

EMFAC 2014



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Outline

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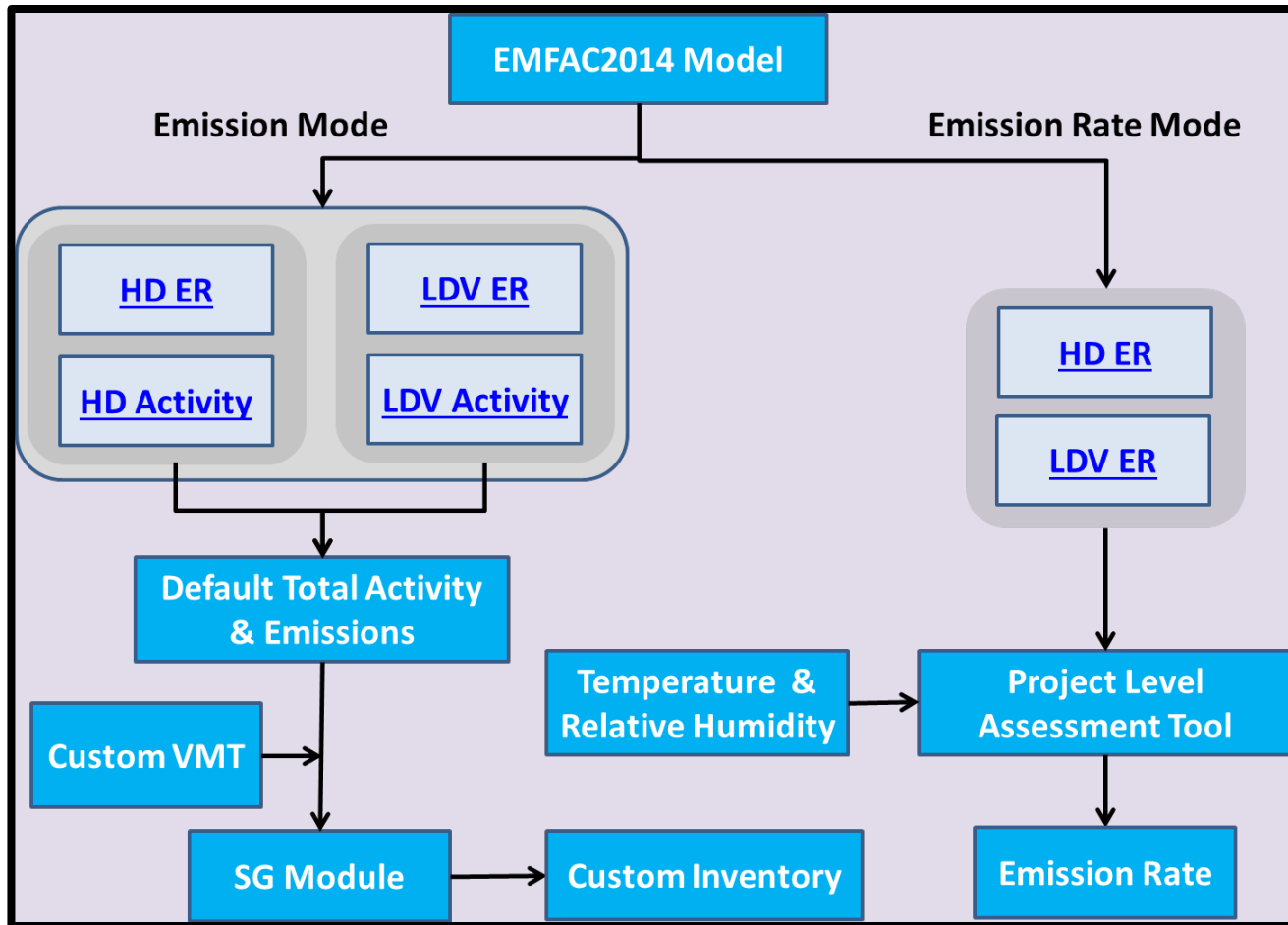
Introduction – Purpose of EMFAC

- Supports Air Quality Planning & SIPs
 - 2008 Ozone standard
 - PM2.5 plans
- Supports Rulemaking
 - Rules to set emission standards for new vehicles
 - Programs to control in-use vehicle emissions
- Supports Analyses that need to be Consistent with GHG inventory
 - New EMFAC “default” uses VMT estimates calculated such that the associated fuel use matches historical fuel sales, similar to GHG inventory

Major Changes

- New programming architecture (MySQL/Python)
- Fuel based default activity while provide capability for specified custom activity
- Socio-econometric modeling of population and VMT
- Revision of heavy-duty diesel truck emission rates
- Incorporation of natural gas vehicles
- Reflecting latest federal and state regulations & standards

Model Structure



Architecture

- MySQL Server
 - Data storage
 - Computation
- Python
 - Workflow
 - Graphic User Interface

Model Demonstration

- Demonstration
 - Emissions mode
 - Web version
 - PL
- Please refer to EMFAC2014 User's Guide for:
 - MySQL Server Installation and Configuration
 - EMFAC2014 model installation

Emissions Mode

- Emissions Run Types
 - Default Emissions
 - Fuel based default activity
 - Custom Activity Emissions (SG)
 - $Custom\ Emissions = Default\ Emissions * \frac{Custom\ Activity}{Default\ Activity}$
- Default emissions mode provides all the options and levels of aggregation
- However, if users do not need hourly emissions or special outputs such as Cat/NCat, the web version provides an easier and quicker way to obtain emissions data

Web Version

- Pros comparing to running model
 - No need to install anything
 - Faster
 - Provides spatially aggregated data
- <http://www.arb.ca.gov/emfac>
- Limitations
 - No hourly emissions FOR NOW
 - No Cat/NonCat split
 - Does not calculate emissions based on custom activity (but there is plan to include emissions based on MPO provided activities)
 - Does not provide emission rates by temperature and humidity, which should be obtained by running PL

EMFAC2014-PL design

- User specified conditions:
 - spatial scales and locations
 - analysis period (month, season, annual average)
 - vehicle classes, model year
 - fuel type aggregation option
 - temperature and relative humidity
 - link speeds

Demo Scenarios

- Scenario 1: Arterial Link with Default Fleet Mix-Running PM2.5
- Scenario 2: Regional Bus Terminal - Diesel Motor Coach – Idle Emissions
- Scenario 3: Urban Bus Terminal - UBUS Idle Emissions
- Scenario 4: Park-n-Ride Parking Lot- Evaporative and Start Emissions

Scenario 1 - Project Details

- The project is for a lane expansion on an existing arterial
- Location: Sacramento, CA
- Analysis year: 2020
- Area is in nonattainment of the annual PM_{2.5} NAAQS and the 2006 24-hour PM_{2.5} NAAQS
- Assessment performed for four periods of a day: Morning peak, Midday, Evening peak, and Overnight
- VMT split between Truck and Non-Truck is known
- Average link speed: 30 mph, same for any period
- Meteorology data for the four periods available

Scenario 2 - Project Details

- This project is a interregional bus terminal where all buses are diesel motor coaches.
- Main process under study at the terminal: idling
- Located in Solano county in San Francisco Bay Area Air Basin
- Analysis year: 2016
- Fleet consists of model year 2008 and 2014
- Population is specified by model year
- Temperature and humidity available, but they do not affect idle emissions.

Scenario 3 - Project Details

- This project to evaluate the idling emissions from urban buses at a bus terminal.
- Sacramento county, 2016
- Population specified by model year: 2008 and 2014
- Population specified by fuel type
- Temperature and humidity: 70F, 70%
- Use running exhaust at 5mph to approximate idle:
- Idle Rate $\left(\frac{g}{hr}\right) = RUNEXER \left(\frac{g}{mile}\right) * 2.5mph$

Speed Bin	Speed Value to compute SCF	Definition
5	2.5*	Speed <=5.0
10	7.5	5.0 < Speed <= 10.0
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Scenario 4 - Project Details

- This project is for a park-n-ride parking lot
- Located in Sacramento county
- Analysis year: 2020
- Vehicle activities including population, number of starts and soak time distributions are collected for fleets defined using EMFAC2007 language: LDA, LDT1, LDT2, MDV and MCY
- Soak time intervals are 5, 360 and 720 minutes
- Population by model year unknown
- Population by fuel type unknown
- Temperature and relative humidity: (70F, 70%)

References

- EMFAC Web Version
(<http://www.arb.ca.gov/emfac>)
- EMFAC2014 User Guide
(<http://www.arb.ca.gov/msei/categories.htm>)
- EMFAC2014 Handbook for Project-level Analyses (link to be announced)
- Questions: please email us at emfac2014@arb.ca.gov