Kern Council
of Governments

February 5, 2018

Mary Nichols
Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Re: Kern Council of Governments Greenhouse Gas Emissions Technical Quantification Methodology for the Development of Sustainable Communities Strategy as part of the 2018 Regional Transportation Plan

Ms. Nichols:

Please find enclosed a revised technical methodology that Kern Council of Governments (Kern COG) intends to use for estimating greenhouse gas (GHG) emissions for the Sustainable Communities Strategy (SCS), and if necessary, the Alternative Planning Strategy (APS), in compliance with the requirements of the Senate Bill 375 (SB 375). This revised methodology incorporates updates based on a January 11, 2018 conference call with your staff.

Kern COG intends to adopt a Regional Transportation Plan (RTP) with an SCS in the summer of 2018 that will meet established per capita GHG emission reduction targets.

Attachment 1 (Kern COG Technical Methodology) presents an overview of the SCS development process, including public participation and input, underlying data development, and technical modeling and approach used to estimate GHG emissions reductions resulting from the anticipated adoption of SCS by Kern COG.

Please contact Rob Ball, Deputy Director, should you have any questions on the technical methodology presented in this document.

Sincerely,

Ahron Hakimi
Executive Director

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KERN COUNCIL OF GOVERNMENTS TECHNICAL METHODOLOGY

SB 375 requires that the Metropolitan Planning Organization (MPO) submit to the Air Resources Board a description of the technological methodology that it intends to apply in the SCS, or APS if applicable

The technical methodology described in this document satisfies the requirements of SB 375 and is consistent with the original Regional Targets Advisory Committee (RTAC) target setting process, as well as the ARB target revision process initiated in 2016. For the 2018 RTP/SCS, Kern COG will be modeling 2005 as the base analysis year and 2020 and 2035 as the target analysis years for the purposes of SB 375. In addition, RTP horizon year 2042 will also be modeled.

SB 375 TARGETS:

Current applicable SB 375 targets for each MPO in the San Joaquin Valley are a 5 percent per capita reduction in GHG emissions by the year 2020, and a 10 percent per capita reduction in GHG emissions by the year 2035. The Valley MPOs (along with other MPOs across the state) have been working with ARB staff to update these targets, however, new targets have yet to be finalized. In a December 2016 report to ARB, the Valley MPOs outlined the various SCS achievements that went beyond existing SCS commitments, as well outlined various challenges to GHG reductions that lie beyond an MPO's control (such as economic recovery and reduction in automobile operating costs). At the December 14, 2017 ARB meeting, ARB staff highlighted those challenges, and stated that their intention is to refocus the SB 375 process only towards those elements that an SCS can address. Per the ARB staff presentation, workshops are to be held in early 2018 to reshape SB 375 target setting and SCS evaluation. However, given the timing of 2018 RTP/SCS development, the Valley MPOs must proceed with the current applicable targets of 5 percent per capita reduction in GHG emissions by the year 2020, and a 10 percent per capita reduction in GHG emissions by the year 2035. The Valley MPOs are excited to be working with ARB staff on a refocusing of target setting and SCS evaluation, and will work directly with ARB staff to strive for success under SB 375 as the updates are finalized.

SCS DEVELOPMENT SUMMARY:

Kern COG in collaboration with the other San Joaquin Valley MPOs, local jurisdictions and interested stakeholders, has been developing an RTP/SCS that seeks to meet SB 375 targets. The process began with updating the necessary modeling tools and developing underlying data and assumptions that would later become part of the scenario evaluation process. Consistent with Kern COG public participation plan, a rigorous public participation process solicits input from stakeholders on potential GHG emission reduction strategies and scenario performance metrics. Consistent with the 2014 process, the Kern COG Board intends to select the "preferred" scenario as part of the adoption of the RTP/SCS in the summer of 2018.

Scenario Modeling

The technical methodology to quantify GHG emissions for the 2018 RTP/SCS is based on Kern COG Valley Model Improvement Program 2 (VMIP2) model, ARB's EMFAC2014 emission

factor model, and off-model adjustments, as necessary, for certain strategies that VMIP2 model does not capture.

In response to ARB feedback received during the technical evaluation of the Valley's first round of SCSs, SJV MPOs have contracted with Fehr & Peers to update the travel models originally developed through the Model Improvement Program (MIP) funded by Proposition 84 funds. The updated model will be used to estimate vehicle miles travelled (VMT) resulting from implementation of the SCS scenario and the alternatives.

In addition, Kern COG staff, in coordination with the other SJV MPOs, has developed a consistent CO_2 emission modeling methodology using ARB's emission modeling software EMFAC2014 to complete all of the SB 375-related emissions analyses.

Public Participation

The technical methodology as well as all other elements of the Kern COG SCS will be subject to Kern COG public involvement policies and procedures, including a minimum 55-day review process when the draft RTP/SCS is released in the first quarter of 2018.

Most recent version of the public involvement policies and procedures was adopted by the Kern COG Board on May 21, 2015. The full text of this public participation plan is available on Kern COG website at http://www.kerncog.org/policies .

Scenario Selection

Kern COG's comprehensive community engagement process, titled "Directions to 2050", was designed to solicit input from stakeholders and community members on priorities for the region's long-term future. The Directions to 2050 community engagement process is continuous, coordinated and comprehensive, with public input for the next RTP process beginning prior to adoption of the previous RTP. So far, over 5,000 community members participated in the Directions to 2050 process. The board will be able to consider public input up to the time of adoption of the RTP/SCS. During the process, community members were allowed to vote on which growth scenario they preferred for their region, the votes weighted by each of 4 scenarios showed similar results from the 2014 RTP outreach process with twice the number of community members voting on scenarios. As with the 2014 RTP/SCS, the "Plan" analyzed by the environmental document will be based on scenario 3 out of the 4 scenarios where scenario 1 was the least ambitious and scenario 4 was the most ambitious interms of SB 375 strategy implementation.

Additional information regarding Kern COG planning process can be located at the following link: www.directionsto2050.com .

SOCIOECONOMIC DATA:

The base year 2015 is used in the modeling of the Kern COG 2018 RTP/SCS. The distribution of the 2015 population, and household data was updated by Fehr & Peers and Kern COG staff using

Census and California Department of Finance (CA DOF) data. The 2015 employment data was updated by Fehr & Peers and Kern COG staff using California Employment Development Department (EDD) and InfoUSA data. A 2017 benchmark model run was made to fit the July 2017 DOF forecasted released in December 2017, and the extrapolated 2016 EDD forecast for employment.

In 2015, Kern COG contracted with PlaceWorks of Santa Ana, CA to develop population, housing and employment forecast for the Kern region for the 2042 horizon year of the RTP. The forecast is based on 2015 Census Data and California Department of Finance (DOF) estimates in base year. Consistent with the Kern COG Board adopted policy and written agreements, The Kern COG Transportation Modeling sub-committee and the Regional Planning Advisory Committee (RPAC) provided oversight during the growth forecast update. The committees meet jointly during the RPAC meeting and are also responsible for sub-area distribution of the growth forecast following the adoption. The regional growth forecast is presented to the Transportation Technical Advisory Committee (TTAC), before being taken to the Transportation Planning Policy Committee/Kern COG Board for final adoption. In November 2015, the Kern COG policy board adopted population, housing and employment forecasts developed by PlaceWorks to be used for development of the Kern COG 2018 RTP/SCS. The complete growth forecast report is available on the Kern COG website at: http://www.kerncog.org/wp-content/uploads/2009/10/Growth_Forecast_20180807.pdf

The adopted forecast numbers were projected from January 2015 to January 2050, along with each intervening year. July estimates were created for use in the transportation model. Summary table below:

Kern Forecast (adopted 2015) - July estimates				
	2015	2020	2035	2042
Total Population	884,800	988,900	1,313,100	1,469,500
Total Households	265,500	292,000	388,400	443,700
Total Employment	324,700	349,600	436,100	483,500

Note that since the development of the forecast during the 2015 base year, Kern entered into a prolonged, second recession triggered by low fuel prices. Kern County is the largest oil producing county in California, and oil accounts for a significant portion of the local economy. By July 2017, Kern's DOF population was nearly 3% lower than the projected forecast for 2017. However, in 2017 Kern's growth rate had already passed Fresno and is anticipated to catch up to the original forecast by the end of the decade, driven by several factors, including the fact that Kern has the most affordable housing for a large metropolitan area in state, and there appears to be a latent demand for housing as millennials begin to start families and enter the home buying market.

MODELS AND TOOLS:

The Kern COG anticipates using the following tools to estimate GHG emissions for the 2018 RTP/SCS, each of which are described in more detail below:

(1) Scenario Planning/Land Use Model;

(2) MIP Travel Model;
(3) EMFAC 2014 Emissions Factor Model;
(4) Off-Model Adjustments.

In addition, off model emission reductions will be quantified if deemed appropriate for the SCS scenario. At this time, Kern COG is in the process of refining a preferred scenario. As such, the type of strategies to be included in the SCS have yet to be finalized. The methodology describing off-model quantification will be provided as part of the RTP/SCS documentation.

In the 2014 RTP/SCS Kern COG chose a more conservative approach not to include any off model adjustments due to difficulty in measuring the potential overlap between the modeled strategies and those strategies in the off model adjustments. It is possible that Kern COG may choose not to incorporate an off model adjustment again because of this issue.

Scenario Planning/ Land Use Model

Scenario modeling allows evaluation of the impacts of the RTP/SCS policies on regional land use. In particular, the scenario planning approach is a way to explore what it would take to achieve the revised SB 375 per capita emissions targets. Scenario modeling tools use building blocks that describe the different types of land uses that exist within the metropolitan area or are planned for the future. The output of the scenario modeling tools forms the fundamental input to the MIP transportation model.

UPlan

The UPlan land use model uses a combination of computer based Geographic Information System, or "GIS" tools to accomplish the land use modeling tasks. The primary tool, UPlan was developed by the University of California, Davis, is a land use modeling software used to forecast future urban growth areas. The key components of UPlan modeling are projected populations, general plan land use, attraction areas, discouragement areas, and masks. UC Davis and the old Blueprint Model Steering Committee provided UPlan to Kern COG with a set of default areas and parameters. These were then modified to provide more accurate and localized inputs for the model based on comments from local jurisdictions in Kern through the Regional Planning Advisory Committee (RPAC). UPlan is used in conjunction with ESRI's ArcGIS software, allowing the results of UPlan models to be displayed visually as easy to understand maps.

The land use model for Kern County has been divided into eight sub areas; Metro Bakersfield, Westside Kern, North Central Kern, Greater Shafter, Frazier Park, Tehachapi, Southeast Kern, Lake Isabella, and Indian Wells Valley. UPlan models are run to report potential effects of future growth on, or in designated general plan areas such as farmland, grazing land, public lands, habitat, military flight corridors, and others as required by SB 375.

UPlan parameters have been separated into two groups. The first group is the distribution by percentage of population among the sub areas and the distribution among the four residential densities for each sub area. Kern COG uses the locally adopted "2015 Region Growth Forecast Report" for population, housing and employment projections. This forecast is within 3% of the

DOF forecasted population for Kern. The second group contains the classification ranges based on dwelling units per acre for each residential density, and the distribution of employment among industrial, high density commercial, and low density commercial.

Residential classification ranges were derived in consultation with each local government member agency and are included in the Kern SB 375 Land Use Modeling Methodology documentation available online at http://www.kerncog.org/transportation-modeling. The report combines the different county and jurisdiction land use codes into similar land use categories or columns. The columns were then classified with the corresponding four residential densities used by UPlan. The report also had more relevant dwelling unit/acre figures than the default figures.

Kern COG has updated and enhanced the version of UPlan that was used in the 2008 Blueprint and the 2010 ARB CO2 Target setting process, the 2014 RTP/SCS process, and now the 2018 RTP process. The updated UPlan is used to generate the residential and employment inputs for the new travel model developed by the MIP. UPlan outputs are also being used to generate a number of performance measures used in the scenario comparison process.

Since 2008, Kern COG has continued to improve the accuracy of forecast distribution in Uplan by incorporating feedback from the RPAC on TAZ level data output, developing an enhanced post processor methodology for making adjustments to Uplan outputs, and creating additional sub regions for Uplan.

In addition to reporting future land uses, Uplan was helpful in developing a range of scenario models for metropolitan area that varied housing mix and revitalization in transit priority areas. The scenarios, inputs, and methodology were developed with assistance and oversight by the Kern Regional Planning Advisory Committee, variety of stakeholders, and public workshops. The successful Kern outreach process received input from over 5,000 participants over the past 2 years. In addition to the outreach mentioned above, Kern COG as well as the other seven SJV MPOs are anticipated to release their draft RTP/SCSs for 55-day public comment period in early 2018.

It is important to note that the output of the scenario planning tool does not yield VMT estimates. As described in the MIP Travel Model section below, the MIP process created standardized land use input categories across all eight San Joaquin Valley MPOs. These standardized categories ensure consistent transportation modeling of household and employment types across all eight MPOs that yields a consistent process to estimate vehicle miles traveled (VMT).

Model Improvement Program (MIP) Travel Model:

Model Development

Beginning in 2010, the eight MPOs began a joint process to improve their travel demand modeling capabilities to help meet SB 375 requirements. This process, known as the San Joaquin Valley Model Improvement Program (MIP) was funded by a $2.5 million Strategic Growth Council Proposition 84 grant. Between 2010 and 2012, staff from each of the eight MPOs participated in monthly meetings with a team of technical consultants to upgrade the models and modeling processes. To enhance coordination efforts, staff from the Air Resources Board and the University

of California Berkeley listened in on the monthly MIP meetings of the MPOs and technical consultants.

The MIP effort resulted in the delivery of substantially upgraded and standardized travel demand models to the MPOs in the summer of 2012. The new travel models are designed to better evaluate the types of land use and transportation policies likely to be considered in the RTP/SCSs. Sensitivity to changes in land use and travel estimates was enhanced compared to previous models by – (i) refining each models' traffic analysis zone (TAZ) system to better capture mixed-use and transit oriented development; (ii) incorporating additional socioeconomic variables such as housing units by building type, household income, housing density, employee by detailed sector, and employment density; and (iii) adding a vehicle ownership component and improved sensitivity to travel characteristics.

In addition, the MIP resulted in the standardization of model software, inputs, and methodologies between the eight MPOs. The new models employ a common travel modeling software package called CUBE, which will enhance the MPOs' ability to share data and resources with each other, as well as coordinate on model improvement and training efforts.

Improvements made to the model input data and each of the key components of the travel demand models (see Figure 2) include: vehicle ownership, trip generation, trip distribution, mode choice, and trip assignment, are discussed in more detail in the following section.

Then in 2014, a minor update to the models developed in 2012 began, known as VMIP 2. VMIP2 takes advantage of the 2010 Census, the most recent American Community Survey, and 2012-2013 California Household Travel Survey data, and enhances the model structure developed as part of the VMIP1. In addition to the updated data, VMIP2 implements changes to the model structure based on ARB feedback received. Model improvements that specifically address ARB's comments include the following:

- Auto ownership was updated to account for land use accessibility (auto, transit, walk, bike) and commute cost as a percentage of household income.

- Trip generation rates were revised depending on area type and accounting for the accessibility of land uses. Area type is recalculated with each model run to account for land use changes between scenarios.

- Trip distribution was updated to include correlation between household income and job salary for home-work trips.

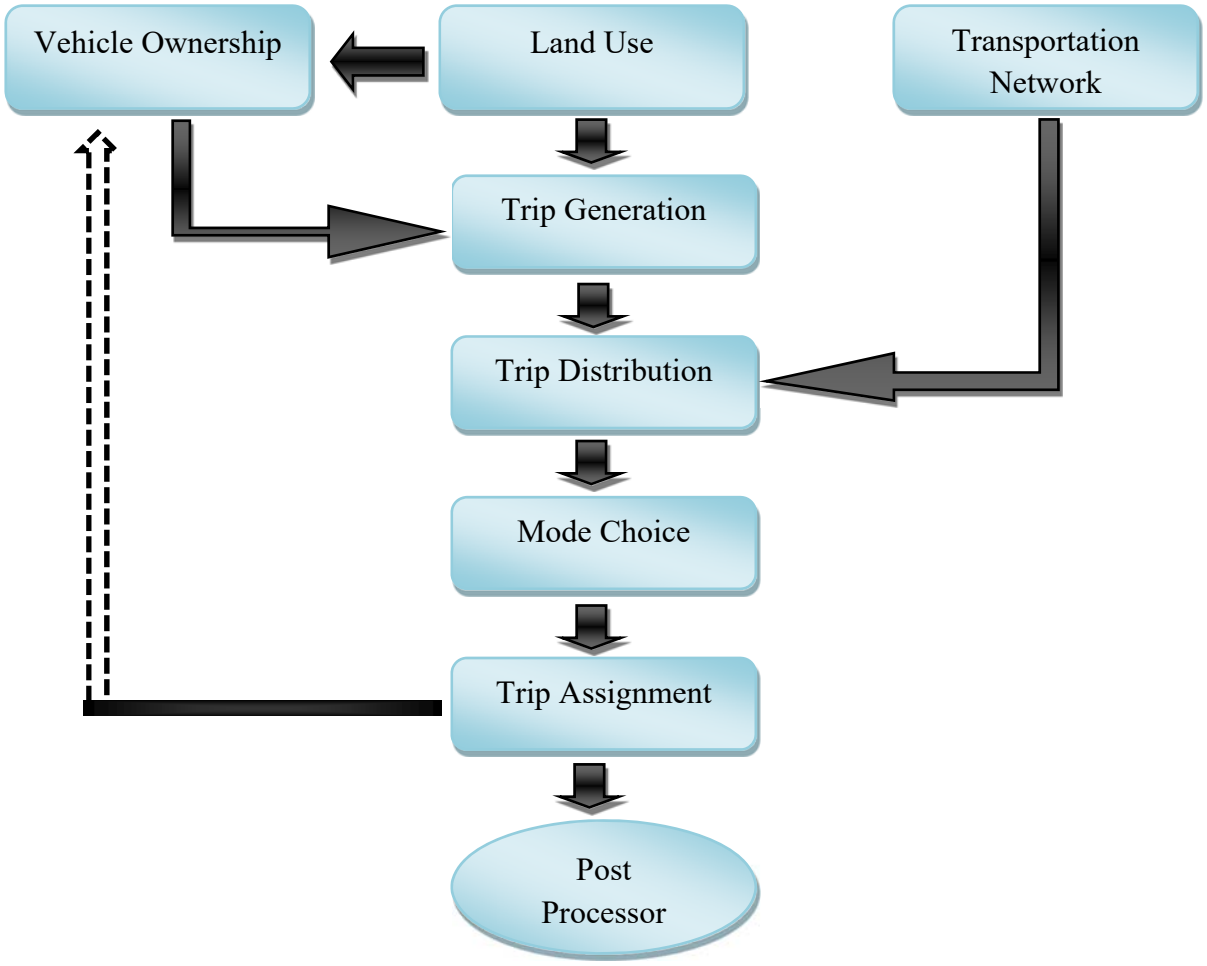
- Mode choice was updated based on demographics from the latest household travel survey data (household size, income, autos owned) and incorporates average vehicle occupancy by purpose.

- In addition to counts and VMT, the model peak period contested locations was compared to observed NPMRDS data provided by FHWA.

Other key enhancements to model sensitivity and usability include:

- Land Use: simplified residential and employment categories
- Socio-economic: employee salary and household income relationship for home-work trips
- Interregional Travel: updated based on the newly released California Statewide Transportation Demand Model, and based on place and purpose, rather than having internal and interregional travel combined and distributed based on time\cost of travel
- Modified Assumptions: adjustments to employment density, intersection density, and access to jobs and houses

Figure 2 – San Joaquin Valley Model Improvement Program: Model Components



Data Input: The MIP models feature improved TAZ systems, socioeconomic data, land use and travel network characteristics. Improvements to the TAZ systems are designed to help capture more detailed travel movements throughout the region, which allows for more precise analysis of land use and smart growth effects. An updated version of the trip based Caltrans statewide traffic

model was developed to help forecast interregional and intraregional trips. Improvements to socioeconomic, land use and transportation network data in the models better account for differences in vehicle ownership and trip generation factors, as well as standardize categories across the eight SJV MPOs.

Vehicle Ownership: The MIP model calculates the number of motor vehicles in a region based on demographic characteristics, auto operating cost, and accessibility. The output of this component is a critical input to the trip generation step, helping to capture the economic characteristics of each household. For VMIP 2, the vehicle operating cost was updated to include tire, maintenance and operations costs based on feedback from ARB.

Trip Generation: The trip generation component estimates the number of person-trips for each activity, such as traveling to-and-from work, school, shops, and social/recreational events. The new models estimate person trips based on demographic and employment characteristics, increasing their capability to analyze the effect of socioeconomic factors on trip rates. Further, the new models increase the number of trip purposes from the typical three or five to eleven[1]. This change allows to distinguish the potential for alternative modes such as school and college trips. The new models also improve the trip generation step by allowing trip rates to vary by income, household size, the number of workers in a household, drivers, and vehicle ownership. This provides better information about regional travel patterns. For VMIP2, trip generation factors were updated to reflect the built environment and area type factors, and home-work trips were grouped by income range.

Trip Distribution: Trip distribution estimates the number of trips from one travel zone to each of the other travel zones in the county. The new models improve the sensitivity of changes to land use on trip distribution by better reflecting the attributes that influence a person's decision to travel. The MIP model provides the capability to consider additional factors such as trip purpose, person travel time by all modes, travel cost, congestion, and vehicle ownership. For VMIP2, trip distribution was updated to match household income and job salary and to better reflect interregional travel at a local scale.

Mode Choice: The Kern COG MIP has an inbuilt mode choice model. This component is used to predict the probability of selecting a travel mode (e.g., auto, transit, bike and walk) for each trip in the region based on the income of the trip maker, the travel cost, time and accessibility of other modes, and improves the travel models' responsiveness to socioeconomic characteristics, land use, pricing and parking strategies. The mode choice model includes seven travel modes with a separate mode choice for walk and bike.

Trip Assignment: The trip assignment component estimates traffic volumes and travel times for each roadway in the network. The new models enhance the trip assignment component by including a new feedback mechanism between the trip assignment and the number of autos to enhance the ability to address induced travel demand. The feedback mechanism inputs congested travel times into the model, which helps to account for travelers who change their travel route and mode in response to congestion.

[1] The additional trip purposes includes home-based K-12, home-based college, highway commercial, trucks-small, trucks-medium, and truck-heavy.

Model Calibration and Validation: A calibration and validation report for the MIP travel model will be part of the final Kern COG RTP/SCS submittal to ARB in the summer of 2018.

In model calibration, each component of the model is calibrated to ensure that it produces accurate forecasts. Calibration is an iterative process where model settings are adjusted so the output of the model matches observed travel patterns.

Static validation is that process where the model is tested to ensure that the model output matches available traffic counts and roadway speeds. As part of the static validation process, elements of trip generation, trip distribution and traffic assignment modules may be adjusted.

Dynamic model validation tests the model to determine how well it responds to change. Dynamic testing includes testing the changes to the following:

- Household location, density, diversity and other household attributes
- Employment location
- Roadway network
- Transit service

The MPOs performed calibration for each component of the model following the Federal Highway Administration and Caltrans guidelines, to ensure that the models produce reasonable forecasts. Model validation, a critical step in the development of any regional travel demand model, establishes the credibility of the model to predict future travel behavior. The MPOs performed both static and dynamic validation on the new models as recommended by Federal Highway Administration guidelines. Static validation includes – (i) trip generation rates, (ii) trip length frequency by purpose, (iii) average travel time by purpose, (iv) mode split by purpose, (v) traffic assignment by facility, and (vi) transit ridership. Dynamic validation included changing socioeconomic (household size, income, age distribution), land use (density, household location) and travel cost (auto operating cost and parking price) inputs.

<u>Modeling Interregional Trips</u>

The California Statewide Travel Demand Model (Statewide Model) was designed to capture the interactions of land use plans all across the State as they affect interregional travel. The model operates at a scale coarser than the SJV-MIP models. Its value is in placing local and regional travel in the context of total statewide activity. For the VMIP 2 update, interregional travel was updated to reflect the 2010 Statewide Model version. However, due to timing of the Statewide Model update, it does not incorporate the latest land-use from 2014 SJV RTPs.

For the VMIP2 model, AirSage data was used to evaluate county-to-county traffic volumes for the 8 SJV MPOs and aggregated volumes for counties outside of the San Joaquin Valley focusing exclusively on long distance trips. The Statewide Model was used to compare the magnitude of county-to-county traffic flows to AirSage. Once the magnitudes were determined to be comparable, the Statewide Model was used to develop through trips and station weights by purpose

for each gateway. A process of interpolating or extrapolating, as appropriate, was implemented using the base and future year from the Statewide Model for multiple years. The Statewide Model was also used to determine the weighted average trip distance for external gateways to represent travel beyond the model area. These gateways were further validated with the latest traffic volumes at the gateways along with forecast model results from neighboring travel demand models and is fully documented in the December 2017 peer review report (http://www.kerncog.org/wp-content/uploads/2018/01/MIP2_peer_review.pdf).

For the purpose of preparing the GHG emissions analysis for the 2018 RTP/SCSs, all emissions from through trips (trips without an origin and a destination in the MPO region) are excluded. In addition, the portion of VMT attributable to trips that either begin or end within the region but travel to/from neighboring regions (IX/XI) has been included for all portions of the trip within the MPO region.

Accounting for interregional travel, or travel that crosses MPO boundaries, continues to be a key issue for SB-375 implementation across the state. The issue is especially important when considering the area covered by SJV MPOs, which in aggregate experience a higher proportion of through traffic relative to other regions (as a percent of total vehicle miles traveled). Statewide discussions to determine how to account for interregional travel across the state should continue.

It is vitally important that the current update to the Caltrans statewide model be fully completed in order for interregional trips to continue statewide conversations regarding interregional travel statewide. In addition, incorporation of SJV long-term transportation planning elements into the Statewide model is highly desired for the next update.

Travel Model Peer Review and Revisions

Consistent with the 2014 RTP process, upon delivery of the VMIP2 travel model from Fehr & Peers consulting, Kern COG retained the services of DKS Associates, Sacramento, to perform an independent peer review of the travel model and work to further refine and improve the model validation statistics. The peer review was overseen by two independent registered engineers (one for DKS and one from Kern COG) to further ensure model quality and accuracy. This process was completed on December 21, 2018 with full documentation available online at http://www.kerncog.org/category/data-center/transportation-modeling/ .

Emissions Modeling

Kern COG is using the latest version of ARB's emissions modeling software EMFAC2014 to complete GHG emissions estimates for the SCS scenario and the alternatives.
The latest EMFAC update includes an “SB 375 Emission Analysis” mode that estimates and reports CO2 emissions in tons per day from appropriate light-duty vehicle classes (LDA, LDT1, LDT2 and MDV). In order to ensure a coordinated approach and reduce potential for user errors, EMFAC2014 modeling instructions and EMFAC output post-processing worksheet have been developed for the SJV MPOs in consultation with ARB. The approach uses Transportation Data Templates that convert VMIP2 travel model outputs into EMFAC2014 inputs including VMT

and speed distributions specific to the region. Per RTAC recommendation, the VMT modeled for SB 375 purposes does not include through trips.

In addition, the 2018 RTP/SCS emissions modeling approach incorporates ARB's "Methodology to Calculate CO_2 Adjustment to EMFAC Output for SB 375 Target Demonstration." The emissions methodology assumes the same 2005 base year CO_2 per capita estimate as for the 2014 RTP. That method used a prior travel model validated to the year 2006 observed data and backcast by one year using the proportionate change in HPMS between 2005 and 06. The methodology then adjusts 2020 and 2035 target performance downward to account for fleet mix and emission factor updates between EMFAC2011 used for the 2014 RTP/SCS and EMFAC2014. The EMFAC output post-processing worksheet calculates per capita CO_2 reductions from 2005 base year for 2020, 2035, and RTP horizon year 2042 using CO_2 emissions modeled with EMFAC2014 and the latest population projections for the region. The spreadsheet also incorporates the ARB CO_2 Adjustment Methodology by applying the difference between CO_2 per capita reductions modeled with EMFAC2011 and EMFAC2014 using 2014 RTP activity data to reductions achieved by the 2018 RTP/SCS using EMFAC2014. Although this approach results in per capita CO_2 reductions that are generally lower than otherwise modeled with EMFAC2014 alone, ARB has indicated that this target demonstration approach is separate from the SB 375 target setting methodology and is not directly comparable to the target recommendations Kern COG provided to ARB.

Off-Model Adjustments

Similar to other traditional four-step travel demand models, the Kern COG model is not as sensitive to the impacts of Transportation Demand Management/Transportation Systems Management (TDM/TSM) projects such as Intelligent Transportation Systems (ITS), bike and pedestrian projects, and rideshare programs, nor electrical vehicle penetration. In these instances, Kern COG may rely on "off-model" adjustments using methodologies commonly used in literature, previously approved or cited by ARB, and consistent with the other MPOs.

Kern COG is considering the following strategies that may need to be quantified "off-model":

1. Neighborhood electrical vehicles
2. Active transportation projects
3. Vanpool program expansion
4. Transit enhancements (not captured in MIP)
5. Rideshare programs
6. Rule 9410 Employer Trip Reductions

At this time, Kern COG has is still refining the preferred scenario, thus the type of strategies to be included in the SCS is yet to be finalized. Detailed documentation of off-model techniques applied in the SCS development will be documented as part of the RTP/SCS documentation.

It is important to point out that in the 2014 RTP/SCS, Kern COG chose a more conservative approach not to include any off model adjustments due to difficulty in measuring the potential overlap between the modeled strategies and those strategies in the off model adjustments. It is

possible that Kern COG may choose not to incorporate an off model adjustment again because of this issue. Whatever off-model adjustments are taken, they will be fully documented as part of the RTP/SCS.

The following is a detailed listing of GHG reduction strategies currently being used in the region, most of which are at least partially accounted for in the regional travel demand modeling. Kern is implementing 55 GHG reduction strategies of which 14 are new, 16 are enhanced, and 43 directly benefit disadvantaged communities. All of the following strategies benefit the disadvantaged communities by improving emissions, however the highlighted strategies benefit Kern's disadvantaged communities directly.

NEW STRATEGIES

1. Bakersfield High Speed Rail Station Area Plan – Specific/General Plan Update
2. Kern COG 4,000 Workplace Charging Spaces by 2025
3. Improvements to 51 Bus Stops – Metro Bakersfield/Disadvantaged Neighborhoods
4. New Taft Transit Center / Regional Transit Hub
5. Early Delivery of Wasco Disadvantage Community Active Transportation Projects
6. Bakersfield Disadvantage Communities Bike Share & Downtown Bicycle Connectivity Project
7. Kern Highway Projects Advancing Complete Streets
8. Kern Regional Active Transportation Plan Including Disadvantaged Communities
9. Kern COG IntelligentTransportation System Plan Update
10. SJV Rural Transit Shared Mobility Study for Disadvantaged Communities
11. SR 184 Lamont Bike and Pedestrian improvements
12. SR 184 and 155 Roundabouts in Disadvantage Communities of Delano and Weedpatch
13. Kern County General Plan Update – Land Use, Conservation, Open Space, Circulation, Housing, and other key elements
14. Early Deployment Pricing Policies for Parking and FastPass HOT Lanes

ENHANCED STRATEGIES

15. City of Bakersfield Redevelopment Projects – Mill Creek and Baker Street
16. Commuter Rail Feasibility Study – Amtrak Improvements
17. Rideshare Program – Commute Kern
18. Expanding Park and Ride Lots
19. Dial-A-Ride and Local Transportation Services
20. Kern County Bicycle Master Plan & Complete Streets Recommendations/City of Tehachapi Bicycle Master Plan
21. City of Bakersfield Bicycle Facilities
22. Westside Station Multi-modal Transit Center
23. San Joaquin Valley Vanpool Program (CalVans)
24. Kern County Wind Farm Areas (Largest in U.S.)
25. City of Shafter Container Yard and Intermodal Rail Facility Expansion
26. Intersection Signalization/Synchronization
27. City of Bakersfield 4 New Downtown Infill Housing Projects

28. Cities of McFarland and Shafter – Conversion of transit fleet to electric vehicles
29. Golden Empire Transit – Purchase of 2 Electric Buses
30. Lost Hills Wonderful Park and Communitywide Improvements
31. Grapevine Specific and Community Plan and Special Plan

EXISTING/CONTINUING STRATEGIES

32. City of Tehachapi General Plan (Form-Based Code, Transect Zone, Mobility Element, Town Form Element)
33. Infill Incentive Zone – Lower Transportation Impact Fee Core Area
34. City of Taft General Plan – Sustainability Principles
35. City of Ridgecrest General Plan and Multi-Modal Circulation Element
36. Metro Bakersfield General Plan Sewer Policy – Hook-up required for parcels less than 6 acres
37. City of Bakersfield Required Lot Area Zoning Strategies
38. San Joaquin Valley Air District's Indirect Source Review to Mitigate Off-Site Impacts of Development
39. Transit Priority Areas in the Kern COG SCS
40. Metropolitan Bakersfield General Plan Centers Concept – Transit Priority & Strategic Employment Place Types
41. GET Short-Term Service Plan (2012–2020)
42. GET X-92 Commuter Express bus service to Tejon Industrial Complex
43. Kern511 – Traveler Information System
44. San Joaquin Valley Blueprint Integration Project
45. Caltrans Vehicle Detection System – State Route 43 Intersection Improvements and East Bakersfield Vehicle Detection Systems
46. California Highway Patrol's Safety Corridors
47. Purchase of CNG Buses (80+ bus fleet)
48. The Electric Cab Company of Delano
49. Downtown Elementary School Expansion (Bakersfield)
50. Traffic Control Devices
51. Kern Region Energy Action Plans (Kern REAP) and Kern Energy Watch Goal 3
52. Tejon Ranch Conservation and Land Use Agreement
53. Kern County Community Revitalization Program
54. Kern Transit – Route Connection with Antelope Valley Transit Authority
55. CSU Bakersfield – Public Transit Center

We look forward to working closely with ARB staff on successfully implementing SB 375. Please contact Rob Ball or Ben Raymond at 661-635-2900 if you have any questions or comments.