# KERN SB 375 MODELING METHODOLOGY

Kern Council of Governments

**02/28/2014 Version 13**

**PAGE INTENTIONALLY LEFT BLANK**

## TABLE OF CONTENTS

# EXECUTIVE SUMMARY

## *OVERVIEW*

Kern Council of Government's 2014 Regional Transportation Plan (RTP) update is scheduled to be adopted in March 2014. Public outreach efforts have been conducted in the spring and summer of 2013, allowing stakeholders the opportunity to give valuable feedback on the goals, policies, and actions of the 2014 RTP. The RTP's Draft EIR is scheduled for public review in December 2013 and will analyze the environmental impacts of the RTP and the Sustainable Communities Strategy's (SCS) preferred and alternative scenarios.

The Sustainable Communities and Climate Protection Act (SB 375) was passed in 2008 to supplement the achievement of AB 32, which strives to reduce California's overall Greenhouse Gas (GHG) emissions. Under SB 375 Municipal Planning Organizations (MPO) are required to prepare an SCS as part of the RTP. The purpose of the SCS is to reduce vehicle emissions from light-duty trucks and passengers vehicles through improvements in Land Use and Transportation planning, and ultimately reducing vehicle miles traveled (VMT). The SCS must meet the emission reduction targets set for each MPO by California's Air Resources Board (ARB) for the years 2020 and 2035.

The reduction targets for Kern Council of Governments (Kern COG), the MPO for the County of Kern, are 5% reduction by 2020 and 10% reduction by 2035. These reductions specifically target the measurement of Carbon Dioxide ($CO_2$) emissions per capita. CARB's documentation and calculations for these targets can be found on Kern COG's website (Kerncog.org). These targets were adopted in October 2010.

## *LAND USE AND TRANSPORTATION MODEL DEVELOPMENT*

Kern COG has adopted the same methodology used in its Blueprint process for land use modeling based on the UPlan modeling software developed by UC Davis.

Model parameters, assumptions, inputs, and reference information such as General Plans have been provided by Kern COG's member agencies. The combined county-wide land use map can be found in Appendix A. The Kern COG Transportation Modeling Committee and other stakeholders have provided input and oversight to the development of the model. The original spreadsheet based land use model will continue to be developed and supported.

Prior to the San Joaquin Valley Model Improvement Plan (MIP), Kern COG used its existing Cube transportation model validated in 2006. The transportation model was enhanced to include the 4-D's, and modified to run in Cube Voyager. The 4-D's relate to Smart Growth Principles and are as follows:

1. New Residential and Employment **Density**
2. Jobs and Housing **Diversity**
3. Walkable **Design**
4. **Destination** Accessibility

Kern COG has developed a procedure that allows the output from the UPlan Land Use model to become the input for the MIP transportation model. Evaluation and testing of the new CubeLand integrated land use and transportation model is underway.

The CubeLand software is used to forecast land use and land price by stimulating the real estate market under different economic conditions. For a user-defined scenario, Cube Land forecasts the supply and the demand for different types of properties, and estimates the location of households and non-residential activities. (Cube Land Webpage)

### *TECHNICAL METHODOLOGY*

Kern COG intends to use the UPlan/MIP modeling platform to develop the many scenarios required for the development and adoption of the Sustainable Communities Strategy and, if necessary, Alternative Planning Strategy. Kern COG further intends to consult with member agencies, stakeholders, valley-wide MPO's and ARB as part of the SCS development process.

## MODELING DEVELOPMENT

### UPLAN – LAND USE MODEL

#### *UPLAN DEVOLPMENT AND FUNDING*

In 2006 the Information Center for the Environment at UC Davis developed the UPlan. The UPlan is a GIS-based land use model used to analyze future urban growth, typically on a regional level.

"UPlan was designed to help regions study the interactive effects of growth and development by projecting future land use patterns. It shows how decisions made today are most likely to impact the region decades into the future." (ShastaFORWARD)

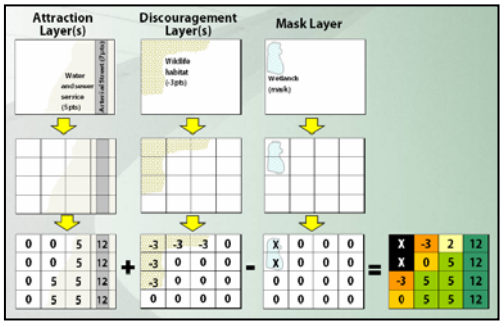
Funding received for the UPlan's development originated from several government agencies, including the University of California Transportation Center, California Energy Commission, US Department of Energy, US Department of Agriculture, Mineta Institute California State University San Jose, and California Department of Transportation.

#### *UPLAN'S OBJECTIVES AND USES*

This urban growth model uses simple demographics and user inputs to project the needed space for each land use type. Projected land uses are assigned based on the attractiveness of locations to a particular land use, unsuitable locations for any development, and a local jurisdiction's general plan that determines where specific types of development are permitted. To consolidate the different general plan land use designations used by Kern's local jurisdictions, the UPlan uses a set of predetermined land use designations. The conversions for each local jurisdiction's land use types can be found in Appendix G.

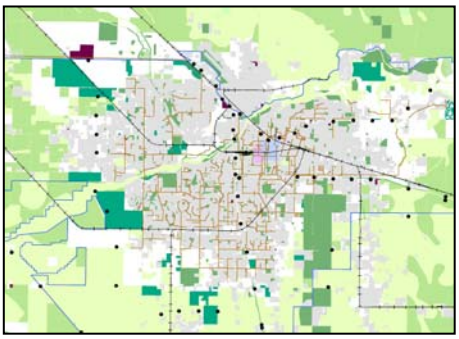
## HOW UPLAN MODEL ALLOCATES NEW GROWTH

### *CELLS*




The UPlan functions by dividing land into "cells", not parcels or TAZs. These cells are equal in size and can only contain one type of future planned growth, although hybrid types can be created to consolidate other types, such as the "Mixed Use" type, showing both residential and commercial growth. Kern's model has 50 by 50 meter cells.

### *ATTRACTIONS*



An attraction could be any number of things that would promote future growth in that particular region, such as availability of electricity, water, sewer, and road infrastructure. Attractions can also be non-physical, such as political boundaries or tax incentives. An attraction will draw the allocation of growth to it, in other words, cells with attractions will have growth allocated to them before cells without attractors. See Appendix B for draft county-wide land use input layers map.

### *DISCOURAGEMENTS*

A discouragement is the opposite of an attraction; an undesirable feature of a place where future development may take place, such as sandy soil. A discouragement does not prevent growth, although it will stop allocation of it until all other areas of that type are allocated. A discouragement represents an area that lacks desirable attributes and makes future development more costly.

Kern's Land Use Model does not use discouragements.

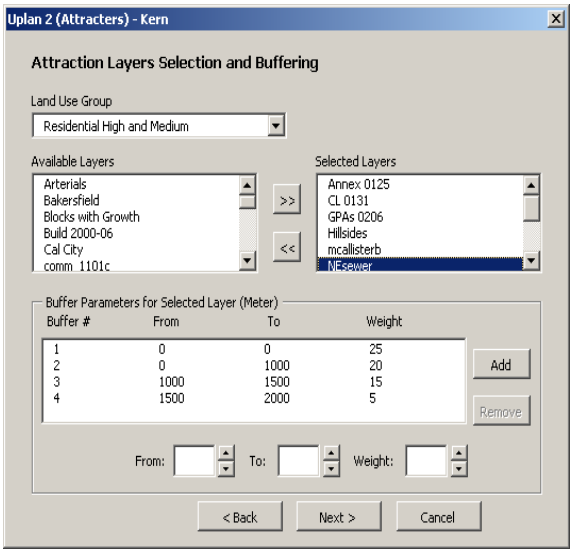
### *WEIGHTING*

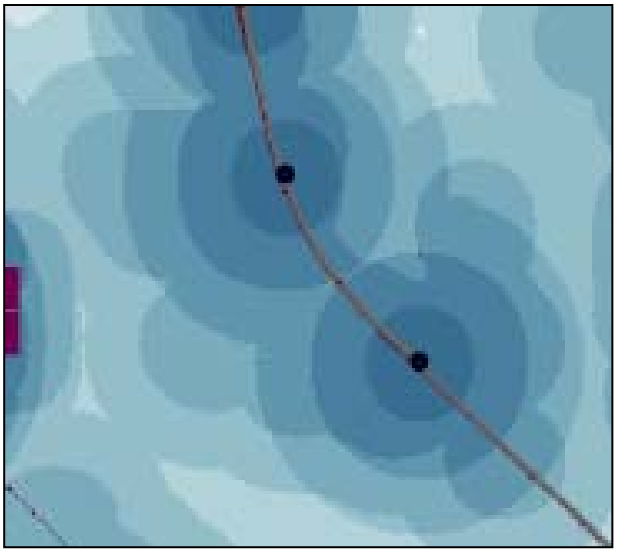
Weighting is how UPlan balances attractions and discouragements, as well as how the user can determine how much an attractor will encourage growth and how much a discouragement will repel it. For example, if a cell has both an attractor and a discouragement, the values of them can be thought as positive and negative values, respectively. If the cell has an attractor with a weight of ten and a discourager with a weight of five, the total value of the cell will be 10 – 5 = 5, so the cell will still have an attractive value to it. An example of the usefulness of weighting something would be the absolute need for industrial areas to be developed with a water supply, thus any water layers would have a very high attraction weight to them for industrial growth.

| | | | |
|---|---|---|---|
| 0 | 0 | 5 | 12 |
| 0 | 0 | 5 | 12 |
| 0 | 5 | 5 | 12 |
| 0 | 5 | 5 | 12 |

### *BUFFERS*

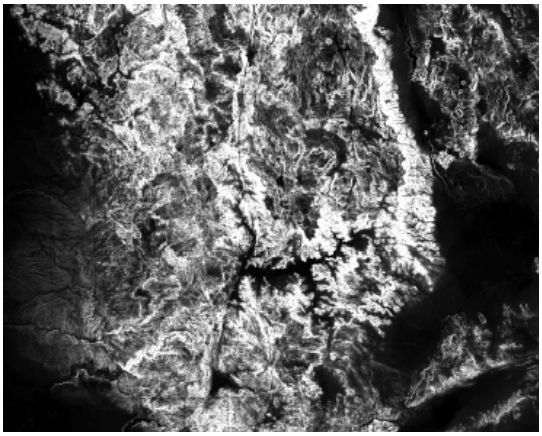
Attractions or discouragements may be surrounded by a user-defined sphere of coordinates or 'buffer'. The user decides the number and width of the buffers. The highest attraction or discouragement values are given to buffers that have the greatest proximity to the feature. A buffer could be used in the situation of a freeway interchange and commercial growth. Clearly, businesses will wish to be closest to the freeway in order to obtain more customers, so areas closest the freeway should be modeled with the highest attraction value, with areas further away slowly decreasing in value relative to the distance from the freeway. Below is an example of the input parameters for a buffer along with an image showing the accumulated buffers the model will use as the attraction for each land use type. See Appendix C for draft county-wide map showing the buffering layer produced from the UPlan.



### *MASKS*

A mask is effectively an infinite discouragement, preventing all growth in that particular cell, even if all other cells have been assigned growth and unassigned growth still remains. A good candidate for a mask in UPlan would be lakes or cliffs where growth would be (by today's economic and technological standards) improbable.



## BASIC RULES UPLAN OPERATES BY

- People take up space.
- People live in groups known as Households.
- Different household types take up different amounts of space.
- Some portion of each household is employed.
- Different forms of employment require different amounts of space.
- Each residential type has attributes that attract or discourage growth.
- Each employment type has attributes that attract or discourage growth.
- Some things block all growth (i.e. a lake).
- The general plan determines where future growth will occur and what type it will be.
- Growth will happen in the areas with the most attractions first, then the next most attractive, then the third most attractive, and so on.

## MODEL IMPROVEMENT PLAN (MIP) DEVELOPMENT

In recent years the San Joaquin Valley Model Improvement Project (MIP) has provided funds for improving all valley wide transportation models to better comply with the requirements of SB 375. Model enhancements have improved the standardization of model inputs and processes, which allow Valley MPOs to share and collaborate on data inputs and resources. New travel models used by Valley MPOs are more sensitive to smart growth strategies, and also take in to account the 4-D elasticity process – Density, Diversity, Design, and Destination.

Each transportation model consists of four travel steps that accurately forecast the regions travel behaviors:

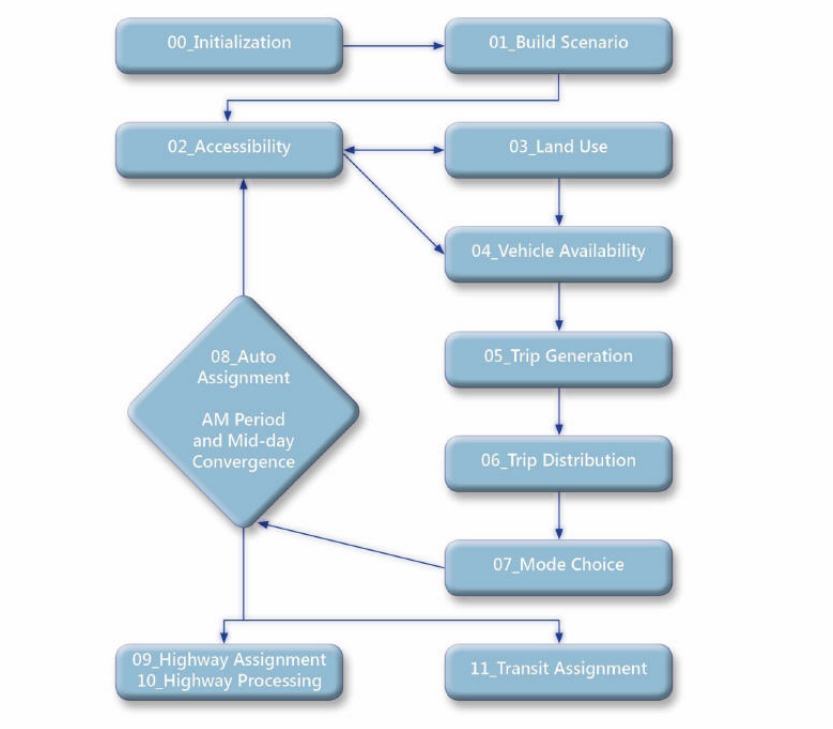
1. Trip Generation – This initial step calculates person or truck trip ends using trip generation rates established during model calibration, cross-classified residential data, employment, and student enrollment. This step also uses the demographics to determine the household passenger vehicle availability.

2. Trip Distribution – The second general step estimates how many trips travel from one zone to any other zone. The distribution is based on the number of trip ends generated in each of the two zones, and on factors that relate the likelihood of travel between any two zones to the travel time between the two zones such as distance, cost, time, and varies by accessibility to passenger vehicles, transit, and walking or biking.

3. Mode Choice – This step uses demographics and the comparison of distance, time, cost, and access between modes to estimate the proportions of the total person trips using drive-alone or shared-ride passenger auto, transit, walk or bike modes for travel between each pair of zones.

4. Trip Assignment – In this final step, vehicle trips or transit trips from one zone to another are assigned to specific travel routes between the zones. Congested travel information is used to influence each of the steps described above starting with vehicle availability.

The following flow chart shows the modeling process with MIP enhancements:




Kern COG has received updated versions of the MIP as it continues to be enhanced and improved upon to output the most promising travel results. To enhance the MIP model even further, Kern COG has worked with DKS Associates, specializing in transportation modeling, to develop a method that converts the UPlan land use outputs into input files used for the MIP model, which utilizes the Cube modeling application.

## DKS MODELING IMPROVEMENTS

***Based on DKS modeling documentation?

# KERN COG METHODOLOGY

## SB 375 MODELING AND TARGET SETTING

### *KERN COUNTY CLIMATE CHANGE TASK FORCE*

Objective: To assist Kern COG and its member agencies to meet the goals and objectives of Senate Bill No. 375 (SB 375) within the required time frame.

Kern COG has recognized the need to begin the task of coordinating the regional planning, housing, and transportation planning processes into a strategy to meet the intention of the Legislation. This will be an evolving process as regions throughout the state work together to establish and understand the targets, educate stakeholders and decision makers, define the Sustainable Community Strategy, and understand the transportation funding implications as well as the housing projections.

For the purposes of outlining the COG's effort in compliance with the Legislation and how Kern COG's consulting efforts may assist, we have broken the efforts into three consecutive steps. Within each step, there are three components: education, technicality, and strategy.

The tasks outlined below are efforts the COG has undertaken ***with assistance and guidance from consulting services as needed***.

**Phase 1: Positioning the COG to participate in the SB 375 implementation process.** This process ended once CARB's RTAC released the draft GHG emission reduction target setting methodology. The purpose of this effort was ultimately to prepare the COG to carry out the SB 375 requirements. *Timeline: September 30, 2008 to September 30, 2009 (Completed)*

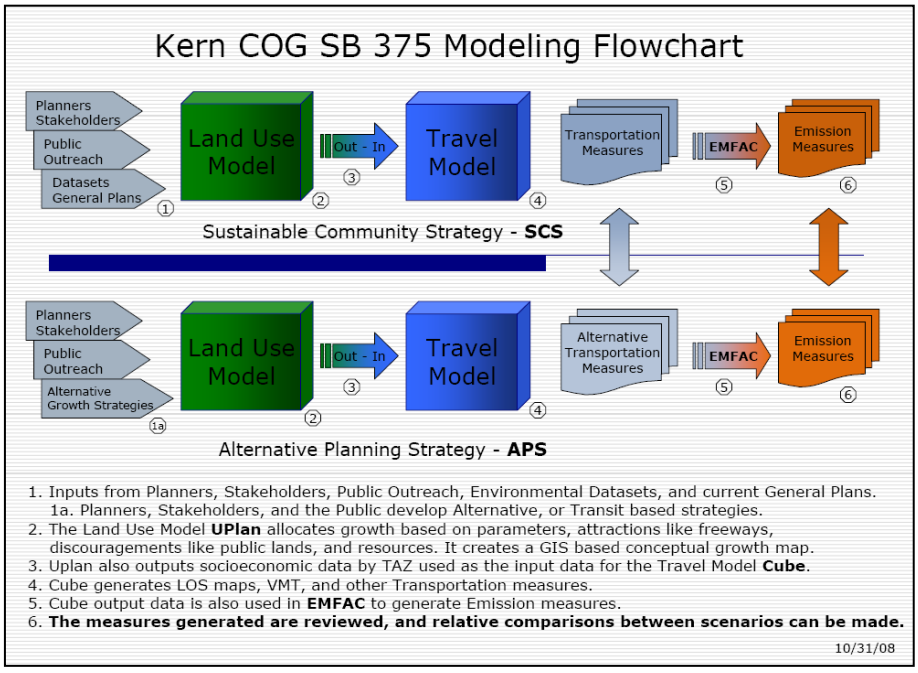
**Phase 2: Preparing the structure to meet the targets.** This period began once CARB's RTAC released the target setting methodology to the COG. *Timeline: October 1, 2009 to September 30, 2010 (Completed)*

**Phase 3: Complying with SB 375.** This period began once the regional targets were finalized and accepted. The COG must prepare the RTP, the SCS, and an Environmental Impact Report (EIR) that discloses the environmental effects of such a proposed plan. After the RTP adoption, the Regional Housing and Needs Allocation (RHNA) will also be adopted. *Timeline: October 1, 2010 to March 2014 (In Progress)*

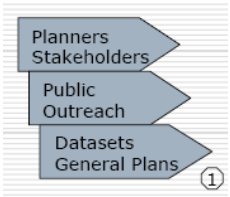
## LAND USE MODEL METHOD

### *KERN COG SB375 MODEL*

- Developed from Blueprint Processed modeling
- Based on GIS-based UPlan land use model
- Existing Cube transportation model
- Updated MIP transportation model

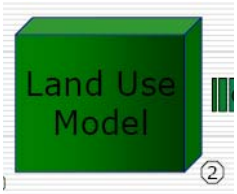


**Planners & Public Information**



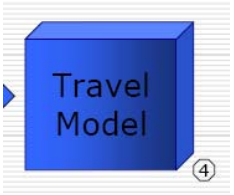

The planners provide information about their forecasts and predictions using the spreadsheet model, public agencies provide general plans, and private stakeholders provide information on forthcoming developments. A public outreach program is also conducted to better predict public opinion on future growth. This information is compiled and put into a matrix for the UPlan Land Use inputs.

**UPlan Land Use Model**



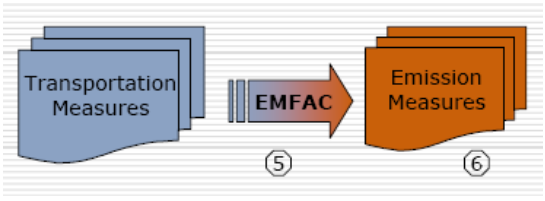

The UPlan model, as described earlier, takes this public and private information and predicts where new growth will be allocated for each incremental period of growth between forecast years (Kern COG uses forecast years 2020, 2035 and 2040). Information generated from the UPlan is then input into the MIP Travel Model at the TAZ level.

**MIP Travel Model**




The MIP Travel model then takes this information and calculates VMT (Vehicle Miles Traveled); this provides input for the **EM**ission **FAC**tors (EMFAC).

**EMFAC Conversion**




EMFAC takes the Transportation Measures from the MIP model and calculates the carbon emissions produced from such planning scenarios. EMFAC2011 is California's most updated model for estimating emissions from on-road vehicles operating in California.

## CREATING SCENARIOS

### *TECHNICAL TOOLS*

#### Existing Models

- Socioeconomic Growth Forecasts
- Trip-based travel demand model
- 4-D technical tool (intra-zonal travel demand)
- Emissions model (ARB's EMFAC Model)

#### New Model Development

- Land Use Model (UPlan)
- San Joaquin Valley MPO's Model Improvement Program (MIP)
- Cube Land integrated Land Use and Transportation model is in development

### *CURRENT TRENDS – BUSINESS AS USUAL*

Current trends are the input parameters for what is "business as usual" without any major change, based on historic growth rates and "normal" planning methodologies.

### *ALTERNATIVE SCENARIOS*

The alternative scenario is the "what if" part of the model. These scenarios are where planners can see what may happen in various hypothetical situations, which can be used to create a Sustainable Community Strategy.

### *PRELIMINARY SCENARIOS (***BASED ON RTP PRESENTATION POWERPOINT)*

#### Scenario A "Old Plan"

Referred to in the modeling process as the "Old Plan", Scenario A is based on historical growth rates and "normal" planning methodologies. This scenario has no new funding sources and is focused on highway transportation. Other trends set by this scenario include an increase in standard suburban development, a slight increase in mixed-use, and no focus on urban infill.

#### Scenario B "Preliminary Plan"

The Preliminary Plan assumes an 11% increase in funding opening up significant opportunities for fully funded maintenance along with transit, bike, and pedestrian facilities. This scenario has identified that Bakersfield will undergo market driven land use changes beyond the year 2023. Other trends set by this scenario include an increase in mixed-use development with only a slight increase in standard urban development.

#### Scenario C "Intensified Transportation"

With a major increase in funding, the Intensified Transportation scenario has a strong emphasis on commuter rail/light rail investments. In Bakersfield, land use around transit service locations will be significantly changed in

order to ensure ridership to support investment. Other trends set by this scenario include a significant increase in mixed-use development with a growing emphasis on urban infill.

## ASSUMPTIONS

### *DATA*

#### Base Years – 2005(2010), 2020, 2035

- Census
- Population
- Employment
- Existing Land Use
- Existing Zoning
- General Plans
- Additional Blueprint Projects
- Base Year Transportation Inventories
- Baseline Transportation Inventories

### *MATRIXES (SPREADSHEET BASED WORKSHEETS)*

#### Population Matrix

- 5 Population Categories – (Consolidated from county and cities individual general plans)
  - High Density Residential
  - Medium Density Residential
  - Low Density Residential
  - Very Low Density Residential
  - Mixed Use (Residential)
- Demographic Reference Information:
  - Population – Kern Adopted Population Growth Tables
  - People per household
  - Future population
  - Employees per household

#### Employment Matrix

- 6 Employment Categories – (See previous definition on population categories)
  - BASIC – Basic Employment
  - RHRET – Retail High
  - RMRET – Retail Medium
  - RETSER – Retail Service

SOSER – Service Other

BWOTH – Basic Warehouse

## GEOGRAPHIC PARAMETERS

### *DRAFT SUB-REGIONAL GHG TARGETS*

Develop Draft Sub-regional Targets to meet Regional Target

Flexibility within Sub-region on SCS

Possible Joint Sub-regional SCS

KCOG Assistance to Sub-regions Where Necessary

Finalize Based on Regional Dialogue

### *SUBAREAS*

Subarea #1 – Westside Kern – Major cities include Taft & Maricopa

Subarea #2 – Greater Delano/McFarland

Subarea #3 – Greater Wasco

Subarea #4 – Greater Tehachapi

Subarea #5 – Greater Metropolitan Bakersfield – Cities include Bakersfield & Arvin

Subarea #6 – Southeast Kern – Communities include Cal City, Mojave, & Rosamond

Subarea #7 – Kern River Valley- Communities include Lake Isabella and Kernville

Subarea #8 – Indian Wells Valley – Communities include Ridgecrest & Inyokern

Subarea #9 – Greater Frazier Park

Subarea #10 – Greater Shafter

### *LAYERS*

TAZ – Traffic Analysis Zones

Sub Areas – Consolidation of TAZs that the model uses

Extent – Kern County Lines

Cities & County General Plans

Slope – (sometimes as a mask)

Attractors (no discouragers are used for Kern's application)

Masks – (such as existing urban)

### *MODEL OUTPUTS*

Final Allocation (All land use types)

Final Attraction Layer

Datasets output (spreadsheet.dbf)

- Allocation Stats
- Land Consumption (See Appendix F)
- Results by TAZ
- TAZ export to socio-economic spreadsheet (used for travel model)

## SCENARIO DEVELOPMENT AND ANALYSIS

### *SCENARIO DEVELOPMENT*

Kern COG has developed and prepared scenario detail sheets for all SCS scenarios in order to summarize assumptions and key results for each scenario. All scenarios have been run using the UPlan/MIP modeling platform, and in some cases additional runs have been conducted to capture updated inputs and parameters

### *SCS SCENARIO DEVELOPMENT WORKSHEET*

Spreadsheets that summarize the 2005 Base case, 2035 base, and each of the scenarios development.

### *SCS SUMMARY GRAPH*

Bar chart illustrating the CO2/capita results for each of the scenarios.

### *SCS SCENARIO DETAIL SHEETS*

Located in Appendix J are multi-page summaries for each scenario describing the inputs, parameters and assumptions for the model scenarios.

## MODELING OUTPUTS AND RESULTS

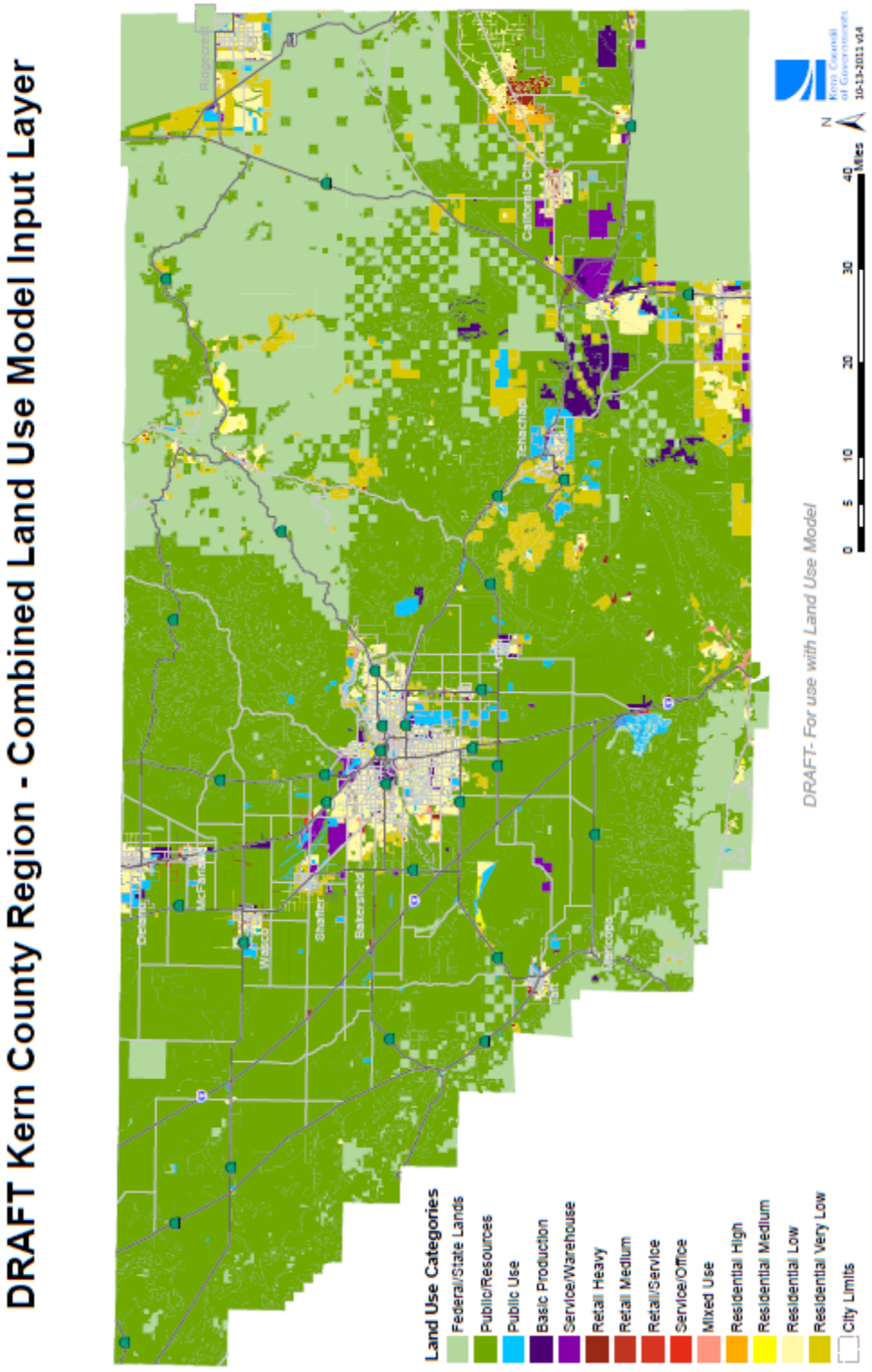
### *MODEL RUN RESULTS*

### *MODEL REPORTS*

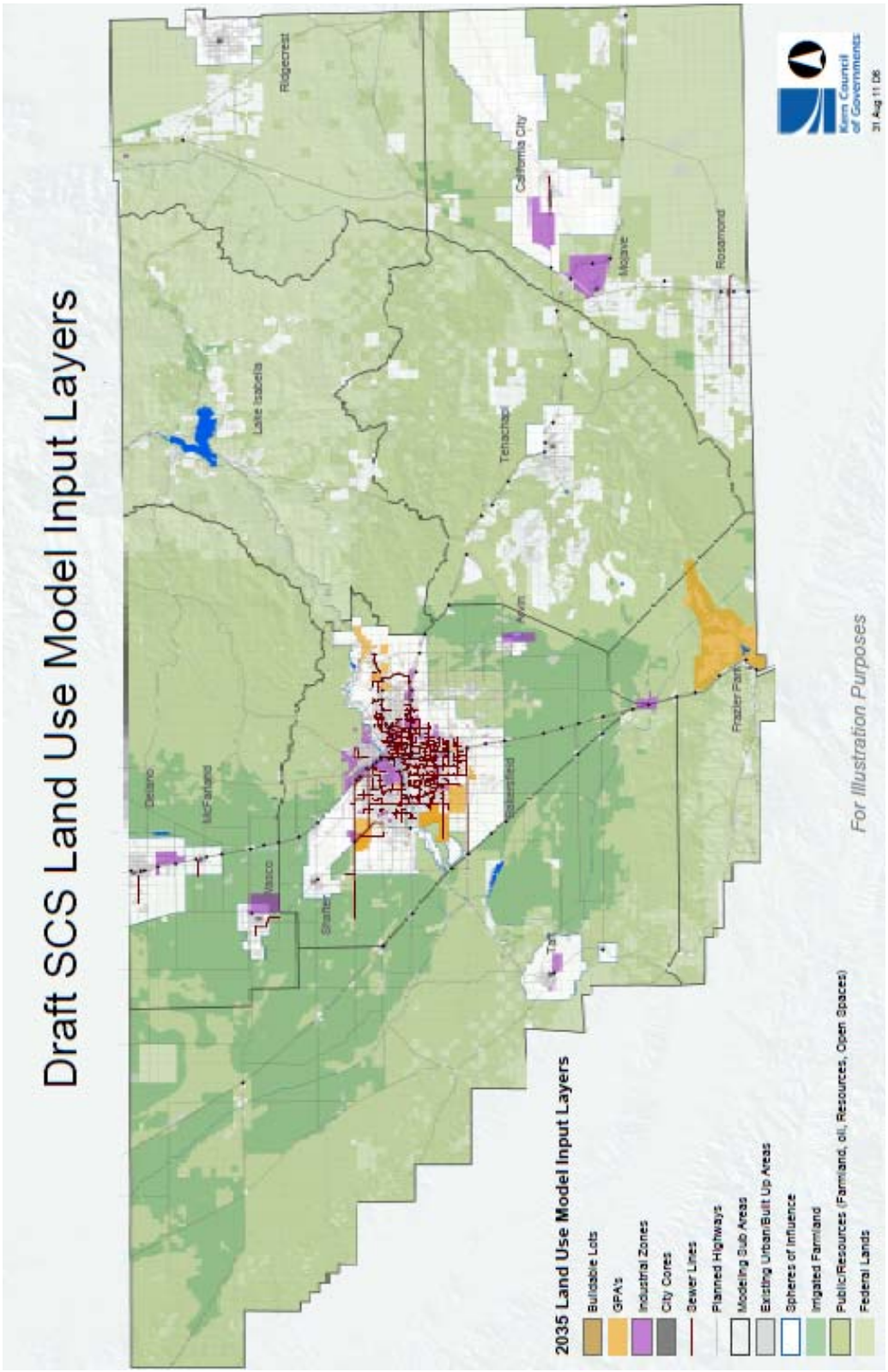
### *PERFORMANCE INDICATORS AND MEASUREMENTS*

## TECHNICAL APPENDIX

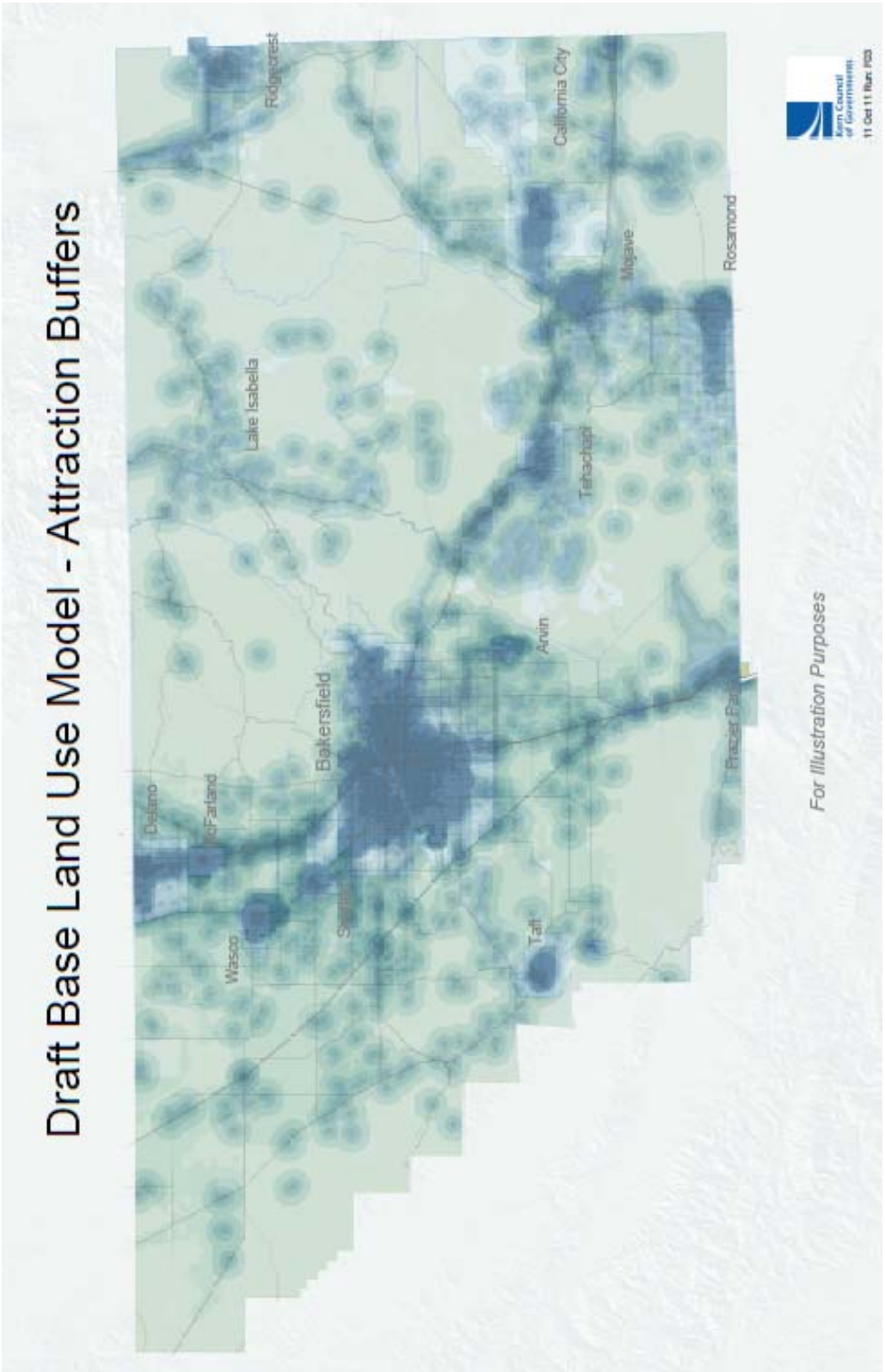
### APPENDIX A – COMBINED LAND USE MAP



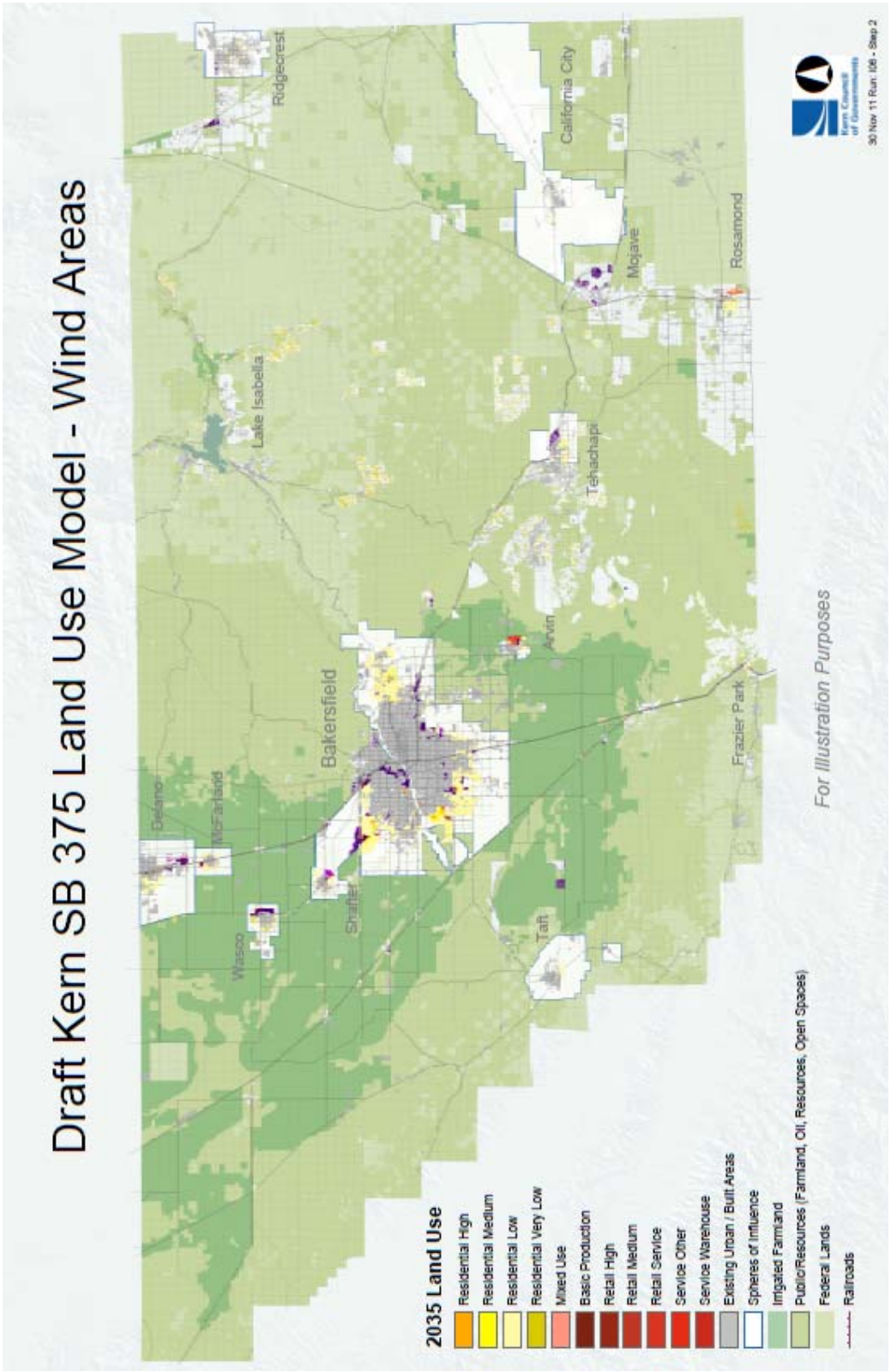
## APPENDIX B – LAND USE MODEL ATTRACTION LAYERS



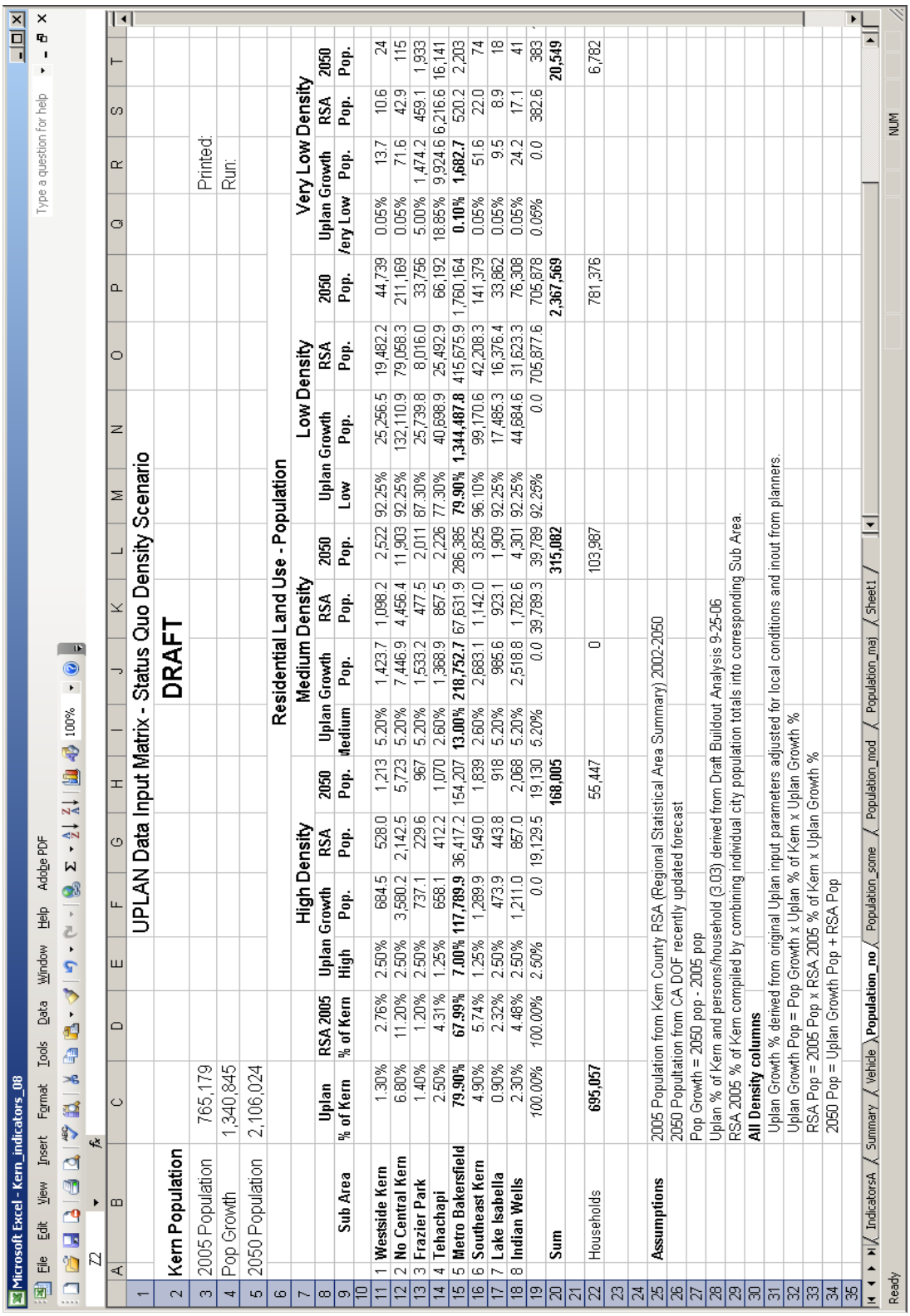
## APPENDIX C – ACCUMULATED ATTRACTION BUFFERS



## APPENDIX D – SAMPLE LAND USE MODEL OUTPUT MAP



## APPENDIX E – SAMPLE UPLAN INPUT – POPULATION DISTRIBUTION MATRIX



Microsoft Excel - Kern_indicators_08

UPLAN Data Input Matrix - Status Quo Density Scenario

DRAFT

Kern Population

| | |
|---|---|
| 2005 Population | 765,179 |
| Pop Growth | 1,340,845 |
| 2050 Population | 2,106,024 |

Printed:

Run:

Residential Land Use - Population

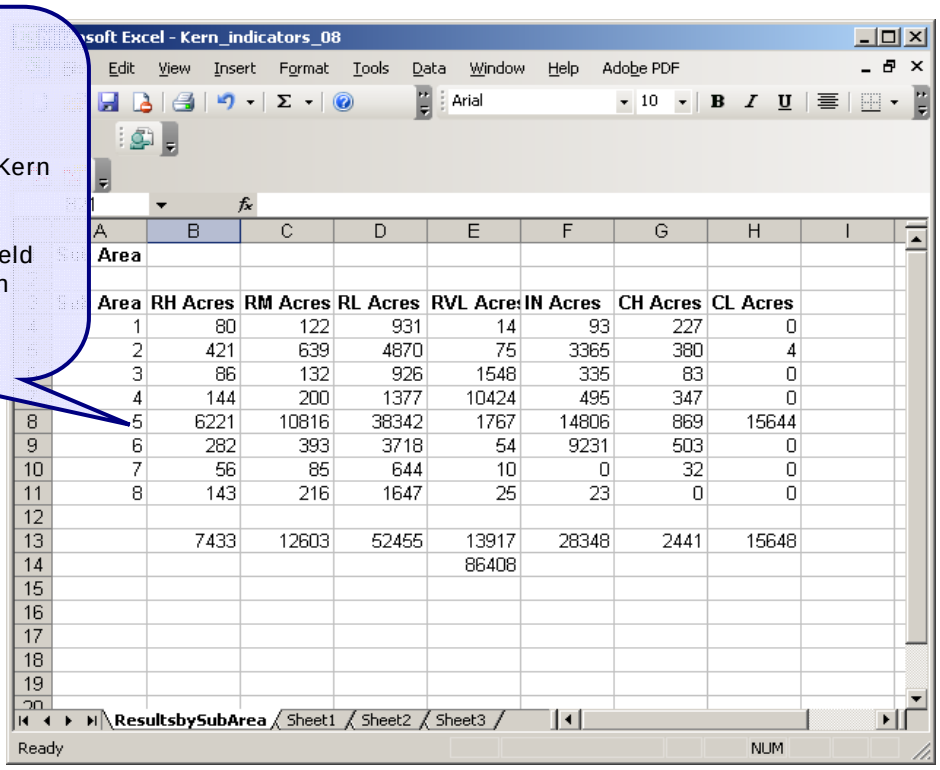
| | Sub Area | Uplan % of Kern | RSA 2005 % of Kern | High Density Uplan High | High Density Uplan Growth Pop. | High Density RSA Pop. | High Density 2050 Pop. | Medium Density Uplan Medium | Medium Density Uplan Growth Pop. | Medium Density RSA Pop. | Medium Density 2050 Pop. | Low Density Uplan Low | Low Density Uplan Growth Pop. | Low Density RSA Pop. | Low Density 2050 Pop. | Very Low Density Uplan Very Low | Very Low Density Uplan Growth Pop. | Very Low Density RSA Pop. | Very Low Density 2050 Pop. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Westside Kern | 1.30% | 2.76% | 2.50% | 684.5 | 528.0 | 1,213 | 5.20% | 1,423.7 | 1,098.2 | 2,522 | 92.25% | 25,256.5 | 19,482.2 | 44,739 | 0.05% | 13.7 | 10.6 | 24 |
| 2 | No Central Kern | 6.80% | 11.20% | 2.50% | 3,580.2 | 2,142.5 | 5,723 | 5.20% | 7,446.9 | 4,456.4 | 11,903 | 92.25% | 132,110.9 | 79,058.3 | 211,169 | 0.05% | 71.6 | 42.9 | 115 |
| 3 | Frazier Park | 1.40% | 1.20% | 2.50% | 737.1 | 229.6 | 967 | 5.20% | 1,533.2 | 477.5 | 2,011 | 87.30% | 25,739.8 | 8,016.0 | 33,756 | 5.00% | 1,474.2 | 459.1 | 1,933 |
| 4 | Tehachapi | 2.50% | 4.31% | 1.25% | 658.1 | 412.2 | 1,070 | 2.60% | 1,368.9 | 857.5 | 2,226 | 77.30% | 40,698.9 | 25,492.9 | 66,192 | 18.85% | 9,924.6 | 6,216.6 | 16,141 |
| 5 | **Metro Bakersfield** | **79.90%** | **67.99%** | **7.00%** | **117,789.9** | 36,417.2 | 154,207 | **13.00%** | **218,752.7** | 67,631.9 | 286,385 | **79.90%** | **1,344,487.8** | 415,675.9 | 1,760,164 | **0.10%** | **1,682.7** | 520.2 | 2,203 |
| 6 | Southeast Kern | 4.90% | 5.74% | 1.25% | 1,289.9 | 549.0 | 1,839 | 2.60% | 2,683.1 | 1,142.0 | 3,825 | 96.10% | 99,170.6 | 42,208.3 | 141,379 | 0.05% | 51.6 | 22.0 | 74 |
| 7 | Lake Isabella | 0.90% | 2.32% | 2.50% | 473.9 | 443.8 | 918 | 5.20% | 985.6 | 923.1 | 1,909 | 92.25% | 17,485.3 | 16,376.4 | 33,862 | 0.05% | 9.5 | 8.9 | 18 |
| 8 | Indian Wells | 2.30% | 4.48% | 2.50% | 1,211.0 | 857.0 | 2,068 | 5.20% | 2,518.8 | 1,782.6 | 4,301 | 92.25% | 44,684.6 | 31,623.3 | 76,308 | 0.05% | 24.2 | 17.1 | 41 |
| 19 | | 100.00% | 100.00% | 2.50% | 0.0 | 19,129.5 | 19,130 | 5.20% | 0.0 | 39,789.3 | 39,789 | 92.25% | 0.0 | 705,877.6 | 705,878 | 0.05% | 0.0 | 382.6 | 383 |
| 20 | Sum | | | | | | **168,005** | | | | **315,082** | | | | **2,367,569** | | | | **20,549** |
| 21 | | | | | | | | | | | | | | | | | | | |
| 22 | Households | **695,057** | | | | | 55,447 | | 0 | | 103,987 | | | | 781,376 | | | | 6,782 |
| 23 | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | |
| 25 | **Assumptions** | 2005 Population from Kern County RSA (Regional Statistical Area Summary) 2002-2050 | | | | | | | | | | | | | | | | | |
| 26 | | 2050 Population from CA DOF recently updated forecast | | | | | | | | | | | | | | | | | |
| 27 | | Pop Growth = 2050 pop - 2005 pop | | | | | | | | | | | | | | | | | |
| 28 | | Uplan % of Kern and persons/household (3.03) derived from Draft Buildout Analysis 9-25-06 | | | | | | | | | | | | | | | | | |
| 29 | | RSA 2005 % of Kern compiled by combining individual city population totals into corresponding Sub Area. | | | | | | | | | | | | | | | | | |
| 30 | | **All Density columns** | | | | | | | | | | | | | | | | | |
| 31 | | Uplan Growth % derived from original Uplan input parameters adjusted for local conditions and inout from planners. | | | | | | | | | | | | | | | | | |
| 32 | | Uplan Growth Pop = Pop Growth x Uplan % of Kern x Uplan Growth % | | | | | | | | | | | | | | | | | |
| 33 | | RSA Pop = 2005 Pop x RSA 2005 % of Kern x Uplan Growth % | | | | | | | | | | | | | | | | | |
| 34 | | 2050 Pop = Uplan Growth Pop + RSA Pop | | | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | | | |

## APPENDIX F – SAMPLE UPLAN OUTPUT – LAND CONSUMPTION

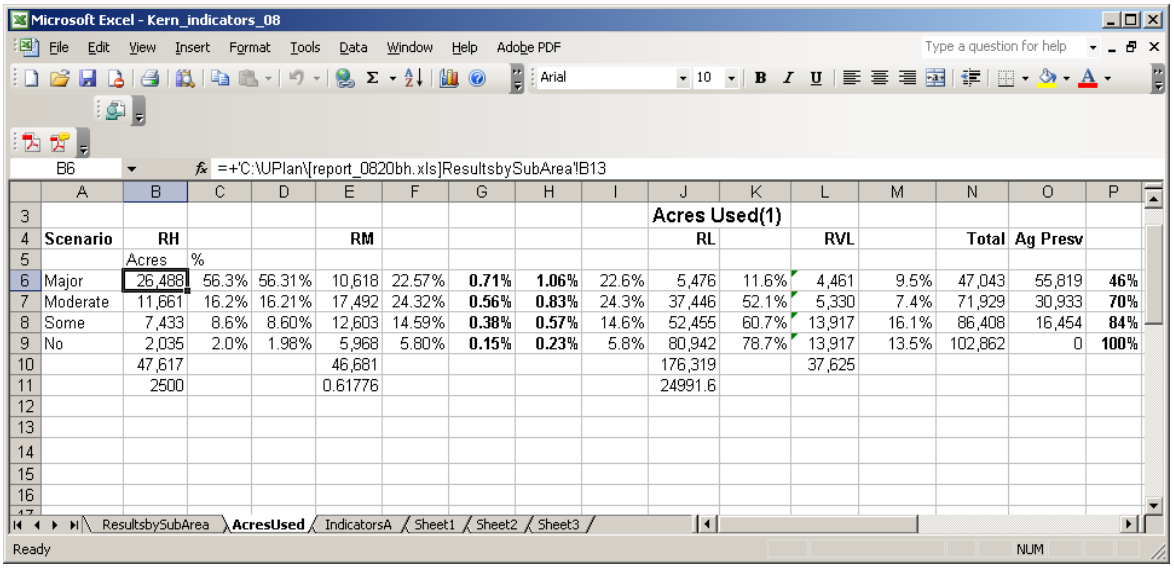
### Acres Consumed by Model Sub Area

**Subareas**

1. Westside Kern
2. North Central Kern
3. Frazier Park
4. Tehachapi
5. Metro Bakersfield
6. Southeast Kern
7. Lake Isabella
8. Indian Wells




### Acres Consumed by Model Scenario



## APPENDIX G – COMBINED LAND USE CONVERSION MATRIX TABLE

| | Combined Land Use - General Plan Conversion Matrix Table | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 10/11/2011 |
| Uplan Abbrevation | Uplan Decsription | Jurisdiction Maximum Dwelling Units /Gross Acre | Jurisdiction Average Dwelling Units /Gross Acre | Model Average Dwelling Units /Gross Acre | Model Gross Acre /Household | Typical Jobs /Gross Acre | Model Floor Area Ratio | Model Average Sq. Footage |
| RH | Residential High Density | 18 to 73 | 15 | 12.5 | 0.08 | 0 | 0 | 0 |
| RM | Residential Medium Density | 11 to 17 | 8 to 10 | 8.3 | 0.12 | 0 | 0 | 0 |
| RL | Residential Low Density | 2 to 10 | 2 to 7 | 4 | 0.25 | 0 | 0 | 0 |
| RVL | Residential Very Low Density | 0.05 to 1 | 0.05 to 1 | 0.2 | 5 | 0 | 0 | 0 |
| UR | Urban Reserve | 18 to 73 | 15 | 4 | 0.08 | 11 to 17 | 0.25 | 269 |
| MU | Mixed Use | 18 to 73 | 15 | 4 | 0.08 | 11 to 17 | 0.25 | 269 |
| RSC | Resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BP | Basic/Production | 0 | 0 | 0 | 0 | 6 to 13 | 0.16 | 1361 |
| REH | Retail/Heavy | 0 | 0 | 0 | 0 | 11 to 17 | 0.25 | 269 |
| REM | Retail/Medium | 0 | 0 | 0 | 0 | 17 | 0.25 | 269 |
| RS | Retail/Service | 0 | 0 | 0 | 0 | 34 | 0.25 | 269 |
| SO | Service/Office | 0 | 0 | 0 | 0 | 26 | 0.25 | 837 |
| SW | Service/Warehouse | 0 | 0 | 0 | 0 | 14 | 0.25 | 837 |
| PU | Public Use | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fed/St | Federal/State | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | |
| SOURCE: Southern California Association of Governments, Rates for Riverside, San Bernardino and Imperial Counties, 2001 | | | | | | | | |

## APPENDIX H – SB 375 SCENARIO DEVELOPMENT COMPARISON

| Scenario Assumptions | 2035 "Old Plan" | 2035 "Plan" | 2035 "Intensified Transportation Alternative" | |
|---|---|---|---|---|
| **Transit:** | | | | Notes |
| Construct new transit lines | Existing | Enhanced | Enhanced | |
| Expanded Bus Routes Coordinated with Planned Centers | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Expand Passenger Rail Service | Existing | Enhanced | Intensified | See 2012 Kern Commuter Rail Study |
| Increase service (e.g., change transit headways, increase network connectivity) | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Expanded Transit Service Area | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Rapid Bus/Shorter Wait Times | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Upgrade transit service (e.g., improve service to express bus, etc.) | Existing | Enhanced | Enhanced | |
| Express Transit | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Bus Rapid Transit | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Light Rail | None | None | Enhanced | See GET 2012 Long Range Transit Plan (cost est. $4B) |
| Improve accessibility (e.g., change bike/walk access distance to transit stations, change auto access distance to transit stations) | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| Optimized Bus Routes | Existing | Enhanced | Enhanced | See GET 2012 Long Range Transit Plan |
| **Transportation Demand Management:** | | | | |
| Promote carpooling, vanpooling, telecommuting and teleconferencing | Existing | Enhanced | Enhanced | |
| Expand Van Pools | Existing | Enhanced | Enhanced | See 2012 Kern MOU with CalVans |
| Promote walking and biking (e.g., new class I bicycle facilities, inter-city bikeways | Existing | Enhanced | Enhanced | See 2012 Kern Bikeway Master Plan |
| Implement employer-based trip reduction strategies and Indirect Source Rule | Existing | Existing | Existing | SJV APCD Rules 94.10 & 95.10 |
| **Pricing:** | | | | |
| Change in auto operation cost/user fees | Existing | Enhanced | Intensified | 50% Increase; 100% Increase |
| Increase the cost of parking | Existing | Existing | Existing | |
| Change in transit fares | Existing | Existing | Existing | |
| **Road Projects:** | | | | |
| Implement Intelligent Transportation Systems (ITS)/Traffic management (e.g., change auto travel times, change highway free-flow speed, 511, etc.) | Existing | Enhanced | Enhanced | New 511 system |
| Add HOV facilities | None | Enhanced | Enhanced | Ramp metering |
| Add general purpose roadway lanes (e.g., change highway capacities) | Existing | Existing | Existing | |
| **Land Use:** | | | | |
| Modify distribution of households, population, jobs or other variables (infill along major transit corridor consistent with GP) | Existing | Enhanced | Intensified | Limited to Bakersfield - Consistent with Core Area Impact Fee Development Incentive. |
| Rebalance housing closer to employment/shopping areas | Existing | Enhanced | Intensified | Assumes shopping opportunities in outlying communities. |
| Market based demand shift to smaller lots/multifamily | Existing | Enhanced | Intensified | Limited to Bakersfield |
| Improve the pedestrian environment (walk distance to transit centers) | Existing | Enhanced | Intensified | Incentivized by ISR rule |
| *Definitions: **Existing** = strategies in current plan; **Enhanced** = improvement over current plan; **Intensified** = improvement over enhanced strategies. | | | | |
| **Some of the listed scenario assumptions are not yet working in the model and maybe included as post model adjustments. | | | | |

**KCOG Draft SB375 Scenario Development Comparison Table As of January 28, 2013**

## *Preliminary MIP Model Results (MIP is in Testing)*

| Category | Scenario Title | 2005 | 2035 | | | |
|---|---|---|---|---|---|---|
| | | Backcast from MIP 2006 model base year | Old Plan M24 | Plan S01 | Plan vs Old Plan | Alternative U01 | Alternative vs Old Plan |
| | Indicators and Measures | 2005 Backcast from MIP 2006 model base year | | | | | |
| DEMOGRAPHIC DATA | Total Population | 765,750 | 1,321,000 | 1,321,000 | 1,321,000 | 1,321,000 | 1,321,000 |
| | Households | 260,700 | 417,115 | 417,057 | | 417,011 | |
| | Jobs | 286,432 | 460,483 | 460,674 | | 459,764 | |
| LAND USE DATA (Growth Only) | Households 2010 - 2035 | | 156,665 | 154,004 | | 156,561 | |
| | Total Residential Land Consumed | -- | 46,579 | 44,426 | -4.62% | 38,640 | -17.04% |
| | Total Employment Land Consumed | | 12,046 | 11,677 | -3.06% | 11,781 | -2.20% |
| | Total Land Consumed | | 58,625 | 56,103 | -4.30% | 50,421 | -13.99% |
| | Households per Acre | -- | 3.36 | 3.47 | 3.07% | 4.05 | 20.47% |
| | | | | | | | |
| | Households within High Quality Transit Areas | 142183* | 169,534 | 180,759 | 6.62% | 172,621 | 1.82% |
| | Residential High / Multi-Family | | 804 | 1,740 | 116.29% | 2,002 | 148.91% |
| | Residential Medium / Small Lot | | 1,956 | 3,091 | 58.05% | 3,969 | 102.93% |
| | Residential Low / Single Family | | 32,019 | 26,572 | -17.01% | 24,272 | -24.20% |
| | Residential Very Low / Large Lot | | 11,800 | 13,023 | 10.36% | 8,397 | -28.84% |

| Category | Scenario Title | 2005 | 2035 | | | |
|---|---|---|---|---|---|---|
| | | Backcast from MIP 2006 model base year | Old Plan M24 | Plan S01 | Plan vs Old Plan | Alternative U01 | Alternative vs Old Plan |
| | Indicators and Measures | 2005 Backcast from MIP 2006 model base year | | | | | |
| | | | | | | | |
| MODEL OUTPUT DATA - Passenger Travel Mode Shares All Trips (%VMT) | SOV | | | | | | |
| | HOV | | | | | | |
| | Public Transit (Boarding) | 22,028* | 127,363 | 155,294 | 21.93% | | -100.00% |
| | Bike+Walk (Non-Motorized) | | 6.1% | 6.1% | | | |
| MODEL OUTPUT DATA - CO2 and Vehicle Miles Traveled | Total SB 375 Emissions | | 10,444 | 9,739.63 | | | |
| | Per Capita SB 375 CO2 Emissions by Passenger Vehicles per Weekday (lbs) | 16.70 | 15.80 | 14.75 | -6.67% | | |
| | Per Capita Vehicle Miles Traveled (VMT) | 29.04 | 28.66 | 27.76 | -3.16% | 26.65 | -7.04% |
| | Difference between Scenarios and 2005 Base Per Capita CO2 14.79 lbs (0% reduction below 2005 Base. Increases in red) | 0.0% | -5.4% | -11.7% | | | |
| | Total VMT per Weekday (Miles, in Thousands) | 22,236 | 37,863 | 36,668 | -3.16% | 35,199 | -7.04% |
| | Total SB 375 VMT by Passenger Vehicles per Weekday (-XX, Miles, in Thousands) | 18,452 | 30,256 | 28,105 | -7.11% | | |

**Kern SB 375Scenario Development - Notes and Assumptions (See Scenario Detail Sheets for more information)**

This is a modified version of the spreadsheet compiled by ARB. The purpose of this spreadsheet is to facilitate scenario data review and development.
Recent Emissions backcast from Kern MIP 2006 base model to 2005 model.
Population projections are based on Kern COG Growth Forecast adopted in Oct 2009 without Group Quarters. Updated 2035 Base with 2010 Census data.
EMFAC2011 used for emissions results.
Land Use Scenarios do not change General Plan densities or areas.
* 2006 Boardings
SB375 VMT excludes External trips (-XX)

## APPENDIX I – KERN SCENARIO DEVELOPMENT – INDICATOR WORKSHEET – 2035

### Kern Scenario Development - Indicator Worksheet - 2035

*DRAFT - Priliminary Results*

1/30/2013

| Travel Related Indicators | Description | Old Plan M24 | Plan S01 | Plan vs Old Plan | Alternative U01(1) | Alternative vs Old Plan |
|---|---|---|---|---|---|---|
| VMT per capita | Vehicle miles traveled per person (Total VMT in 1,000's) | 28.66 | 27.76 | -3.2% | | |
| Mode share. Percent of trips (commute / non-commute / all) by travel mode: e.g. auto, bike, walk, transit, car share 2+, etc. | Drive Alone | 45.86% | 45.86% | | | |
| | Shared Ride 2 | 22.82% | 22.82% | | | |
| | Shared Ride 3 | 21.06% | 21.06% | | | |
| | Transit (Walk + Drive) | 2.08% | 2.08% | | | |
| | Bike | 1.02% | 1.02% | | | |
| | Walk | 5.07% | 5.07% | | | |
| Transportation options in compact neighborhoods | Proportion of daily trips less than 3 miles and less than 1 mile by mode (walking/biking/bus and rail transit/driving) | | | | | |
| Rural mobility | % of HH with no access to transit (rural / urban / all) | 59.3% | 56.7% | -4.5% | 58.6% | -1.2% |
| **Health Indicators** | | | | | | |
| Per capita criteria pollutants | Criteria pollutants per capita (ROG, NOX, CO, PM2.5, PM10) from all vehicles (passenger vehicles / freight / all) divided by total population | | | | | |
| Transportation-related physical activity | Daily walk / bike travel time (in minutes) per capita | 7.04 | 7.01 | -0.4% | | |
| **Resource Conservation Indicators** | | | | | | |
| Acres of land consumed | Total acres of land consumed due to new development (important farmland / identified natural resource areas by type [state- or federally-designated habitat lands, floodplains, riparian areas, vernal pools, forested areas, groundwater recharge zones] / all) | 58,625 | 56,103 | -4.3% | 50,421 | -14.0% |
| Acres of important farmland consumed | Total acres of important farmland consumed due to new development (where "important" includes prime, statewide importance) | 21,117 | 19,078 | -9.7% | 18,976 | -10.1% |
| | Percentage of important farmland consumed due to new development | 36.0% | 34.0% | -5.6% | 37.6% | |
| **Efficiency** | | | | | | |
| Fiscal impacts of growth | Costs to build and maintain urban infrastructure (exempting disadvantaged rural community infrastructure provision costs from the calculations) | | | | | |
| Energy usage(2) | Total energy consumption per household from new growth(Billon Btu). | 4,085 | 3,813 | -6.7% | 38,640 | 846.0% |
| Water consumption | Total tons of water usage from new growth | | | | | |

| Travel Related Indicators | Description | Old Plan M24 | Plan S01 | Plan vs Old Plan | Alternative U01 | Alternative vs Old Plan |
|---|---|---|---|---|---|---|
| Percent of growth by land type | Land use mix: Percentage of new development that is infill development, redevelopment, and greenfield | | | | | |
| **Equity** | ALL INDICATORS SHOULD BE COMPARED EJ vs. NON-EJ AREAS | | | | | |
| Walk/bike accessibility | Proportion of households that can walk or bike (10 minutes) to meet at least 50 percent of their daily needs. Public daily needs defined as: schools, parks, healthcare institutions and transit. Private daily needs defined as: restaurants, grocery stores, food markets and childcare. | | | | | |
| Cumulative impacts | Reduction in air pollution (EJ areas vs. all, freight specific air pollution: EJ vs. all) | | | | | |
| Protection of sensitive sites from roadway pollutants | Percentage of HH within 500' of a high-volume roadway (EJ area vs. all, affordable housing vs. all) | | | | | |
| **Housing & Employment** | | | | | | |
| Distance of housing and employment from major transit stations | Percent of new housing and employment located with 1/4 and 1/2 mile of major transit stations (transit with 15 min headways), including what portion of those homes are affordable, senior housing, or larger (3-4 bedroom units) | | | | | |
| Jobs / housing fit | Jobs-housing balance and fit (the relationship between wages and home prices), by sub-area | | | | | |
| Household costs | % of HH income spent on Housing, utility + Transportation (each separately and combined, by income category) | | | | | |
| Housing type (Acres) | Total | 46,579 | 44,426 | -4.6% | 38,640 | -17.0% |
| | Attached | 804 | 1,740 | 116.3% | 2,002 | 148.9% |
| | Small-lot | 1,956 | 3,091 | 58.1% | 3,969 | 102.9% |
| | Large-lot | 32,019 | 26,572 | -17.0% | 24,272 | -24.2% |
| | Very Large-lot | 11,800 | 13,023 | 10.4% | 8,397 | -28.8% |
| Housing type (Units) | Total | 156,762 | 156,797 | 0.0% | 156,846 | 0.1% |
| | Attached | 10,051 | 21,096 | 109.9% | 25,028 | 149.0% |
| | Small-lot | 16,295 | 25,748 | 58.0% | 33,069 | 102.9% |
| | Large-lot | 128,065 | 107,355 | -16.2% | 97,078 | -24.2% |
| | Very Large-lot | 2,351 | 2,598 | 10.5% | 1,671 | -28.9% |

Notes: (1) Alternative U01 still under development.

(2) US Energy Information Administration (EIA), 2009 Residential Energy Consumption Survey.

## APPENDIX J – SCENARIO DETAIL WORKSHEETS – 2035

**Scenario Title:** 2035 Base "Old Plan" (M24)
**Status as of January 07, 2012:** Draft MIP Model

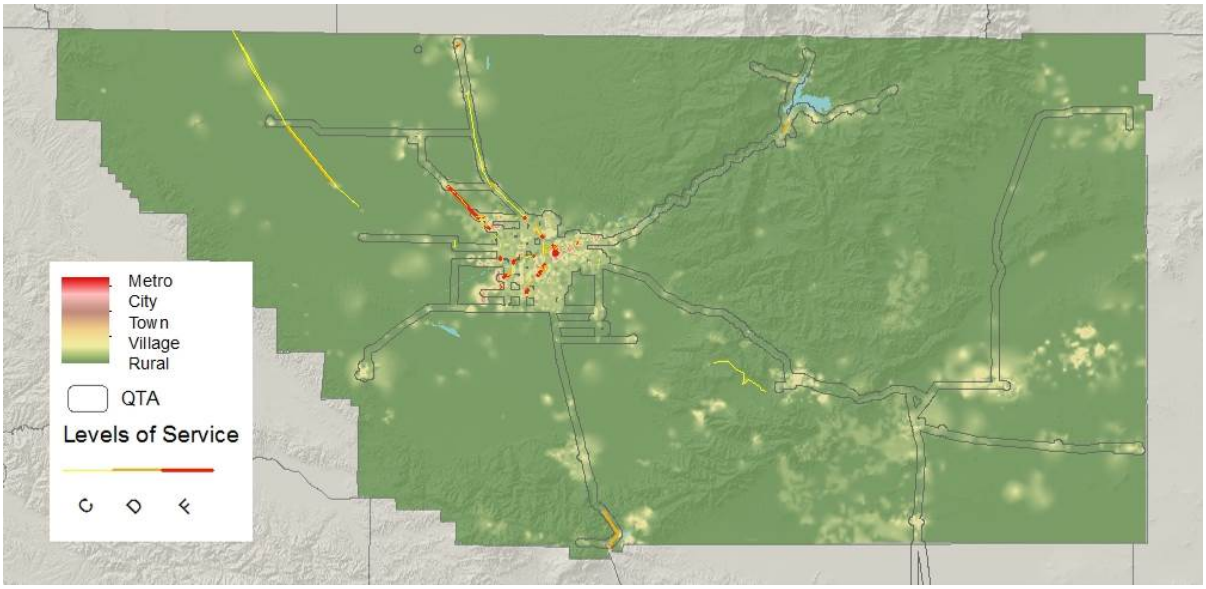
**Scenario Description and Assumptions:**
The 2035 Base "Old Plan" (M24) uses transportation planning assumptions from the Kern COG 2011 RTP list of constrained projects to assign growth to non-developed areas based on member agencies general plans and planning assumptions. M24 was developed over a two year period of refining the land use model to match planning assumptions and existing development patters presented by member agencies. Pre-model adjustments were made to distribute growth to special planning.

**Summary of Inputs:**
Existing transit network, 2011 RTP constrained projects, attraction layers based on planning assumptions and general plans of member agencies. Scenario was run using the MIP model still under development.

**Results: The 2035 Base shows a 5.39% decrease in CO2 lbs/capita compared to 2005 levels.**

| Indicator or Measure for 2035 | 2005 | 2035 M24 Base | Difference from 2005 |
|---|---|---|---|
| Public Transit Boarding's | 22,028 | 127,363 | +478% |
| SB 375 CO2/Capita | 16.70 | 15.8 | -5.39% |
| Per Capital VMT/Weekday | 29.04 | 28.66 | -1.29% |
| Per Capita SB 375 VMT (Minus External Trips) | 24.10 | 22.90 | -0.05% |

**Land Use Pattern Map & LOS**



**Scenario Title:** 2035 Base "Old Plan" (M24)

Land Use Model - Data Input Parameters

| | | Growth | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 Population | 819,921 | | | | | | | | | | | | |
| 2035 Population | 1,264,100 | 444,179 | | | | DRAFT | | | | | Printed: | | 13-Dec-12 |
| | | | | | | | | | | | Run: | | S01 |
| Persons per Hhld | 2.829 | 157,009 | | | | | | | | | Model year: | | 2035 |
| Employees per Hhld | 0.887 | 177,051 | | | | | | | | | | | |

**2035 Old Plan - Scenario (M24)**

| | | Mixed Use | | Multifamily | | Townhouse | | Single Family | | Large Lot | | County Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds |
| Countywide Totals | | 4,442 | 1,570 | 24,523 | 8,668 | 46,240 | 16,345 | 363,276 | 128,412 | 5,702 | 2,016 | 444,183 | 157,011 |
| | | | 1.0% | | 5.5% | | 10.4% | | 81.8% | | 1.3% | 100% | 100% |
| Assumptions | *Population and Employment from Kern COG 2009 Adopted Growth Forecast.* | | | | | | | | | | | | |

## 2035 Land Use Model Distribution by Subarea - Run M24

| County Division<br>Regional Statistical Area | Households | Household Population | Total Employment |
|---|---|---|---|
| **Delano_McFarland** | **17,777** | **68,409** | **30,198** |
| **Wasco** | **10,663** | **37,171** | **18,151** |
| **Taft_Maricopa** | **8,993** | **26,701** | **14,594** |
| **Frazier_Tehachapi** | **27,960** | **75,687** | **26,954** |
| Frazier | 5,740 | 14,960 | 7,883 |
| Tehachapi | 22,220 | 60,727 | 19,071 |
| **Metro Bakersfield** | **294,852** | **904,219** | **305,053** |
| Greater Arvin | 4,952 | 21,355 | 5,109 |
| Metro - Central | 8,248 | 20,369 | 35,931 |
| Metro - NOR | 81,635 | 234,003 | 78,643 |
| Metro - Northeast | 51,562 | 159,268 | 18,478 |
| Metro - Southeast | 42,761 | 156,537 | 31,389 |
| Metro - Southwest | 90,339 | 262,903 | 86,808 |
| Greater Shafter | 15,355 | 49,784 | 48,695 |
| **Southeast Kern** | **26,814** | **76,034** | **36,972** |
| Greater Cal City/Mojave | 11,661 | 32,444 | 12,590 |
| Greater Rosamond | 15,153 | 43,590 | 24,382 |
| **Kern River Valley** | **12,491** | **30,171** | **5,504** |
| **Indian Wells Valley** | **17,381** | **45,025** | **22,611** |
| **Kern County Total** | **416,931** | **1,263,417** | **460,037** |

*Population is the total household population; does not included group quarters and prisons

11/27/2012

**Scenario Title:** The 2035 "Plan" Scenario (S01)
**Status as of January 07, 2012:** Draft MIP Model

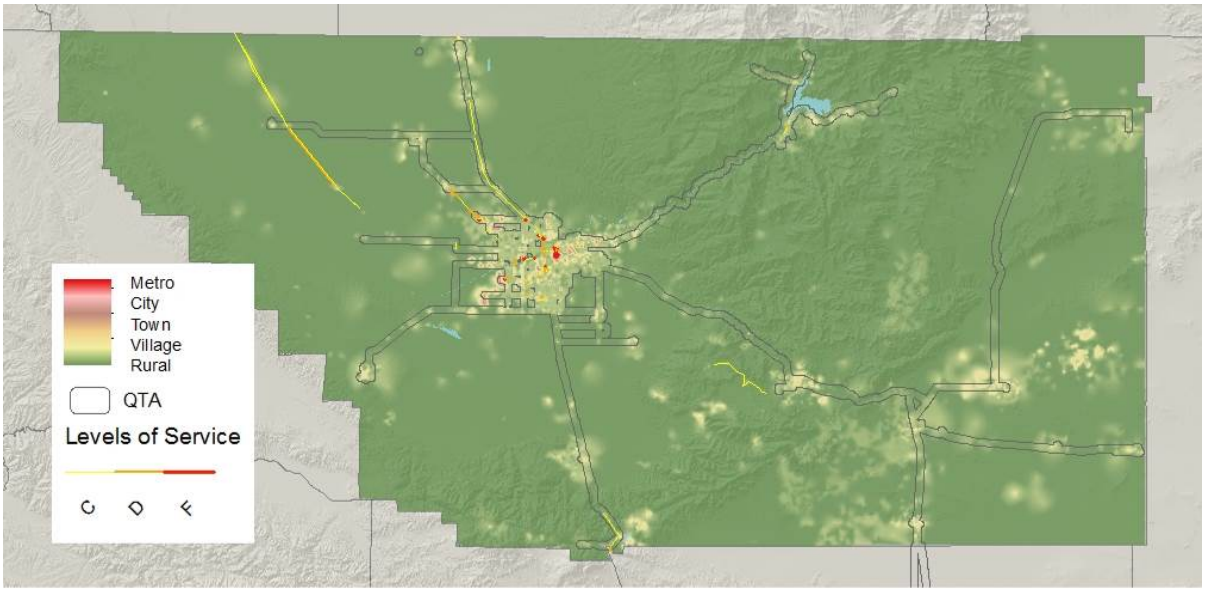
**Scenario Description and Assumptions:**
Enhancements based on long range transit plan, bikeway plans, and implementing more walk, bike and transit friendly developments. Includes increased auto operating costs. The scenario assumes 2.5% more employment and 6% more housing to be redistributed to Metro Bakersfield infill areas already designated and zoned for these activities. This scenario includes modified distribution assumptions of residential housing type demand from the "No Plan" scenario. Growth for each housing type was applied according to general plan average densities. This shifted 25% of households from residential low to existing medium and high areas in Metro Bakersfield (see Data Input Worksheet). Results do not include off-model adjustments for strategies not accounted for in the model (van pooling, telecommuting, employer-based trip reduction, etc.).

**Summary of Inputs:**
This scenario uses the urban built area developed for the Infill Scenario that allowed growth in the downtown core area. Scenario was run using the MIP model still under development.

**Results: Housing Demand Shift Scenario when compared to 2005 shows a 11.7% decrease in CO2 lbs. per capita. The 2035 "Old Plan" shows a 5.4% decrease in lbs. per capita.**

| Indicator or Measure for 2035 | 2005 | 2035 S01 Scenario | Difference from 2005 |
|---|---|---|---|
| Public Transit Boarding's | 22,028 | 155,294 | +605% |
| SB 375 CO2/Capita | 16.70 | 14.75 | -11.7% |
| Per Capita VMT/Weekday | 29.04 | 27.76 | -4.41% |
| Per Capita SB 375 VMT (Minus External Trips) | 24.10 | 21.28 | -0.12% |

**2035 Land Use Pattern Map & LOS**



**Scenario Title:** The 2035 "Plan" Scenario (S01)

Land Use Model - Data Input Parameters

| | | Growth | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 Population | 819,921 | | | | | | | | | | | | | | |
| 2035 Population | 1,264,100 | 444,179 | | | | | | **DRAFT** | | | | | Printed: | | 13-Dec-12 |
| | | | | | | | | | | | | | Run: | | S01 |
| Persons per Hhld | 2.829 | 157,009 | | | | | | | | | | | Model year: | | 2035 |
| Employees per Hhld | 0.887 | 177,051 | | | | | | | | | | | | | |

**2035 Old Plan - Scenario (M24)**

| | Mixed Use | | Multifamily | | Townhouse | | Single Family | | Large Lot | | County Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds |
| **Countywide Totals** | 4,442 | 1,570 | 24,523 | 8,668 | 46,240 | 16,345 | 363,276 | 128,412 | 5,702 | 2,016 | 444,183 | 157,011 |
| | | 1.0% | | 5.5% | | 10.4% | | 81.8% | | 1.3% | 100% | 100% |

**2035 Plan - Scenario (S01)**

| | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds | Pop. | HHlds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Countywide Totals** | 7,588 | 2,682 | 54,994 | 19,439 | 73,159 | 25,860 | 303,708 | 107,355 | 4,733 | 1,673 | 444,183 | 157,011 |
| | | 1.7% | | 12.4% | | 16.5% | | 68.4% | | 1.1% | 100% | 100% |

**Assumptions** *Population and Employment from Kern COG 2009 Adopted Growth Forecast.*
*Subarea % of Kern derived from Draft Buildout Analysis 9-25-06 and RSA distribution.*

| **2035 Land Use Model Distribution by Subarea - Run S01** | | | | **Change from Base Model (Run S01 - Run M24)** | | |
|---|---|---|---|---|---|---|
| **County Division** Regional Statistical Area | **Households** | **Household Population** | **Total Employment** | **Households** | **Household Population** | **Total Employment** |
| **Delano_McFarland** | **17,775** | **68,403** | **30,200** | **(2)** | **(6)** | **2** |
| **Wasco** | **10,709** | **37,302** | **18,151** | **46** | **131** | **-** |
| **Taft_Maricopa** | **9,042** | **26,841** | **14,529** | **49** | **140** | **(65)** |
| **Frazier_Tehachapi** | **27,953** | **75,667** | **26,968** | **(7)** | **(20)** | **14** |
| Frazier | 5,567 | 14,472 | 7,921 | (173) | (488) | 38 |
| Tehachapi | 22,386 | 61,195 | 19,047 | 166 | 468 | (24) |
| **Metro Bakersfield** | **294,865** | **904,264** | **305,068** | **13** | **45** | **15** |
| Greater Arvin | 4,612 | 20,392 | 5,109 | (340) | (963) | 0 |
| Metro - Central | 11,731 | 30,222 | 37,763 | 3,483 | 9,853 | 1,832 |
| Metro - NOR | 88,629 | 253,797 | 76,018 | 6,994 | 19,794 | (2,625) |
| Metro - Northeast | 49,326 | 152,939 | 18,780 | (2,236) | (6,329) | 302 |
| Metro - Southeast | 43,847 | 159,609 | 31,940 | 1,086 | 3,072 | 551 |
| Metro - Southwest | 83,568 | 243,753 | 92,413 | (6,771) | (19,150) | 5,605 |
| Greater Shafter | 13,152 | 43,552 | 43,045 | (2,203) | (6,232) | (5,650) |
| **Southeast Kern** | **26,806** | **76,010** | **36,971** | **(8)** | **(24)** | **(1)** |
| Greater Cal City/Mojave | 12,322 | 34,314 | 12,524 | 661 | 1,870 | -66 |
| Greater Rosamond | 14,484 | 41,696 | 24,447 | (669) | (1,894) | 65 |
| **Kern River Valley** | **12,496** | **30,183** | **5,523** | **5** | **12** | **19** |
| **Indian Wells Valley** | **17,384** | **45,036** | **22,612** | **3** | **11** | **1** |
| **Kern County Total** | **417,030** | **1,263,706** | **460,022** | **99** | **289** | **-15** |

*Population is the total household population; does not included group quarters and prisons
11/27/2012

## APPENDIX K – GENERAL PLAN LAND USE MATRIX TABLE – 2035