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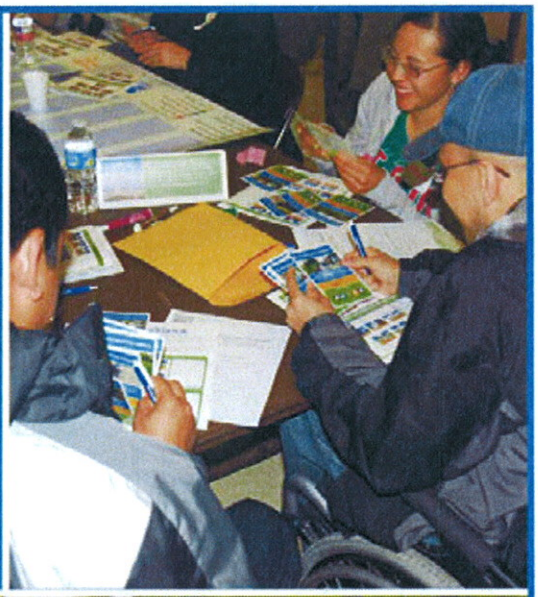
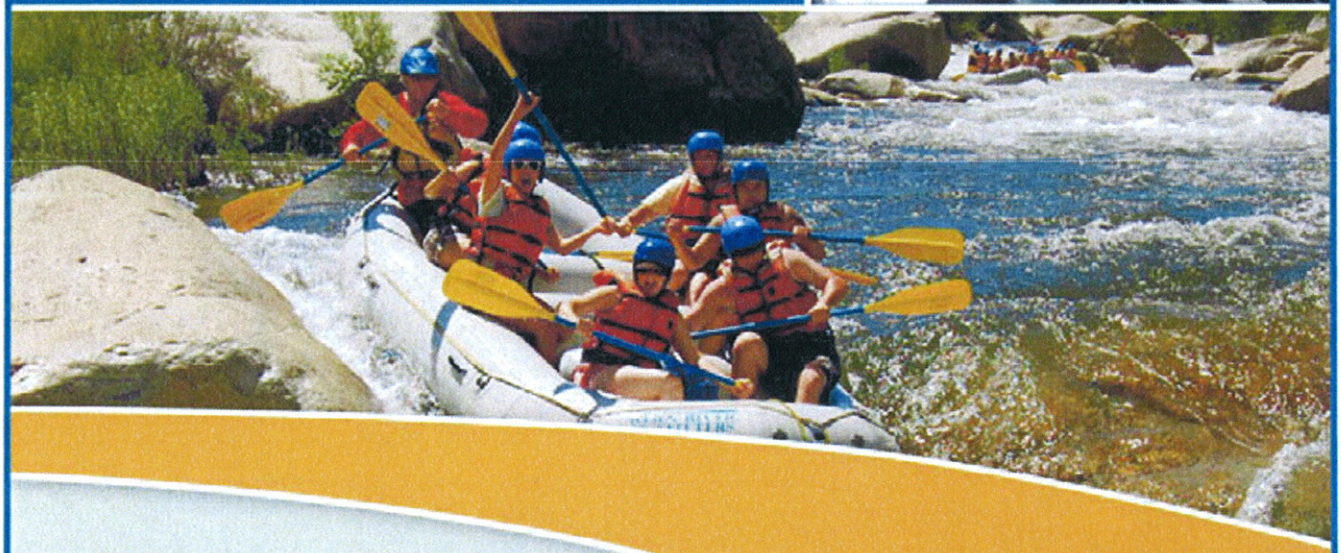




Draft Appendix D

Integrated Performance Measures
Smart Mobility Framework Measures
Environmental Justice Measures
Analysis

March 12, 2014

Kern Council of Governments

www.kemcog.org

INTEGRATED PERFORMANCE MEASURES, SMART MOBILITY FRAMEWORK MEASURES, AND ENVIRONMENTAL JUSTICE MEASURES ANALYSIS

Planning Approach

The goal of Kern COG's Environmental Justice (EJ) process is to ensure that all people, regardless of race, color, national origin or income, are protected from disproportionate negative or adverse impacts caused by the 2014 Regional Transportation Plan (RTP) Program of Projects.

The EJ analysis has been prepared consistent with Federal Title VI of the 1964 Civil Rights Act and Executive Order 12898 requiring metropolitan planning organizations to consider EJ concerns in their planning processes. The analysis is part of a larger, proactive planning effort to provide outreach to EJ communities. Garnering public input in the early planning stages from all communities can help successfully deliver regionally significant projects, and minimize the potential for costly challenges late in the process. Appendix C summarizes the RTP outreach effort. The EJ analysis provides important feedback to policy makers on how well the RTP performs in areas that relate to the goals of the plan. The results of the analysis indicate that with an implemented plan, EJ communities show better performance measures than the region as a whole.

This Appendix implements and incorporates by reference the methodology to define EJ areas developed by UC Davis in November 2011, titled *The Cumulative Environmental Vulnerability Assessment (CEVA)* and adopted by the Kern COG Board in October 2013. Prior to adoption of the UC Davis methodology, Kern COG developed and adopted EJ policies in November 2003. The UC Davis methodology is consistent with the methodology developed in 2003. Kern COG was recognized in the 2010 RTP Guidelines for its EJ methodology. The Guidelines state: "Kern Council of Government's 2007 RTP provides a good example of an Environmental Justice analysis within an RTP".

Background

The legal basis for environmental justice (EJ) is rooted in the United States Constitution of the United States and civil rights laws. Title VI of the Civil Rights Act of 1964 provides protection from discriminatory actions or results from programs or activities receiving federal financial assistance. Title VI not only bars intentional discrimination, but it also prohibits unjustified and disparate impact discrimination, i.e., a neutral policy or practice that has a disparate impact on protected groups. The understanding of civil rights has expanded to include low-income communities, as discussed in more detail below. As a governmental agency receiving federal funding, Kern Council of Governments is responsible for implementing Title VI and conforming to federal environmental justice principles.

President Clinton signed Executive Order 12898 in February 1994 that considered *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Population*. Executive Order 12898 requires that federal agencies shall, to the greatest extent allowed by law, administer and implement their programs, policies, and activities that affect human health or the environment so as to identify and avoid disproportionately high and adverse effects on minority and low income populations. Consequently, the U.S. Department of Transportation (DOT) and Federal Highway Administration (FHWA) issued orders (in 1997 and 1998, respectively), along with a 1999 DOT guidance memorandum which ordered every federal agency to make Environmental Justice part of its mission by identifying and addressing the effects of all programs, policies and activities on underrepresented groups and low-income populations. Consistent with Title VI, these measures ensure that every federally funded project nationwide consider the human environment when undertaking the planning and decision-making process.

On August 4, 2011, seventeen federal agencies signed the "Memorandum of Understanding on Environmental Justice and Executive Order 12898." The signatories, including the U.S. Department of Transportation (DOT), agreed to develop Environmental Justice strategies to protect the health of people living in communities overburdened by pollution and to provide the public with annual progress reports on their efforts. The MOU advances agency responsibilities outlined in the 1994 Executive Order 12898 and directs each of the Federal agencies to make Environmental Justice part of its mission and to work with other agencies on Environmental Justice issues as members of the Interagency Working Group on Environmental Justice.

In response to this MOU, DOT revised its Environmental Justice Strategy. The revisions reinforce the DOT's programs and policies related to Environmental Justice and strengthen its efforts to outreach to minority and low-income populations. In addition, on August 15, 2012, the Federal Transit Authority (FTA) issued Circular 4703.1, Environmental Justice Policy Guidance for Federal Transit Administration Recipients, and on October 1, 1012, FTA issued Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients. Neither of these circulars contains any new requirements, policies or directives. Nevertheless, Kern COG complies with the framework provided to integrate the principles of Environmental Justice into its decision-making processes.

In addition to Federal requirements, California Government Code Section 11135 also provides protection from discriminatory actions or results from programs or activities receiving state financial assistance. The State of California also provides guidance for those involved in transportation decision-making to address Environmental Justice. In 2003, the California Department of Transportation (Caltrans) published the Desk Guide on Environmental Justice in Transportation Planning and Investments to provide information and examples of ways to promote Environmental Justice. The Desk Guide identified requirements for public agencies, guidance on impact analyses, recommendations for public involvement, and mitigation.

Finally, under Senate Bill 375 (SB 375), Kern COG is required to include a Sustainable Communities Strategy within the RTP/SCS. The RTP/SCS represents the collective vision of Kern County and the eleven cities in the Kern COG region and provides a framework for the future development of its regional transportation system. Through SB 375, the California Air Resources Board (ARB) established per capita targets for GHG reduction for cars and light trucks for the SCS. The targets for the Kern COG region are 5 percent in 2020 and 10 percent in 2035, from 2005 levels. As part of the early target setting process, the ARB appointed a Regional Target Advisory Committee (RTAC) to recommend factors to be considered and methodologies to be used for setting the targets. The RTAC report was finalized in September 2009 and included a recommendation on Housing and Social Equity. The report recognized the impact policies to reduce Vehicle Miles Traveled (VMT) could have on social equity, specifically calling for appropriately located affordable housing that match local wage levels. The RTAC further recommended that displacement and gentrification, as a result of changing land uses and increased housing costs, should be addressed and specifically avoided to the extent possible in the SCS. As a result of this recommendation and input from its Environmental Justice stakeholders, Kern COG has updated its methodology to include new areas of analysis, including gentrification and displacement as developed by CEVA.

Kern COG's environmental justice principles are:

1. To avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic impacts, on traditionally disadvantaged communities, especially racial minority and low-income communities;

2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process;

3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

Demographics

Kern County is California's third largest county, encompassing approximately 8,200 square miles. Kern County comprises 11 incorporated cities and a federally recognized urban area, Metropolitan Bakersfield, with a population of just over 530,000 (2010 Census), as well as 42 Census-recognized unincorporated communities. Federal environmental justice guidelines call for identification of traditionally under-represented populations, including classified minorities such as those of Hispanic/Latino descent, African-Americans, Asian-Americans, Native Americans and others, as well as low-income populations. To these groups, Kern COG added seniors of 65 and older, and the disabled.

Table D-1 Demographic Profile: Kern County Population: 856,158	**Percentage of Total Population**
White, Non-Hispanic	37.4
Hispanic/Latino	50.3
African American, Non-Hispanic	5.1
Native American, Non-Hispanic	0.7
Asian, Hawaiian, Pacific Islander, Non-Hispanic	4.7
Other	1.8

Source: U.S. Census Bureau, 2012 American Community Survey

The Kern region has a slight ethnic majority with Hispanics/Latinos making up 50.3% of the total population. Non-Hispanic Whites account for 37.4% of the population, down from 50% in 2000. The rise and shift in population makeup in the Kern region is primarily because of births along with an influx of new immigrants. The African American, Asian, and American Indian populations make up 5.1%, 4.7% and .7% of the population respectively. Population growth in Kern mirrors the rest of the state, which is one of the most diverse in the nation. Population growth results from large net increases in three population groups: aging baby boomers, their young children - the echo-boomers - and immigrants, mostly from Mexico and Central America. Net migration (people moving to the county minus those moving away) accounted for most of the population gain between 2000 and 2010, i.e. 54%. Nearly 30% of the net migration was the result of immigration from outside the United States. Natural increase (births minus deaths) accounted for 45% of the population gain.

Approximately 18% of households and 22% of individuals live below the federal poverty line, generally defined as $19,530 for households (of three members) and $11,490 for individuals. In addition, of those living below the federal poverty line who are 25 years and over, 30.5% have not graduated high school. In Kern County, the percentage of the population that identify themselves as seniors 65 and over is 9.1%.

Kern County experienced population growth in the past decade. Census data indicates the county gained more than 178,000 persons from 2000 to 2010, which translates to a 27% increase. However, this population growth is not equally distributed among racial groups. For example, the Hispanic/Latino population grew from 38% in 2000 to 50% in 2013, while the proportion of White, Non-Hispanics declined from 50% to 37% in the same time period. It is likely the racial composition of the population growth will follow this pattern in the future, basically mirroring the general population growth pattern for the State. Addressing the transportation needs of a racially diverse population becomes more important and significant in Kern COG's transportation planning efforts.

Net migration (people moving to the county minus those moving away) accounted for most of the population gain between 2000 and 2010, i.e., 54%. Nearly 30% of the net migration was the result of

immigration from outside the United States. Natural increase (births minus deaths) accounted for 45% of the population gain. Kern County's changing demographics necessitate a shift in the manner environmental justice concerns are received and addressed.

Environmental Justice Process

In January 2002, Kern COG appointed representatives from 22 government and community-based agencies to serve on an environmental justice task force (Task Force) to focus on EJ concerns. In addition to the environmental justice populations identified by FHWA and FTA – non-white and low-income groups – Kern COG added senior citizens and transportation-disabled individuals to its list of "targeted" groups. The agencies were chosen based on the services they provided to environmental justice populations.

Participating agencies included:

- Native American Heritage Council
- Kern County Economic Opportunity Corporation
- Kern Senior Collaborative/Center for Living and Learning
- Independent Living Center
- City of Shafter
- Kern Council Housing Authority
- Kern County Office on Aging and Adult Services
- Consolidated Transportation Services Agency
- Hispanic Chamber of Commerce
- California Highway Patrol
- Hispanic Chamber Foundation
- NOR Recreation and Parks District
- American Indian Health Project.

The Task Force was provided an overview of requirements that government agencies such as Kern COG must meet to conform to federal mandates as well as graphic representations of the EJ populations using 2000 Census data for the county as a whole and Metropolitan Bakersfield in particular. Distributions included:

- Non-white people
- People age 65 and older
- Transit-disabled people (defined as those who declared themselves unable to go outside the home alone to shop or attend appointments because of a disability)
- Hispanics/Latinos
- Low-income households (defined as households at or below the federal poverty level)
- Zero car households.

The Task Force initially developed the methodology to define EJ areas based on income, age, and minority status using federal census data. After the 2010 Census data was made available, the task force was reformed as the Environment and Social Equity Roundtable (Rountable) as part of the Directions of 2050 RTP outreach process, to determine if the methodology defining EJ areas should be revised.

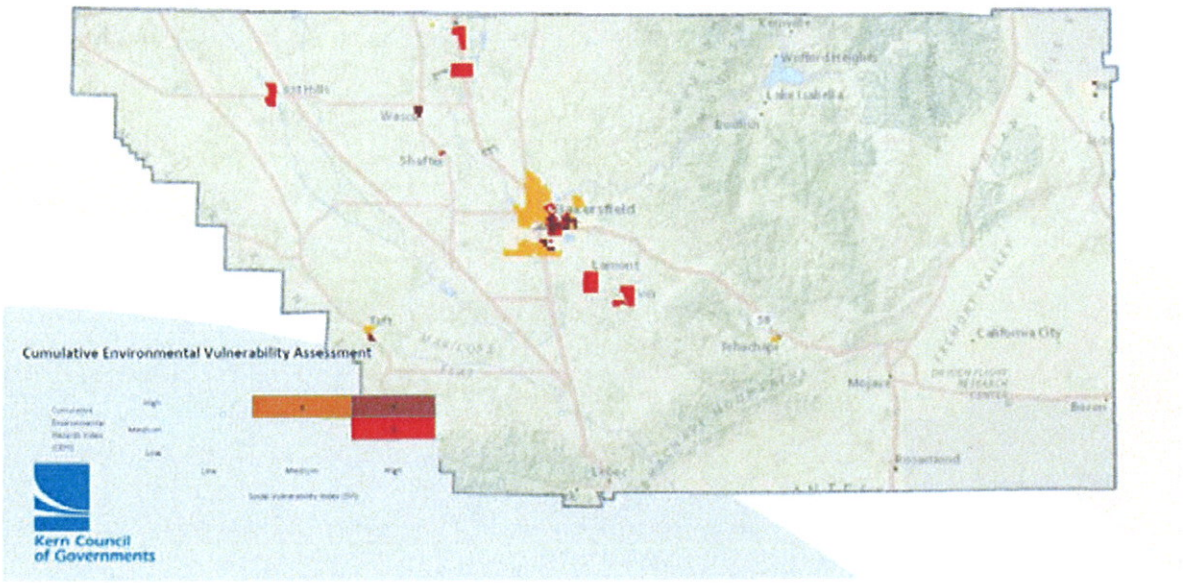
Three Roundtable meetings were held from July 2012 to March 2013. Participants included: Community Action Partnership of Kern, Bike Bakersfield, California Rural Legal Assistance, Greenfield Walking Group, Kern County Department of Public Health, California Walks, Independent Living Center for Kern, Center for Race Poverty and the Environment, Sequoia Riverlands Trust, Sierra Club, City of Shafter, and the Kern County Housing Authority.

The Roundtable made a recommendation to the Regional Planning Advisory Committee (RPAC) that was ultimately approved by the Transportation Planning Policy Committee and the Kern COG Board at their October 2013 meeting. The recommendation was to revise the methodology for identifying EJ communities. Previously the EJ communities were defined as areas having a higher than average occurrence of low income, minority, elderly, and/or transportation disability. The Roundtable recommended a more sophisticated methodology developed by UC Davis titled the Cumulative Environmental Vulnerability Assessment (CEVA) as detailed in the "Land of Risk/ Land of Opportunity" Report (November 2011) by Jonathan London Ph.D., Ganlin Huang Ph.D., and Tara Zagofsky M.S. from the Center for Regional Change at UC Davis that resulted in a more concise and refined EJ communities compared to the old method.

Although not without limitations, CEVA offers clear advantages by analyzing multiple factors involved in environment hazards and social vulnerability. Besides national air toxic assessment, CEVA includes other indicators of localized environmental hazards such as pesticide applications and point source pollutions sites. It goes beyond income and race when considering the social vulnerability of the residents by incorporating formal education, English language fluency, age, and in-patient residence into the model. It also brings in health status as a reference to illustrate how the existing health problems may exacerbate the vulnerability to environmental hazards. CEVA gives special consideration in permitting, monitoring, and enforcement actions, as well as investments in public participation, capacity building, and community economic development.

The CEVA methodology report for the San Joaquin Valley is available online at http://www.kerncog.org/public-information/environmental-justice. The following map illustrates the Environmental Justice Communities Transportation Analysis Zones (TAZs) in Kern identified using the CEVA methodology:

FIGURE D-1: CEVA ANALYSIS AREAS



Population Concentrations

The challenge was to identify all populations within the Kern region that qualify as "traditionally disadvantaged" without counting the same people more than once. In addition, because of Kern County's farm- and oil-based economies, significant portions of both its rural and urban regions would qualify under one or more of the criteria if population "floors" were not established to represent minimum concentrations.

To account for these issues, Kern COG limited its inquiry to four populations: low-income, nonwhite, seniors and transit-disabled. Specific demographic groups, such as the homeless or migrant farm workers, were discussed as particularly identifiable. Because these groups often share characteristics with other groups already identified as traditionally disadvantaged, Kern COG determined that they were already being considered in the process. Population concentrations of traditionally disadvantaged groups were established to better focus the examination onto particular neighborhoods rather than attempting to look at the entire county en masse. The maps showed significant concentrations of environmental justice populations outside more densely populated areas, but near major transportation facilities, such as Routes 46 (Wasco) and 178 (Lake Isabella).

RTP Development

Pursuant to Government Code Section 14522, the California Transportation Commission (CTC) is authorized to prepare guidelines to assist in the preparation of RTPs. The CTC's RTP guidelines suggest that projections used in the development of an RTP should be based upon available data (such as from the Bureau of the Census), use acceptable forecasting methodologies, and be consistent with the Department of Finance baseline projections for the region. The most recent update to the RTP guidelines was published in 2010, and includes new provisions for complying with SB 375, as well as new guidelines for regional travel demand.

SB 375 requires MPOs to prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its greenhouse gas (GHG) reduction targets through integrated land use, housing and transportation planning. Specifically, the SCS must identify a transportation network that is integrated with the forecasted development pattern for the plan area and will reduce GHG emissions from automobiles and light trucks in accordance with targets set by the California Air Resources Board.

In compliance with SB 375 and the CTC guidelines, the eight San Joaquin Valley Metropolitan Planning Organizations (SJV MPOs) have collaborated and developed the San Joaquin Valley Model Improvement Plan (SJV MIP). The new MIP includes a number of model upgrades that respond directly to the requirements of the CTC guidelines and allow for measurable outputs that help ensure transportation system investments benefit all populations, without consistently burdening any single one. The upgrades include:

- Land Use – demographic characteristics that influence travel behavior
- Geographic scale – land use and transportation system refinements in transit oriented developments, central business districts, and mixed-use development
- Sensitivity to mode – person trips, auto availability, mode choice/split, transit assignment
- Pricing – auto operations (fuel, maintenance, etc.), parking, toll, transit fare
- Sensitivity to congestion – time of day refinements, influence on auto availability and distribution
- Air Quality/Greenhouse Gas – speed, trucks, interregional travel

- Best Management Practices – sensitivity to smart growth, demand and/or system management within model or as quick-response tools

- Validation – formal static and dynamic tests

- Documentation – Clear and fully documented executive/public and technical staff including limitations and potential ways to overcome limitations.

Complete documentation on the SJV MIP can be found at http://www.kerncog.org/transportation-modeling.

Measuring Performance

Performance measures: (1) provide information on how well the transportation system is performing compared to the base year and/or future no-build scenario; (2) identify opportunities for system improvements to meet the plan's goals; and (3) assess the system-wide impacts of future improvements.

System-wide performance measures should not be applied unilaterally, but should only be used as an indicator that the plan's policies and actions are headed in the same direction as the goals. Often progress shown in one performance measure can show a negative effect in another area.

Demonstrating improvements in all performance measures may be nearly impossible to achieve. For example, improvements in congestion may increase travel speeds and negatively affect air quality. In addition, improvements under a specific performance measure may take several planning cycles to achieve. The existing activity in the plan has a certain level of inertia created by previously adopted RTPs. Projects that have completed environmental review need to move to right-of-way acquisition and construction fairly quickly, before the environmental work is out of date and more resources are needed to update the environmental work. The performance measure process is designed to provide feedback in areas upon which the region should focus the subsequent plan update, while minimizing disruptions to the project delivery process.

The Kern Regional Transportation Model is the primary tool for measuring system-level performance of the plan. Kern COG uses an integrated one-model approach for its performance measures analysis. The model uses monitoring data and growth assumptions to compare the performance measures for the RTP and SCS. The two primary categories of performance measures used are the Smart Mobility Framework and EJ. The EJ measures have been in place since 2001 and have been adapted for use with the Smart Mobility Framework performance measure category.

The State of California prepares an annual Regional Progress Report. This RTP includes measures that are coordinated with the measures in the statewide progress report. In February 2010, the California Department of Transportation (Caltrans) released *Smart Mobility 2010: A Call to Action for the New Decade* that establishes performance measures based on place types in recognition of a "one-size does NOT fit all" philosophy. Kern County has been split into two broad place-types for the smart mobility analysis. The first is the Metropolitan Bakersfield or urban place type. The second is made up of the outlying communities or rural place type. The RTP performance measure analysis differs somewhat for these two place types. One of the performance measures for sustainability/livability uses a slightly different modeling method to analyze air quality on a per-capita basis. This measure differs from the other performance measures in that a second model, EMFAC, developed by the California Air Resources Board, uses the output vehicle travel from the Regional Transportation Model to generate nitrogen oxide (NOx) by air basin analysis areas rather than urban and rural. NOx is a precursor gas that contributes to ozone and particulate matter, Kern's two most significant air pollutants.

Tracking Progress

Performance measures are often driven more by the tools available to measure than by the policies that need to be tracked. Performance measures can be divided into two types. The first includes future performance measures that are used in modeling to compare scenarios such as the ones in this Chapter. A second type is a monitoring indicator that measures real-world data, such as traffic counts and air quality. The following indicator variables are already tracked and provide longitudinal data to help update forecasts and track progress toward our goals:

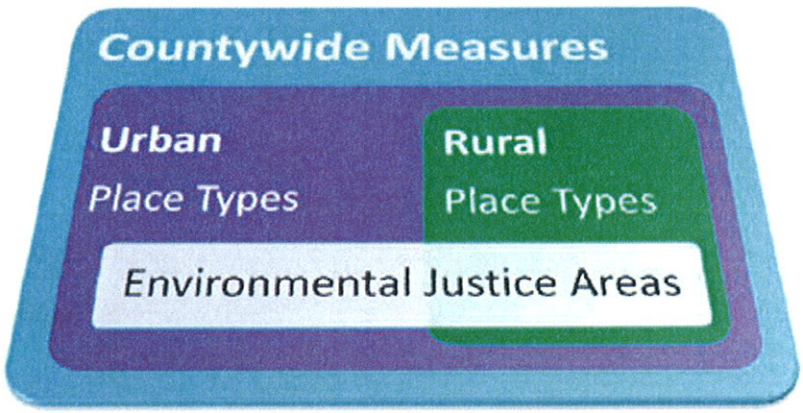
- Traffic count information
- Truck origin destination studies along key corridors
- Traffic speed survey program
- Transit ridership travel survey
- Bike rider survey
- Air Quality Monitoring System

These datasets are incorporated into the base year validation of the regional transportation model and provide the basis for forecasting future performance measures and tracking progress toward the goals.

Performance Measures Analysis Methodology

Kern COG has developed an integrated framework for eleven performance measures to demonstrate consistency of the RTP and SCS with its seven established goals. Some of the performance measures comply with as many as five goals.

FIGURE D-2 INTEGRATED PERFORMANCE MEASURES FRAMEWORK



This figure illustrates the overlap among the eleven performance measures used for countywide analysis, the two smart mobility framework place types, and environmental justice areas. For example, some measures are the same for environmental justice, urban and rural place types, and countywide, while other measures may only be used in two of the three categories. The following table contains a breakdown of which measure applies to which categories and goals.

Table D-3 RTP Goals, Performance Measures, and Smart Mobility Framework Place Types Adapted for Kern County

	RTP Goal/Measure Category	Performance Measure Description	Performance Target	Applicability by Smart Mobility Place Types/ Geographic Coverage
1	Mobility	Average Travel Time – Peak Highway Trips, Peak Transit Trips	Improvement over No Project Baseline	Urban
2	Accessibility/economic well being	Average Travel Time to Job Centers – Highway Trips, Transit Trips	Improvement over No Project Baseline	Urban
3	Reliability/congestion	Average Level of Congestion in Hours	Improvement over Base Year	Urban, Countywide
4	Reliability/safety	Annualized Accident Statistics for Annual Average Daily Traffic	Improvement over Base Year	Urban, Rural, Countywide
5	Efficiency/cost effectiveness	Average Daily Investment per Passenger Mile Traveled – Highways, Transit	Improvement over Countywide Average	Urban, Rural, Countywide
6	Livability/customer satisfaction	Average Trip Delay Time in Hours	Improvement over Base Year	Urban, Rural, Countywide
7	Environment/health	Percentage Change NOx/PM by air basin	Improvement over Base Year	Air Basins (San Joaquin Valley, Mojave Desert, Indian Wells Valley)
8	Environment/health	Percentage Change in Households within ¼ mile of Roadway Volumes Greater than 100,000	Improvement over Base Year	Urban, Rural, Countywide
9	Sustainability/preservation	Percentage Change in Maintenance Dollars Per Lane Mile	Improvement over Base Year	Countywide
10	Equity	Percentage of Expenditures versus Passenger Miles Traveled in 2035 – Highways, Transit	Improvement over Countywide Average	Urban, Rural, Countywide
11	Land Consumption	Percentage of Farmland outside City Spheres of Influence	Improvement over No Project Baseline	Countywide

**Due to the limitations of the analysis methodology, Environmental Justice areas were not able to be analyzed for Performance Measures 7, 9 and 11.*

Performance Measure Results

As discussed above, as part of the Directions to 2050 outreach process Kern COG held Environment and Social Equity Roundtable stakeholder meetings. The meetings built on the federally recognized best practices effort began by Kern COG in 2000. The Environment and Social Equity Roundtable identified low-income, minority, elderly, and disabled people as the target populations for analyzing federal Title VI EJ efforts. Areas with higher than average concentrations of the target populations were identified and mapped by census block groups. Kern COG used the transportation model output stratified by EJ areas and the urban and rural place types to determine whether the goals of the RTP were being met. Following is a more detailed description of the performance measures used to measure progress toward the RTP Goals described in Chapter 2.

1) **Mobility** – Calculates average trip time by mode (auto and transit) from environmental justice Transportation Analysis Zones (TAZs) and countywide.

2) **Accessibility/Economic Well-Being** – Calculates average trip time by mode (auto and transit) to major job centers from a group of approximately 2,400 TAZs. Accessibility also provides an economic measure by indicating the level of congestion around major job centers that may affect freight movement.

3) **Reliability/Congestion** – Calculates the distance of level of service D through F links inside environmental justice TAZs and countywide.

4) **Reliability/Safety** – Calculates the percentage increase between property damage, injury, and fatal accident rates between base year 2008 and 2040.

5) **Efficiency/Cost-Effectiveness** – Calculates the planned expenditure per passenger miles traveled. Calculates passenger miles traveled by both vehicle and transit networks for current and planned transit projects (increased headway, new routes) and capacity-increasing road projects links in future years, inside EJ TAZs and countywide. These figures are divided by the total investment in these projects and used to calculate their cost-effectiveness.

6) **Livability/Consumer Satisfaction** – Calculates the average trip delay after feedback between constrained and unconstrained roadways on links inside EJ TAZs and countywide.[1]

7) **Environment/Health** – Calculates vehicle emissions of NOx per person for the valley and mountain/desert portions of Kern and PM-10 for the Indian Wells Valley. NOx is a precursor emission for both ozone and particulate matter 2.5 which the Mojave Desert (including mountain areas) and the San Joaquin Valley portions of Kern have exceeded the federal standards. The Indian Wells Valley portion of Kern was has only exceeded the PM-10 standard.

8) **Environment/Health** – Calculates the percentage change in households within ¼ mile of roadway volumes greater than 100,000 in urban and rural place types and in environmental justice communities.

9) **Sustainability/Preservation** – Provides for maintenance as the system expands.

10) **Equity** – Calculates the passenger miles traveled and compares to the percentage of investment in EJ areas and urban and rural place types.

The model generated several factors, including travel times, vehicle miles traveled, passenger miles traveled, transit boardings, transit trip hours, transit trip distance, and road miles of LOS C or worse for 2008 (base year), 2040 build scenario, and 2040 no-build scenario. The 2040 build scenario assumes all projects listed in Table 5-1 of the 2014 RTP will have been completed, whereas the No-Build scenario assumes 2040 traffic levels on the same network used in 2008. An additional assumption was that funding sources and technology will remain constant. The model also stratified its factors along three separate lines: all of Metropolitan Bakersfield (urban); all other areas of Kern County, including the ten other incorporated cities (rural); and countywide. Kern COG paid particular attention to the accessibility and mobility criteria because they represent overall system performance now and in the future.

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1 Delay refers to the amount of additional time a vehicle spends on the road because of congestion. Constrained and unconstrained roads refer to those streets, highways, or freeways where congestion is either typical or atypical.

Mobility

Mobility is defined as the ability to move throughout the region and the time it takes to reach desired destinations; it is considered to be the most informative performance measure in the RTP. The criterion is measured by calculating average travel times during the base year 2008, in 2040 when all RTP projects are completed, and in a 2040 no-build scenario where none of the RTP projects are completed. The goal for mobility is to demonstrate that EJ TAZs perform better, or at least no worse, than the countywide average. Peak highway and transit trip periods (evening commute times) were used to demonstrate the worst-case scenario.

Metropolitan Bakersfield's average travel time in 2008 for all trips was 12.13 minutes, compared to a rural time of 23.94, for a countywide average of 15.85 minutes. In considering just Metro Bakersfield's EJ TAZs, the average travel time was 11.89, versus rural EJ TAZs at 18.59, for a countywide average of 13.01 minutes. During the 2008 base year, EJ TAZs throughout the county enjoyed shorter average travel times than in the county as a whole. As depicted in the table below, that trend is maintained over both the 2040 build and the 2040 no-build scenario. On the whole, people living in EJ TAZs will have shorter average travel times anywhere within the county than the county will have as a whole.

TABLE D-4 AVERAGE TRAVEL TIME – PEAK HIGHWAY TRIPS (IN MINUTES)

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	12.13	11.39	20.46
Rural Areas	23.94	23.50	24.74
Countywide	15.85	16.38	23.25

TABLE D-5 EJ TAZS AVERAGE TRAVEL TIME – PEAK HIGHWAY TRIPS

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	11.89	11.21	14.30
Rural Areas	18.59	17.54	18.93
Countywide	13.01	12.33	15.27

Because rural transit ridership comprises such a small percentage of trips in the model, and because no data is being forecasted by rural transit agencies regarding trip lengths and travel times, staff is unable to compare the rural transit network to the Golden Empire Transit system in Metro Bakersfield. However, in judging average travel times for transit trips between EJ TAZs in Metro and the rest of Metro as a whole, EJ TAZs also continue to fare better in this category. In 2008, the average peak hour transit trip took 32.61 minutes in Bakersfield. However, transit trips emanating from EJ TAZs were clocked at 32.33 minutes. In 2040, the model estimates the difference to decrease from 29.45 minutes in Bakersfield as a whole to 27.89 minutes in Bakersfield EJ TAZs.

TABLE D-6 AVERAGE TRAVEL TIME – PEAK TRANSIT TRIPS[2]

Place Type	2008	2040	2040 No Build
Urban/Metro	32.61	29.45	34.10
Rural Areas	39.80	46.31	43.63
Countywide	33.25	31.37	35.04

** includes portions of trips outside of Metro that drive to use metro transit*

TABLE D-7 EJ TAZS AVERAGE TRAVEL TIME – PEAK TRANSIT TRIPS

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	32.33	27.89	33.27
Rural Areas	39.51	42.94	40.96
Countywide	32.79	28.99	33.99

** Includes portions of trips outside of Metro that drive to use metro transit*

Accessibility/Economic Well Being

Accessibility differs from mobility in that it is measured by commuter trip times to major job centers rather than overall trip times. Major job centers are defined as those TAZs containing employment sites with 75 or more workers. Specifically, accessibility is defined as the ease of reaching destinations as measured by the percentage of commuters who can get to work within a given period of time. As with mobility, the goal is to ensure that commuters in EJ TAZs throughout the county have average trip times that are shorter, or at least no longer, than in the county as a whole. The measure on highways also provides an indicator of the ability of freight to get to major employment sites, providing a measure of economic well-being for the region.

In 2008, the average trip length from anywhere in Bakersfield to a major job center was 9.76 minutes. For areas outside Bakersfield, the time was approximately 7 minutes longer at 16.8 minutes. The average commute time to a major job center in Kern County was 11.89 minutes in 2008. This compares to 9.72 minutes for all commutes from EJ TAZs to major job centers throughout the county in 2008.

EJ TAZs generally fare better across the board against urban, rural, and countywide averages for commutes to major job centers under the 2040 build and 2040 no-build scenarios. This is true for both private vehicle trips countywide and transit trips in Bakersfield. Rural transit data is unavailable.

TABLE D-8 AVERAGE TRAVEL TIME TO MAJOR JOB CENTERS – HIGHWAY

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	9.76	9.09	10.56
Rural Areas	16.80	17.97	15.94
Countywide	11.89	11.88	13.41

2 No data are maintained on average travel times for rural fixed-route and dial-a-ride services. The countywide average listed under Average Travel Time – Peak Transit Trips and EJ TAZs Average Travel Time – Peak Transit Trips reflects statistics on the Golden Empire Transit network only. Rural transit ridership is a small percentage of countywide and would result in a negligible increase.

TABLE D-9 AVERAGE TRAVEL TIME FROM EJ TAZS TO MAJOR JOB CENTERS – HIGHWAY

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	8.99	8.16	8.84
Rural Areas	15.23	14.38	12.67
Countywide	9.72	8.86	9.44

TABLE D-10 AVERAGE TRAVEL TIME TO MAJOR JOB CENTERS – TRANSIT [3]

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	31.45	26.31	32.65
Rural Areas	38.44	45.10	42.51
Countywide	32.14	28.26	33.69

** Includes portions of trips outside of Metro for those who drive to use metro transit*

TABLE D-11 AVERAGE TRAVEL TIME FROM EJ TAZS TO MAJOR JOB CENTERS – TRANSIT

Place Type	2008	2040 Build	2040 No Build
Urban/Metro	30.84	24.57	31.38
Rural Areas	38.15	42.22	40.15
Countywide	31.31	25.52	32.09

** Includes portions of trips outside of Metro for those who drive to use metro transit*

Reliability/Congestion

Reliability is the percentage of on-time arrivals for both transit and highway trips. For highways, it is measured by the number of hours daily that passengers spend in congested traffic. Congestion on roadways is measured by levels of service (LOS) on roadways and also by the amount of time in hours that a vehicle is not able to reach the speed limit on a given roadway segment. LOS also affects the reliability of transit service in Metropolitan Bakersfield. The Metro transit system lacks any facilities immune to congestion such as carpool lanes, bus lanes, or rail. The level of congestion is not a significant measure for rural place type areas based on the smart mobility framework analysis; however, the numbers are provided for comparison purposes.

For transit, reliability is judged by the percentage of on-time arrivals for each operator. Golden Empire Transit District has developed its own environmental justice analysis, "Title VI Update," last produced in August 2013. Based on observations through February 2004, GET estimated its on-time arrival rate for July 2009 through February 2010 was 76% of all trips.

Metropolitan Bakersfield residents will see the number of hours spent in congested traffic rise 73.6% from 2008 to 2040 as compared to the Metropolitan Bakersfield EJ TAZs with only a 55.9% increase. Hours spent in congestion countywide for EJ TAZs will be 27% less than the county as a whole.

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3 No data are maintained on average travel times for rural fixed-route and dial-a-ride services. The countywide average listed under Average Travel Time – Peak Transit Trips and EJ TAZs Average Travel Time – Peak Transit Trips reflects statistics on the Golden Empire Transit network only.

TABLE D-12 AVERAGE LEVEL OF CONGESTION IN HOURS

Place Type	2008	2040	Percentage Increase
Urban/Metro	204,972	355,798	73.6
Rural Areas	228,562	433,011	89.5
Countywide	433,535	788,808	81.9

TABLE D-13 AVERAGE LEVEL OF CONGESTION IN HOURS – EJ TAZS

Place Type	2008	2040	Percentage Increase
Urban/Metro	88,128	137,432	55.9
Rural Areas	8,669	12,566	44.9
Countywide	96,797	149,999	54.9

Reliability/Safety

For Kern COG's environmental justice policy purposes, safety is considered to be the minimal risk of accident or injury as measured by reduced accidents. While the model does make predictions regarding the number of accidents that cause property damage, injury, and fatalities, it cannot stratify that information specifically by project, as the environmental justice safety goal requires. On new facilities within environmental justice TAZs, projects outlined in the 2014 RTP will demonstrate no more accidents than the countywide average.

Despite the model's inability to predict accident rates on specific projects, it does provide an aggregate look at annual accidents in 2008 compared to 2040. Results show that injury accidents will rise sharply throughout the county by 2040. Meanwhile, EJ TAZs will see a slower increase for injury accidents than the region as a whole. For example, in Metro Bakersfield, the injury accident rate is predicted to rise from 575 in 2008 to 975 in 2040, a 69.6% increase. In urban EJ TAZs, however, the rate for the same type of accident will go from 255 to 394, a 54.5% rise.

Using the Smart Mobility 2010 philosophy, safety is a higher concern in rural place type areas than congestion. Based on this plan's funded project list, accidents in rural areas are forecast to rise at a slightly lower rate than the countywide average as travel increases on Kern's roadway network.

TABLE D-14 ANNUALIZED ACCIDENT STATISTICS FOR ANNUAL AVERAGE DAILY TRAFFIC

Place Type	2008	2040	Percentage Increase
Urban/Metro			
Property damage	1,060	1,799	69.7
Injury	575	975	69.6
Fatality	24	41	70.8
Rural			
Property damage	1,037	1,686	62.6
Injury	562	914	62.6
Fatality	24	39	62.5
Countywide			
Property damage	2,098	3,485	66.1
Injury	1,137	1,889	66.1
Fatality	48	80	66.7

TABLE D-15 ANNUALIZED ACCIDENT STATISTICS FOR ANNUAL AVERAGE DAILY TRAFFIC – EJ TAZS

Place Type	2008	2040	Percentage Increase
Urban/Metro			
Property damage	470	727	54.7
Injury	255	394	54.5
Fatality	11	17	54.5
Rural			
Property damage	44	61	38.6
Injury	24	33	37.5
Fatality	1	1	0
Countywide			
Property damage	514	788	53.3
Injury	279	427	53.0
Fatality	12	18	50.0

Efficiency/Cost-Effectiveness

Efficiency and cost-effectiveness can be measured by maximized returns on transportation investments. This criterion was measured by dividing the average daily capital investment from 2014 RTP projects through 2040 by the average number of daily passenger miles traveled (PMT) on the transportation network, both inside and outside of EJ TAZs for urban and rural place types. In general, highways are carrying higher volumes and tend to be more cost effective on a daily basis, however transit has a higher capacity during peak periods, making it more cost-effective to expand during peak traffic periods. In addition transit expands the carrying capacity of road investments. This analysis looks at daily cost effectiveness of capital expenditures.

In the Metropolitan Bakersfield area, the average daily investment in highways will amount to $.01 per PMT versus $.02 per PMT in Bakersfield EJ TAZs illustrating that highway investment is $.01 more cost effective than in EJ TAZs. In rural areas outside Bakersfield, the highway cost is $.01 versus $.09 in rural EJ TAZs reflecting the lower traffic volumes in rural areas. For transit service in Bakersfield, the daily investment per PMT is $.19 versus $.13 in Bakersfield EJ TAZs illustrating that transit is receiving greater usage in EJ areas. Overall, daily investment per PMT for roads is using more funds per PMT in EJ areas than in the county as a whole, while the transit system performs better in EJ areas in terms of cost effectiveness.

Because the cost-effectiveness criterion assumes that RTP projects will be built, the no-build scenario is not displayed.

Table D-16 Average Daily Investment per Passenger Mile Traveled – Highways

Place Type	2040
Urban/Metro	.01
Rural Areas	.01
Countywide	.01

TABLE D-17 AVERAGE DAILY INVESTMENT PER PASSENGER MILE TRAVELED – HIGHWAYS – EJ TAZS

Place Type	2040
Urban/Metro	.02
Rural Areas	.09
Countywide	.02

TABLE D-18 AVERAGE DAILY INVESTMENT PER PASSENGER MILE TRAVELED – TRANSIT[4]

Place Type	2040
Urban/Metro	.19
Rural Areas	.79
Countywide	.28

TABLE D-19 AVERAGE DAILY INVESTMENT PER PASSENGER MILE TRAVELED – TRANSIT – EJ TAZS

Place Type	2040
Urban/Metro	.13
Rural Areas	.13
Countywide	.13

4 Because Kern COG's regional transportation model cannot estimate passenger miles traveled for rural transit services, estimates for daily investment per PMT countywide are unable to be calculated.

Livability/Consumer Satisfaction

Consumer satisfaction is one potential measure of livability and is defined as the condition where consumers can largely agree that their transportation needs are being met in a safe, reliable, efficient, and cost-effective manner. The criterion is measured by the daily amount of trip delay in hours. On roadways, trip delay refers to the difference between the time a trip should take and the time it actually requires, or the difference between free-flow traffic and some level of congestion. Traffic congestion also affects the on-time performance of transit operations, limiting alternative transportation choices during peak periods and impacting the region's livability.

For example, between 2008 and 2040, Kern COG's traffic model estimates the number of daily trip delay hours in the urban metro area will rise from 5,963 to 14,370, a 141% increase. However, in Metro Bakersfield's EJ TAZs, the number would increase from 4,273 to 8,340, a 95% rise. While neither scenario is desirable, EJ TAZs within Metropolitan Bakersfield increase 46% less than the area as a whole. In rural areas, travel delay grows faster than in the county as a whole.

TABLE D-20 AVERAGE VEHICLE DELAY TIME IN HOURS

Place Type	2008	2040	Percentage Increase
Urban/Metro	5,963	14,370	141
Rural Areas	51	19,980	39,076
Countywide	6,013	34,349	471

TABLE D-21 AVERAGE VEHICLE DELAY TIME IN HOURS FOR EJ TAZS

Place Type	2008	2040	Percentage Increase
Urban/Metro	4,273	8,340	95
Rural Areas	0	4	400
Countywide	4,273	8,344	95

Environment/Health

This measure is defined as enhancing the existing transportation system while improving the environment and health of the population. It is the one factor in Kern COG's environmental justice criteria set that the transportation model currently cannot measure. Environmental effects vary among different transportation projects and can only be determined meaningfully on a project-by-project basis. The goal is for projects in this RTP to demonstrate no difference in unmitigated impacts between environmental justice populations and the region as a whole. This goal is measured through conformity with the Clean Air Act Amendments of 1990 according to measures of certain pollutants such as nitrous oxide and particulate matter.

Both Kern COG's long-term RTP and the short-term Federal Transportation Improvement Program (FTIP) require a demonstration of air quality "conformity" prior to being adopted by Kern COG and the federal government. This conformity process is necessary because the San Joaquin Valley Air Basin is nonattainment for ozone and particulate matter. The process ensures that new transportation projects will either benefit or at least have no negative effect on air quality. Kern COG's conformity analysis for its most recent FTIP amendment was approved by the US Department of Transportation on November 4, 2013. A revised conformity analysis has been undertaken to support the 2014 RTP and the 2014 FTIP.

TABLE D-22 VEHICLE NOx/PM10 EMISSIONS DECREASE

Air Basin (portion of Kern)	Base 2008	Horizon 2040	Percentage Decrease	Federal Air Standard Met?
San Joaquin Valley NOx	75.5	18.4	76	YES
Mojave Desert NOx	14.6	3.9	73	YES
Indian Wells Valley PM10*	1.3	.9	31	YES

**Indian Wells Valley totals are for all particulate matter 10 microns or smaller, not just the NOx precursor.*

The above table illustrates that federal standards are being met with this RTP. For a more detailed discussion of air quality, see the 2014 Conformity Analysis for simultaneous adoption with the 2014 RTP and FTIP.

In addition to maintaining federal air standards for each air basin/planning area, an analysis has been performed that indicates that the RTP shows improvement in households with in ¼ mile of major high volume roadways. However, environmental effects vary among different transportation projects and can only be determined meaningfully on a project-by-project basis.

TABLE D-23 HOUSEHOLDS WITHIN ¼ MILE OF ROADWAY VOLUMES GREATER THAN 50,000

Place Type	2013	2040	Percentage Increase
Urban/Metro	12,175	35,396	191%
Rural Areas	1,442	7,086	391%
Countywide	13,617	42,482	212%

TABLE D-24 HOUSEHOLDS WITHIN ¼ MILE OF ROADWAY VOLUMES GREATER THAN 50,000 FOR EJ TAZS

Place Type	2013	2040	Percentage Increase
Urban/Metro	5,496	16,079	193%
Rural Areas	-	1,820	#DIV/0!
Countywide	6,732	17,899	166%

The analysis indicates that additional revitalization in the urban/metro area may significantly increase housing closer to high volume transportation corridors which may negatively impact this Environment/Health goal. However, environmental justice areas are being affected at a slower rate than all areas countywide. This is partially due to the fact that majority of volume increases are not in areas that affect environmental justice communities consistent with Federal Title VI goals.

Sustainability/Preservation

Sustaining and preserving the transportation system can be measured by the total annualized amount of maintenance funding divided by the number of lane miles in the model. Countywide maintained lane miles are calculated from the transportation model. In November 2006, an initiative with 56% voter approval failed to garner the two-thirds vote required to pass. Had it passed, approximately 40% of the funding would have been reserved for maintenance. This RTP assumes a modest increase in funding of 11% over previous RTPs reflecting possible increase to federal, state and/or local sources such as a local

transportation measure (see Ch. 6 – Financing Transportation for a detailed discussion). The following tables illustrate the growing issue of maintaining an expanding road system and underscores the need for rapid action to provide new funding sources to maintain the system.

TABLE D-25 MAINTENANCE DOLLARS PER LANE MILE FOR THE TRANSPORTATION SYSTEM

Countywide	Base 2008	Horizon 2040	Percentage Change
Lane Miles	7,421	9,579	29
Annual Maintenance	$64,000,000	$92,000,000	44
Maintenance per Mile	$8,624	$9,604	11

TABLE D-26 MAINTENANCE DOLLARS PER LANE MILE FOR THE TRANSPORTATION SYSTEM IF ADDITIONAL FUNDING DOES NOT BECOME AVAILABLE

Countywide	Base 2008	Horizon 2040	Percentage Change
Lane Miles	7,421	9,579	29
Annual Maintenance	$64,000,000	$64,000,000	0
Maintenance per Mile	$8,624	$6,681	-23

Equity

Equity is defined as a fair and reasonable distribution of transportation investment benefits (as a share of benefits). Kern COG took a similar approach to equity as with cost-effectiveness, comparing the total investment in roads and transit through 2040 with total passenger miles traveled in Bakersfield, rural areas, and the county as a whole. All numbers were converted to percentages for simplicity. The EJ transportation analysis zones (TAZs) percentages compare to the table above with all TAZs being reported.

In 2040, Urban/Metro Bakersfield EJ TAZs will account for 38% of all passenger miles traveled (PMT) in the Urban/Metro region, coincidentally approximately 38% of transportation expenditures will go directly into the metropolitan EJ TAZs. Rural EJ TAZs will represent 3% of Rural PMT, and 23% of all highway funding will be spent in those areas. Countywide, approximately 18% of all PMT will occur in EJ TAZs, which will collect 36% of funding and projects.

In 2040, the model predicts that EJ TAZs countywide will make up approximately 48% of transit PMT. Those same TAZs, however, will receive 60% of all transit funding attributable to the metropolitan area.

TABLE D-27 PERCENTAGE OF EXPENDITURES VERSUS PASSENGER MILES TRAVELED IN 2040 – HIGHWAYS

Place Type	2040 PMT	Total Investment*	PMT % (countywide)	Investment % (countywide)
Urban/Metro	22,000,983	$2,438,000,000	44	86
Rural Areas	28,593,586	$412,000,000	56	14
Countywide	50,594,510	$2,850,000,000	100	100

*Investment totals include all forecasted funding sources. Funding by place type is subject to the adopted Project Delivery Policies and Procedures (http://www.kerncog.org/publications/policies-and-procedures) as implemented in each Regional Transportation Improvement Program (RTIP) 2-year cycle.

TABLE D-28 PERCENTAGE OF EXPENDITURES VERSUS PASSENGER MILES TRAVELED IN EJ TAZS BY 2040 – HIGHWAYS (EJ AREAS SHOULD RECEIVE INVESTMENT ROUGHLY EQUAL OR GREATER THAN THE % PMT)

Place Type	2040 PMT	Total Investment	PMT % (compared to table above)	Investment % (compared to above)
Urban/Method	8,279,662	$918,000,000	38	38
Rural Areas	823,269	$94,000,000	3	23
Countywide	9,102,933	$1,012,000,000	18	36

TABLE D-29 PERCENTAGE OF EXPENDITURES VERSUS PASSENGER MILES TRAVELED IN 2040 – TRANSIT

Place Type	2040 PMT	Total Investment	PMT % (countywide)	Investment (countywide)
Urban/Metro	94,220	1,323,500,000	63	65
Rural Areas	55,513	698,700,000	37	35
Countywide	149,733	2,022,200,000	100	100

TABLE D-30 PERCENTAGE OF EXPENDITURES VERSUS PASSENGER MILES TRAVELED IN EJ TAZS BY 2040 – TRANSIT (EJ AREAS SHOULD RECEIVE INVESTMENT ROUGHLY EQUAL OR GREATER THAN THE % PMT)

Place Type	2040 PMT	Total Investment	PMT % (compared to table above)	Investment % (compared to above)
Urban/Metro	54,252	1,150,672,370	57	87
Rural Areas	17,340	66,428,253.71	31	27
Countywide	71,592	1,217,100,623	48	60

Land Consumption

The California Department of Conservation maps farmland throughout California under the Farmland Mapping and Monitoring Program (FMMP) shows a 2010 FMMP map of these farmlands outside the spheres of influence boundaries. For more detailed analysis through the year 2035, see Chapter 4, Table 4-3. The definition of farmland under Government Code Section 65080.01 (b) excludes farmland from spheres of influence boundaries. In the 22 year period from 1988 to 2010, an average of -0.4 square miles of farmland per year was converted to urban use. With this RTP, farmland consumption may be reduced as much as 33% compared to the No Project Baseline (2011 RTP) for a total of 1.43 square miles through 2040.

TABLE D-31 KERN COUNTY IMPORTANT FARMLAND CONVERSION 2040

Place Type	No Project Baseline Farmland Consumed Outside Spheres of Influence 2040	Planned Farmland Consumed Outside Spheres of Influence 2040	% Reduction
Countywide	-2.13	-1.43	33

Environmental Justice Conclusions

Considering the analyses as a whole, it is clear that the 2014 RTP meets the Federal Title VI EJ requirements by ensuring that all of the population is subject to proportionate benefits and detriments. Note that EJ does not create an entitlement; however, it does attempt to assure that transportation projects do not have discriminatory effects or disparate impacts on any segment of the population, especially those traditionally disadvantaged groups such as racial minorities and low-income communities. The above analyses demonstrate that the 2014 RTP meets those expectations. However, Kern COGs EJ Strategy focuses equally on our public information process as well as this planning analysis.

From a public information perspective, Kern COG's commitment to environmental justice and both rural and urban community types is demonstrable through its efforts in gathering public input. These efforts include broadcasting its monthly meetings on television, using display advertising and electronic notices to announce workshops and public hearings, and developing web and social media advertisements for long-range planning efforts. Kern COG has been visible in every community over the last three years during city council meetings, street fairs, and community festivals. Kern COG's quarterly newsletter is distributed to 2,000 organizations and individuals. Over 8,000 people have provided input to the 2014 RTP's development. Appendix C summarizes the RTP outreach effort.

From a planning standpoint, the transportation model indicates that, with few exceptions, Kern COG has and will continue to divide its resources equitably, with no single population group suffering disproportionate and adverse effects from agency activity. However, analyses demonstrated some shortcomings that will be addressed. For example, Metropolitan Bakersfield will see the number of hours spent in congested traffic rise from 204,972 in 2008 to 355,798 in 2040, a 73.6% increase. Metro area EJ TAZs will only experience a 55.9% rise in congestion levels over the same period.

While delay times will rise 95% in EJ areas, delay times for the region are predicted to increase by 471% over the long term. As such, the model shows that the EJ areas are actually less impacted by the inevitable increase in delays in the transportation network as compared to the county as a whole.

Similarly, cost-effectiveness and equity measures both attempt to determine how expenditures are being divided between EJ areas and the region as a whole. While each measure uses a different analysis method, the conclusions demonstrate the Kern COGs 2014 RTP does not disproportionally impact EJ communities.

Other examples are the environment/health performance measures. These measures indicate that policies related to environmental concerns such as air quality and noise will be affected by this plan, but EJ areas will again not be impacted to the same degree as countywide. The increased impact in EJ areas is linked to the increased revitalization and new households in those areas.

Smart Mobility Conclusions

The smart mobility framework method divided the performance measures into two place types—urban and rural. The measures reveal that a relatively even distribution of resources in efficiency/cost-effectiveness. For example, highway investment is $.01 per passenger mile traveled in both urban and rural area highways, while transit investment is 4 times less cost effective than rural compared to urban areas primarily due to the long distance lower volume trips that Kern Regional Transit provides.

A new trend in the rural place type appeared in this RTP compared to the 2011 RTP. Rural areas are receiving greater congestion than urban place types. This is primarily due to an anticipated increase in traffic on I-5 to and from L.A and developments proposed near Frazier Park.

As urban growth and traffic increase, both rural and urban place types are anticipated to see an increase in traffic accidents, however rural areas will not increase as fast as urban areas.

The performance measures examined all funding sources, and not just those subject to the 60–40 guideline policy adopted by the Kern COG Board. It is interesting to note that more passenger miles are traveled outside of Metropolitan Bakersfield than within. That is because the metro area makes up 5% of the total area of the county, and through-county trips make up about 25% of all travel in Kern County.

System-wide Conclusions

System-wide, the performance measures indicate that the Kern region is losing ground in its battle with overall congestion. With the focus of more than $640 million in federal demonstration funds to the region, accessibility to major job centers countywide is forecasted to improve by 1 second between 2008 and 2040.

Many of the future improvements will be more expensive. The cheap, easy fixes are no longer available. Changing a six-lane arterial to eight or ten lanes can be costly. Not only does the congestion affect the reliability of our transportation system, it affects transit operations as well.

Transit can only provide a relief for congestion if the express bus service is not stuck in the same traffic as single-occupant vehicles. Planned investment in carpool and bus lanes on freeways, ramps, and arterial streets is not much more expensive than adding free-flow lanes; however, they can provide a vital relief valve during peak travel times. The ability to get around during peak periods is important to ensure the economic vitality of the region and can stretch the effectiveness of Kern's transportation dollar.

The Sustainability/Preservation measure indicates the importance of increasing maintenance funding with the expanding transportation system. This is consistent with the input during the Directions to 2050 public outreach that placed maintenance as a top priority.

Some local successes have occurred for new funding sources. Recently, the City of Bakersfield passed a utility tax for transportation maintenance, and the City of Delano has approved a 1-cent general fund measure that can be used for road maintenance. The national American Recovery and Reinvestment Act (ARRA) has provided a one-time influx of funding to catch up on maintenance backlogs for more than 80 projects in Kern County. The state and federal highway trust funds are insolvent and must be fixed as part of the federal surface transportation act reauthorization now under way. Innovative long-term pay-as-you-go solutions, such as a phased-in odometer-based gas tax, should be seriously considered.

Appendix D Attachment

D-1 – Kern Travel Model EJ Performance Measures Output

2014 RTP Performance Measures Output Alternatives:	2008	2040 A	2040 C	2040 E	2040 Nbld
ACCESSIBILITY AND MOBILITY - COUNTYWIDE					
*** Average travel times (minutes) from county zones to all zones					
Peak All-Auto Travel Time	15.85	15.24	16.38	16.28	23.25
Peak Transit Travel Time	88.25	84.80	81.87	81.86	85.04
*** Average travel times (minutes) from county zones to Job Centers					
Peak All-Auto Travel Time	11.89	12.39	11.88	11.72	13.41
Peak Transit Travel Time	32.14	32.80	28.26	28.36	33.69
*** Average travel times (minutes) from county EJ zones to all zones					
Peak All-Auto Travel Time	13.01	12.99	12.33	12.23	15.27
Peak Transit Travel Time	32.79	33.52	28.99	29.07	33.99
*** Average travel times (minutes) from county EJ zones to Job Centers					
Peak All-Auto Travel Time	9.72	9.28	8.86	8.85	9.44
Peak Transit Travel Time	31.31	31.65	25.52	25.70	32.09
*** Average travel times (minutes) from county zones to EJ zones					
Peak All-Auto Travel Time	11.78	12.18	11.80	11.65	13.16
Peak Transit Travel Time	32.61	33.34	29.49	29.56	34.15
ACCESSIBILITY AND MOBILITY - URBAN/METRO					
*** Average travel times (minutes) from metro zones to all zones					
Peak All-Auto Travel Time	12.13	12.14	11.39	11.53	20.46
Peak Transit Travel Time	32.61	33.57	29.45	30.90	34.10
*** Average travel times (minutes) from metro zones to Job Centers					
Peak All-Auto Travel Time	9.76	9.88	9.09	9.82	10.56
Peak Transit Travel Time	31.45	31.91	26.31	27.98	32.65
*** Average travel times (minutes) from metro EJ zones to all zones					
Peak All-Auto Travel Time	11.69	12.00	11.21	11.11	14.30
Peak Transit Travel Time	32.33	33.04	27.89	28.75	33.27
*** Average travel times (minutes) from metro EJ zones to Job Centers					
Peak All-Auto Travel Time	8.99	8.70	8.16	8.32	8.84
Peak Transit Travel Time	30.84	31.19	24.57	25.45	31.38
*** Average travel times (minutes) from metro zones to EJ zones					
Peak All-Auto Travel Time	9.87	9.83	9.22	9.96	10.31
Peak Transit Travel Time	31.97	32.52	27.69	29.22	33.36
ACCESSIBILITY AND MOBILITY - RURAL/NON METRO					
*** Average travel times (minutes) from nonmetro zones to all zones					
Peak All-Auto Travel Time	23.94	19.69	23.50	24.56	24.74
Peak Transit Travel Time	39.80	38.62	46.31	46.68	43.63
*** Average travel times (minutes) from nonmetro zones to Job Centers					
Peak All-Auto Travel Time	16.80	15.59	17.97	18.64	15.94
Peak Transit Travel Time	38.44	38.72	45.10	48.21	42.51
*** Average travel times (minutes) from nonmetro EJ zones to all zones					
Peak All-Auto Travel Time	18.59	16.42	17.54	18.51	18.93
Peak Transit Travel Time	39.51	38.89	42.94	45.91	40.96
*** Average travel times (minutes) from nonmetro EJ zones to Job Centers					
Peak All-Auto Travel Time	15.23	12.47	14.38	15.00	12.67
Peak Transit Travel Time	38.15	36.73	42.22	46.21	40.15
*** Average travel times (minutes) from nonmetro zones to EJ zones					
Peak All-Auto Travel Time	16.55	15.03	17.35	17.52	15.40
Peak Transit Travel Time	39.42	38.94	40.76	44.63	38.59

COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - COUNTYWIDE							
Area	Condition	Congested Vehicle Hours					
county	all	Total	433535	810100	788808	780540	1101686
county	EJ	Total	96797	135754	149999	150594	152272
COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - URBAN/METRO							
Area	Condition	Congested Vehicle Hours					
metro	all	Total	204972	250699	355798	351168	671614
metro	EJ	Total	88128	116203	137432	137990	138423
COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - RURAL/NON METRO							
Area	Condition	Congested Vehicle Hours					
nonmetro	all	Total	228562	289031	433011	429373	430072
nonmetro	EJ	Total	8669	4201	12566	12606	13849
COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - COUNTYWIDE							
Area	Condition	Vehicle-Delay Hours					
county	all	Total	6013	29949	34349	33652	308563
county	EJ	Total	4273	4682	8344	8576	17112
COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - URBAN/METRO							
Area	Condition	Vehicle-Delay Hours					
metro	all	Total	5963	7623	14370	14745	293404
metro	EJ	Total	4273	4331	8340	8571	17104
COST EFFECTIVENESS CONSUMER SATISFACTION & RELIABILITY - RURAL/NON METRO							
Area	Condition	Vehicle-Delay Hours					
nonmetro	all	Total	51	6390	19980	18906	15159
nonmetro	EJ	Total	0	0	4	4	8
SAFETY - COUNTYWIDE							
All county							
ACCIDENTS DATA							
Total =			3283	5663	5454	5380	5727
PDO =			2098	3618	3485	3437	3659
Injury =			1137	1962	1889	1864	1984
Fatal =			48	83	80	79	84
county EJ Links only							
ACCIDENTS DATA							
Total =			804	1142	1233	1230	1163
PDO =			514	729	788	786	743
Injury =			279	395	427	426	403
Fatal =			12	17	18	18	17
SAFETY - URBAN/METRO							
All metro							
ACCIDENTS DATA							
Total =			1659	2118	2816	2761	3119
PDO =			1060	1353	1799	1764	1993
Injury =			575	734	975	956	1080
Fatal =			24	31	41	41	46
metro EJ Links only							
ACCIDENTS DATA							
Total =			735	968	1137	1134	1056
PDO =			470	619	727	725	675
Injury =			255	335	394	393	366
Fatal =			11	14	17	17	15
SAFETY - RURAL/NON METRO							
All nonmetro							
ACCIDENTS DATA							
Total =			1624	1629	2639	2619	2608
PDO =			1037	1041	1686	1673	1666
Injury =			562	564	914	907	903
Fatal =			24	24	39	38	38
nonmetro EJ Links only							
ACCIDENTS DATA							
Total =			69	36	95	96	107
PDO =			44	23	61	61	69
Injury =			24	12	33	33	37
Fatal =			1	1	1	1	2