

Summary

SECTION 7.9 ENTRAINED ROAD TRAVEL, PAVED ROAD DUST

Revised and updated, March 2021
California Air Resources Board

Emission Inventory Source Category

Miscellaneous Processes/Road Dust

Emission Inventory Codes (CES Codes) and Description

- 640-635-5400-0000 (83618)** Paved Entrained Road Dust-Freeways
- 640-637-5400-0000 (83626)** Paved Entrained Road Dust-Major Streets
- 640-639-5400-0000 (83634)** Paved Entrained Road Dust-Collector Streets
- 640-641-5400-0000 (83642)** Paved Entrained Road Dust-Local Streets
- 640-643-5400-0000 (89656)** Paved Entrained Road Dust-Rural Streets
- 640-636-5400-0000 (47456)** Paved Entrained Road Dust-Unspecified Paved Roads

Method Summary

The paved road dust category includes emissions of particulate matter (PM) from resuspended road surface material that are entrained by vehicular travel on paved roads. The California Air Resources Board (CARB) staff estimated 2017 Total PM, PM10, and PM2.5 emissions for freeway, major, collector, local¹, and local rural/sand/gravel processing facility² roadways by county, air basin, and district (COABDIS). This methodology does not include motor vehicle emissions (exhaust, brake, nor tire wear), nor TOG, CO, NO_x, SO_x, or PM exhaust emissions; these emissions are included in CARB's mobile source emission inventory.

¹ As with the previous version of this methodology, the current 2021 update notes that SJU District splits local roads into local and local rural classes, and uses separate silt loading values. Due to anticipated higher silt loading levels, a higher silt loading value derived from AP-42 data is used in computing emissions for local rural roads. Local emissions include only local urban roadways. Local rural emissions are captured under the "Local Rural, Sand/Gravel Proc." roadway category.

² The updated 2021 methodology uses the same emissions as the 2018 update provided by SC District (South Coast Air Quality Management District, SCAQMD) from paved roads at sand and gravel processing facilities (Unspecified Paved Roads).

Emission Factor Source

The emission factor equation and corresponding emissions factors are from U.S. EPA's AP-42 document, Section 13.2.1 (January 2011). The California-specific roadway silt loading inputs are from a Midwest Research Institute (MRI), University of California, Davis, and University of California, Riverside study conducted in 1995-1997. A default statewide average vehicle fleet weight was used based on an informal traffic count conducted by MRI in 1996. Precipitation data from gridMET was used to estimate the average number of days per year during 2007-2017.

Activity Data Source

Data from CARB's EMFAC2017 model, Air Districts, and transportation planning agencies were used to estimate region specific vehicle miles traveled (VMT). VMT were distributed using 2017 travel fractions calculated using California Department of Transportation (Caltrans) Highway Performance Monitoring System (HPMS) data, by COABDIS, for each of five road types: freeway, major, collector, and local/local urban, and local rural.

Temporal Data

Average daily precipitation data for 2007-2017 from gridMET were used to determine the average number of days per year that each COABDIS received 0.01 inch or greater, of precipitation. The temporal profile used the average daily precipitation data to calculate a normalized rainfall value, per month, to reflect seasonal rainfall patterns by COABDIS.

The methodology assumed that on-road motor vehicles see peak activity at 7 AM and 4 PM, with uniform activity on weekdays and reduced activity on weekends, 52 weeks a year.

Changes in Method and Emissions Estimates

VMT were updated to reflect 2017 activity based on CARB's EMFAC2017 model, Air Districts, and transportation planning agencies. Travel fractions were updated for Freeway, Major, Collector, Local/Local Urban, and Local Rural roads to reflect 2017 Caltrans HPMS data. The average number of days per year that each county within an air basin received 0.01 inch or more of precipitation during 2007-2017 were updated using gridMET precipitation data. Entrained road dust emissions for 2017 PM10 and PM2.5, by COABDIS were updated. The methodology now includes Total PM emissions, by COABDIS.

Date of Last Update

March 2021

MISCELLANEOUS PROCESS METHODOLOGY 7.9
Entrained Road Travel, Paved Road Dust
Revised and Updated March 2021

Growth Parameter

Emissions for all roadway categories are assumed to be proportional to changes in VMT.

Statewide Emissions Summary

(2017-Annual Average Tons/Day, Uncontrolled)

| EIC Code | Description | TOG | CO | NOX | SOX | PM10 |
|-----------------------------|-------------------------|------|------|------|------|--------|
| 640-635-5400-0000 | Freeways | 0.00 | 0.00 | 0.00 | 0.00 | 24.99 |
| 640-637-5400-0000 | Major Streets | 0.00 | 0.00 | 0.00 | 0.00 | 38.25 |
| 640-639-5400-0000 | Collector Streets | 0.00 | 0.00 | 0.00 | 0.00 | 11.18 |
| 640-641-5400-0000 | Local Streets | 0.00 | 0.00 | 0.00 | 0.00 | 84.19 |
| 640-643-5400-0000 | Rural Streets | 0.00 | 0.00 | 0.00 | 0.00 | 13.38 |
| 640-636-5400-0000 | Unspecified Paved Roads | 0.00 | 0.00 | 0.00 | 0.00 | 1.65 |
| Statewide PM10 Total | | 0.00 | 0.00 | 0.00 | 0.00 | 173.62 |