INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PLAN FOR THE KERN REGION

DELIVERABLE NO. 4
SYSTEM INVENTORY SUMMARY REPORT
MAY 2017

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> INTRODUCTION</td>
<td>1-1</td>
</tr>
<tr>
<td>1.1 PROJECT BACKGROUND</td>
<td>1-1</td>
</tr>
<tr>
<td>1.2 ITS PLANNING PROCESS</td>
<td>1-1</td>
</tr>
<tr>
<td>1.3 STAKEHOLDER PARTICIPANTS</td>
<td>1-3</td>
</tr>
<tr>
<td>1.4 RELATIONSHIP TO 1997 EDP</td>
<td>1-4</td>
</tr>
<tr>
<td>1.5 PURPOSE OF SYSTEM INVENTORY SUMMARY REPORT</td>
<td>1-4</td>
</tr>
<tr>
<td><strong>2.0</strong> PROJECT STUDY AREA</td>
<td>2-1</td>
</tr>
<tr>
<td>2.1 POPULATION</td>
<td>2-1</td>
</tr>
<tr>
<td>2.2 REGIONAL AREA</td>
<td>2-1</td>
</tr>
<tr>
<td>2.2.1 Regional Recreation Areas</td>
<td>2-2</td>
</tr>
<tr>
<td><strong>3.0</strong> EXISTING TRANSPORTATION NETWORK</td>
<td>3-1</td>
</tr>
<tr>
<td>3.1 FREeways, Highways, and Streets</td>
<td>3-1</td>
</tr>
<tr>
<td>3.2 REGION-WIDE</td>
<td>3-2</td>
</tr>
<tr>
<td>3.3 METROPOLITAN AREA</td>
<td>3-4</td>
</tr>
<tr>
<td>3.4 INCORPORATED CITIES</td>
<td>3-6</td>
</tr>
<tr>
<td>3.5 TRANSIT SYSTEM</td>
<td>3-6</td>
</tr>
<tr>
<td>3.5.1 Urban Area</td>
<td>3-6</td>
</tr>
<tr>
<td>3.5.2 Rural Area</td>
<td>3-8</td>
</tr>
<tr>
<td><strong>4.0</strong> RAIL FACILITIES</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1 PASSENGER SERVICE</td>
<td>4-1</td>
</tr>
<tr>
<td>4.2 FREIGHT SERVICE</td>
<td>4-1</td>
</tr>
<tr>
<td><strong>5.0</strong> AIR FACILITIES</td>
<td>5-1</td>
</tr>
<tr>
<td><strong>6.0</strong> TRAFFIC OPERATIONS MANAGEMENT CENTER</td>
<td>6-1</td>
</tr>
<tr>
<td><strong>7.0</strong> ROADSIDE ASSISTANCE</td>
<td>7-1</td>
</tr>
<tr>
<td>7.1 KERN MOTORIST AID AUTHORITY</td>
<td>7-1</td>
</tr>
<tr>
<td><strong>8.0</strong> EMERGENCY SERVICES</td>
<td>8-1</td>
</tr>
<tr>
<td>8.1 HALL AMBULANCE</td>
<td>8-1</td>
</tr>
<tr>
<td>8.2 KERN COUNTY EMERGENCY OPERATIONS CENTER</td>
<td>8-1</td>
</tr>
<tr>
<td><strong>9.0</strong> NEXT STEPS</td>
<td>9-1</td>
</tr>
<tr>
<td><strong>10.0</strong> REFERENCES</td>
<td>10-1</td>
</tr>
</tbody>
</table>
TABLES
TABLE 1-1. ITS PLAN FOR THE KERN REGION STAKEHOLDER LIST ..................................................... 1-4
TABLE 2-1: KERN COUNTY POPULATION ............................................................................................. 2-1

FIGURES
FIGURE 1. MAP OF THE KERN REGION ................................................................................................. 2-3
FIGURE 2. MAP OF THE SAN JOAQUIN VALLEY COUNTIES WITHIN THE STATE OF CALIFORNIA .................................................................................................................... 2-4
FIGURE 3. REGIONALLY SIGNIFICANT ROUTES .................................................................................. 3-3
FIGURE 4. BAKERSFIELD TRAFFIC SIGNALS ...................................................................................... 3-5
FIGURE 5. COUNTYWIDE TRANSIT SERVICE AREAS ........................................................................ 3-7
FIGURE 6. REGIONAL RAIL SYSTEM .................................................................................................... 4-2
FIGURE 7. REGIONAL AIRPORTS ............................................................................................................ 5-3
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

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

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 was 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 SYSTEM INVENTORY SUMMARY REPORT

This project is being conducted through 13 tasks with multiple milestones and deliverables. This deliverable represents the activities under Task 4, which requires an update to the System Inventory Summary Report.

The purpose of the System Inventory Summary Report is summarizing the existing and planned transportation circulation and ITS efforts. ITS inventory forms were provided to Stakeholders via email and posted to the Kern COG ITS website. The form was formatted to gather specific ITS related existing technologies and planned project information. In addition, document research provided in the Data Report (Deliverable 2) and the findings from the 1997 EDP were used as information sources.
2.0 PROJECT STUDY AREA

The study area for the ITS Plan is defined by the boundaries of Kern County as shown in Figure 1. Kern County is located in California’s Central Valley as shown in Figure 2. There are 11 incorporated cities in Kern County: Arvin, Bakersfield, California City, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi and Wasco.

2.1 POPULATION

The population of the County is approximately 886,500. The largest city is Bakersfield (population 379,000). Although two-thirds of Kern’s population lives within 1/20th of the area of the county known as Metropolitan Bakersfield, many of the economic centers require long exurban commutes to areas that may not be conducive to urban development. Table 2-1 presents the population details of Kern County.

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Arvin</td>
<td>10,969</td>
<td>20,978</td>
</tr>
<tr>
<td>Bakersfield</td>
<td>214,554</td>
<td>379,110</td>
</tr>
<tr>
<td>California City</td>
<td>8,758</td>
<td>13,992</td>
</tr>
<tr>
<td>Delano</td>
<td>32,360</td>
<td>52,999</td>
</tr>
<tr>
<td>Maricopa</td>
<td>1,230</td>
<td>1,140</td>
</tr>
<tr>
<td>McFarland</td>
<td>8,013</td>
<td>14,658</td>
</tr>
<tr>
<td>Ridgecrest</td>
<td>28,693</td>
<td>28,064</td>
</tr>
<tr>
<td>Shafter</td>
<td>11,006</td>
<td>18,048</td>
</tr>
<tr>
<td>Taft</td>
<td>6,659</td>
<td>9,405</td>
</tr>
<tr>
<td>Tehachapi</td>
<td>6,491</td>
<td>12,217</td>
</tr>
<tr>
<td>Wasco</td>
<td>18,843</td>
<td>26,471</td>
</tr>
<tr>
<td>Unincorporated County</td>
<td>280,640</td>
<td>309,425</td>
</tr>
<tr>
<td>Total</td>
<td>628,216</td>
<td>886,507</td>
</tr>
</tbody>
</table>

Source: California Department of Finance 1/1/97 and 1/1/16

The Kern Region population has grown about 250,000 from 1997 to 2016. Per the Kern County 2014 Regional Transportation Plan and Sustainable Communities Strategy (RTP), the countywide population is forecasted to grow by more than ½ million persons to 1,444,100 in the forecast year 2040. Total employment is anticipated to grow to just over 500,000 by forecast year 2040.

2.2 REGIONAL AREA

Kern County, consists of about 8,200 square miles (the size of New Jersey). Kern County is 159 miles in length from the northwestern boundary to the southeastern boundary. Kern is bordered by nine counties: Inyo, Kings, Los Angeles, Monterey, San Bernardino, San Luis Obispo, Santa Barbara, Tulare, and Ventura. Kern County comprises separate regions based on significant variations in terrain, climate, geographic and environmental factors. The regions are identified as follows:

- Valley Region: The southern San Joaquin Valley below an elevation of 1,000 feet mean sea level.
• Mountain Region: The westernmost and central portion of the county above the 1,000-foot mean sea level contour in the valley and western region of the county and west of the primary alignment of the Los Angeles Aqueduct in the eastern county, including the southernmost portion of the county.

• Desert Region: The eastern section of the county, east of the primary alignment of the Los Angeles Aqueduct.

2.2.1 Regional Recreation Areas
Several recreation destinations are located in or adjacent to Kern County. These areas attract travelers from within the County and also the state, country, and world. Some of these areas include:

• Alta Sierra Ski Resort
• Auto Club Famoso Raceway
• Buena Vista Aquatic Recreation Area
• Kern County Raceway Park
• Kern River
• Lake Isabella (reservoir)
• National Parks: Bitter Creek National Wildlife Refuge; Carrizo Plain National Monument; Cesar E. Chavez National Monument; Kern River National Wildlife Refuge; Los Padres National Forest
• State Parks: Red Rock Canyon State Park; Fort Tejon State Historic Park; Tule Elk State Natural Reserve; Tomo-Kahni State Historic Park
• Tehachapi Loop
Figure 1. Map of the Kern Region
Figure 2. Map of the San Joaquin Valley Counties within the State of California

<table>
<thead>
<tr>
<th>State</th>
<th>Current Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>39,255,883</td>
</tr>
<tr>
<td>Counties</td>
<td></td>
</tr>
<tr>
<td>Fresno</td>
<td>984,541</td>
</tr>
<tr>
<td>Kern</td>
<td>886,507</td>
</tr>
<tr>
<td>Kings</td>
<td>150,373</td>
</tr>
<tr>
<td>Madera</td>
<td>155,349</td>
</tr>
<tr>
<td>Merced</td>
<td>271,579</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>733,383</td>
</tr>
<tr>
<td>Stanislaus</td>
<td>540,214</td>
</tr>
<tr>
<td>Tulare</td>
<td>466,339</td>
</tr>
<tr>
<td>SJ Valley Total</td>
<td>4,188,285</td>
</tr>
</tbody>
</table>

Source: Department of Finance, Demographic Research Unit, May 1, 2016
3.0 EXISTING TRANSPORTATION NETWORK

3.1 FREEWAYS, HIGHWAYS, AND STREETS

Several major routes serve Kern County, providing circulation within the County as well as access in and out of the County. Major routes and a brief description are listed below and illustrated in Figure 3.

**Interstate 5**: I-5 is the primary north-south route through the State of California, this interstate traverses the western portions of Kern County. I-5 provides connections to major routes in the Kern Region. I-5 is a gateway into the Central Valley for goods movement and for interstate and international transport.

**State Route 14**: SR-14 runs through the Eastern Kern desert terrain. The highway serves local, interregional, interstate and recreational traffic while providing access to Edwards Air Force Base and China Lake Naval Air Weapons Station.

**State Route 33**: SR-33 runs north-south in western Kern County and serves oil and agricultural industry traffic.

**State Route 41**: SR-41 runs through the northwest corner of Kern County and is designated as a truck route.

**State Route 43**: SR-43 is a north-south route that serves agricultural needs and as an alternate to SR 99.

**State Route 46**: SR-46 serves as a way to the Central Coast from the San Joaquin Valley for recreational and farm-to-market traffic.

**State Route 58**: SR-58 serves both interregional and interstate travel. The route crosses the Tehachapi Mountains. The route serves as an extension of the Interstate System by connecting I-5 in Bakersfield to I-15 in Barstow. I-15 connects to I-40 in Barstow, providing a continuous east-west freeway route from Barstow to Wilmington, North Carolina.

**State Route 65**: SR-65 is a route that begins in Bakersfield and runs north. The route is primarily commercial and is adjacent to Meadows Field Airport.

**State Route 99**: A major north-south route through Kern County, SR-99 begins at I-5 near the base of the Grapevine and is generally parallel to I-5. This route connects each of the major urbanized areas in the San Joaquin Valley, and attracts high volumes of commercial truck traffic.

**State Route 119**: This east-west route begins in the City of Taft and ends at SR 99. This route serves the oil industry and recreational traffic.

**State Route 155**: This east-west route begins at SR 99 in the City of Delano and ends at SR 178 near Lake Isabella. This route is used primarily for recreational traffic.
**State Route 166**: SR-166 runs east-west from SR 99 through the City of Maricopa towards SR 101. This route serves as an alternate route when I-5 at the Grapevine is closed.

**State Route 178**: SR-178 runs east-west from the urban area of Bakersfield to San Bernardino County. It is a route for urban commuters in Bakersfield, connecting Bakersfield with East Bakersfield and Lake Isabella. This route serves recreational traffic.

**State Route 184**: This north-south route begins at SR 223 and ends at SR 178. This route connects less urbanized areas with the Bakersfield metropolitan area and serves agricultural and recreational traffic.

**State Route 202**: This route begins near the California Correction Institution in Kern County and runs easterly through the City of Tehachapi to SR 58.

**State Route 223**: This route begins at I-5 and runs east to SR 58. This route serves truck and others connecting I-5 with SR 58 while bypassing the City of Bakersfield.

**U.S. Route 395**: This north-south route begins in Eastern Kern County at the community of Johannesburg and continues north through Kern County into Inyo County. This route serves interregional and interstate goods movement and recreational traffic. The route connects at I-15 in Hesperia north to the Canadian border.

In addition to the major routes listed above, the 2014 Regional Transportation Plan (RTP) illustrates the streets and highways system. It includes interstate and state highway routes as well as some of the major arterials and regionally significant roadways. The regionally significant system was selected to maintain and improve access between cities, accommodate a high level-of-service access to and within the Bakersfield Metropolitan Area, and to link regionally significant commercial, educational, industrial and recreational facilities. **Figures 3** show both the regional roadways within the Bakersfield Metro area as well as Kern County.

### 3.2 Region-wide

Kern County and local jurisdictions within the Kern region are responsible for collecting traffic data on roadways within their jurisdiction. Caltrans is responsible for collecting traffic data on State highways, and does so on a schedule and under procedures set at the State level. The Kern Council of Governments’ Regional Traffic Count Program is limited to roadways under local jurisdiction. It is recommended that efforts be made to make Caltrans traffic count data available in conjunction with data collected under the Program.

Kern Council of Governments manages a uniform regional count program that improves the coverage throughout the Kern region, conserves resources by eliminating redundant count locations, facilitates analysis of historical trends, provides data on goods movement, allows for extrapolation through the establishment of control stations, and creates an understanding of seasonal variation. Most recently, pedestrian and bike counts have been added. All count data collected is available on the Kern Council of Governments website.
Figure 3. Regionally Significant Routes
3.3 **Metropolitan Area**

The City of Bakersfield operates approximately 400 traffic signals. Of those, about 340 are controlled by city traffic systems and can be timed to move traffic more effectively, while the rest have fixed cameras that record video that tells traffic control boxes when to change the lights. The traffic cameras are linked to the Traffic Operations Center located in City Hall South through fiber optic cable. Since June 2014, traffic engineers can retime Bakersfield intersections from the traffic operations center which also features six 50-inch flatscreen monitors capable of displaying up to six cameras at once, or a mix of live feed and traffic map or timing information. The traffic system has signal pre-emption for emergency vehicles and signal priority for transit vehicles. The City of Bakersfield has been installing pedestrian countdown heads at intersections throughout the city. The traffic cameras are separate from the city’s red light traffic cameras, which are operated by Redflex Traffic Systems at 12 city intersections. The existing traffic signals for the City of Bakersfield are illustrated in Figure 4 and also available at: [http://www.bakersfieldcity.us/civicax/filebank/blobdload.aspx?BlobID=28916](http://www.bakersfieldcity.us/civicax/filebank/blobdload.aspx?BlobID=28916).

The County of Kern operates over 100 traffic signals throughout the county. Existing traffic signals for the County are shown in Figure 4. Some of these intersections are equipped with emergency vehicle preemption and signal priority for transit vehicles. The County of Kern has been installing pedestrian countdown heads at intersections throughout the county. The County operates a speed warning system and changeable message signs. Planned ITS elements include roadway surveillance system, information management/archive system.
Figure 4. Bakersfield Traffic Signals
3.4 INCORPORATED CITIES

The City of Arvin, located along SR 223, has traffic signals. In 2018, the City of Arvin in coordination with Caltrans and the railroad hope to install a traffic signal at SR 223/Derby St.

The City of Delano, located along SR 99, operates a traffic signal system and emergency vehicle traffic signal preemption.

The City of Maricopa, located along SR 33, in coordination with Caltrans installed a flashing beacon in 2016.

The City of McFarland, located along SR 99, installed their first traffic signal in 2017.

The City of Ridgecrest, located along US 395, has installed traffic signals that are set on an operating timing sequence for each turn pocket and intersection leg.

The City of Shafter, located along SR 43, has installed traffic signals.

The City of Tehachapi, located along SR 58 and SR 202, in coordination with Caltrans has installed traffic signals and share the cost for maintenance and operations. The signals are located partially in Caltrans right of way and partially in the City of Tehachapi right of way.

The City of Wasco, located along SR 43 and SR 46, have plans to install flashing beacons.

3.5 TRANSIT SYSTEM

3.5.1 Urban Area

Public transportation in Kern County consists of both public transit and AMTRAK rail passenger service. Service areas are shown in Figure 5. The major provider of public transportation in the metropolitan Bakersfield area is Golden Empire Transit District (GET) and serves both fixed-route bus lines and a paratransit service with service on demand for those not able to use the regular bus service. GET has implemented a number of ITS transit applications. Many of GET’s fixed-route buses are equipped with on-board surveillance cameras. All vehicles are equipped with electronic fareboxes. Both fixed route and paratransit operations utilize computer-aided scheduling and dispatch computer software. GET provides information to customers on their website, printed materials, kiosks, and a staffed telephone information line. GET has an automatic vehicle location (AVL) system, a GPS-based system with mobile data terminals (MOTs). GET also has a trip planner powered by Google Maps on their website or using a mobile app.

The major provider of public transportation in the county is Kern Transit, a department of the County of Kern. Kern Transit operates 17 fixed-routes and offers dial-a-ride service. The fixed route service is scheduled to coincide with GET routes when possible to allow for easy transfers between the two services. The transit system offers intercity service between Arvin, Bakersfield, Bodfish, Boron, Buttonwillow, California City, Delano, Edwards, Frazier Park, Inyokern, Keene, Kernville, Lake Isabella, Lamont, Lebec, Lost Hills, McFarland, Mojave, Onyx, Ridgecrest, Rosamond, Shafter, Taft, Tehachapi, Wasco, Weldon, and Wofford Heights, along with local transit service. Connections to Metrolink in Lancaster are also available. Kern Transit routes are shown in Figure 5.
Figure 5. Countywide Transit Service Areas
3.5.2 Rural Area

A map of the rural service area is also shown in Figure 5.

The City of Arvin transit services include demand response service from Monday to Friday. Fixed route service operates weekday linking Arvin and Lamont five times a day as well as evening service to Taft College Monday to Thursday during the school year.

The City of California City operates dial-a-ride system providing curb-to-curb transportation in the central core of the city on weekdays. Kern Transit provides links to surrounding communities through two routes Mojave-California City and Mojave-Ridgecrest.

Delano Area Rapid Transit provides intra-city fixed route service, with four interconnected routes and Delano Dial-A-Ride.

The City of McFarland offers dial-a-ride service on weekdays.

The City of Ridgecrest operates a dial-a-ride system in the Greater Ridgecrest Area and fulfills a contract for dial-a-ride service (on a reservation-basis only) to Randsburg and the Inyokern area. Service is Monday through Saturday.

The City of Shafter features a dial-a-ride service and an on-demand fixed route service to Minter Field, Mexican Colony, and North Kern Labor Camp. This weekday service provides four scheduled stops to each of the three locations on a reservation basis.

Taft Area Transit provides demand response service to Taft, Derby Acres, Fellows, Ford City, McKittrick, South Taft, and Taft Heights on weekdays. Kern Transit provides a connection to Bakersfield via the Westside Express fixed route service weekdays and Saturdays.

Kern Transit operates a dial-a-ride service covering a majority of the City of Tehachapi and unincorporated areas of Golden Hills. Kern Transit operates the fixed route East Kern Express between Bakersfield and Lancaster, with stops in Keene, Tehachapi, Mojave, and Rosamond, and with connections possible to other transit providers in each city on weekdays.

The City of Wasco features a dial-a-ride service on weekdays.
4.0 RAIL FACILITIES

4.1 PASSENGER SERVICE

The City of Bakersfield and the City of Wasco are served by AMTRAK passenger service. Amtrak operates trains daily between Bakersfield and Oakland as well as Bakersfield and Sacramento. Currently, two daily round trips run between Sacramento and Bakersfield and five daily trips run between Oakland and Bakersfield. Dedicated bus service connects rail stations with those cities not directly served by the train service.

The rail service is supplemented by AMTRAK Thruway Bus service to destinations not served directly by rail. At Bakersfield, a number of buses fan out to reach destinations all over Southern California and Nevada, including Santa Barbara, Ventura, Los Angeles, Orange County, San Diego, Palm Springs, and Las Vegas.

Federal law requires that a Positive Train Control (PTC) system be implemented by 2018. Caltrans Division of Rail and Amtrak have completed work for the onboard installation of the PTC equipment on the cab control cars and locomotives. The UPRR and BNSF are working to complete installation of the wayside PTC equipment. The entire PTC system will be tested and initiated to meet the 2018 federal deadline.

4.2 FREIGHT SERVICE

The Union Pacific Railroad (UP) and the Burlington Northern Santa Fe Railway (BNSF) both operate freight rail service in the area, and this service is used to transport a large number of goods throughout the region. UP operates trains daily through the San Joaquin Valley carrying food products, general freight, grain, and lumber. UP has teamed up with RailEx, a refrigerated railcar and warehousing service, to offer perishable goods transportation from the San Joaquin Valley to New York. The San Joaquin Valley Railroad operates a regional freight service between Tulare, Fresno, and Kern counties on leased UP and BNSF branch lines connecting outlying areas to mainline carriers. They move freight comprised primarily of agricultural and petroleum-based products.

A major example of rail limitation is the route over Tehachapi Summit. Part of the route is single track, and although tunnels have been modified to allow double-stacked containers to pass through, traffic in the opposite direction is often diverted to sidings, creating a congested bottleneck. With the planned Tehachapi Pass capacity improvement project jointly funded by the state of California and the BNSF, the current 35 trains that pass through the summit daily, are forecasted to increase to 50 trains per day by 2020.

Figure 6 depicts the regional railroad system.
Figure 6. Regional Rail System
5.0 AIR FACILITIES

The airport system in Kern County includes a county-owned and operated airport, several municipally-owned airports, special airport district, numerous privately-owned airports, and two major military facilities.

**Meadows Field Airport** is owned by the County of Kern and is one of seven airports operated by the Department of Airports. “BFL” serves more than 700,000 people in or near the Southern San Joaquin Valley. There are flights to Denver and San Francisco on United Airlines. There are flights to Phoenix, Arizona on American Airlines.

On February 27th, 2006, the new William M. Thomas Passenger Terminal was opened. The terminal is located approximately 7 miles north of downtown Bakersfield. Highway 99 and Seventh Standard Road provide the most direct access to the passenger terminal. The airport is approximately 1,400 acres in size. The passenger terminal is open daily. The airport is served by an FAA air traffic control tower.

Air cargo operations for the Kern region are conducted primarily at Meadows Field. Federal Express, DHL/Airborne, and UPS currently provide air cargo service from Meadows Field.

The Cities of Bakersfield, California City, Delano and Tehachapi all have municipal airports that serve business, personal, and recreational aviation needs.

**Elk Hills/Buttonwillow Airport** serves seasonal agricultural aircraft and personal aviation needs of western Kern County. It is located near the intersection of I-5 and SR 58, a highway-oriented commercial area.

**Kern Valley Airport** serves commercial, recreational, and occasional fire suppression activities in the Lake Isabella/Kern River Valley area, and is on lease from the US Forest Service. The airport is located south and east of the community of Kernville, with other nearby communities, including Wofford Heights, Lake Isabella, Bodfish, Mountain Mesa, Onyx, and Weldon. Outdoor recreation is the prime attraction in this region, and aviation activity continues to increase.

**Lost Hills Airport** serves local and regional agricultural, business, and personal aviation needs in northwestern Kern County and is located near the intersection of I-5 and SR 46. This intersection is developing as a highway-oriented commercial area. SR 46 is the primary access to the central coast area from the southern San Joaquin Valley. The airport is an important base for agricultural aircraft operating over the area’s extensive cropland.

**Minter Field Airport District/Shafter Airport** serves general aviation activities at the junction of SR 99 and Lerdo Highway.

**Poso Airport**, located approximately 20 miles north of Bakersfield, is used primarily for agricultural and training aircraft. The airport is also used for recreational purposes in conjunction with drag racing events at an adjacent paved strip.
Taft Airport serves business and personal aviation needs for the City of Taft and southwestern Kern County, an area of intensive oil production and processing.

Wasco Airport serves agricultural, business, and personal needs for the area around the City of Wasco. The airport is located 1 mile north of Wasco and 22 miles northwest of Bakersfield. The airport is an important base for agricultural aircraft operations.

East Kern Airport District/Mojave Air/Spaceport currently offers fixed-base operator facilities for airport users from Edwards Air Force Base, Rosamond, Mojave, Tehachapi, California City, and Boron. The airport serves as a civilian flight test center for business, military, civil, and home-built aircraft being developed for testing. It also serves as a base for modification of major military and civilian aircraft. The airport is located northeast of the community of Mojave and is within 1 mile of SR 14 and SR 58. A rail spur from the Union Pacific Railroad leads into the airport. In 2004 the Mojave Air/Spaceport became the first FAA approved civilian spaceport, and is home to the manufacturing and flight testing of Virgin Galactic’s Spaceship One and Spaceship Two, the first manned civilian re-useable spacecraft.

China Lake Naval Air Weapons Station (NAWS) and Edwards Air Force Base (EAFB) are located in the eastern part of the Kern Region in an area referred to as “the R-2508 complex,” which is used for the advancement of weapons systems technology and tactical training. The R-2508 complex consists of several restricted airspace areas.

Figure 7 depicts the regional airport locations.
Figure 7. Regional Airports
6.0 TRAFFIC OPERATIONS MANAGEMENT CENTER

The California Department of Transportation (Caltrans) and the California Highway Patrol (CHP) opened the Central Valley Transportation Management Center (CVTMC) in December 1992. This center is a joint operation between the two agencies, with the goal of reducing traffic congestion, improving motorists' safety, and conserving fuel on state highways in Kern and other counties in District 6.

The CVTMC gathers information on state highways in the five counties (Fresno, Kern, Kings, Madera, Tulare) that make up District 6. Caltrans workers, CHP officers, and motorists provide first-hand information on the traffic in the area. This information supplements data collected from electronic equipment such as magnetic sensors linked to computers. If an incident is detected a team of highway workers is sent to aid in the resolution of the incident by removing debris or placing an appropriate sign to inform motorists of the conditions ahead. The CVTMC also uses closed-circuit cameras to monitor highway incidents. This technology helps speed up the response time to incidents, and helps staff determine what equipment and personnel are needed at the incident scene.

Other technology in use in District 6 includes changeable message signs, radio transmitters, traffic monitoring stations, and weather stations. Weather stations are used to determine the environmental conditions. The stations have sensors that measure highway visibility, wind speed and direction, humidity levels, precipitation, and moisture on the pavement. One application of this technology is the highly developed fog warning system, which detects dangerous fog conditions, during which travelers are warned of conditions via changeable message signs. Information is provided to motorists through the changeable message signs, television broadcasts and through a Highway Radio Advisory (HAR). Signs are posted along the roads alerting motorists where to tune in to receive information. In addition, daily television broadcasts are conducted from the TMC to local cable carriers and broadcast stations to provide current peak period traffic conditions.

Caltrans District 9 operates a smaller center. Caltrans District 9 Transportation Management Center/Satellite Operations Center opened in 1954.
7.0 ROADSIDE ASSISTANCE

7.1 KERN MOTORIST AID AUTHORITY

The Kern Motorist Aid Authority (KMAA) is authorized to finance, operate and maintain a network of almost 500 roadside motorist aid call boxes in coordination with Caltrans and the California Highway Patrol for use by motorists in need of assistance within Kern County. KMAA provides a dependable motorist aid communications system to areas of the county not heavily patrolled and where traditional communications services do not exist. The calls are answered by the California Highway Patrol are intended to assist during vehicle breakdown, or to report road hazards or accidents.

The KMAA also maintains the Kern 511 system, the traveler information service that provides traffic conditions, transit information and road work information in the Kern region via a toll-free phone number and website. Kern 511 provides real-time conditions like traffic alerts and accident information and is a resource for transit, train, neighboring 511 websites, rideshare information. Live Caltrans cameras can be viewed on the interactive map available on the website.
8.0 EMERGENCY SERVICES

8.1 HALL AMBULANCE

Hall Ambulance is the largest emergency service provider in the Kern region and has developed many ITS technologies for their fleet. Each vehicle is equipped with automatic vehicle location (AVL) technology. Hall Ambulance has a computer aided dispatch center. Hall Ambulance has both ground and air transport.

8.2 KERN COUNTY EMERGENCY OPERATIONS CENTER

The Kern County Emergency Operations Center (EOC) is a centralized location to support multi-agency and/or multi-jurisdiction disaster response coordination and communication. Unique to the State of California is the definition of an Operational Area, which includes all political subdivisions within the County boundary. On behalf of the Kern Operational Area, the Kern County EOC will serve as the designated point of contact between the jurisdictions within the County, as well as between the State and the Operational Area.
9.0 NEXT STEPS

The Project Team will continue working on an ITS user needs prioritization and strategies. One of the activities related to ITS user needs yet to be initiated is coordination with public safety stakeholders on their own unique ITS user needs. These tasks and activities will further lead into development of the Regional ITS Architecture and Final ITS Plan.
10.0 REFERENCES


