July 05, 2011

TO: Transportation Modeling Committee

FROM: Robert Ball
Planning Director

BY: Ben Raymond
Regional Planner I

SUBJECT: Requested Information: The information below was requested at the June 22nd 2011 meeting to be distributed to the committee members.

INFORMATION:

1. Provide Draft Land Use Model Map with overlay of transportation networks

A link to the latest Land Use Model Map is provided below:
http://www.kerncog.org/cms/attachments/348_Kern_2035Bas_D06_gp13b-Metro.pdf

2. Provide Draft SCS Centers Map; **Committee Members need to submit comments to Kern COG by July 31st as requested at the May 25th meeting.**

Links to maps were provided on May 25th Agenda, and were posted online under handouts; links are provided below:
http://www.kerncog.org/cms/attachments/348_Draft_Metro_Bakersfield_Centers_2-17-11.pdf
http://www.kerncog.org/cms/attachments/348_Draft%20SCS%20Centers%20Concept%20View%204-8-11.pdf
http://www.kerncog.org/cms/attachments/348_KernBlueprint%20Centers%20Concept%20View%202008.pdf

3. Notify Cities of Availability of Speed Surveys

A notice of the availability of speed surveys as part of this year's traffic count program will be sent out to the member agencies the week of July 11th.

i. Define needs/reasons for Speed Survey data

Speed Survey data is required by 2010 California RTP Guidelines
http://www.catc.ca.gov/programs/rtp/2010_RTP_Guidelines.pdf
Section 3.2 RTP Modeling Requirements and Recommendations, p. 43: *"C. Regions with moderate to rapid growth, non-attainment AQ, or the potential for transit to significantly reduce VMT. ...11. Agencies should investigate their model's volume-delay function and ensure that speeds outputted from the model are reasonable. Road capacities and* ***speeds should be validated with surveys****."*

4. CTC Draft Statewide Transportation System Needs Assessment

Kern COG has reviewed draft performance measures to be used in the CTC Statewide Transportation System Needs Assessment report; Kern COG staff has prepared an example (based on SANDAG template, also included) of how Kern COG will be providing input data for each measure. See Attachment A.

5. Provide more information about Environmental Justice Reports

The Environmental Justice 2010 Model Results report, Attachment B, summarizes the performance measures of the Environmental Justice Model and includes, at the end of the report, the raw data generated by Environmental Justice Model for the base 2006 year.

6. Provide Maps of Traffic Count Locations – Past and Present

Attachment C includes one Metropolitan Bakersfield Area map and one Kern County Area map with traffic count locations: past and present.

# ATTACHMENT A - MPO Performance Measure Template

**Reporting Agency:** **Kern COG**

**Data Inputs**

| SMART MOBILITY 2010 GOALS | CATEGORIES | PROPOSED MEASURES | PROPOSED ESTIMATION METHOD | Assumptions | Base Year Data | 2020 Data | Results |
|---|---|---|---|---|---|---|---|
| **Robust Economy** | Employment | Increase in jobs | Caltrans Benefit – Cost Model | | Forthcoming Spreadsheet Template | Forthcoming Spreadsheet Template | Forthcoming from Caltrans |
| **Robust Economy** | Economic Output | Value added to Gross State Product | Caltrans Benefit – Cost Model | | Forthcoming Spreadsheet Template | Forthcoming Spreadsheet Template | Forthcoming from Caltrans |
| **Reliable Mobility** | Multi-modal Travel Mobility | Change in average per-trip travel time:<br>Passengers | Reported results from RTPs | Peak Transit Travel Time<br>Off Peak Transit Travel Time<br>Peak Highway Travel Time<br>Off Peak Highway Travel Time<br>Base 2011 | 48<br>51.26<br>16.21<br>15.19 | 47.91<br>53.1<br>16.41<br>15.26 | -0.09<br>1.84<br>0.2<br>0.07 |
| **Reliable Mobility** | Asset Condition | Conformance with accepted standards for maintenance of transportation system in good state of repair | Caltrans to provide (ref. System Preservation analysis) | | | | |
| **Environmental Stewardship** | Climate and Energy Conservation | System wide Vehicle Miles Travelled (VMT) per capita | Target-setting Analysis; reported results from RTPs | Base 2011 | 40 | 42.2 | 2.2 |
| **Environmental Stewardship** | Emissions Reductions | Greenhouse gas (GHG) emissions per capita | Target-setting Analysis | Base 2005 | 14.3 | 14.2 | -0.1 |
| **Environmental Stewardship** | Air Quality /<br>Public Health | Criteria pollutant emissions per capita | Reported results from RTPs | Base 2011 | CO<br>OZONE<br>PM10<br>PM2.5 | 0.34<br>0.27<br>0.01<br>0.01 | 0.17<br>0.12<br>0.00<br>0.00 | -0.17<br>-0.15<br>0.00<br>0.00 |
| **Health and Safety** | Multi-modal Safety | Number of injuries and fatalities per capita from all collisions (including bicycle and pedestrian) | Reported results from RTPs | Base 2011 | 0.005 | 0.005 | 0.000 |
| **Health and Safety** | Pedestrian and Bicycle Mode Share | Percent of total trips per capita taken by biking or walking | Reported results from RTPs | Base 2011 | 3.4% | 3.0% | -0.4% |
| **Location Efficiency** | Support for Sustainable Growth | Percent of total dwelling units in Transit Priority Areas | Target-setting Analysis | Current transit centers do not meet the frequency and density defination of SB 375 Transit Priority Projects | 0% | 0 | |
| **Location Efficiency** | Transit Mode Share | Percent of total trips per capita taken by transit | Target setting Analysis; reported results from RTPs | Base 2011 | 2% | 2% | |

**Reporting Agency: SANDAG**

**Data Inputs**

| SMART MOBILITY 2010 GOALS | CATEGORIES | PROPOSED MEASURES | PROPOSED ESTIMATION METHOD | Assumptions | Base Year Data | 2020 Data | Results |
|---|---|---|---|---|---|---|---|
| **Robust Economy** | Employment | Increase in jobs | Caltrans Benefit – Cost Model | | Forthcoming Spreadsheet Template | Forthcoming Spreadsheet Template | Forthcoming from Caltrans |
| **Robust Economy** | Economic Output | Value added to Gross State Product | Caltrans Benefit – Cost Model | | Forthcoming Spreadsheet Template | Forthcoming Spreadsheet Template | Forthcoming from Caltrans |
| **Reliable Mobility** | Multi-modal Travel Mobility | Change in average per-trip travel time:<br>Passengers | Reported results from RTPs | All trips in min.<br>Work trips in min. | 16.95<br>27.19 | 17.98<br>29.85 | 1.03<br>2.66 |
| **Reliable Mobility** | Asset Condition | Conformance with accepted standards for maintenance of transportation system in good state of repair | Caltrans to provide (ref. System Preservation analysis) | | | | |
| **Environmental Stewardship** | Climate and Energy Conservation | System wide Vehicle Miles Travelled (VMT) per capita | Target-setting Analysis; reported results from RTPs | | 27.65 | 28.03 | 0.38 |
| **Environmental Stewardship** | Emissions Reductions | Greenhouse gas (GHG) emissions per capita | Target-setting Analysis | | 26.0 | 23.7 | -8.8% |
| **Environmental Stewardship** | Air Quality /<br>Public Health | Criteria pollutant emissions per capita | Reported results from RTPs | | 0.020 | 0.008 | -0.012 |
| **Health and Safety** | Multi-modal Safety | Number of injuries and fatalities per capita from all collisions (including bicycle and pedestrian) | Reported results from RTPs | Weekday not including bike/ped | 0.01 | 0.01 | 0.00 |
| **Health and Safety** | Pedestrian and Bicycle Mode Share | Percent of total trips per capita taken by biking or walking | Reported results from RTPs | Work trip mode split | 2% | 2% | 0% |
| **Location Efficiency** | Support for Sustainable Growth | Percent of total dwelling units in Transit Priority Areas | Target-setting Analysis | | 40% | TBD | |
| **Location Efficiency** | Transit Mode Share | Percent of total trips per capita taken by transit | Target setting Analysis; reported results from RTPs | Work trip mode split | 6% | 7% | 1% |

**ATTACHMENT - B**

Overall Work Program – Element 601.4

# Environmental Justice 2010 Model Results

January 2010

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**Kern Council of Governments**
## Board of Directors

The Kern Council of Governments is the regional planning agency as well as the technical and informational resource, and rideshare administrator for the area's 11 incorporated cities and the County of Kern. Following Board direction, staff coordinates between local, state, and federal agencies to avoid overlap or duplication of programs. This intergovernmental coordination enables staff to work with many public agencies to ensure that planning and implementation of programs proceed in a coordinated manner.

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## 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 on areas upon which the region should focus in the 2014 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 Regional Transportation Plan. The two primary categories of performance measures used are the Sustainable Mobility Framework, and Environmental Justice. The Environmental Justice measures have been in place since 2001 and have been adapted for use with the Sustainable Mobility Framework performance measure category.

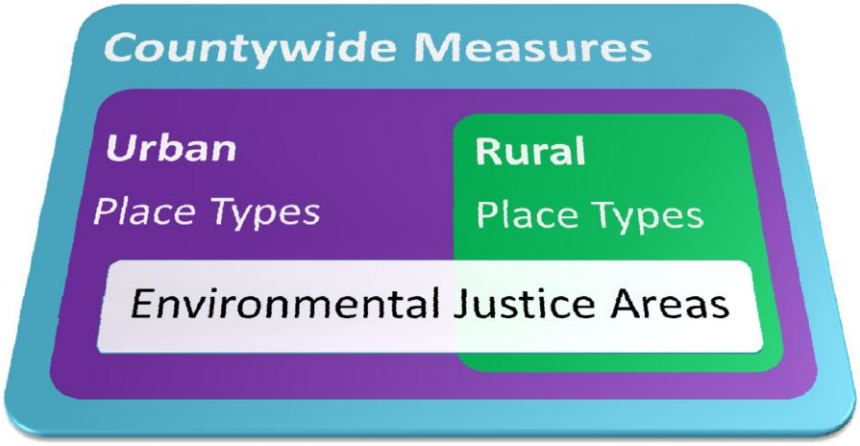
In February 2010, Caltrans released the *Smart Mobility 2010: A Call to Action for the New Decade* that establishes performance measures based on place type in recognition of a "one-size does NOT fit all" philosophy. Kern has been split into two broad place-types. The first is the Metropolitan Bakersfield 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.

The performance measure for sustainability/environment 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 worst pollutants that violate federal standards.

## Performance Measures Analysis Methodology

Kern COG has developed an integrated framework of performance measures to demonstrate consistency of the Regional Transportation Plan with its seven established goals.

**Figure 2-1 Integrated Performance Measures Framework**




This figure illustrates the overlap among the seven 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 apply to which categories and goals.

**Table 2-3 RTP Goals, Performance Measures and Smart Mobility Framework Place Types Adapted for Kern County**

| | RTP Goal(s) | Measure Description | Applicability by Place Types |
|---|---|---|---|
| 1 | mobility, livability, sustainability, congestion | Average Travel Time – Peak Highway Trips, Peak Transit Trips | EJ, Urban |
| 2 | Accessibility, livability, sustainability, congestion | Average Travel Time to Job Centers – Highway Trips, Transit Trips | EJ, Urban |
| 3 | Reliability, livability, congestion | Average Level of Congestion in Hours | EJ, Urban, Countywide |
| 4 | Reliability, safety, livability | Annualized Accident Statistics for Annual Average Daily Traffic | EJ, Urban/Rural, Countywide |
| 5 | Efficiency, cost effectiveness, sustainability | Average Daily Investment per Passenger Mile Traveled – Highways, Transit | EJ, Urban/Rural, Countywide |
| 6 | livability, customer Satisfaction, sustainability, congestion | Average Trip Delay Time in Hours | EJ, Urban/Rural, Countywide |
| 7 | Sustainability, environment | Percent Change NOx/PM by air basin | Air Basins |

| | RTP Goal(s) | Measure Description | Applicability by Place Types |
|---|---|---|---|
| 8 | Sustainability, preservation | Percent Change in Maintenance Dollars Per Lane Mile | Countywide |
| 9 | Equity | Percent of Expenditures versus Passenger Miles Traveled in 2035 – Highways, Transit | EJ, Urban/Rural, Countywide |

The above table demonstrates that some of the performance measures comply with as many as five goals. The geographic area of analysis varies for the environmental justice and smart mobility framework place type performance measures, while the environmental justice analysis uses all seven measures and compares countywide performance with performance in environmental justice areas. The Smart Mobility Framework establishes the use different performance measures based on place type. Kern has divided the region into two place types and uses different performance measures for each place type. Urban place type uses all the performance measures while the rural place type excludes the ones related to congestion. Although congestion occurs in the County's rural areas, other factors such as safety are primary concerns.

**Performance Measure Results**

After the release of the 2000 Census, Kern COG convened an Environmental Justice Task Force, which identified low income, minority, elderly, and disabled people as the target populations for analyzing federal Title VI Environmental Justice (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.

The process involved preparing and testing a series of "scripts" or small programs that allow the model to run projections for the 2006 base year and future years on measures established for environmental justice criteria. Specific model scripts requested were:

- **Mobility** – Calculates average trip time by mode (auto and transit) from environmental justice Traffic Analysis Zones (TAZs) and countywide.
- **Accessibility/Economic Well Being** – Calculates average trip time by mode (auto and transit) to major job centers from a group of approximately 1700 (AZs. Accessibility also provides an economic measure by indicating the level of congestion around major job centers that may affect freight movement.
- **Reliability/Congestion** – Calculates the distance of level of service D through F links inside environmental justice TAZs and countywide.
- **Reliability/Safety** – Calculates the percentage increase between property damage, injury and fatal accident rates between base year 2006 and 2035.
- **Efficiency/Cost-effectiveness** – Calculates the planned expenditure per passenger miles traveled. Calculate 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.

- **Livability/Consumer Satisfaction** – Calculates the average trip delay after feedback between constrained and unconstrained roadways on links inside EJ TAZs and countywide.[1]
- **Sustainability/Environment** – Vehicle emissions of NOx per person for the valley and mountain/desert portions of Kern.
- **Sustainability/Preservation** – Provides for maintenance as the system expands.
- **Equity** – Calculates the passenger miles travel and compare to the percent of investment in EJ areas and urban and rural place types.

The RTP Guidelines also recommend including goals on transportation system preservation. Preservation was not included in the model because it is not a component the model can measure readily. A detailed description of maintenance and preservation funding can be found in the Financial Element.

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 2006 (base year), 2035 build scenario, and 2035 no-build scenario. The 2035 build scenario assumes all projects listed in Table 4-1 of the 2011 Regional Transportation Plan will have been completed, whereas the No-Build scenario assumes 2035 traffic levels on the same network used in 2006. 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 represented overall system performance now and in the future.

**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 2006, in 2035 when all RTP projects are completed, and in a 2035 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 2006 for all trips was 12.67 minutes, compared to a rural time of 20.58, for a countywide average of 16.26. In considering just metro Bakersfield's EJ TAZs, the average travel time was 12.40, versus rural EJ TAZs at 20.31, for a countywide average of 14.14 minutes. During the 2006 base year, EJ TAZs throughout the county enjoyed shorter average travel times than the county as a whole. As depicted in the chart below, that trend is maintained over both the 2035 build and the 2035 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.

[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.

**Table 2-4 Average Travel Time – Peak Highway Trips (in minutes)**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 12.67 | 13.39 | 14.47 |
| Rural Areas | 20.58 | 20.78 | 21.37 |
| Countywide | 16.26 | 16.94 | 18.75 |

**Table 2-5 EJ TAZs Average Travel Time – Peak Highway Trips**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 12.40 | 13.00 | 13.51 |
| Rural Areas | 20.31 | 20.69 | 21.34 |
| Countywide | 14.14 | 14.71 | 15.23 |

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 2006, the average peak hour transit trip took 44.77 minutes in Bakersfield. However, transit trips emanating from EJ TAZs were clocked at 43.86 minutes. In 2035, the model estimates the difference to increase from 46.10 minutes in Bakersfield as a whole to 45.38 minutes in Bakersfield EJ TAZs.

**Table 2-6 Average Travel Time – Peak Transit Trips[2]**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 44.77 | 46.10 | 45.50 |
| Rural Areas | N/A | N/A | N/A |
| Countywide* | 47.54 | 47.98 | 49.07 |

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

**Table 2-7 EJ TAZs Average Travel Time – Peak Transit Trips**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 43.86 | 45.38 | 44.14 |
| Rural Areas | N/A | N/A | N/A |
| Countywide* | 48.63 | 45.65 | 44.73 |

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

[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.

**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 percent 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 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 and measure of economic well being for the region.

In 2006, the average trip length from anywhere in Bakersfield to a major job center was 12.13 minutes. For areas outside Bakersfield, the time was approximately 15 minutes longer – 27.26 minutes. The average commute time to a major job center in Kern County was 19.69 minutes in 2006. This compares to 14.8 minutes for all commutes from EJ TAZs to major job centers throughout the county in 2006.

EJ TAZs generally fare better across the board against urban, rural and countywide averages for commutes to major job centers under the 2035 Build and 2035 No-Build scenarios. This is true for both private vehicle trips countywide and transit trips in Bakersfield. Rural transit data are unavailable.

**Table 2-8 Average Travel Time to Major Job Centers – Highway**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 12.13 | 12.12 | 13.24 |
| Rural Areas | 27.26 | 27.16 | 27.73 |
| Countywide | 19.69 | 19.39 | 21.55 |

**Table 2-9 Average Travel Time from EJ TAZs to Major Job Centers – Highway**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 11.85 | 11.78 | 12.20 |
| Rural Areas | 25.31 | 24.73 | 25.27 |
| Countywide | 14.80 | 14.65 | 15.08 |

**Table 2-10 Average Travel Time to Major Job Centers – Transit [3]**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 43.98 | 46.23 | 44.91 |
| Rural Areas | N/A | N/A | N/A |
| Countywide* | 47.07 | 49.35 | 49.02 |

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

[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 2-11 Average Travel Time from EJ TAZs to Major Job Centers – Transit**

| Place Type | 2006 | 2035 Build | 2035 No Build |
|---|---|---|---|
| Urban/Metro | 43.88 | 45.29 | 44.73 |
| Rural Areas | N/A | N/A | N/A |
| Countywide* | 44.42 | 45.62 | 17.1 |

*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 percent of on-time arrivals for each operator. Golden Empire Transit District has developed its own environmental justice analysis, “Title VI Update” last produced in March 2010. Based on observations through February 2004, GET estimated its on-time arrival rate for July 2009 through February 2010 was 76% of all trips. The report does not stratify by EJ TAZ.

Metropolitan Bakersfield residents will see the number of hours spent in congested traffic rise from 284,056 in 2006 to 500,661 in 2035. Relative to increases regionally, EJ TAZs will be 6% more congested than other areas countywide.

**Table 2-12 Average Level of Congestion in Hours**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| Urban/Metro | 284,056 | 500,661 | 76 |
| Rural Areas | 276,468 | 503,753 | 82 |
| Countywide | 560,524 | 1,004,414 | 79 |

**Table 2-13 Average Level of Congestion in Hours – EJ TAZs**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| Urban/Metro | 122,791 | 183,661 | 50 |
| Rural Areas | 64,257 | 116,046 | 81 |
| Countywide | 187,048 | 299,896 | 60 |

**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 2011 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 2006 compared to 2035. Results show that injury accidents will rise sharply throughout the County by 2035. Meanwhile, EJ TAZs will see a slower increase for injury accidents over the region as a whole. For example, in Metro Bakersfield, the injury accident rate is predicted to rise from 879 in 2006 to 1,636 in 2035, an 86% increase. In urban EJ TAZs, however, the same type of accident will go from 370 to 572, a 55% 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 forecasted to rise at a slightly lower rate than the countywide average as travel increases on Kern's roadway network.

**Table 2-14 Annualized Accident Statistics for Annual Average Daily Traffic**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| **Urban/Metro** | | | |
| Property damage | 1,537 | 2,862 | 86 |
| Injury | 879 | 1,636 | 86 |
| Fatality | 55 | 103 | 87 |
| **Rural** | | | |
| Property damage | 2,239 | 4,092 | 83 |
| Injury | 1,279 | 2,338 | 83 |
| Fatality | 81 | 147 | 81 |
| **Countywide** | | | |
| Property damage | 3,776 | 6,954 | 84 |
| Injury | 2,158 | 3,974 | 84 |
| Fatality | 136 | 250 | 84 |

**Table 2-15 Annualized Accident Statistics for Annual Average Daily Traffic – EJ TAZs**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| **Urban/Metro** | | | |
| Property damage | 647 | 1,001 | 55 |
| Injury | 370 | 572 | 55 |
| Fatality | 23 | 36 | 57 |
| **Rural** | | | |
| Property damage | 490 | 911 | 86 |
| Injury | 280 | 521 | 86 |
| Fatality | 18 | 33 | 83 |
| **Countywide** | | | |
| Property damage | 1,137 | 1,912 | 68 |
| Injury | 650 | 1,093 | 68 |
| Fatality | 41 | 69 | 68 |

**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 investment from 2011 RTP projects through 2035 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 the metropolitan Bakersfield area, the average daily investment in highways will amount to $.009 per PMT versus $.015 per PMT in Bakersfield EJ TAZs. In rural areas outside Bakersfield, the cost is $.004 versus $.006 in rural EJ TAZs. For transit service in Bakersfield, the daily investment per PMT is $.11 versus $.07 in Bakersfield EJ TAZs While the daily investment per PMT for roads indicates that the transportation system will meet the goal of spending more money per PMT in EJ areas than in the county as a whole, *the transit system does not measure up to that criterion, with all factors constant.* However, more funding will be spent per PMT in EJ TAZs than the county as a whole, and mobility and accessibility for EJ TAZs will also be higher.

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

**Table 2-16 Average Daily Investment per Passenger Mile Traveled – Highways**

| Place Type | 2035 Build |
|---|---|
| Urban/Metro | $.009 |
| Rural Areas | $.004 |
| Countywide | $.007 |

**Table 2-17 Average Daily Investment per Passenger Mile Traveled – Highways – EJ TAZs**

| Place Type | 2035 Build |
|---|---|
| Urban/Metro | $.015 |
| Rural Areas | $.006 |
| Countywide | $.0105 |

**Table 2-18 Average Daily Investment per Passenger Mile Traveled – Transit[4]**

| Place Type | 2035 |
|---|---|
| Urban/Metro | $.11 |
| Rural Areas | N/A |
| Countywide | $.13 |

**Table 2-19 Average Daily Investment per Passenger Mile Traveled – Transit – EJ TAZs**

| Place Type | 2030 |
|---|---|
| Urban/Metro | $.0723 |
| Rural Areas | N/A |
| Countywide | $.06 |

**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, impacting the region's livability.

For example, between 2006 and 2035, Kern COG's traffic model estimates the number of daily trip delay hours in the urban metro area will rise from 61,929 to 105,837 – a 71 percent increase. However, in Metro's EJ TAZs, the number would increase from 27,134 to 43,190, a 59% rise. While neither scenario is desirable, EJ TAZs within Metro increase 12 percentage points less than the area as a whole. In rural areas travel delay grows a little faster than the county.

[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.

**Table 2-20 Average Trip Delay Time in Hours**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| Urban/Metro | 61,929 | 105,837 | 71 |
| Rural Areas | 24,703 | 48,163 | 95 |
| Countywide | 86,632 | 154,000 | 78 |

**Table 2-21 Average Trip Delay Time in Hours for EJ TAZs**

| Place Type | 2006 | 2035 | Percent increase |
|---|---|---|---|
| Urban/Metro | 27,134 | 43,190 | 59 |
| Rural Areas | 8,905 | 15,344 | 72 |
| Countywide | 36,039 | 58,534 | 62 |

**Sustainability/Environment**

This measure is defined as enhancing the existing transportation system while improving the environment. 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 the 2011 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. A greenhouse gas (GHG) measure is currently under development as part of efforts to implement AB 32 and SB 375, and should be available in time for the next major RTP update. In the meantime, measuring current federal criteria pollutants offer an adequate surrogate for GHG because the strategies used to reduce one usually help reduce the other.

Both Kern COG's long-term 2011 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 non-attainment 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 U.S. Department of Transportation on November 3, 2009. A revised conformity analysis has been undertaken to support the 2011 RTP and the 2011 FTIP.

**Table 2-22 Vehicle NOx/PM10 Emissions Decrease**

| Air Basin (portion of Kern) | Base 2008/11 | Horizon 2030/35 | Percent Decrease | Air Standard Met? |
|---|---|---|---|---|
| San Joaquin Vly | 75.5 | 22.9 | 70 | YES |
| Mojave Desert | 14.6 | 4.2 | 71 | YES |
| Indian Wells Vly.* | 1.3 | 1.1 | 15 | YES |

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

For a more detailed discussion of air quality see the 2011 Conformity Analysis up for simultaneous adoption with the 2011 RTP and FTIP.

**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 2008 an initiative with 56% voter approval failed to garner the 2/3rds vote required to pass. Had it passed, approximately 40% of the funding was reserved for maintenance. The following tables illustrate the growing problem of maintaining an expanding system and underscore the need for rapid action to provide new funding sources to maintain the system.

**Table 2-23 Maintenance Dollars Per Lane Mile for the Transportation System**

| Countywide | Base 2006 | Horizon 2035 | Percent Change |
|---|---|---|---|
| Lane Miles | 7349 | 9474 | 29 |
| Annual Maintenance | $96,000,000 | $96,000,000 | 0 |
| Maintenance Per Mile | $13,063 | $10,133 | -22 |

**Table 2-24 Maintenance Dollars Per Lane Mile for the Transportation System if the 2008 Transportation Measure Had Passed**

| Countywide | Base 2006 | Horizon 2035 | Percent Change |
|---|---|---|---|
| Lane Miles | 7349 | 9474 | 29 |
| Annual Maint. | $96,000,000 | $124,000,000 | 29 |
| Maint. Per Mile | $13,063 | $13,088 | 0 |

**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 2035 with total passenger miles traveled in Bakersfield, rural areas and the county as a whole. All numbers were converted to percentages for simplicity.

In 2035, Urban/Metro Bakersfield EJ TAZs will account for 52% of all passenger miles traveled in the region. However, approximately 73% of transportation expenditures will go directly into the metropolitan EJ TAZs. Rural EJ TAZs will represent 13% of countywide PMT and 13% of all

highway funding will be spent in those areas. Countywide, approximately 28% of all passenger miles traveled will occur in EJ TAZs, which will collect 47% of funding and projects.

Although Kern COG cannot reliably project the number of passenger miles traveled by rural transit agencies in 2035, the model does predict that EJ TAZs in the metro Bakersfield region will make up approximately 68% of transit PMT. Those same TAZs, however, will receive 90% of all transit funding attributable to the metropolitan area. Stratification between metro and rural transit services is impractical because of the rural transit PMT variable. The model currently excludes rural transit because the extremely low volumes are difficult to calibrate.

**Table 2-25 Percent of Expenditures Versus Passenger Miles Traveled in 2035 - Highways**

| Place Type | 2035 PMT | Total investment | PMT (percent) | Investment (percent) |
|---|---|---|---|---|
| Urban/Metro | 23,381,541 | $2,403,140,132 | 41 | 63 |
| Rural Areas | 33,427,754 | $1,435,741,868 | 59 | 37 |
| Countywide | 56,809,295 | $3,838,882,000 | 100 | 100 |

**Table 2-26 Percent of Expenditures Versus Passenger Miles Traveled in EJ TAZs by 2035 - Highways**

| Place Type | 2035 PMT | Total investment | PMT (percent) | Investment (percent) |
|---|---|---|---|---|
| Urban/Metro | 8,179,260 | $1,303,108,495 | 52 | 73 |
| Rural Areas | 7,443,927 | $481,971,635 | 48 | 27 |
| Countywide | 15,623,187 | $1,785,080,130 | 100 | 100 |

**Table 2-27 Percent of Expenditures Versus Passenger Miles Traveled in 2035 – Transit**

| Place Type | 2035 PMT | Total investment | PMT (percent) | Investment (percent) |
|---|---|---|---|---|
| Urban/Metro | 95,045 | $96,000,000 | 100 | 85 |
| Rural Areas | N/A | $16,800,000 | N/A | 15 |
| Countywide | N/A | $112,800,000 | 100 | 100 |

**Table 2-28 Percent of Expenditures Versus Passenger Miles Traveled in EJ TAZs by 2035 - Transit**

| Place Type | 2035 PMT | Total investment | PMT (percent) | Investment (percent) |
|---|---|---|---|---|
| Urban/Metro | 64,610 | $46,944,000 | N/A | 90 |
| Rural Areas | N/A | $5,410,000 | N/A | 10 |
| Countywide | N/A | $52,354,000 | 100 | 100 |

## Environmental Justice Conclusions

Ideally, transportation projects not only achieve immediate transportation goals (such as congestion relief) but contribute to the betterment of our physical and socioeconomic environment. It is inevitable, however, that some transportation projects generate negative impacts as well. This chapter identifies the methodology used to determine the 2011 RTP projects' equitability and their overall cost and benefit to the residents of Kern County, including traditionally disadvantaged neighborhoods.

From a public information perspective, Kern COG's commitment to environmental justice and both rural and urban community types is demonstrable through its efforts at 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 radio 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. Press releases are generated at project milestones. Kern COG's quarterly newsletter is distributed to over 2,000 organizations and individuals.

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. Analyses demonstrated some shortcomings that will be addressed, however. For example, Metropolitan Bakersfield will see the number of hours spent in congested traffic rise from 284,056 in 2006 to 500,661 in 2035 – a 76% increase. But metro area EJ TAZs will experience a 50% rise in congestion levels over the same period.

Kern COG's position that it is meeting the rigors of environmental justice is based largely on averages, and in some cases predicated on a worst-case scenario for every portion of the Kern region. The fact that delay times will rise by *only* 62% in EJ Areas versus 78% for the region as a whole over the long-term is nothing to trumpet; however, it does demonstrate that despite substantial financial commitments, and with all issues remaining constant, the Kern region's transportation network will continue to deteriorate for every segment of the population. The model shows that, generally speaking, the transportation network will not deteriorate in EJ areas as quickly as in the county as a whole.

Kern COG expects to re-evaluate its environmental justice policies and procedures with the release of the federal 2010 Census results. In its initial analysis, Kern COG determined that several of the criteria were measured redundantly. For example, consumer satisfaction is measured in delay time whereas reliability is measured in the number of vehicle hours spent in congestion. The two measures, while different, may be similar enough to use one or the other, though not both.

Similarly, cost-effectiveness and equity 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 appear to be the same. Because environmental issues such as noise, air quality, wildlife disturbances, and context-sensitive design must be addressed through the mitigation process on a project-by-project basis, no substantive means are available to measure these environmental effects as a systemwide criterion in this analysis.

Considering all the analyses as a whole, it is fair to conclude that the 2011 RTP meets the Federal Title VI environment justice requirements by ensuring that all of the population is

subject to proportionate benefits and detriments. It also must be understood that environmental justice 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 2011 RTP has met those expectations.

**Smart Mobility Conclusions**

The smart mobility method divided the performance measures into two place types - urban and rural. The measures reveal that a relatively even distribution of resources addresses mobility and accessibility. For example, the greatest improvement in accessibility to job centers is found in rural areas were average travel times are reduced by about six seconds compared to one second in urban areas, despite 63% of the highway investment in the Metro/urban area. Trip delay and congestion increases in rural areas at a faster rate than in Metro; however, congestion is not considered as important a factor as safety where rural place types see a 3-6% reduction in accidents. This is primarily because projects in outlying rural areas are focused less on relieving congestion and more on safety improvements.

The performance measures look at 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 Metro than within. That is because Metro makes up less than 10% of the total area of the county, and through-county trips make up about 25% of all travel in Kern County.

**Systemwide Conclusions**

Systemwide, the performance measures indicate that Kern is losing ground in its battle with congestion while improving the economy by providing better accessibility to major job centers. Accessibility to major job centers countywide improved by 18 seconds between 2006 and 2035. However, even with the influx of more than $640 million in federal demonstration funds to the region, and a recent increase in traffic impact fees on housing in Metropolitan Bakersfield are forecasted to see an 80% increase in congestion over the next 25 years. With the current housing downturn, it is not likely that another increase in impact fees can absorb the costs needed to accommodate the growth for the region. In addition, many of these future improvements are becoming 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 occupancy vehicles. Investment in carpool and bus lanes on freeways, ramps and arterial streets are 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.

One of the worst performing indicators is the Sustainability/Preservation measure.

Recent polling for both the 2008 local transportation sales tax measure and the Kern Blueprint ranked maintenance of the existing system as the highest priority for transportation funding. However, federal, state and local efforts have failed to provide the funding necessary to maintain the infrastructure that Kern County is building. The 2008 sales tax measure would have provided sufficient funding to maintain the system at current levels to 2030.

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 ARRA II may provide additional funding; however, deficit stimulus spending is not a permanent solution. The state and federal highway trust funds are insolvent and must be fixed as part of the federal surface transportation act re-authorization now underway. Innovative long-term pay-as-you-go solutions, such as a phased in odometer- based gas tax, should be seriously considered.

**Future Improvements to Measuring Performance**

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 is a list of potential future performance measures for modeling scenario analysis that may enhance the analysis of progress made toward the RTP goals.

**Table 2-29 Potential Performance Measures Under Development**

| | RTP Goal(s) | Measure Description |
|---|---|---|
| 1 | Accessibility, mobility, livability, sustainability, congestion | vehicle miles traveled per person/employee |
| 2 | livability, sustainability, congestion | $CO_2$ pounds per person |
| 3 | livability, sustainability | Acres of resource areas converted to urban use |
| 4 | livability, sustainability | Balanced/compact/mixed development |
| 5 | Cost Effectiveness, sustainability | Goods movement |

In addition to these measures, a monitoring system is needed to track progress toward these goals. The following variables are already tracked annually and may be enhanced:

- Traffic count information;
- Improve truck counts along key corridors;
- Develop a more regular traffic speed survey program;
- Improve transit ridership information.

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

2006

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 44.77 |
| OffPeak Transit Travel Time | 47.90 |
| Peak Highway Travel Time | 12.67 |
| OffPeak Highway Travel Time | 11.96 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 43.98 |
| OffPeak Transit Travel Time | 45.33 |
| Peak Highway Travel Time | 12.13 |

OffPeak Highway Travel Time 11.27

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==========
Peak Transit Travel Time 43.88
OffPeak Transit Travel Time 44.24
Peak Highway Travel Time 11.85
OffPeak Highway Travel Time 10.77

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==========
Peak Transit Travel Time 43.86
OffPeak Transit Travel Time 48.12
Peak Highway Travel Time 12.40
OffPeak Highway Travel Time 11.40

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===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====
==========

TRANSIT - SYSTEMWIDE INFORMATION
==========

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 18,638 | 66,399 | 4,540 |
| EJZones to EJZones | 13,729 | 48,635 | 3,363 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT
==========

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 10,732 | 1,106,291 | 34,002 | 1,439,086 |
| PM Peak Period | 10,732 | 2,049,866 | 67,029 | 2,666,507 |
| Midday Peak Period | 10,732 | 1,732,029 | 54,266 | 2,253,058 |
| OffPeak Period | 10,732 | 4,328,348 | 130,139 | 5,630,402 |
| Daily | 10,732 | 9,216,603 | 284,056 | 11,989,142 |
| Daily KERN - CAP | 10,732 | 9,216,603 | 284,056 | 11,989,142 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 3,947 | 471,996 | 14,886 | 613,982 |
| PM Peak Period | 3,947 | 879,126 | 28,857 | 1,143,584 |
| Midday Peak Period | 3,947 | 715,563 | 22,803 | 930,819 |
| OffPeak Period | 3,947 | 1,812,102 | 56,948 | 2,357,219 |
| Daily | 3,947 | 3,878,812 | 122,791 | 5,045,637 |
| Daily KERN - CAP | 3,947 | 3,878,812 | 122,791 | 5,045,637 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 115 | 114,921 | 3,829 | 149,491 |
| PM Peak Period | 230 | 305,087 | 11,304 | 396,863 |
| Midday Peak Period | 160 | 244,404 | 8,561 | 317,925 |
| OffPeak Period | 142 | 506,125 | 13,920 | 658,377 |
| Daily | 145 | 1,147,075 | 34,782 | 1,492,138 |
| Daily KERN - CAP | 379 | 2,260,238 | 64,954 | 2,940,163 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 54 | 62,985 | 1,774 | 81,933 |
| PM Peak Period | 100 | 166,244 | 4,447 | 216,254 |
| Midday Peak Period | 70 | 137,998 | 3,317 | 179,510 |
| OffPeak Period | 75 | 321,063 | 7,674 | 417,645 |
| Daily | 69 | 690,178 | 16,219 | 897,797 |
| Daily KERN - CAP | 182 | 1,125,872 | 27,857 | 1,464,557 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 24.07 | 23.75 |
| Constd.(n Iter.) | - Average Speeds | 24.12 | 23.78 |

| | | | |
|---|---|---|---|
| Constd.(1 Iter.) | - VHT(hours) | 300,026 | 127,118 |
| Constd.(n Iter.) | - VHT(hours) | 284,056 | 122,791 |
| Constd.(1 Iter.) | - VMT(miles) | 9,595,228 | 4,009,251 |
| Constd.(n Iter.) | - VMT(miles) | 9,216,603 | 3,878,812 |
| Constd.(1 Iter.) | - PMT(miles) | 12,481,664 | 5,215,314 |
| Constd.(n Iter.) | - PMT(miles) | 11,989,142 | 5,045,637 |
| Constd.(1 Iter.) | - VHT PER TRIP | 17.60 | 32.20 |
| Constd.(n Iter.) | - VHT PER TRIP | 16.66 | 31.11 |
| Constd.(1 Iter.) | - VMT PER TRIP | 9.38 | 16.93 |
| Constd.(n Iter.) | - VMT PER TRIP | 9.01 | 16.38 |
| Constd.(1 Iter.) | - PMT PER TRIP | 12.20 | 22.02 |
| Constd.(n Iter.) | - PMT PER TRIP | 11.72 | 21.30 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 284,056 | 222,126 | 61,929 |
| EJZones to EJZones | 122,791 | 95,657 | 27,134 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 2,471 | 1,537 | 879 | 55 |
| EJZones to EJZones | 1,040 | 647 | 370 | 23 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 70 | 1,521 |

EJ Zones to EJZones 29 640

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - NON METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 65.23 |
| OffPeak Transit Travel Time | 66.96 |
| Peak Highway Travel Time | 20.58 |
| OffPeak Highway Travel Time | 18.46 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 61.01 |
| OffPeak Transit Travel Time | 68.08 |
| Peak Highway Travel Time | 27.26 |

OffPeak Highway Travel Time 24.78

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==========
========
Peak Transit Travel Time 67.50
OffPeak Transit Travel Time 74.30
Peak Highway Travel Time 25.31
OffPeak Highway Travel Time 22.91

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==========
========
Peak Transit Travel Time 67.62
OffPeak Transit Travel Time 62.35
Peak Highway Travel Time 20.31
OffPeak Highway Travel Time 17.60

==========
===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====
==========

TRANSIT - SYSTEMWIDE INFORMATION
==========

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 34 | 122 | 7 |
| EJZones to EJZones | 6 | 26 | 1 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT
==========

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 6,062 | 1,519,290 | 32,492 | 1,976,323 |
| PM Peak Period | 6,062 | 2,665,821 | 57,921 | 3,467,753 |
| Midday Peak Period | 6,062 | 2,742,409 | 54,956 | 3,567,381 |
| OffPeak Period | 6,062 | 6,493,350 | 131,397 | 8,446,679 |
| Daily | 6,062 | 13,420,851 | 276,468 | 17,458,111 |
| Daily KERN - CAP | 6,062 | 13,420,851 | 276,468 | 17,458,111 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 1,606 | 327,017 | 7,512 | 425,390 |
| PM Peak Period | 1,606 | 575,551 | 13,419 | 748,688 |
| Midday Peak Period | 1,606 | 608,610 | 12,725 | 791,692 |
| OffPeak Period | 1,606 | 1,428,684 | 30,651 | 1,858,460 |
| Daily | 1,606 | 2,939,871 | 64,257 | 3,824,243 |
| Daily KERN - CAP | 1,606 | 2,939,871 | 64,257 | 3,824,243 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 6 | 2,937 | 264 | 3,820 |
| PM Peak Period | 9 | 5,725 | 640 | 7,448 |
| Midday Peak Period | 5 | 1,360 | 273 | 1,769 |
| OffPeak Period | 4 | 2,194 | 276 | 2,854 |
| Daily | 4 | 4,589 | 840 | 5,970 |
| Daily KERN - CAP | 13 | 20,231 | 1,455 | 26,317 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 1 | 134 | 17 | 174 |
| PM Peak Period | 2 | 374 | 45 | 487 |
| Midday Peak Period | 2 | 364 | 43 | 473 |
| OffPeak Period | 2 | 967 | 112 | 1,257 |
| Daily | 2 | 1,955 | 228 | 2,544 |
| Daily KERN - CAP | 2 | 1,955 | 228 | 2,544 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 32.98 | 29.43 |
| Constd.(n Iter.) | - Average Speeds | 33.00 | 29.48 |

| | | | |
|---|---|---|---|
| Constd.(1 Iter.) | - VHT(hours) | 281,368 | 65,693 |
| Constd.(n Iter.) | - VHT(hours) | 276,468 | 64,257 |
| Constd.(1 Iter.) | - VMT(miles) | 13,564,885 | 2,979,560 |
| Constd.(n Iter.) | - VMT(miles) | 13,420,851 | 2,939,871 |
| Constd.(1 Iter.) | - PMT(miles) | 17,645,474 | 3,875,871 |
| Constd.(n Iter.) | - PMT(miles) | 17,458,111 | 3,824,243 |
| Constd.(1 Iter.) | - VHT PER TRIP | 45.46 | 72.64 |
| Constd.(n Iter.) | - VHT PER TRIP | 44.67 | 71.05 |
| Constd.(1 Iter.) | - VMT PER TRIP | 36.53 | 54.91 |
| Constd.(n Iter.) | - VMT PER TRIP | 36.14 | 54.18 |
| Constd.(1 Iter.) | - PMT PER TRIP | 47.52 | 71.42 |
| Constd.(n Iter.) | - PMT PER TRIP | 47.02 | 70.47 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 276,468 | 251,766 | 24,703 |
| EJZones to EJZones | 64,257 | 55,352 | 8,905 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 3,599 | 2,239 | 1,279 | 81 |
| EJZones to EJZones | 788 | 490 | 280 | 18 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 102 | 2,214 |

EJ Zones to EJZones 22 485

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - KERN COUNTY

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 47.54 |
| OffPeak Transit Travel Time | 50.58 |
| Peak Highway Travel Time | 16.26 |
| OffPeak Highway Travel Time | 15.03 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 47.07 |
| OffPeak Transit Travel Time | 49.47 |

| | |
|---|---|
| Peak Highway Travel Time | 19.17 |
| OffPeak Highway Travel Time | 17.69 |

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

| | |
|---|---|
| Peak Transit Travel Time | 44.42 |
| OffPeak Transit Travel Time | 44.79 |
| Peak Highway Travel Time | 14.80 |
| OffPeak Highway Travel Time | 13.47 |

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

| | |
|---|---|
| Peak Transit Travel Time | 44.42 |
| OffPeak Transit Travel Time | 48.63 |
| Peak Highway Travel Time | 14.14 |
| OffPeak Highway Travel Time | 12.77 |

## ===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====

### TRANSIT - SYSTEMWIDE INFORMATION

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 18,638 | 66,399 | 4,540 |
| EJZones to EJZones | 13,729 | 48,635 | 3,363 |

### COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 16,794 | 2,625,581 | 66,494 | 3,415,408 |
| PM Peak Period | 16,794 | 4,715,687 | 124,950 | 6,134,260 |
| Midday Peak Period | 16,794 | 4,474,439 | 109,222 | 5,820,439 |
| OffPeak Period | 16,794 | 10,821,698 | 261,537 | 14,077,081 |
| Daily | 16,794 | 22,637,454 | 560,524 | 29,447,253 |

| | | | | |
|---|---|---|---|---|
| Daily KERN - CAP | 16,794 | 22,637,454 | 560,524 | 29,447,253 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 5,553 | 799,013 | 22,398 | 1,039,372 |
| PM Peak Period | 5,553 | 1,454,676 | 42,277 | 1,892,272 |
| Midday Peak Period | 5,553 | 1,324,173 | 35,528 | 1,722,511 |
| OffPeak Period | 5,553 | 3,240,786 | 87,600 | 4,215,679 |
| Daily | 5,553 | 6,818,684 | 187,048 | 8,869,880 |
| Daily KERN - CAP | 5,553 | 6,818,684 | 187,048 | 8,869,880 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 121 | 117,857 | 4,094 | 153,311 |
| PM Peak Period | 239 | 310,813 | 11,944 | 404,311 |
| Midday Peak Period | 165 | 245,763 | 8,834 | 319,694 |
| OffPeak Period | 146 | 508,319 | 14,196 | 661,231 |
| Daily | 149 | 1,151,664 | 35,621 | 1,498,107 |
| Daily KERN - CAP | 392 | 2,280,469 | 66,409 | 2,966,480 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 55 | 63,119 | 1,790 | 82,107 |
| PM Peak Period | 102 | 166,619 | 4,492 | 216,741 |
| Midday Peak Period | 72 | 138,362 | 3,360 | 179,984 |
| OffPeak Period | 77 | 322,030 | 7,786 | 418,902 |
| Daily | 71 | 692,133 | 16,447 | 900,341 |
| Daily KERN - CAP | 184 | 1,127,827 | 28,085 | 1,467,101 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | WITHIN KERN | WITHIN EJ |
|---|---|---|
| Constd.(1 Iter.) - Average Speeds | 27.42 | 25.41 |

| | | | |
|---|---|---|---|
| Constd.(n Iter.) | - Average Speeds | 27.45 | 25.44 |
| Constd.(1 Iter.) | - VHT(hours) | 581,394 | 192,811 |
| Constd.(n Iter.) | - VHT(hours) | 560,524 | 187,048 |
| Constd.(1 Iter.) | - VMT(miles) | 23,160,113 | 6,988,811 |
| Constd.(n Iter.) | - VMT(miles) | 22,637,454 | 6,818,684 |
| Constd.(1 Iter.) | - PMT(miles) | 30,127,138 | 9,091,185 |
| Constd.(n Iter.) | - PMT(miles) | 29,447,253 | 8,869,880 |
| Constd.(1 Iter.) | - VHT PER TRIP | 18.49 | 37.93 |
| Constd.(n Iter.) | - VHT PER TRIP | 17.83 | 36.80 |
| Constd.(1 Iter.) | - VMT PER TRIP | 12.28 | 22.92 |
| Constd.(n Iter.) | - VMT PER TRIP | 12.00 | 22.36 |
| Constd.(1 Iter.) | - PMT PER TRIP | 15.97 | 29.81 |
| Constd.(n Iter.) | - PMT PER TRIP | 15.61 | 29.09 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 560,524 | 473,892 | 86,632 |
| EJZones to EJZones | 187,048 | 151,010 | 36,039 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 6,070 | 3,776 | 2,158 | 136 |
| EJZones to EJZones | 1,828 | 1,137 | 650 | 41 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|

| | | |
|---|---|---|
| Countywide to Countywide | 171 | 3,735 |
| EJ Zones to EJZones | 52 | 1,125 |

2035 Build

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 46.10 |
| OffPeak Transit Travel Time | 50.48 |
| Peak Highway Travel Time | 13.39 |
| OffPeak Highway Travel Time | 12.82 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 46.23 |
| OffPeak Transit Travel Time | 47.64 |
| Peak Highway Travel Time | 12.12 |
| OffPeak Highway Travel Time | 11.31 |

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

| | |
|---|---|
| Peak Transit Travel Time | 45.29 |
| OffPeak Transit Travel Time | 46.01 |
| Peak Highway Travel Time | 11.78 |
| OffPeak Highway Travel Time | 10.76 |

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

| | |
|---|---|
| Peak Transit Travel Time | 45.38 |
| OffPeak Transit Travel Time | 50.17 |
| Peak Highway Travel Time | 13.00 |
| OffPeak Highway Travel Time | 12.23 |

## ===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====

### TRANSIT - SYSTEMWIDE INFORMATION

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 24,635 | 95,045 | 5,979 |
| EJZones to EJZones | 16,947 | 64,610 | 4,138 |

### COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 12,849 | 2,133,308 | 61,815 | 2,907,186 |
| PM Peak Period | 12,849 | 3,837,998 | 117,447 | 5,230,270 |
| Midday Peak Period | 12,849 | 3,178,551 | 93,388 | 4,331,602 |
| OffPeak Period | 12,849 | 8,007,536 | 230,405 | 10,912,349 |

| | | | | |
|---|---|---|---|---|
| Daily | 12,849 | 17,157,490 | 500,661 | 23,381,541 |
| Daily KERN - CAP | 12,849 | 17,157,490 | 500,661 | 23,381,541 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 4,503 | 750,797 | 22,773 | 1,023,156 |
| PM Peak Period | 4,503 | 1,359,542 | 43,099 | 1,852,729 |
| Midday Peak Period | 4,503 | 1,091,296 | 33,655 | 1,487,174 |
| OffPeak Period | 4,503 | 2,800,339 | 85,511 | 3,816,189 |
| Daily | 4,503 | 6,001,981 | 183,849 | 8,179,260 |
| Daily KERN - CAP | 4,503 | 6,001,981 | 183,849 | 8,179,260 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 166 | 298,895 | 7,708 | 407,322 |
| PM Peak Period | 296 | 741,322 | 21,273 | 1,010,244 |
| Midday Peak Period | 189 | 502,346 | 14,074 | 684,577 |
| OffPeak Period | 186 | 1,163,965 | 29,261 | 1,586,205 |
| Daily | 194 | 2,518,682 | 65,671 | 3,432,360 |
| Daily KERN - CAP | 546 | 6,104,705 | 141,413 | 8,319,248 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 66 | 135,960 | 3,401 | 185,281 |
| PM Peak Period | 110 | 323,969 | 8,273 | 441,492 |
| Midday Peak Period | 85 | 217,916 | 5,757 | 296,968 |
| OffPeak Period | 83 | 540,093 | 13,747 | 736,018 |
| Daily | 84 | 1,166,953 | 29,110 | 1,590,277 |
| Daily KERN - CAP | 203 | 2,262,361 | 51,600 | 3,083,055 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | WITHIN KERN | WITHIN EJ |
|---|---|---|

| | | | |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 24.21 | 23.70 |
| Constd.(n Iter.) | - Average Speeds | 24.21 | 23.74 |
| Constd.(1 Iter.) | - VHT(hours) | 521,886 | 191,200 |
| Constd.(n Iter.) | - VHT(hours) | 500,661 | 183,849 |
| Constd.(1 Iter.) | - VMT(miles) | 17,616,017 | 6,177,785 |
| Constd.(n Iter.) | - VMT(miles) | 17,157,490 | 6,001,981 |
| Constd.(1 Iter.) | - PMT(miles) | 24,006,404 | 8,418,838 |
| Constd.(n Iter.) | - PMT(miles) | 23,381,541 | 8,179,260 |
| Constd.(1 Iter.) | - VHT PER TRIP | 23.98 | 50.08 |
| Constd.(n Iter.) | - VHT PER TRIP | 23.01 | 48.16 |
| Constd.(1 Iter.) | - VMT PER TRIP | 13.49 | 26.97 |
| Constd.(n Iter.) | - VMT PER TRIP | 13.14 | 26.20 |
| Constd.(1 Iter.) | - PMT PER TRIP | 18.39 | 36.75 |
| Constd.(n Iter.) | - PMT PER TRIP | 17.91 | 35.71 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 500,661 | 394,825 | 105,837 |
| EJZones to EJZones | 183,849 | 140,659 | 43,190 |

## ===== SAFETY ANALYSIS ====

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 4,601 | 2,862 | 1,636 | 103 |
| EJZones to EJZones | 1,609 | 1,001 | 572 | 36 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 130 | 2,831 |
| EJ Zones to EJZones | 45 | 990 |

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - NON METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 46.59 |
| OffPeak Transit Travel Time | 62.88 |
| Peak Highway Travel Time | 20.78 |
| OffPeak Highway Travel Time | 19.00 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 57.21 |
| OffPeak Transit Travel Time | 71.87 |
| Peak Highway Travel Time | 27.16 |
| OffPeak Highway Travel Time | 24.43 |

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FRO M A ZONE

| | |
|---|---|
| Peak Transit Travel Time | 74.86 |
| OffPeak Transit Travel Time | 77.60 |
| Peak Highway Travel Time | 24.73 |
| OffPeak Highway Travel Time | 21.39 |

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A Z ONE

| | |
|---|---|
| Peak Transit Travel Time | 66.34 |
| OffPeak Transit Travel Time | 78.55 |
| Peak Highway Travel Time | 20.69 |
| OffPeak Highway Travel Time | 17.77 |

## ===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====

TRANSIT - SYSTEMWIDE INFORMATION

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 302 | 1,267 | 69 |
| EJZones to EJZones | 143 | 659 | 36 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 6,578 | 2,824,883 | 60,236 | 3,849,638 |
| PM Peak Period | 6,578 | 4,826,313 | 104,437 | 6,577,106 |
| Midday Peak Period | 6,578 | 4,989,813 | 99,861 | 6,799,918 |
| OffPeak Period | 6,578 | 11,888,417 | 239,684 | 16,201,060 |

| | | | | |
|---|---|---|---|---|
| Daily | 6,578 | 24,529,451 | 503,753 | 33,427,754 |
| Daily KERN - CAP | 6,578 | 24,529,451 | 503,753 | 33,427,754 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 1,642 | 620,364 | 13,869 | 845,407 |
| PM Peak Period | 1,642 | 1,059,462 | 23,967 | 1,443,793 |
| Midday Peak Period | 1,642 | 1,117,139 | 22,712 | 1,522,392 |
| OffPeak Period | 1,642 | 2,665,395 | 55,545 | 3,632,294 |
| Daily | 1,642 | 5,462,391 | 116,046 | 7,443,927 |
| Daily KERN - CAP | 1,642 | 5,462,391 | 116,046 | 7,443,927 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 50 | 148,155 | 4,367 | 201,900 |
| PM Peak Period | 57 | 195,097 | 6,489 | 265,870 |
| Midday Peak Period | 39 | 623,330 | 10,307 | 849,449 |
| OffPeak Period | 11 | 117,950 | 3,456 | 160,738 |
| Daily | 8 | 18,033 | 3,091 | 24,575 |
| Daily KERN - CAP | 207 | 7,702,977 | 138,712 | 10,497,309 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 13 | 65,807 | 1,544 | 89,679 |
| PM Peak Period | 16 | 79,777 | 1,933 | 108,718 |
| Midday Peak Period | 15 | 305,641 | 4,411 | 416,515 |
| OffPeak Period | 2 | 951 | 107 | 1,296 |
| Daily | 2 | 1,941 | 228 | 2,645 |
| Daily KERN - CAP | 65 | 2,855,772 | 47,542 | 3,891,732 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | WITHIN KERN | WITHIN EJ |
|---|---|---|

| | | | |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 33.14 | 29.25 |
| Constd.(n Iter.) | - Average Speeds | 33.20 | 29.29 |
| Constd.(1 Iter.) | - VHT(hours) | 513,335 | 119,099 |
| Constd.(n Iter.) | - VHT(hours) | 503,753 | 116,046 |
| Constd.(1 Iter.) | - VMT(miles) | 24,802,020 | 5,557,323 |
| Constd.(n Iter.) | - VMT(miles) | 24,529,451 | 5,462,391 |
| Constd.(1 Iter.) | - PMT(miles) | 33,799,201 | 7,573,297 |
| Constd.(n Iter.) | - PMT(miles) | 33,427,754 | 7,443,927 |
| Constd.(1 Iter.) | - VHT PER TRIP | 49.96 | 98.15 |
| Constd.(n Iter.) | - VHT PER TRIP | 49.02 | 95.64 |
| Constd.(1 Iter.) | - VMT PER TRIP | 40.23 | 76.33 |
| Constd.(n Iter.) | - VMT PER TRIP | 39.79 | 75.03 |
| Constd.(1 Iter.) | - PMT PER TRIP | 54.82 | 104.02 |
| Constd.(n Iter.) | - PMT PER TRIP | 54.22 | 102.24 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 503,753 | 455,589 | 48,163 |
| EJZones to EJZones | 116,046 | 100,702 | 15,344 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 6,577 | 4,092 | 2,338 | 147 |
| EJZones to EJZones | 1,465 | 911 | 521 | 33 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 186 | 4,047 |
| EJ Zones to EJZones | 41 | 901 |

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - KERN COUNTY

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
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========

| | |
|---|---|
| Peak Transit Travel Time | 47.98 |
| OffPeak Transit Travel Time | 53.79 |
| Peak Highway Travel Time | 16.94 |
| OffPeak Highway Travel Time | 15.65 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
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========
Peak Transit Travel Time                          49.35
OffPeak Transit Travel Time                       53.25
Peak Highway Travel Time                          19.32
OffPeak Highway Travel Time                       17.71


ACCESSIBILITY: EJ ZONES TO JOB CENTRES  -  AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==============================================================================
========
Peak Transit Travel Time                          45.62
OffPeak Transit Travel Time                       46.35
Peak Highway Travel Time                          14.65
OffPeak Highway Travel Time                       13.14


MOBILITY: EJ ZONES TO COUNTYWIDE  -   AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==============================================================================
========
Peak Transit Travel Time                          45.65
OffPeak Transit Travel Time                       50.42
Peak Highway Travel Time                          14.71
OffPeak Highway Travel Time                       13.44


==============================================================================
=====  COST EFFECTIVENESS,  CONSUMER SATISFACTION, & RELIABILITY       ====
==============================================================================


TRANSIT  - SYSTEMWIDE INFORMATION
==============================================================================

TRANSIT                      TOTAL BOARDINGS  TRIP_DISTANCE  TRIP_HOURS
Countywide to Countywide           24,635        95,045         5,979
EJZones to EJZones                 16,947        64,610         4,138



COUNTYWIDE TO COUNTYWIDE  -   TOTAL VMT, VHT & PMT
==============================================================================
PERIOD                  TOTAL_LINKS    TOTAL_VMT     TOTAL_VHT     TOTAL_PMT
AM Peak Period              19,427     4,958,191       122,051     6,756,825
PM Peak Period              19,427     8,664,311       221,884    11,807,376
Midday Peak Period          19,427     8,168,364       193,249    11,131,520
```

| | | | | |
|---|---|---|---|---|
| OffPeak Period | 19,427 | 19,895,953 | 470,089 | 27,113,409 |
| Daily | 19,427 | 41,686,940 | 1,004,414 | 56,809,295 |
| Daily KERN - CAP | 19,427 | 41,686,940 | 1,004,414 | 56,809,295 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 6,145 | 1,371,161 | 36,642 | 1,868,563 |
| PM Peak Period | 6,145 | 2,419,004 | 67,066 | 3,296,522 |
| Midday Peak Period | 6,145 | 2,208,435 | 56,367 | 3,009,566 |
| OffPeak Period | 6,145 | 5,465,734 | 141,056 | 7,448,483 |
| Daily | 6,145 | 11,464,372 | 299,896 | 15,623,187 |
| Daily KERN - CAP | 6,145 | 11,464,372 | 299,896 | 15,623,187 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 216 | 447,050 | 12,076 | 609,222 |
| PM Peak Period | 353 | 936,418 | 27,762 | 1,276,114 |
| Midday Peak Period | 228 | 1,125,675 | 24,381 | 1,534,025 |
| OffPeak Period | 197 | 1,281,915 | 32,717 | 1,746,943 |
| Daily | 202 | 2,536,715 | 68,762 | 3,456,934 |
| Daily KERN - CAP | 753 | 13,807,682 | 280,125 | 18,816,557 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 79 | 201,767 | 4,945 | 274,961 |
| PM Peak Period | 126 | 403,746 | 10,205 | 550,210 |
| Midday Peak Period | 100 | 523,557 | 10,167 | 713,483 |
| OffPeak Period | 85 | 541,044 | 13,855 | 737,314 |
| Daily | 86 | 1,168,894 | 29,338 | 1,592,922 |
| Daily KERN - CAP | 268 | 5,118,133 | 99,142 | 6,974,786 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 27.31 | 25.17 |
| Constd.(n Iter.) | - Average Speeds | 27.32 | 25.21 |
| Constd.(1 Iter.) | - VHT(hours) | 1,035,222 | 310,298 |
| Constd.(n Iter.) | - VHT(hours) | 1,004,414 | 299,896 |
| Constd.(1 Iter.) | - VMT(miles) | 42,418,038 | 11,735,107 |
| Constd.(n Iter.) | - VMT(miles) | 41,686,940 | 11,464,372 |
| Constd.(1 Iter.) | - PMT(miles) | 57,805,605 | 15,992,135 |
| Constd.(n Iter.) | - PMT(miles) | 56,809,295 | 15,623,187 |
| Constd.(1 Iter.) | - VHT PER TRIP | 20.50 | 58.44 |
| Constd.(n Iter.) | - VHT PER TRIP | 19.89 | 56.48 |
| Constd.(1 Iter.) | - VMT PER TRIP | 14.00 | 36.84 |
| Constd.(n Iter.) | - VMT PER TRIP | 13.76 | 35.99 |
| Constd.(1 Iter.) | - PMT PER TRIP | 19.08 | 50.20 |
| Constd.(n Iter.) | - PMT PER TRIP | 18.75 | 49.04 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 1,004,414 | 850,414 | 154,000 |
| EJZones to EJZones | 299,896 | 241,362 | 58,534 |

## ===== SAFETY ANALYSIS ====

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 11,178 | 6,954 | 3,974 | 250 |
| EJZones to EJZones | 3,074 | 1,912 | 1,093 | 69 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 316 | 6,877 |
| EJ Zones to EJZones | 87 | 1,891 |

2035 No Build

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========
========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
========
==========
========

MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

==========
========

| | |
|---|---|
| Peak Transit Travel Time | 45.50 |
| OffPeak Transit Travel Time | 48.30 |
| Peak Highway Travel Time | 14.47 |
| OffPeak Highway Travel Time | 14.02 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

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==============================================================================
========
Peak Transit Travel Time                              44.91
OffPeak Transit Travel Time                           46.08
Peak Highway Travel Time                              13.24
OffPeak Highway Travel Time                           12.11


ACCESSIBILITY: EJ ZONES TO JOB CENTRES  -  AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==============================================================================
========
Peak Transit Travel Time                              44.11
OffPeak Transit Travel Time                           44.57
Peak Highway Travel Time                              12.20
OffPeak Highway Travel Time                           11.10


MOBILITY: EJ ZONES TO COUNTYWIDE  -   AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==============================================================================
========
Peak Transit Travel Time                              44.14
OffPeak Transit Travel Time                           48.01
Peak Highway Travel Time                              13.51
OffPeak Highway Travel Time                           13.05


=============================================================================
=====  COST EFFECTIVENESS,  CONSUMER SATISFACTION, & RELIABILITY       ====
=============================================================================


TRANSIT  - SYSTEMWIDE INFORMATION
=============================================================================

TRANSIT                      TOTAL BOARDINGS  TRIP_DISTANCE  TRIP_HOURS
Countywide to Countywide          21,587        75,919         5,293
EJZones to EJZones                15,509        53,562         3,761


COUNTYWIDE TO COUNTYWIDE  -   TOTAL VMT, VHT & PMT
=============================================================================
PERIOD                  TOTAL_LINKS    TOTAL_VMT     TOTAL_VHT     TOTAL_PMT
AM Peak Period              10,772     2,005,900        82,793     2,733,560
PM Peak Period              10,772     3,638,734       158,641     4,958,721
```

| | | | | |
|---|---|---|---|---|
| Midday Peak Period | 10,772 | 2,902,940 | 122,013 | 3,956,010 |
| OffPeak Period | 10,772 | 7,399,615 | 258,967 | 10,083,899 |
| Daily | 10,772 | 15,947,224 | 599,956 | 21,732,239 |
| Daily KERN - CAP | 10,772 | 15,947,224 | 599,956 | 21,732,239 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 3,953 | 721,787 | 24,675 | 983,622 |
| PM Peak Period | 3,953 | 1,326,289 | 48,500 | 1,807,413 |
| Midday Peak Period | 3,953 | 1,038,797 | 37,364 | 1,415,631 |
| OffPeak Period | 3,953 | 2,655,199 | 89,613 | 3,618,399 |
| Daily | 3,953 | 5,742,052 | 197,365 | 7,825,038 |
| Daily KERN - CAP | 3,953 | 5,742,052 | 197,365 | 7,825,038 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 518 | 527,873 | 33,500 | 719,364 |
| PM Peak Period | 898 | 1,232,444 | 74,477 | 1,679,526 |
| Midday Peak Period | 501 | 727,184 | 45,532 | 990,977 |
| OffPeak Period | 557 | 1,878,745 | 75,722 | 2,560,279 |
| Daily | 563 | 3,968,759 | 193,339 | 5,408,466 |
| Daily KERN - CAP | 1,332 | 8,088,804 | 316,620 | 11,023,099 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 160 | 196,124 | 6,227 | 267,270 |
| PM Peak Period | 264 | 434,712 | 15,511 | 592,409 |
| Midday Peak Period | 149 | 265,026 | 9,282 | 361,167 |
| OffPeak Period | 165 | 693,581 | 20,647 | 945,185 |
| Daily | 162 | 1,446,661 | 44,513 | 1,971,452 |
| Daily KERN - CAP | 385 | 2,712,912 | 82,460 | 3,697,048 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 22.66 | 22.78 |
| Constd.(n Iter.) | - Average Speeds | 22.94 | 23.05 |
| Constd.(1 Iter.) | - VHT(hours) | 718,598 | 225,962 |
| Constd.(n Iter.) | - VHT(hours) | 599,956 | 197,365 |
| Constd.(1 Iter.) | - VMT(miles) | 17,386,880 | 6,269,772 |
| Constd.(n Iter.) | - VMT(miles) | 15,947,224 | 5,742,052 |
| Constd.(1 Iter.) | - PMT(miles) | 23,694,145 | 8,544,194 |
| Constd.(n Iter.) | - PMT(miles) | 21,732,239 | 7,825,038 |
| Constd.(1 Iter.) | - VHT PER TRIP | 33.06 | 57.34 |
| Constd.(n Iter.) | - VHT PER TRIP | 27.60 | 50.08 |
| Constd.(1 Iter.) | - VMT PER TRIP | 13.33 | 26.52 |
| Constd.(n Iter.) | - VMT PER TRIP | 12.23 | 24.29 |
| Constd.(1 Iter.) | - PMT PER TRIP | 18.17 | 36.14 |
| Constd.(n Iter.) | - PMT PER TRIP | 16.66 | 33.10 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 599,956 | 389,649 | 210,307 |
| EJZones to EJZones | 197,365 | 140,545 | 56,820 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 4,276 | 2,660 | 1,520 | 96 |
| EJZones to EJZones | 1,540 | 958 | 547 | 34 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 121 | 2,631 |
| EJ Zones to EJZones | 43 | 947 |

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - NON METRO AREAS

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
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MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 63.75 |
| OffPeak Transit Travel Time | 66.72 |
| Peak Highway Travel Time | 21.37 |
| OffPeak Highway Travel Time | 19.74 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FROM A ZONE

```
==============================================================================
========
Peak Transit Travel Time                              66.83
OffPeak Transit Travel Time                           71.81
Peak Highway Travel Time                              27.73
OffPeak Highway Travel Time                           24.87


ACCESSIBILITY: EJ ZONES TO JOB CENTRES  -  AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==============================================================================
========
Peak Transit Travel Time                              74.12
OffPeak Transit Travel Time                           78.05
Peak Highway Travel Time                              25.27
OffPeak Highway Travel Time                           21.58


MOBILITY: EJ ZONES TO COUNTYWIDE  -   AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==============================================================================
========
Peak Transit Travel Time                              68.47
OffPeak Transit Travel Time                           64.47
Peak Highway Travel Time                              21.34
OffPeak Highway Travel Time                           18.21


=============================================================================
=====  COST EFFECTIVENESS,  CONSUMER SATISFACTION, & RELIABILITY       ====
=============================================================================


TRANSIT  - SYSTEMWIDE INFORMATION
=============================================================================

TRANSIT                      TOTAL BOARDINGS  TRIP_DISTANCE  TRIP_HOURS
Countywide to Countywide             257           987            64
EJZones to EJZones                   136           577            34


COUNTYWIDE TO COUNTYWIDE  -   TOTAL VMT, VHT & PMT
=============================================================================
PERIOD                  TOTAL_LINKS    TOTAL_VMT     TOTAL_VHT     TOTAL_PMT
AM Peak Period               6,064     2,544,621        56,957     3,467,708
PM Peak Period               6,064     4,374,322       100,420     5,961,151
```

| | | | | |
|---|---|---|---|---|
| Midday Peak Period | 6,064 | 4,089,685 | 87,686 | 5,573,260 |
| OffPeak Period | 6,064 | 9,958,677 | 209,904 | 13,571,287 |
| Daily | 6,064 | 20,967,258 | 452,384 | 28,573,340 |
| Daily KERN - CAP | 6,064 | 20,967,258 | 452,384 | 28,573,340 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 1,606 | 550,983 | 13,218 | 750,857 |
| PM Peak Period | 1,606 | 943,010 | 22,680 | 1,285,097 |
| Midday Peak Period | 1,606 | 902,781 | 19,925 | 1,230,274 |
| OffPeak Period | 1,606 | 2,196,212 | 48,844 | 2,992,910 |
| Daily | 1,606 | 4,592,977 | 104,358 | 6,259,125 |
| Daily KERN - CAP | 1,606 | 4,592,977 | 104,358 | 6,259,125 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 64 | 177,185 | 5,809 | 241,460 |
| PM Peak Period | 72 | 248,186 | 9,907 | 338,218 |
| Midday Peak Period | 13 | 7,529 | 2,196 | 10,260 |
| OffPeak Period | 11 | 16,683 | 1,683 | 22,735 |
| Daily | 10 | 33,026 | 5,814 | 45,007 |
| Daily KERN - CAP | 202 | 2,426,296 | 62,961 | 3,306,460 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 19 | 82,564 | 2,203 | 112,514 |
| PM Peak Period | 24 | 108,614 | 2,857 | 148,014 |
| Midday Peak Period | 2 | 376 | 60 | 512 |
| OffPeak Period | 2 | 1,023 | 138 | 1,394 |
| Daily | 2 | 2,081 | 283 | 2,836 |
| Daily KERN - CAP | 63 | 828,571 | 20,718 | 1,129,143 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 32.77 | 29.14 |
| Constd.(n Iter.) | - Average Speeds | 32.84 | 29.21 |
| Constd.(1 Iter.) | - VHT(hours) | 462,505 | 105,649 |
| Constd.(n Iter.) | - VHT(hours) | 452,384 | 104,358 |
| Constd.(1 Iter.) | - VMT(miles) | 21,204,823 | 4,604,254 |
| Constd.(n Iter.) | - VMT(miles) | 20,967,258 | 4,592,977 |
| Constd.(1 Iter.) | - PMT(miles) | 28,897,084 | 6,274,493 |
| Constd.(n Iter.) | - PMT(miles) | 28,573,340 | 6,259,125 |
| Constd.(1 Iter.) | - VHT PER TRIP | 44.93 | 87.13 |
| Constd.(n Iter.) | - VHT PER TRIP | 43.95 | 86.06 |
| Constd.(1 Iter.) | - VMT PER TRIP | 34.33 | 63.28 |
| Constd.(n Iter.) | - VMT PER TRIP | 33.95 | 63.13 |
| Constd.(1 Iter.) | - PMT PER TRIP | 46.79 | 86.24 |
| Constd.(n Iter.) | - PMT PER TRIP | 46.26 | 86.03 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 452,384 | 401,502 | 50,882 |
| EJZones to EJZones | 104,358 | 88,472 | 15,886 |

## SAFETY ANALYSIS

ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 5,622 | 3,497 | 1,999 | 126 |
| EJZones to EJZones | 1,232 | 766 | 438 | 28 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 159 | 3,459 |
| EJ Zones to EJZones | 35 | 758 |

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********** KERNCOG ENVIORNMENTAL JUSTICE (EJ) ANALYSIS **********
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TRAVEL MODEL RESULTS - KERN COUNTY

Developed by Parsons - San Jose 2/10/03

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========== ACCESSIBILITY & MOBILITY MEASURES BY MODE ========
========
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========

MOBILITY: COUNTYWIDE TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 49.07 |
| OffPeak Transit Travel Time | 51.86 |
| Peak Highway Travel Time | 18.75 |
| OffPeak Highway Travel Time | 16.97 |

ACCESSIBILITY: COUNTYWIDE TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes)

FROM A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 49.02 |
| OffPeak Transit Travel Time | 51.31 |
| Peak Highway Travel Time | 21.55 |
| OffPeak Highway Travel Time | 19.17 |

ACCESSIBILITY: EJ ZONES TO JOB CENTRES - AVERAGE TRAVEL TIME (minutes) FRO
M A ZONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 44.73 |
| OffPeak Transit Travel Time | 45.17 |
| Peak Highway Travel Time | 15.08 |
| OffPeak Highway Travel Time | 13.44 |

MOBILITY: EJ ZONES TO COUNTYWIDE - AVERAGE TRAVEL TIME (minutes) FROM A Z
ONE
==========
========

| | |
|---|---|
| Peak Transit Travel Time | 44.73 |
| OffPeak Transit Travel Time | 48.56 |
| Peak Highway Travel Time | 15.23 |
| OffPeak Highway Travel Time | 14.18 |

==========
===== COST EFFECTIVENESS, CONSUMER SATISFACTION, & RELIABILITY ====
==========

TRANSIT - SYSTEMWIDE INFORMATION
==========

| TRANSIT | TOTAL BOARDINGS | TRIP_DISTANCE | TRIP_HOURS |
|---|---|---|---|
| Countywide to Countywide | 21,587 | 75,919 | 5,293 |
| EJZones to EJZones | 15,509 | 53,562 | 3,761 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT
==========

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 16,836 | 4,550,520 | 139,750 | 6,201,267 |

| | | | | |
|---|---|---|---|---|
| PM Peak Period | 16,836 | 8,013,055 | 259,061 | 10,919,871 |
| Midday Peak Period | 16,836 | 6,992,625 | 209,698 | 9,529,270 |
| OffPeak Period | 16,836 | 17,358,292 | 468,871 | 23,655,185 |
| Daily | 16,836 | 36,914,482 | 1,052,340 | 50,305,579 |
| Daily KERN - CAP | 16,836 | 36,914,482 | 1,052,340 | 50,305,579 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 5,559 | 1,272,769 | 37,892 | 1,734,479 |
| PM Peak Period | 5,559 | 2,269,299 | 71,179 | 3,092,510 |
| Midday Peak Period | 5,559 | 1,941,578 | 57,289 | 2,645,905 |
| OffPeak Period | 5,559 | 4,851,411 | 138,457 | 6,611,310 |
| Daily | 5,559 | 10,335,029 | 301,723 | 14,084,164 |
| Daily KERN - CAP | 5,559 | 10,335,029 | 301,723 | 14,084,164 |

COUNTYWIDE TO COUNTYWIDE - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 582 | 705,057 | 39,309 | 960,824 |
| PM Peak Period | 970 | 1,480,630 | 84,384 | 2,017,744 |
| Midday Peak Period | 514 | 734,713 | 47,728 | 1,001,238 |
| OffPeak Period | 568 | 1,895,429 | 77,405 | 2,583,014 |
| Daily | 573 | 4,001,785 | 199,153 | 5,453,473 |
| Daily KERN - CAP | 1,534 | 10,515,100 | 379,581 | 14,329,558 |

EJZONES TO EJZONES - TOTAL VMT, VHT & PMT WITH VC RATIOS >= .80 (LOS D)

| PERIOD | TOTAL_LINKS | TOTAL_VMT | TOTAL_VHT | TOTAL_PMT |
|---|---|---|---|---|
| AM Peak Period | 179 | 278,687 | 8,430 | 379,784 |
| PM Peak Period | 288 | 543,326 | 18,369 | 740,423 |
| Midday Peak Period | 151 | 265,402 | 9,342 | 361,679 |
| OffPeak Period | 167 | 694,604 | 20,785 | 946,579 |
| Daily | 164 | 1,448,742 | 44,796 | 1,974,288 |
| Daily KERN - CAP | 448 | 3,541,483 | 103,178 | 4,826,191 |

AVERAGE DAILY SYSTEMWIDE STATISTICS - FEEDBACK LOOP

| MODEL RUN | | WITHIN KERN | WITHIN EJ |
|---|---|---|---|
| Constd.(1 Iter.) | - Average Speeds | 26.35 | 24.61 |
| Constd.(n Iter.) | - Average Speeds | 26.54 | 24.82 |
| Constd.(1 Iter.) | - VHT(hours) | 1,181,103 | 331,611 |
| Constd.(n Iter.) | - VHT(hours) | 1,052,340 | 301,723 |
| Constd.(1 Iter.) | - VMT(miles) | 38,591,703 | 10,874,025 |
| Constd.(n Iter.) | - VMT(miles) | 36,914,482 | 10,335,029 |
| Constd.(1 Iter.) | - PMT(miles) | 52,591,229 | 14,818,687 |
| Constd.(n Iter.) | - PMT(miles) | 50,305,579 | 14,084,164 |
| Constd.(1 Iter.) | - VHT PER TRIP | 23.84 | 61.04 |
| Constd.(n Iter.) | - VHT PER TRIP | 21.24 | 55.53 |
| Constd.(1 Iter.) | - VMT PER TRIP | 12.98 | 33.36 |
| Constd.(n Iter.) | - VMT PER TRIP | 12.42 | 31.70 |
| Constd.(1 Iter.) | - PMT PER TRIP | 17.69 | 45.46 |
| Constd.(n Iter.) | - PMT PER TRIP | 16.92 | 43.21 |

AVERAGE DELAY SYSTEMWIDE STATISTICS - CONGESTED/UNCONGESTED

| VEHICLE HOURS TRAVELLED - | CONGESTED | UNCONGESTED | DELAY |
|---|---|---|---|
| Countywide to Countwide | 1,052,340 | 791,151 | 261,188 |
| EJZones to EJZones | 301,723 | 229,017 | 72,706 |

## SAFETY ANALYSIS

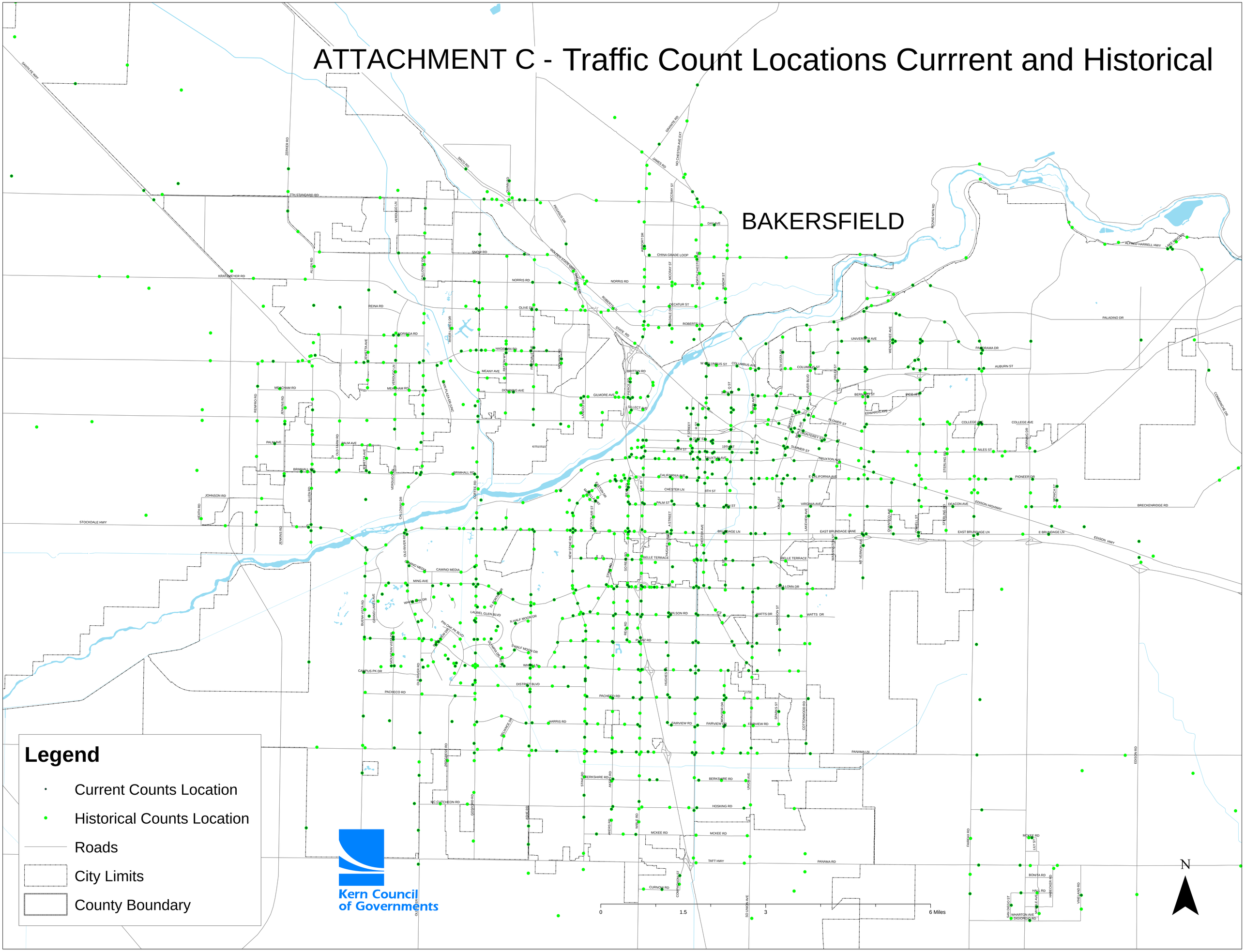
ACCIDENT STATISTICS FOR KERN COUNTY - BASED ON ANNUAL AVERAGE DAILY TRAFFIC

| ACCIDENTS DATA | TOTAL | PDO | INJURY | FATAL |
|---|---|---|---|---|
| Countywide to Countywide | 9,898 | 6,158 | 3,519 | 222 |

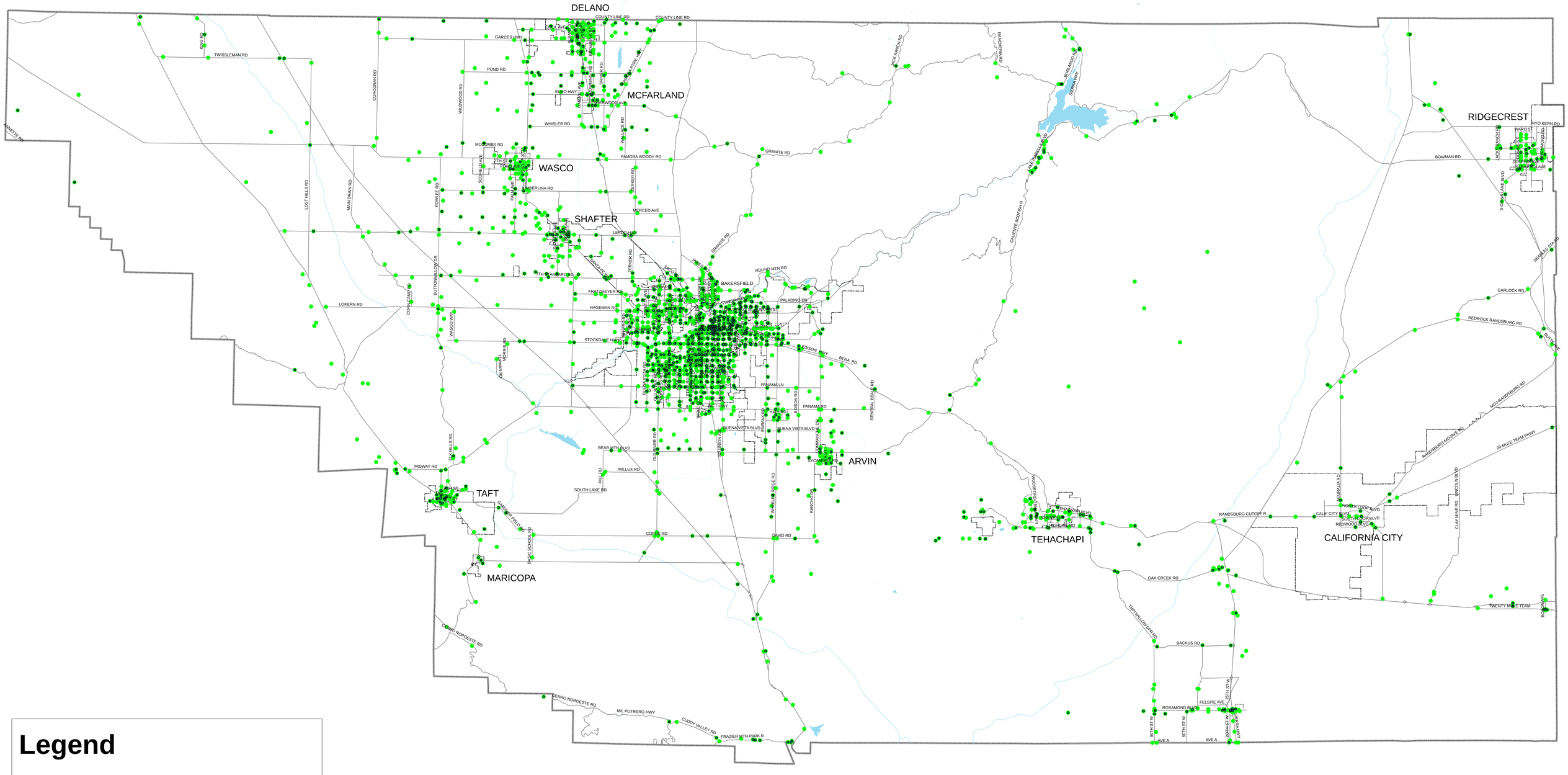
| | | | | |
|---|---|---|---|---|
| EJZones to EJZones | 2,771 | 1,724 | 985 | 62 |

| VICTIMS DATA | KILLED | INJURED |
|---|---|---|
| Countywide to Countywide | 280 | 6,090 |
| EJ Zones to EJZones | 78 | 1,705 |

# ATTACHMENT C - Traffic Count Locations Currrent and Historical



# ATTACHMENT C - Traffic Count Locations Currrent and Historical




## Legend

- Current Counts Location
- Historical Counts Location
- Roads
- City Limits
- County Boundary

Kern Council of Governments

0 10 20 40 Miles

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