February 6, 2018

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

SUBJECT: Fresno COG Greenhouse Gas Emissions Technical Quantification Methodology for the Development of Sustainable Communities Strategy as part of the 2018 Regional Transportation Plan

Ms. Nichols:

Based on the comments received from the ARB staff, please find enclosed the revised technical methodology that Fresno 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).

Fresno COG intends to adopt a Regional Transportation Plan (RTP) with an SCS in the summer of 2018 that will meet the established per capita GHG emission reduction targets set by the California Air Resources Board (ARB).

Attachment 1 (Fresno 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 Fresno COG.

Please contact Kristine Cai at kcai@fresnocog.org should you have any questions on the technical methodology presented in this document.

Sincerely,

Tony Boren  
Executive Director
Fresno COG 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. For the 2018 RTP/SCS, Fresno 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. The 2018 RTP/SCS covers projects from 2018 to 2042.

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 as 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 Board 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:

Over the past three years, Fresno 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 Fresno COG’s public participation plan, a rigorous public participation process was initiated to solicit input from stakeholders on potential GHG emission reduction strategies and scenario performance metrics. Fresno COG Board selected the “preferred” scenario in November 2017. The 2018 RTP/SCS will be adopted by Fresno COG Policy Board in the summer of 2018.

Scenario Modeling

The technical methodology to quantify GHG emissions for the 2018 RTP/SCS is based on Fresno 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 their 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, Fresno COG staff, in coordination with the other SJV MPOs, has developed a consistent CO2 emission modeling methodology using ARB’s emission modeling software EMFAC2014 to complete all of the SB 375-related emissions analyses.

Based on ARB’s recommended GHG calculation methodology, 2005 base year assumption is kept consistent with the assumption made when 2014 RTP/SCS was developed.

Public Participation

The technical methodology as well as all other elements of the Fresno COG SCS will be subject to Fresno COG public participation plan and outreach requirements including a minimum 55-day review process when the draft RTP/SCS is released in the first quarter of 2018.


Scenario Selection
Fresno COG created four scenarios with the assistance of the RTP Roundtable, an advisory committee that consists of member agencies staff, and representatives from transit agencies, Caltrans, the Air District, BIA, water agency, public health, social equity, environmental group, education, agriculture industry, and other public at large. The scenario concepts were also taken to the general public at a workshop in April 2017. Ten indicators were selected to compare the performance and impacts of the scenarios. Eight of these indicators (GHG reduction, criteria pollutant emission, TOD, density, housing mix, important farmland consumed, VMT, and active transportation and transit trips) were selected from the ten indicators used in the 2014 SCS, which were chosen based on input from stakeholders and the public through focus group meetings, each representing one of six community interests: transportation, environment, health, business, social equity, and natural resources. The remaining two indicators not chosen for comparative scenario analysis in the 2018 SCS (compact development and land consumption) were omitted to make room for the two new indicators discussed below. These two indicators were selected for omission based on their close relationship with other indicators, specifically: compact development is already addressed in the density indicator, and land consumption was determined to be similar in scope to the important farmland consumption indicator.

The two indicators added to the 2018 SCS process were premature deaths prevented and access to resources for EJ population. The former was made possible for consideration due to the use of the Integrated Transport and Health Impact Modeling Tool (ITHIM), which was calibrated for use in the Fresno County in 2016. The latter was the result of Fresno COG’s desire to have an EJ-related indicator, and was chosen by the EJ Subcommittee.

Additionally, eight funding priorities were determined for the scenario development process. These priorities were: road maintenance, capacity increase, transit, active transportation, public safety, air quality, congestion, and disadvantaged populations. Each scenario analyzed in the 2018 SCS was given a set of values corresponding to these priorities, indicating which priorities were emphasized for each scenario. To develop constrained project lists for each scenario, a tool was created in Excel to transpose each project’s scores according to each scenario’s suite of funding priorities, giving each project a new modified total score specific to the priorities defined for each scenario. The tool then ranked the transportation projects based on these new scores and applied projected funding from applicable sources to the highest-ranked projects. Four project lists were created for the four scenarios using this methodology.

When the indicator results were produced for the four scenarios, the scenarios were taken to the public for their input. More than 1300 people were reached out to during October 2017 through 11 presentations and 20 pop-up events, which were assisted by 6 mini-grant groups funded by Fresno COG. The participants were asked to select a preferred scenario,
and their demographic information such as household income, ethnicity, zip code, age, etc. were collected during the outreach events. The survey results were reported to the RTP Roundtable on October 25, and the Transportation Technical Committee (TTC) and the Policy Advisory Committee (PAC) on November 3rd, and the Policy Board on November 16th. The recommendations of the Roundtable, TTC and PAC were also reported to the Policy Board. The Policy Board selected Scenario D as the preferred SCS scenario at the November 16th meeting.

Additional information regarding Fresno COG’s RTP/SCS planning process can be located at the following link http://www.fresnocog.org/rtp.

SOCIOECONOMIC DATA:

Fresno COG commissioned a growth forecast study in 2016 to reflect the impacts of the recession on the population and employment growth in the region. The study provides growth projections for Fresno County and the sphere of influence of each of its cities between 2015 and 2050. The study also includes projections of demographic characteristics and housing demand such as households, housing, age distribution average household size, group quarters, average income, household type, race/ethnicity and school enrollment.

Compared to the demographic study used in the 2014 RTP/SCS (San Joaquin Valley Demographic Forecasts 2010 to 2050 by The Planning Center, 2012), the recent study concluded from the latest observed data that the Fresno region recovered faster from the recession in employment but is experiencing slower population growth than foreseen by the last growth forecast. The finding was reported to ARB in the target recommendation letter on May 17, 2017. The difference between the forecasts for countywide total population and employment can be seen in the following graph:
The report of the 2017 growth forecast can be found at:

MODELS AND TOOLS:

The Fresno COG will utilize 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/

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 GHG emissions reduction 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.
Fresno COG employed two land use modeling tools: Cube Land, and Envision Tomorrow.

**Cube Land**

Fresno COG added Cube Land to its land-use modeling methodology for the 2018 SCS in order to add a predictive, economically-driven element to land-use forecasting. Cube Land takes demographic and economic characteristics of the target year and pairs that with zoning and policy characteristics to create a virtual marketplace where households and employers can essentially bid against each other for land on which to reside and work. This creates a land-use development pattern that mirrors the economics of real estate while considering the political climate and land-use planning assumptions of the region.

Cube Land was used to create development patterns for future years that, when compared to base year calibrated runs, provide sound patterns for new residential and commercial growth at the zone level. Using demographic forecast data from the Applied Development Economics (ADE) growth forecast, Fresno COG consulted with The Manhan Group to develop and run the Cube Land model for the 2014 base year calibrated run and for the 2035 forecast run for the Fresno County region. The results from these runs were compared to create delta growth values for housing units and employment at the traffic analysis zone (TAZ) level.

These zonal characteristics for new growth (discounted to 90% in order to allow some flexibility to model the impacts of policies and strategies that might affect future growth patterns) were treated as control totals for the Envision Tomorrow tool, which produces development characteristics at the parcel level, which is a much finer scale. In short, Cube Land is used to determine an economically-driven growth pattern, but produces results at the large-grain TAZ level; then, Envision Tomorrow takes those zonal results and refines them to produce parcel-level growth assumptions.

**Envision Tomorrow**

*Figure 1 – Envision Tomorrow*
Envision Tomorrow is a suite of scenario planning tools that tests different land use and transportation options. It consists of two primary tools: a Prototype Builder and a Scenario Builder, which work in unison to develop scenarios.

The Prototype Builder is a “return on investment” (ROI) spreadsheet tool that can be used to determine the physical and financial feasibility of development. This tool allows the user to examine land use regulations in relation to the current development market and consider the impact of various factors, such as parking, height requirements, construction costs, rents and subsidies. The Prototype Builder also considers inputs such as physical building characteristics, parking layout and costs, and other development costs such as landscaping, site acquisition, etc. Stakeholder input is utilized to create building types and development types so that the scenarios reflect existing conditions as well as possible future conditions. Building and development types can be created to represent the development aspirations of the community.

The Scenario Builder is a Geographic Information Systems (GIS) based application that lets the user “paint the landscape” by allocating various, created development types across a study area to create unique land use scenarios. The tool then allows real-time evaluation of each scenario through a set of user-defined indicators. The indicators measure such things as the scenario’s impact on land use, housing, sustainability, transportation and economic conditions. General plans, specific plans, community plans, zoning maps, Assessor’s parcel data information, and environmental constraints, if any, are all inputs into the Scenario
Builder tool. The growth forecast is allocated—by the user—to locations as desired in this tool.

Once the coordinated land use/transportation scenario is developed the output of that process will be converted into transportation model inputs and run through the MPO MIP travel demand model to estimate vehicle miles traveled attributable to the MPO scenarios.

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 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 was developed, 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 made to address ARB’s comments include the following:

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

- Trip generation rates were revised to be by area type, which includes 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.

- The mode choice was updated based on the latest household survey and includes demographics (household size, income, autos owned) and incorporates average vehicle occupancy by purpose.

- In addition to counts and VMT, the model peak period congested 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

- 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

Vehicle Ownership → Land Use

Trip Generation → Trip Distribution

Mode Choice → Trip Assignment

Post Processor
**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 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

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\(^1\)The additional trip purposes includes home-based K-12, home-based college, highway commercial, trucks-small, trucks-medium, and truck-heavy.
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 Fresno 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.

**Model Calibration and Validation:** A calibration and validation report for the MIP travel model will be part of Fresno COG’s final 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.

**Modeling Interregional trips**

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 contains pre-2014 RTP/SCS land use.

For the VMIP2, AirSage data was used to evaluate county-to-county magnitudes for the 8 MPOs within the San Joaquin Valley and aggregated counties outside of the San Joaquin Valley and focused exclusively on long distance trips. The statewide model was used to compare the magnitude of county-to-county flows to AirSage. Once the magnitudes were determined to be comparable, the statewide model was used to develop through trips (i.e. XX) and station weights by purpose for each gateway. A process of interpolating/extrapolating 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.

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 next 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.

**Emissions Modeling**

Fresno 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 San Joaquin Valley MPOs in consultation with ARB. The approach uses Transportation Data Templates that convert VMIP2 travel model output 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 CO2 Adjustment to EMFAC Output for SB 375 Target Demonstration.” The emissions methodology assumes the same 2005 base year CO2 per capita estimate as for the 2014 RTP, and 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 CO2 reductions from 2005 base year for 2020, 2035, and RTP horizon year 2042 using CO2 emissions modeled with EMFAC2014 and the latest population projections for the region. The spreadsheet also incorporates the ARB CO2 Adjustment Methodology by applying the difference between CO2 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 CO2...
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 Fresno COG provided to ARB.

Off-Model Adjustments

Similar to other traditional four-step travel demand models, the Fresno COG model is not 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, Fresno COG relies on “off-model” adjustments using methodologies commonly used in literature, previously approved or cited by ARB, and consistent with the other MPOs.

Fresno COG considers the following strategies that are quantified “off-model”:

1. Regional electric vehicle (EV) charging infrastructure programs
2. Active transportation projects
3. Vanpool program expansion
4. Rideshare programs
5. Rule 9410 Employer Trip Reductions
6. ITS and other TSM projects

Regional efforts to enhance EV charging infrastructure come from both public and private sectors. A good example of the effort is the Fresno Rural Transit Agency secured funding to install publicly accessible solar powered charging stations at all municipal yards of the small cities that it serviced throughout the Fresno COG region. PG&E recently announced that it will significantly expand access to EV charging stations throughout Northern and Central California over the next three years. Up to 7,500 EV charging stations will be installed at apartment, condominium complexes and workplaces. Electrify America, a subsidiary of Volkswagen, plans to invest $800 million in Zero Emission Vehicle infrastructure and education over the next 10 years in California as part of Volkswagen’s court settlement with U.S. regulators over excessive diesel emission. Fresno Metropolitan Statistical Area
(MSA) is included as one of the six metro areas selected for the investment. A methodology created by SANDAG will be adapted and applied to quantify the additional electric VMT not accounted for in the EMFAC model because of the additional regional efforts in building EV infrastructure. The SANDAG methodology was modified to accommodate Fresno COG’s 2018 RTP/SCS modeling conditions, a different horizon year from SANDAG for example. Parameters and assumptions were updated to reflect Fresno COG’s regional conditions. Vehicle fleet and VMT numbers were updated using EMFAC2014 output. The numbers of Regional Residents ZEVs are scaled from San Diego EMFAC MY percentages. However, the percentage of eVMT increase due to regional charger program is assumed to be 5% (6% lower than the SANDAG assumption), to account for regional differences between San Diego and Fresno regions.

Fresno COG uses Moving Cooler, An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emission, to account for the reduction in VMT from the active transportation, ITS and other TSM projects. Specifically, Table 4.2 in Moving Cooler identifies the GHG reduction that can be expected from different strategies at varying level of deployment. For 2018 RTP/SCS Fresno COG assumes an Aggressive level of deployment of Combined Pedestrian and Combined Bicycle strategies in 2020, 2035 and 2042.

CalVans provides vanpool services to farmworkers and commuters in the rural counties in California. The agency reports Passenger Lane Miles (PLM) Reduced by van service by county. CalVans received $3 million in 2015/2016 from the AHSC program for the Vanpool Expansion project and expects to have rapid growth in its fleet size. Fresno COG will project the VMT savings from the vanpool program based on the historical PLM and the growth projection from CalVans.

Fresno County Measure C carpool program is funded by Fresno County’s ½ cent sales tax, Measure C. It provides incentives to commuters who carpool. The program reported 58,527 daily commute carpool VMT in year 2015/16. It is assumed that the level of participation in this program will continue into the future at the same rate as the reported year, with the assumption that Measure C will be renewed again in 2026.

San Joaquin Valley Air Pollution Control District Rule 9410 implements Employer Based Trip Reduction through eTRIP program. The eTRIP Rule (Rule 9410, Employer Based Trip Reduction), was adopted by the Air District in 2009. The rule requires larger employers to establish an Employer Trip Reduction Implementation Plan (eTRIP) to encourage employees to reduce single-occupancy vehicle trips, thus reducing pollutant emissions associated with work commutes. The VMT reduction of work commutes was estimated based on model reported average home-based work trip length, countywide worksite numbers, and average number of employees per worksite by tier. The VMT reduction was
applied to the total VMT by scenario before it was fed to EMFAC emission model, where GHG and criteria pollutant emissions were calculated.

A detailed documentation of the quantification methodology of the above off-model strategies will be provided as part of the RTP/SCS document.