

## APPENDIX D. Recommended Method to Calculate Mobile Source Emissions from EMFAC Model

### Background:

The **Emission FACTors (EMFAC) model** was developed by California Air Resources Board (CARB) for use to calculate emissions from all motor vehicles operating on highways, freeways and local roads in California. The following discussion is based on EMFAC2014, the most recent version of this model.

Generally, a land use project's mobile source emissions are calculated based on its forecasted vehicle miles traveled (VMT) and the emission rates for each vehicle class from passenger cars to heavy-duty trucks. EMFAC2014 includes the database for VMT data, vehicle population, vehicle trips, and emission factor profiles for exhaust emissions, evaporative emissions, and tire and brake emissions so it can calculate mobile source emissions by the user's selection for statewide, regional, or local such as air basin or county areas. EMFAC2014 can be downloaded and run through a personal computer. The EMFAC2014 software installation package can be downloaded from <https://www.arb.ca.gov/msei/categories.htm>. It also can be accessed through CARB's EMFAC2014 Web Database which can provide a quick and easy way to obtain commonly used EMFAC emissions and emission rates data through internet access. The EMFAC2014 Web Database can be accessed from the following website: <https://www.arb.ca.gov/emfac/2014/>.

As stated in the District's CEQA Handbook, in addition to CalEEMod the project applicant can use the EMFAC model to calculate the project's related mobile source emissions by using emission factors from EMFAC and the project's specific vehicle trips along with the VMT developed as part of the project's traffic study. To do this, the District recommends the following method that uses the project's specific data to calculate the project's related mobile source emissions at the buildout.

### PCAPCD Recommended Method:

Mobile sources emissions are calculated based on the project's related VMT and emission factors generated from the EMFAC model for Placer County. Prior to the calculation, the applicant should identify the project's total VMT from its traffic study. The following describes the recommended steps to calculate the project's mobile source emissions when its total VMT is estimated. The District requires that the project's CEQA document should explicitly describe how the project's mobile source emissions are calculated. All the related calculation spreadsheets and data generated from the EMFAC2014 should be well-organized and included in the document for review.

#### Step 1: Generate the Placer County specific mobile source data from EMFAC2014 Web Database

When the EMFAC2014 Web Database window opens, the project applicant should select the appropriate variables to generate the Placer County specific mobile source data. The following are the District's suggested selections:

- Data Type: Emission Rates
- Region: Air District for Placer County APCD or sub-Area for Placer (LT), Placer (MC), or Placer (SV)
- Calendar Year: Project's Buildout Year
- Season: Summer for criteria pollutants or Annual for GHGs
- Vehicle Category: EMFAC2011 Categories-All
- Model Year: Aggregated
- Speed: Aggregated

- Fuel: All or Special fuel-type such as diesel, gas, or electric

When clicking the “Download Data” button, an Excel spreadsheet will be generated by the model which includes the data from the selected variables.

Step 2: Determine the percentage of VMT contributed in the region by each vehicle class

The spreadsheet downloaded from Step 1 includes the VMT data for each vehicle class in the selected region. The applicant can use this data to determine the % of VMT contribution for each vehicle class. This % of VMT will be used to allocate the project’s total VMT for each vehicle class.

Step 3: Determine the project’s VMT for each vehicle class

The following equation is used to determine the project’s VMT for each vehicle class in the buildout year.

$$VMT_{\text{vehicle class, CY}} = (VMT_{\text{CY}} * \text{Fleet Mix}_{\text{vehicle class, CY}})$$

Where:

- VMT<sub>vehicle class, CY</sub> is the project’s miles traveled by each vehicle class in the buildout year.
- VMT<sub>CY</sub> is the forecasted project’s daily VMT in the buildout year.
- Fleet Mix<sub>vehicle class, CY</sub> is the % of VMT contributed by a vehicle class in the region from EMFAC2014.

Step 4: Calculate the emissions for a pollutant

This step is to calculate the pollutant mobile source emissions from the project’s forecasted mobile activities.

$$\text{Emissions}_{\text{pollutant, CY}} = \sum_{LDV}^{HDV} (VMT_{\text{vehicle class, CY}} * ER_{\text{vehicle class, pollutant, CY}})$$

Where:

- Emissions<sub>pollutant, CY</sub> is the running emissions calculated for a pollutant in the buildout year.
- VMT<sub>vehicle class, CY</sub> is the miles traveled by each vehicle class in the buildout year from Step 3.
- ER<sub>vehicle class, pollutant, CY</sub> is the emission rate of a pollutant by each vehicle class in the buildout year. This data is included in the spreadsheet downloaded from EMFAC2014 Web Database by Step 1.

Each pollutant can be calculated by following the above District recommended method. Please note that the applicant should identify the project’s total VMT from its daily or annually traffic study. The District’s significance thresholds for ROG, NOX, and PM10 are daily base and GHG emissions are annual base. If the project’s traffic study estimates the daily VMT, the applicant should include an appropriate assumption to estimate how the annual VMT is forecasted so the GHG annual emissions from mobile sources can be determined.

