



INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PLAN FOR THE KERN REGION

DELIVERABLE NO. 2

DATA REPORT

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1.0 INTRODUCTION

The Intelligent Transportation Systems (ITS) Plan for the Kern Region is a critical component in addressing the transportation needs of the region. As travel demand on the freeway and arterial system increases, there is an increasing need to improve the system through better management of existing capacity. In recognition of this, the Kern Council of Governments (Kern COG) and the local communities in the region continue to invest in ITS. The ITS Plan will ensure that these investments address the important needs in the region and bring the maximum benefit to travelers. The ITS Plan will include a specific implementation plan that reflects the changes in technology since the 1997 ITS Early Deployment Plan (EDP) was completed.

1.1 PROJECT BACKGROUND

The EDP was developed for the Kern region in 1997, led by Kern COG. The EDP was developed in consultation with local Kern County agencies, and reflected the input and priorities of the local agencies. Subsequently, the San Joaquin Valley ITS Strategic Deployment Plan (SDP) was developed for the eight counties of the San Joaquin Valley: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. The 1997 EDP and the 2001 SDP documents are consistent with one another with regards to the Kern regions' inputs, needs, and plans.

A comprehensive update of the countywide EDP has not been completed since 1997. In the interim, Kern metropolitan area agencies have made significant investments in the planning, design, and implementation of ITS for the surface transportation and transit networks. There is an expectation, documented in the 1997 EDP and Architecture, that investment in ITS strategies will continue with a focus at the local level. At the same time, it's important that investments be made in reliable technologies that deliver proven benefit in a cost effective manner. Toward this end, Kern COG is leading this countywide ITS Plan to direct ITS investments throughout the county over the next twenty years and beyond.

Concurrently, Kern COG is in the process of updating the Regional Transportation Plan (RTP) for 2018, including the development of an updated project list for implementation using local and federal funding. ITS strategies, particularly those related to operational improvements to the arterial street system, and to enhancing transit service are important elements of the RTP and can provide improvements that lend to the Sustainable Community Strategies (SCS). Updating the ITS Plan will provide timely input to the RTP and the SCS, and will improve consistency among the three planning documents.

1.2 ITS PLANNING PROCESS

The ITS planning process is much like any other transportation planning activity, with the primary difference being the focus on technological solutions. One of the primary areas of emphasis of ITS planning is the extensive involvement and participation by the stakeholders of the region. This is especially important to ensure interagency systems integration, address potential institutional issues early, and to provide the necessary education and awareness of advanced technology transportation solutions.

Using the federal ITS planning process as a guideline, the overall approach to achieving the stated project goals will be performance of the following tasks (the **bolded text** indicates the current task and/or deliverable):

Task 1: Project Initiation

Deliverable 1: Project Plan

- The Project Plan will incorporate the Stakeholder Engagement Plan, the stakeholder governance structure, and the detailed master project schedule.

Task 2: Data Gathering

Deliverable 2: Existing Data Report

- **The report identifies the ITS elements within the Kern region, existing and planned policies/projects combined with an understanding of the region's users to fully recognize the various opportunities and constraints.**

Task 3: Assessment of the 1997 ITS Early Deployment Plan (EDP) and the Kern portion of the 2001 San Joaquin Valley ITS Strategic Deployment Plan (SDP)

Deliverable 3: Report assessing the 1997 EDP and the Kern portion of the 2001 SDP

- The report documents the findings of the assessment of the 1997 EDP and the 2001 SDP with the lessons learned in the interviews with project stakeholders.

Task 4: Update Regional ITS Inventories

Deliverable 4: System Inventory Summary Report

- The report presents a summary of the findings from the Inventory Survey forms from various Stakeholders identifying existing and planned ITS elements within each jurisdiction.

Task 5: Stakeholder Consultation/Identification of ITS Needs, Vision, Goals, and Objectives

Deliverable 5: Vision, Goals, Objectives and Needs Technical Report

- The report will identify an ITS vision for the Kern region, set of goals and objectives, and identify ITS needs after various exercises with Stakeholders.

Task 6: Develop Key Regional ITS Strategies

Deliverable 6: Regional ITS Strategies Report

- The report will refine and present a range of Intelligent Transportation Systems (ITS) components for inclusion in the ITS Plan.

Task 7: Determine Specific Needs, ITS Service Packages and Elements Based on Strategies

Deliverable 7: Regional Consolidated Needs Assessment Summary Technical Report

- The report will translate generic ITS needs into the National ITS Architecture framework. ITS Elements will also be identified as part of the process of identifying and selecting Service Packages for the region.

Task 8: Define Operational Roles and Responsibilities Consistent with Regional Vision, Goals, Objectives, and Strategies

Deliverable 8: Regional ITS Operational Roles and Responsibilities Technical Report

- The report will identify Operational Roles and Responsibilities that are consistent with the Vision Statement and the Goals and Objectives identified and developed in Task 5 and will also be based on the Strategies development in Task 6.

Task 9: Determine the Functional Requirements

Deliverable 9: Functional Requirements Report

- The report will identify Functional Requirements for ITS Architecture for the Kern region based on Federal Highway Administration's (FHWA) guidance

Task 10: Prepare Regional ITS Architecture

Deliverable 10: Draft and Final Electronic Copy of the Turbo Architecture Database

- The electronic Turbo Architecture database will be developed consistent with Version 7.1 of the National ITS Architecture, FHWA Rule 940.9, and Part V of the Federal Transit Administration (FTA) National ITS Architecture Policy for Transit Projects and provided to Kern COG.

Task 11: Develop an Architecture Maintenance Plan

Deliverable 11: Architecture Maintenance Plan

- The report will develop an Architecture Maintenance Plan that will describe how to use the Architecture. The Report will provide project planning, project programming, project design, and maintenance procedures.

Task 12: Develop Kern Region ITS Plan

Deliverable 12: Kern Region ITS Plan

- The report will take all of the inputs from Tasks 2 through 11 and meld them together into a cohesive and comprehensive ITS Plan Report and Phasing Plan for Kern County.

Task 13: ITS Website for Regional Stakeholders

Deliverable 13: Draft and Final Website

- The Kern COG website ITS webpage will provide background on the project, the deliverables, and links to meeting agendas and material during Draft ITS Plan development. The Final webpage will include the Final ITS Plan.

1.3 STAKEHOLDER PARTICIPANTS

The success of a regional ITS architecture depends on participation by a diverse set of regional Stakeholders. **Table 1-1** lists the agencies/organizations of approximately 28 key stakeholders that will be engaged to provide input for the ITS Plan. Input from the Stakeholders as well as others, will be instrumental in the development of the information presented in the final ITS Plan. These Stakeholders, and any others that join the project along the way, will be instrumental to the

development of the regional ITS architecture. The stakeholder list will be updated periodically throughout the life of the project.

Table 1-1. ITS Plan for the Kern Region Stakeholder List

Amtrak	City of Taft
Bureau of Land Management	City of Tehachapi
Burlington Northern Santa Fe Railroad	City of Wasco
Caltrans District 6	CommuteKern (Kern COG)
Caltrans District 9	County of Kern
Caltrans Headquarters	Delano Area Rapid Transit
City of Arvin	Federal Highway Administration California Division
City of Bakersfield	Federal Transit Administration Region 9
City of California City	Golden Empire Transit District (GET)
City of Delano	Kern Council of Governments (Kern COG)
City of Maricopa	Kern Motorist Aid Authority (Kern COG)
City of McFarland	Kern Transit
City of Ridgecrest	Tejon Indian Tribe
City of Shafter	Union Pacific Railroad

1.4 RELATIONSHIP TO 1997 EDP

As noted in Section 1.1, the ITS Early Deployment Plan (EDP) was completed for Kern County in 1997. That plan was comprehensive, in terms of both needs assessment and the development of recommendations. For this ITS Plan update, the 1997 EDP will be reviewed and assessed in Task 3. This assessment will provide some insight and guidance in the project process when considering project and program prioritization, which will also be influenced to varying degrees by the changes in technology since 1997. The assessment will provide a look back at prior ITS planning and implementation efforts and lessons learned from those efforts while moving forward with this most current ITS planning and implementation effort.

1.5 PURPOSE OF DATA REPORT

The purpose of the Data Report is to obtain a complete understanding of ITS elements in the Kern region, including: existing conditions, ongoing planning efforts and their relationships to this study, needs and expectations of the Stakeholders, and a thorough understanding of the physical features that will influence opportunities for enhancing ITS in the Kern region. The report identifies the ITS elements, existing and planned policies/projects, within the Kern region.

2.0 DATA COLLECTION PROCESS

2.1 DATA COLLECTION

ITS project-related documents were primarily researched for the Kern region. San Joaquin Valley documents as well as Caltrans documents with significant ITS projects were evaluated. These documents were researched on the Internet. Pertinent documents evaluated include the Kern COG Regional Transportation Plan, ITS deployment plans, Metropolitan Bakersfield General Plan, and various Caltrans Transportation Concept Reports and Corridor System Management Plans. These documents were reviewed and relevant ITS information from those documents is summarized in the Chapter 3.0 of this document. In addition, a brief summary of the 1997 ITS Early Deployment Plan is provided.

3.0 SUMMARY OF ITS DOCUMENTS REVIEWED

3.1 COUNTY-LEVEL DOCUMENTS

3.1.1 Kern COG Regional Transportation Plan (2014)

The Kern COG's Regional Transportation Plan (RTP) (2014) provides an overview of ITS opportunities in the region. The Kern region aims to take advantage of the level of awareness and precedent for joint action established through previous planning efforts. The region wants to continue efforts to improve coordination between Caltrans District 6 and Kern traffic management centers, continue Stakeholder engagement, and mainstream ITS into program and project prioritization. The region aims to support and expand upon the projects identified in the ITS Early Deployment Plan for the Kern Region that are developed through a continuing, comprehensive, and cooperative planning process, and provides for effective coordination between local, regional, state and federal agencies.

The RTP lists general ITS opportunities for the San Joaquin Valley including the following:

- Support more efficient use of the transportation system through the implementation of Intelligent Transportation Systems technology
- Build upon the momentum and stakeholder coalition generated through the San Joaquin Valley Goods Movement Study to pursue ITS commercial vehicle projects.
- Investigate how ITS can support efforts to improve east/west travel between the inland areas and coastal communities.
- Use momentum from the valley-wide ITS planning effort in conjunction with federal rules (ITS architecture and standards conformity and statewide and metropolitan planning) to expand ITS actions.
- Build upon the existing Caltrans District 6 Traffic Management Systems to fill gaps and complete coverage on major facilities, including expansion of their highway closures and restrictions database, to include other agencies.
- Capitalize on the extensive ITS technology testing and standards development conducted by Caltrans by using, where appropriate, Caltrans approaches for local traffic management systems.
- Build upon lessons learned from past and current transit ITS deployment experience in the San Joaquin Valley (Fresno Area Express, Golden Empire Transit, and San Joaquin Regional Transit).
- Build upon Caltrans District 6 experience with sharing facilities, equipment, and information between traffic management and California Highway Patrol staff.
- Provide traveler information for commercial vehicle operators at truck rest stops.
- Improve visibility and access to existing Caltrans' valley-wide alternate route plans.
- Coordinate the Bakersfield area Transportation Management Center with Caltrans' District 6 Transportation Management Center via satellite.

- Integrate the ITS capabilities being implemented at Golden Empire Transit (GET) with Bakersfield’s traffic management system, including sharing information between the two centers during emergencies.
- Facilitate the transfer of lessons learned from GET ITS deployment to other area transit operators, and look for opportunities for those agencies to better coordinate with GET using its ITS capabilities.
- Expand the accident reduction campaigns on Kern’s rural highways.

3.1.2 ITS Early Deployment Plan for the Kern Region (1997)

The 1997 ITS Early Deployment Plan (EDP) contains project recommendations organized by a set of program areas, which are: Communication Network Development Program; Traffic and Incident Management Program; Kern Traveler Safety Program; Kern Informed Traveler Program; Kern Smart Transit Program; Enhanced Emergency Response Program. The projects contained in those program areas contain varying levels of detail that are indicative of the level of planning and preparedness to design and implement the individual initiatives. The following paragraphs summarize the programs and projects contained in the 1997 EDP.

In the Communication Network Development Program, an extensive communications network will be provided to connect different agencies within the region to allow cooperation and coordination in operating and managing the transportation system. The components of this program include the following:

- Communication links with Caltrans District 6 Transportation Management Center, Kern County, rural cities, Kern COG traveler information system, Golden Empire Transit District, and Kern Transit
- Smart Call Boxes
- Links to other regions – other Central Valley Transportation Management Centers, Southern California, other traveler information systems throughout California

The Traffic and Incident Management Program improves day to day traffic operations through the use of advanced technologies and proven management strategies. This means that accidents get cleared more quickly, daily traffic problems are relieved, roadway safety is improved, and agencies can get more done. The components of this program include the following:

- Census Stations, System Detectors and Incident Detection
- Decision Support System (DSS) shared among all agencies
- Coordinated Incident Management Procedures
- Urban Smart Corridors
- Freeway Field Elements: Changeable Message Signs (CMS); Highway Advisory Radio (HAR); Closed Circuit Television (CCTV) Cameras

The third program area is the Kern Traveler Safety Program. Traveler safety concerns in Kern vary from adverse weather conditions, to red light violations, to railroad crossing safety. The components of this program include the following:

- Weather Stations
- Photo Radar for Red Light Enforcement
- Railroad Grade Crossing Technology
- Road Closure Enforcement during Flooding
- Smart Studs
- Rockfall Detection System

The fourth program area is the Kern Informed Traveler Program. Making Kern travelers more informed travelers will reduce congestion and the number of avoidable accidents when advance warnings are available. The best way to keep the transportation system working safely and efficiently is to get information to travelers quickly. This allows travelers to make informed decisions about when to leave for a trip, which route to take, and even what mode of transportation would be best. The components of this program include the following:

- Development of an Advanced Traveler Information System (ATIS)
- Workstations for Traveler Information
- Upgrade of Bakersfield Traffic Operations Center
- Interactive and Commuter Kiosks
- Live Video Feeds to the Media
- Community Access Television (CATV)
- Highway Advisory Telephone (HAT)
- Internet site

The Kern Smart Transit Program applies to the Kern Transit and the Golden Empire Transit District (GET) systems. The program improves the efficiency and productivity of the transit systems, enabling them to provide better, more reliable service; extend coverage temporally and geographically; and become more self-sustaining in terms of costs and revenue. The components of this program include the following:

- Upgrade of GET and Kern Transit Systems
- Kern Smart Shuttles or Demand Responsive Service
- Coordination of GET and Kern Transit Schedules

The final program area the Enhanced Emergency Response Program, improves the safety of the transportation system by providing police, sheriff, fire, ambulance and other emergency service providers with the tools that they need to quickly and accurately determine the quickest and safest routes. The components of this program include the following:

- Traveler Information Workstations for Emergency Response Providers
- Establishment of Emergency Corridor Routes

3.2 CITY-LEVEL DOCUMENTS

3.2.1 Metropolitan Bakersfield General Plan - Circulation Element (2009)

The Metropolitan Bakersfield General Plan Circulation Element describes the location and extent of existing and proposed transportation systems, including roadways, public transportation, airports, bicycle and pedestrian routes, railroads, and other means of moving people and goods. The Circulation Element contains the following policies which set more specific direction and guide actions for roadway capacity for existing and future traffic and help alleviate traffic congestion.

- Place traffic signals to minimize vehicular delay
- Require synchronization of all traffic signals, subject to available funding

3.3 REGION-LEVEL DOCUMENTS

3.3.1 California Intelligent Transportation Systems (ITS) Rural/Non-Urban Transit Statewide Plan (2012)

The Intelligent Transportation Systems (ITS) Rural/Non-Urban Transit Plan, the ITS Plan, aims to develop a comprehensive statewide rural and non-urban transit ITS strategy to ensure compliance with the National ITS Architecture Final Rule and Final Policy requirements. The ITS Plan describes a process that allows rural/non-urban transit providers to manage and develop their services, while allowing the state to identify the systems that are considered ITS and ensure that they meet all federal requirements. Two projects were outlined in the Kern area:

- *City of Arvin Passenger Counting Surveillance*: The City of Arvin project is supporting the implementation of onboard surveillance cameras.
- *Demand-Response Management Software*: The City of Ridgecrest project supported the implementation of upgraded paratransit vehicle tracking and management.

3.3.2 Caltrans District 6 Transportation System Development Plan (2012)

The Transportation System Development Plan (TSDP) is the principal document for identifying State Highway improvements recommended for consideration and ultimately for inclusion into regional transportation plans and programs. The TSDP presents a listing of candidate projects that encompass a comprehensive, reasonable and effective range of transportation improvements. One of the TSDP categories is New Technology. Intelligent Transportation Systems (ITS) is a key tool in this category and is planned for use on State routes, major local streets, major corridors, and transportation modes where new technology application may be promising. The following ITS projects are listed within Kern County:

- Central Valley CCTV: Install Closed Circuit TV system and TMS in Fresno, Kern, Tulare, Kings, and Madera Counties at various locations.
- District 6 Weather Stations: Install weather stations in various locations in Kern County.
- Various Counties CMS: Install changeable message signs at various locations in Kern, Kings, Tulare, Fresno, and Madera Counties on Routes 65, 99, 145, 152, & 198.
- Route 99/204: Install ramp meters

3.3.3 Caltrans District 6 Corridor System Management Plans (CSMP) (2008 and 2011)

A Corridor System Management Plan (CSMP) is a long-range planning document that identifies recommended management strategies within a transportation corridor. A transportation corridor encompasses all transportation components including the highway, major local parallel roads, local road intersections, ramps and ramp meters, signal controls, transit, rail, bikes, and pedestrians. The strategies identified are phased and include both operational and long range capital expansion strategies. The following subsections summarize pertinent ITS information contained in various CSMP documents, on a route-by-route basis.

3.3.3.1 SR-46

The 2008 CSMP encompasses State Route 46 from the San Luis Obispo line to Route 99. 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. Existing ITS elements along the corridor within Kern County include: changeable message sign and traffic signals. Proposed ITS elements include closed circuit television (CCTV) camera, traffic monitoring stations (TMS), roadside weather information systems (RWIS), highway advisory radio (HAR), changeable message signs (CMS), and traffic signals. These elements will help advise motorists of incidents and inclement weather as well as improve performance along the corridor.

3.3.3.2 SR 58

The 2011 CSMP covers the portion of State Route 58 in Caltrans District 6, from the San Luis Obispo County line to San Bernardino County line, the portion of the route in Kern County. State Route 58 in Kern County, connects to I-5 and State Routes 14, 33, 43, 99, 178, 184, 202, 204, and 223. Existing ITS Elements along the corridor within Kern County include traffic signals, traffic count stations, TMS, and CMS. Proposed ITS elements include HAR, CMS, TMS, RWIS, CCTV, and ramp metering. 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 transportation system, as a whole, including highways, local roads, and alternative modes of transportation, operate as one seamless network.

3.3.4 Caltrans District 6 Transportation Concept Report (TCR) (2003 – 2013)

A Transportation Concept Report (TCR) is a long-range system-planning document that establishes a planning concept for the corridor. The TCR provides route data and information, as well as current and projected year operating characteristics. The following subsections summarize pertinent ITS information contained in various TCR documents, on a route-by-route basis. TCRs are summarized below for highways within Kern County on which ITS is being actively considered in the TCR. TCRs for other highways in the County can be found on the Caltrans District 6 website (<http://www.dot.ca.gov/d6/planning/tcrs/>).

3.3.4.1 SR-14

The TCR addresses the 65.82 miles of SR-14 located in Kern County. The recommendation cited: To service both eastbound and westbound Rosamond Boulevard traffic destined to travel south on

SR 14, two ramp meters are planned for installation, one for the eastbound Rosamond Boulevard ramp, the other for the westbound Rosamond Boulevard ramp. The meters will be maintained by Caltrans District 9.

33.4.2 SR-33

The TCR for SR-33 proposes ITS applications along Route 33 in District 6. Examples of proposed ITS applications along SR-33 include: weather stations (WS) and changeable message signs (CMS), and traffic monitoring stations (TMS). However, the TCR does not indicate the time frame for implementation of those ITS elements. It is common practice for Caltrans to consider ITS applications in the development of any capacity enhancing project, and presumably, the proposed applications would be considered with any large project under development along SR-33 in Kern County.

33.4.3 SR-43

The TCR covers the 98 miles of SR-43 in Caltrans District 6 from southern Kern County to Fresno County. The corridor serves as an alternate to SR 99. In base year 2012, existing ITS Elements along the corridor within Kern County include traffic count stations, traffic signals, and CMS elements. The 20-25 year system operations and management concept ITS elements include closed circuit television (CCTV) cameras.

33.4.4 SR-46

The TCR covers the 57 miles of SR-46 in Caltrans District 6 from San Luis Obispo County line to SR 99 in Kern County. In base year 2011, existing ITS Elements along the corridor within Kern County include traffic count stations, vehicle detection system, CMS, signals, and highway advisory radio (HAR). The 20-25 year system operations and management concept ITS elements include CCTV and more of the existing elements.

33.4.5 SR-65

The TCR covers the 65 miles constructed of SR-65 in Caltrans District 6. In District 6, SR 65 begins at SR 99 and extends north to SR 198 north of Exeter in Tulare County. Existing ITS Elements along the corridor within Kern County include traffic monitoring stations and a signal. Planned ITS elements include HAR, weather stations, vehicle detection stations, and CMS elements.

33.4.6 SR-99

The TCR covers the 173 miles of SR-99 in Caltrans District 6 from I-5 in southern Kern County to the Madera/Merced county line. The corridor passes through the San Joaquin and Sacramento Valleys. Existing ITS Elements along the corridor within Kern County include traffic monitoring stations, ramp metering, weather stations, HAR, CCTV cameras, and CMS elements. The Central Valley Transportation Management Center (TMC) monitors specific traffic locations from its headquarters at the District Office in Fresno. Proposed ITS elements include strategies to more effectively sustain and improve traffic flow including ramp metering, CCTV, and CMS.

33.4.7 SR-119

The TCR covers the 31 miles of SR-119 entirely in Kern County. In base year 2012, existing ITS Elements along the corridor include signals, traffic count stations, and CMS elements. The 20-25 year system operations and management concept ITS elements include CCTV, RWIS, and CMS elements.

33.4.8 SR-155

The TCR covers the nearly 71 miles of SR-155 entirely in Kern County. In base year 2014, existing ITS Elements along the corridor include traffic census stations. The planned ITS element is a CMS.

33.4.9 SR-166

The TCR covers the 24 miles of SR-166 in Kern County. In base year 2014, existing ITS Elements along the corridor include traffic census stations. The proposed ITS elements include CCTV, CMS, and HAR.

33.4.10 SR-178

The TCR covers the 58 miles of SR-178 within Caltrans District 6 in Kern County. In base year 2009, existing ITS Elements along the corridor include traffic count stations, signals, CMS. The proposed ITS elements include CCTV, CMS, HAR, ramp meters, RWIS, and video detection system.

33.4.11 SR-184

The TCR covers the 14 miles of SR-184 entirely in Kern County. In base year 2012, existing ITS Elements along the corridor include signal and traffic census stations. The proposed ITS elements CCTV and CMS.

33.4.12 I-5

The TCR covers the 180 miles of I-5 within Caltrans District 6, from the Los Angeles/Kern County line to the Madera/Merced County line northwest of Fresno County. Within Caltrans District 6, I-5 is a multi-lane freeway through Kern, Kings, and Fresno Counties. Existing ITS Elements along the corridor within Kern County include traffic count stations, remote processing units, HAR, CCTV cameras, and CMS elements. Proposed ITS elements include additional remote processing units, CCTV cameras, and CMS elements.

3.3.5 Route 99 Corridor Business Plan (2013)

The Intelligent Transportation Systems strategy identified in the State Route 99 Corridor Business Plan is to continue to expand the use of ITS technology along the Route 99 corridor and, when it is mutually beneficial, do so in partnership with other agencies as a cost effective tool to improve traffic management, safety and traveler information. Caltrans and its regional and local partners recognize that addressing congestion requires a multipronged approach that includes: adding new capacity, maintaining infrastructure, investing in and encouraging the use of alternate modes such as transit and rail, and using transportation management systems (TMS) and strategies.

By using ITS and TMS strategies, Caltrans is better able to:

- Expedite the removal of major incidents to prevent secondary incidents and reduce delay.
- Control traffic demand and optimize the balanced usage of the regional transportation system.
- Facilitate the dissemination of transportation and traffic information to the traveling public.
- Provide a central hub for special event and emergency operations.
- Facilitate coordinated district communication services.
- Monitor and facilitate the coordination of planned lane closures.

3.3.6 Route 99 Corridor Enhancement Master Plan (2004)

The Route 99 Corridor Enhancement Master Plan encompasses Route 99 from Interstate 5 in Kern County to Sacramento County. This 274-mile section of Route 99 runs through the counties of Kern, Tulare, Fresno, Madera, Merced, Stanislaus, and San Joaquin in the San Joaquin Valley. The Route 99 Corridor Enhancement Master Plan aims to provide a community identity, freeway improvements, and develop design concepts for the entire corridor. This document focuses primarily on aesthetic concerns and capacity and operational needs. Examples of existing ITS technology along Route 99 include CMS, HAR stations and weather stations. The Plan states that currently, commercial entities are being built in the form of Information Service Providers known as ISPs. These ISPs collect data from various sources and create information products and services that consumers now see as necessary. Services that are currently being offered in California include electronic toll payment, driver and traveler services, and emergency services.

3.3.7 Commercial Vehicle Enforcement Facility Inventory of Needs (2011)

The Commercial Vehicle Enforcement Facility Inventory of Needs is prepared by the California Highway Patrol (CHP) and the California Department of Transportation. The document states that research for deployment of advanced technology to automate weight and safety inspection/enforcement that could potentially replace the existing practice for truck size, weight and safety inspections would require many years to complete. Weigh-in-motion (WIM) technology cannot yet provide consistent and reliable data.

Facility maintenance is funded by Caltrans and administered by CHP. The CHP is responsible for maintenance of the facilities as defined in the joint CHP/Caltrans Interagency Agreement. The local Caltrans District Maintenance Offices are responsible for resolving all other maintenance issues. The commercial vehicle enforcement facility at Keene on SR 58 is listed as a priority for major upgrades.

3.3.8 San Joaquin Valley Intelligent Transportation Systems Strategic Deployment Plan (2001)

The Intelligent Transportation System Strategic Deployment Plan (SDP) for the San Joaquin Valley Region was a 28-month study jointly funded by California Department of Transportation (Caltrans) and the individual Metropolitan Planning Organizations with San Joaquin Council of Governments (SJCOG) as administrative lead. The San Joaquin Valley region includes eight

counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Fresno and Kern County prepared ITS Strategic Plans prior to the San Joaquin Valley SDP. The SDP has a 20-year ITS strategy for the valley and identifies recommendations for valleywide and inter-jurisdictional initiatives to address problems that affect the entire region, as well as recommendations for specific priority projects and opportunities that will address specific problems. Goals developed for Kern County as part of this document are called out in Kern County's Regional Transportation Plan as listed in Section 3.1.2 of this document.

3.3.9 State Highway System Management Plan (2017)

The State Highway System Management Plan integrates the maintenance, rehabilitation and operation into a single management plan that implements a number of key federal asset management requirements. The new management methodology allows Caltrans to better integrate multimodal transportation options into traditional rehabilitation work to provide a cost-effective way to expand mode choice and reduce transportation-related emissions. The Plan is implementing fundamental changes in the way Caltrans manages the available funding by placing the focus on measured condition and performance objectives. The Highway Maintenance program is focusing on four asset classes; pavement, bridges, culverts and transportation management system (TMS) projects. TMS elements include elements such as changeable message signs, traffic signals, ramp meters, highway advisory radios, video cameras, traffic detectors, roadway weather information systems, and the associated communication infrastructure and software systems to support their operation.

There are almost 19,000 TMS elements on the State Highway System. Approximately 59 percent of them are in good condition. The remaining 41 percent are obsolete or in poor operating condition and are in need of rehabilitation or replacement. TMS elements require continuous maintenance to realize the operational benefits they are designed to achieve. Technological improvements are likely to make future elements more reliable and potentially increase equipment-life expectancies.

4.0 NEXT STEPS

The next task is an assessment of the 1997 ITS Early Deployment Plan (EDP). The main point of this exercise will be to look back at prior ITS planning and implementation efforts and learn from those efforts as well as determine which projects from the 1997 EDP were implemented and which remain. A report documenting the findings of the assessment of the 1997 EDP will then be developed.

The Project Team has initiated the collection of ITS inventory from ITS Stakeholders throughout the Kern region. The Project Team has performed an ITS needs assessment, in which Stakeholders were asked to identify their own ITS needs, and to assist with prioritization of those ITS needs. These tasks will further the development of the Regional ITS Architecture and Final ITS Plan.

5.0 REFERENCES

- California Highway Patrol and Caltrans. 2011. Commercial Vehicle Enforcement Facility Inventory of Needs. 2011.
- Caltrans. 2012. California Department of Transportation. California Intelligent Transportation Systems (ITS) Rural/Non-Urban Transit Statewide Plan. September 2012.
- Caltrans. 2012. California Department of Transportation. Caltrans District 6 Transportation System Development Plan. May 2012.
- Caltrans. 2004. California Department of Transportation. Route 99 Corridor Enhancement Master Plan.
- Caltrans. 2008. California Department of Transportation. Caltrans District 6 Corridor System Management Plan State Route 46 Kern County PM 0.0/57.8. October 2008.
- Caltrans. 2011. California Department of Transportation. Caltrans District 6 Corridor System Management Plan State Route 58. September 2011.
- Caltrans. 2003-2013. California Department of Transportation. Caltrans District 6 Transportation Concept Report (TCR). 2003-2017.
- Caltrans District 6 & 10 Business Plan Development Team. 2013. California Department of Transportation and San Joaquin Valley Metropolitan Planning Organizations. Route 99 Corridor Business Plan. February 2013.
- Caltrans. 2017. California Department of Transportation. State Highway System Management Plan. March 2017.
- City of Bakersfield. 2009. Metropolitan Bakersfield General Plan – Circulation Element. April 2009.
- Kern COG. 1997. Kern Council of Governments. Intelligent Transportation System Early Deployment Plan for the Kern Region. June 12, 1997.
- Kern COG. 2014. Kern Council of Governments. 2014 Regional Transportation Plan/Sustainable Communities Strategy. June 19, 2014.
- San Joaquin Valley ITS Steering Committee. 2001. San Joaquin Valley Intelligent Transportation Systems Strategic Deployment Plan. September 2001.