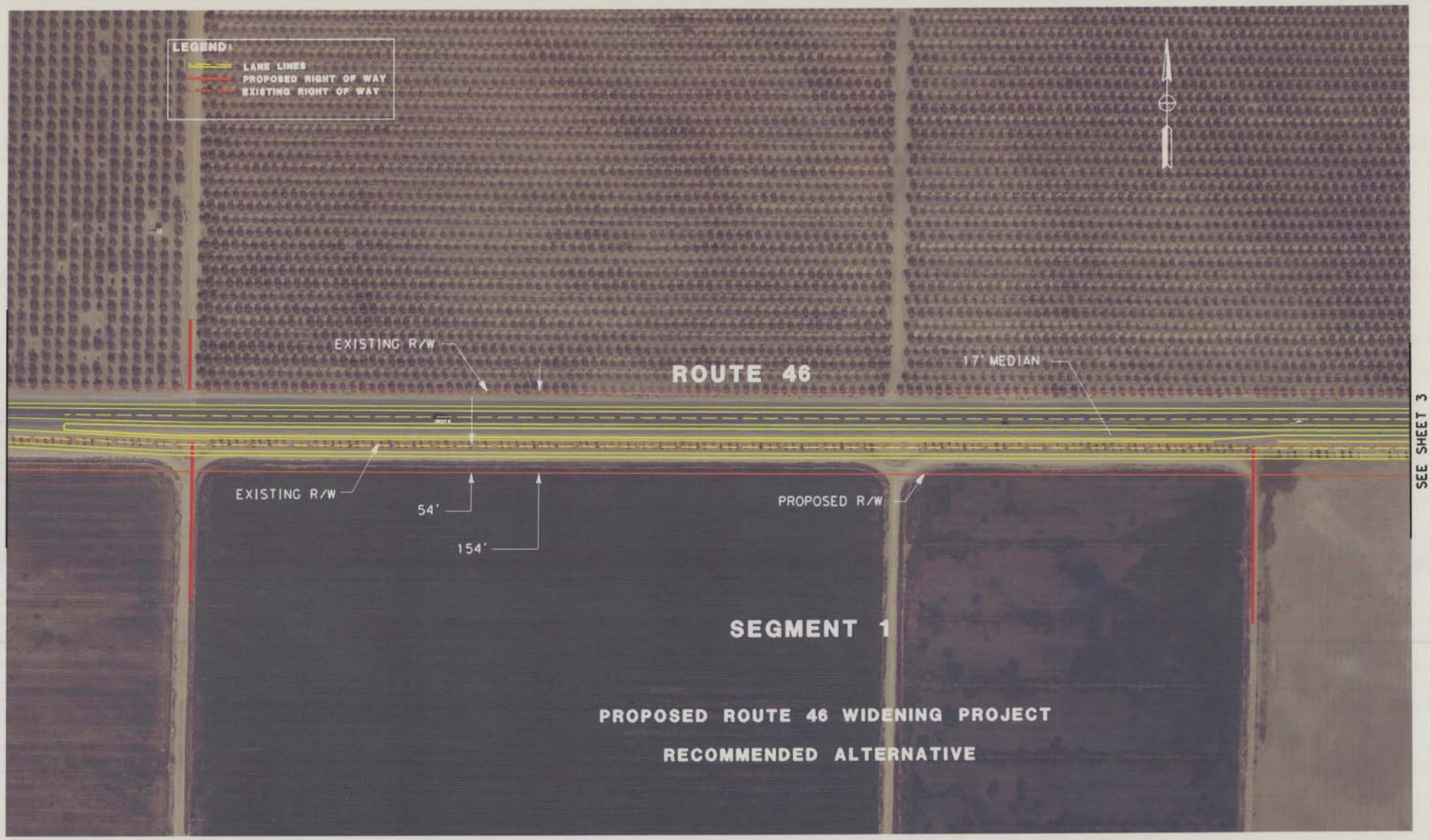

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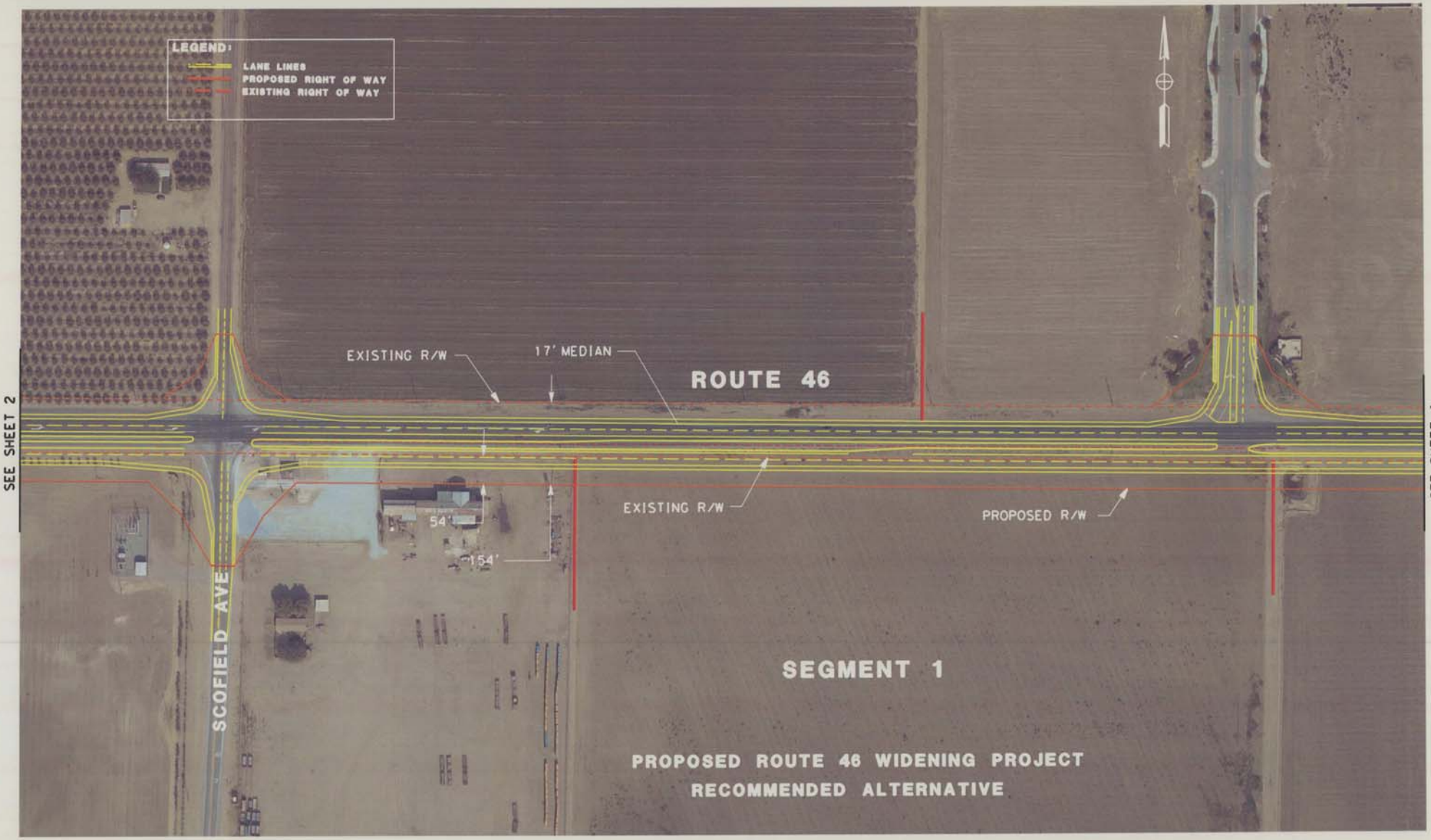

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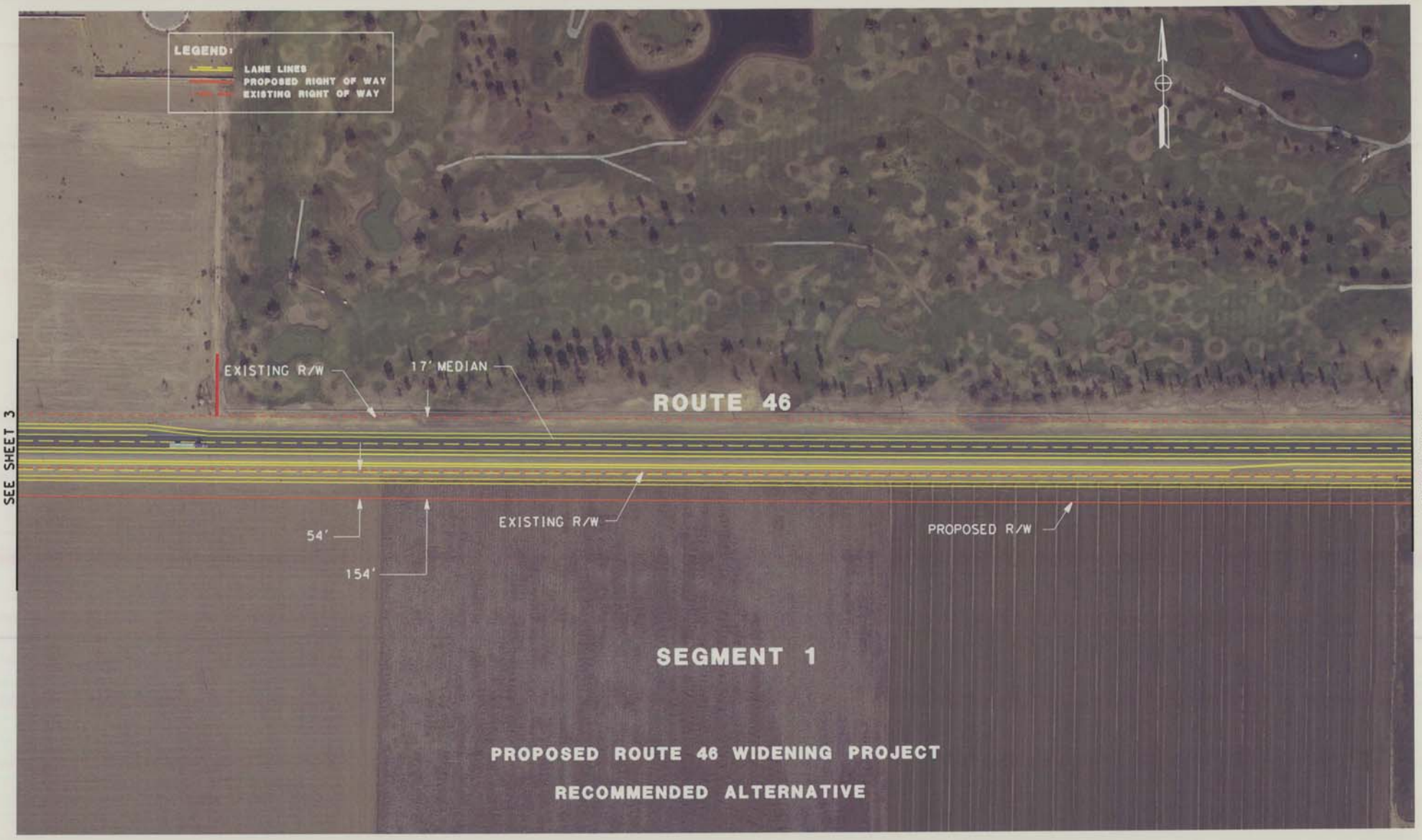

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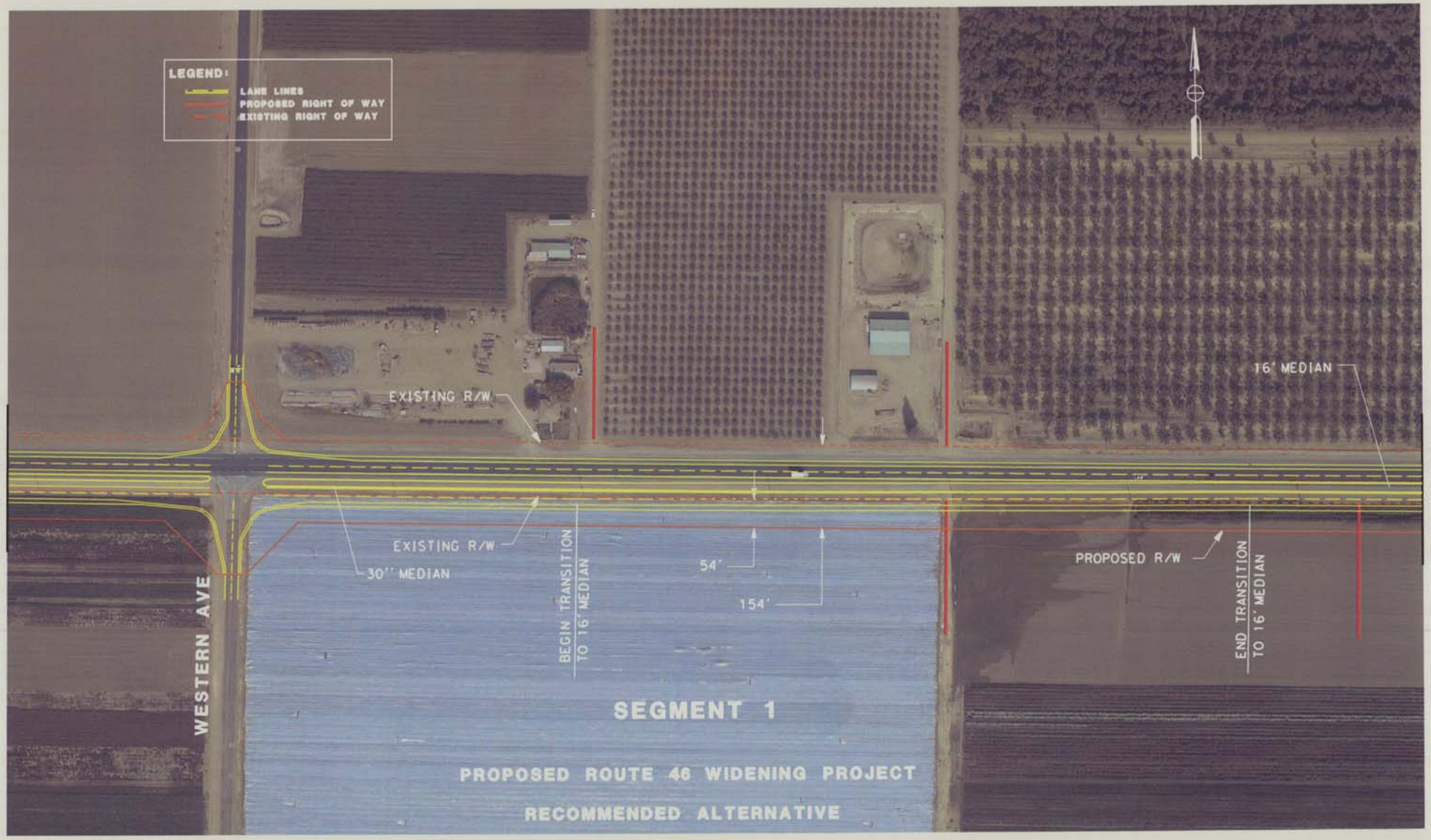

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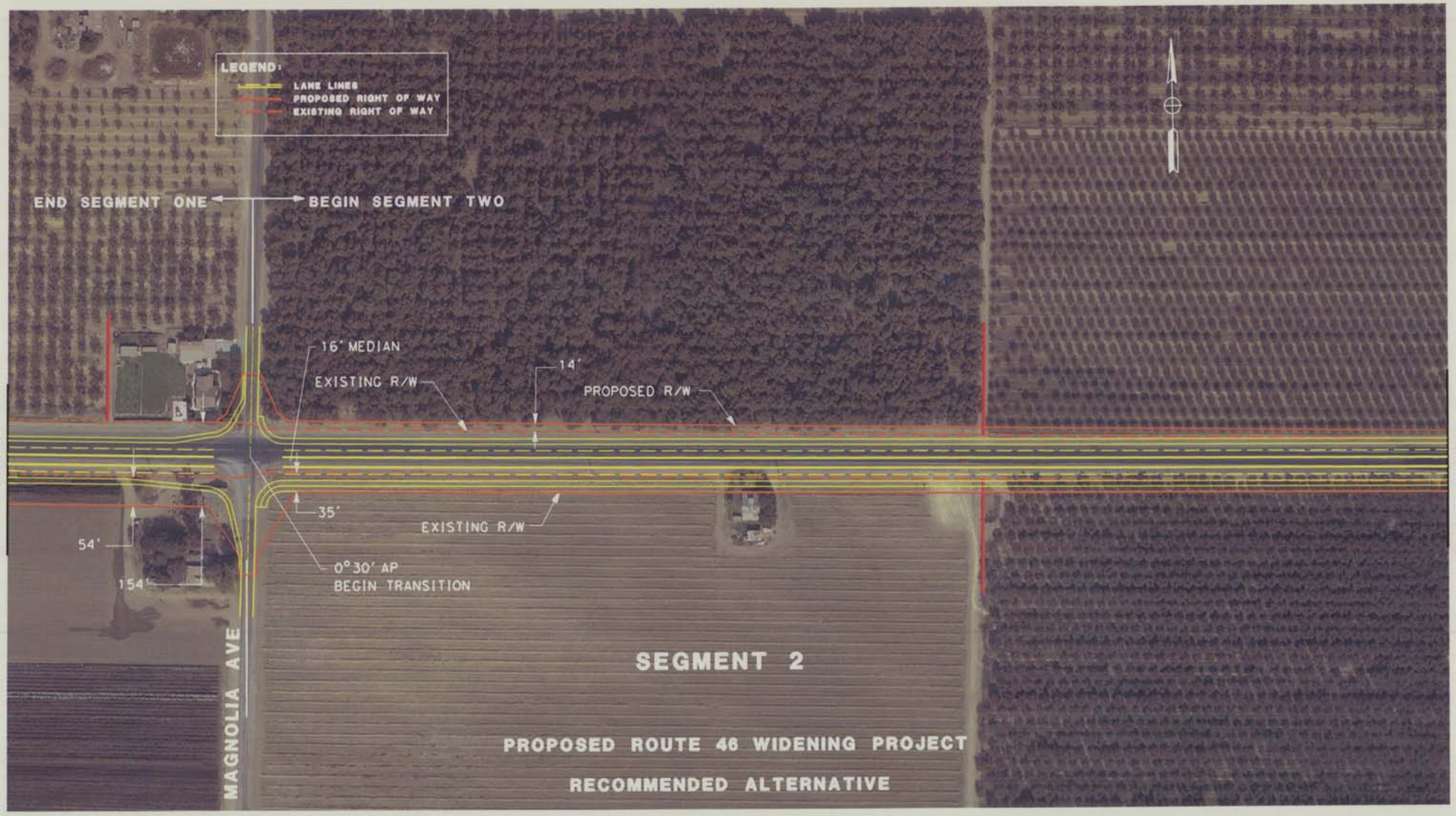

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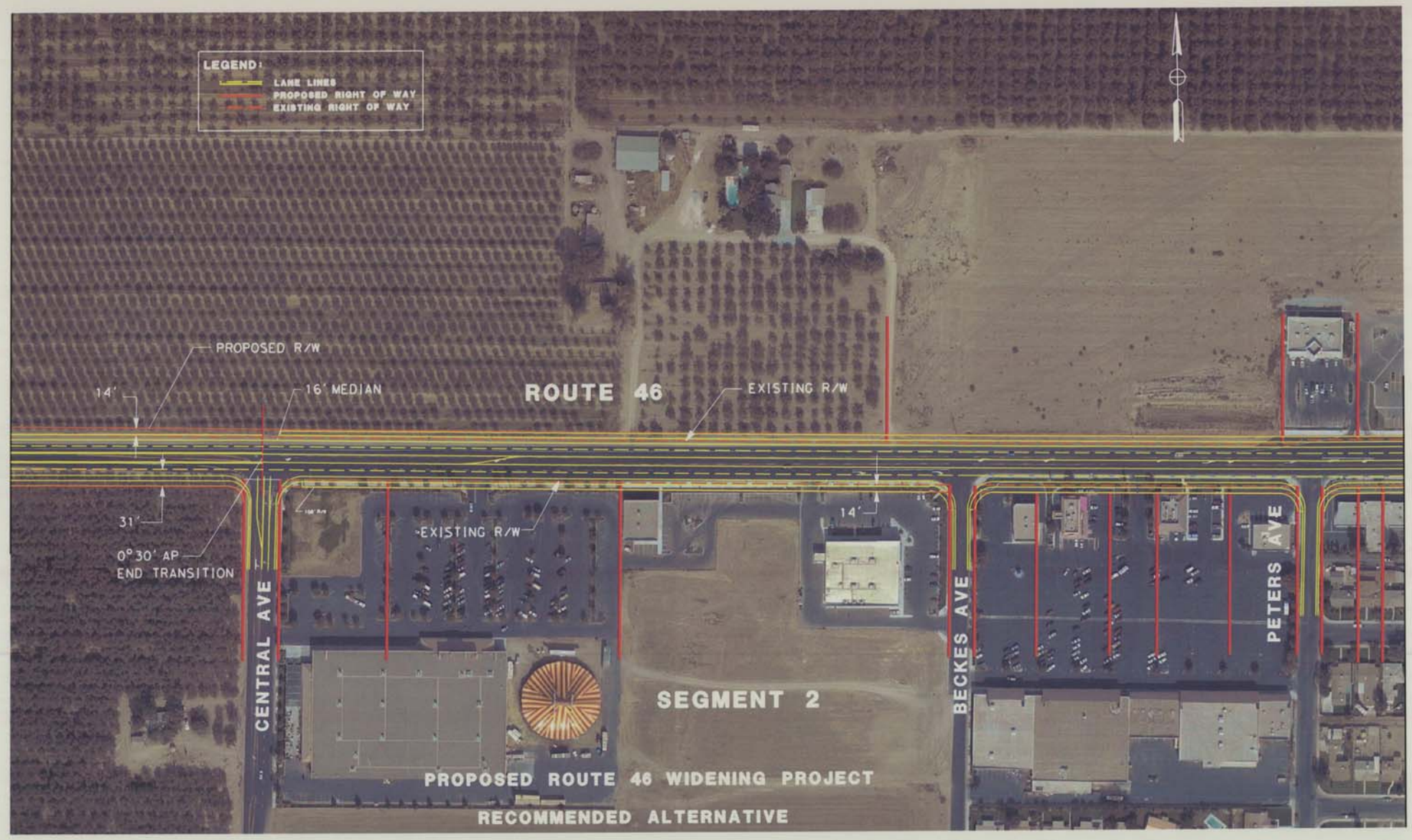

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SEE SHEET 10

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SHEET 10

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SHEET 11

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LEGEND:
- LANE LINES
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY

SEE SHEET 11

PROPOSED ROUTE 46 WIDENING PROJECT

RECOMMENDED ALTERNATIVE

SHEET 12

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