On-Road Mobile Source SIP Inventory – EPA MOVES2010a Overview

The purpose of this document is to explain how EPA MOVES2010a (Motor Vehicle Emission Simulator) released in August 2010 was utilized to design a PM2.5 SIP on-road mobile source SIP inventory for air dispersion modeling. The inventory episodes covered 86 wintertime days in 2007, 2008 and 2009 - 2010 covering 17 counties. Counties that are members of a Metropolitan Planning Organization (MPO) were modeled by their respective MPO. The Utah Division of Air Quality (UDAQ) created inventories for the remaining rural counties.

The modeling goal for this project was to provide a mobile source inventory that approximates transportation conditions based upon best practices in transportation and air quality modeling. Model development relied primarily on interagency consultation procedures to ensure the best mix of local and default MOVES2010a inputs. Model development included discussions on the following topics: MOVES default database scale modifications, GUI selections, County Data Manager input development utilizing local and default data, and output selection for air dispersion modeling. The following agencies provided MOVES modeling development through the interagency consultation procedures.

Cache Metropolitan Planning Organization (CMPO)
EPA Office of Transportation and Air Quality: MOVES Team (OTAQ)
FHWA Resource Center: Air Quality Team (FHWA)
Utah Department of Transportation Systems Planning & Programming: Traffic Analysis
Utah Division of Air Quality (UDAQ)
Utah Division of Motor Vehicles (UDMV)
Mountainland Association of Governments (MAG)
Wasatch Front Regional Council (WFRC)

(1) PM2.5 SIP Modeling Domain Responsibilities

The modeling domain is divided into two groups: counties modeled by a Metropolitan Planning Organization (MPO); and counties modeled by UDAQ Planning Branch (Mobile Sources and Transportation Section):

Agency	Non-Attainment	County(-ies)	Coordinator
CMPO	Logan, UT	Cache	Jeff Gilbert
MAG	Provo, UT	Utah	Susan Hardy
WFRC	Salt Lake City, UT	Box Elder, Davis, Salt Lake, Tooele, Weber	Kip Billings
UDAQ	none	Carbon, Duchesne, Emery, Juab, Millard, Morgan, Rich, Sanpete, Summit, Wasatch	Rick McKeague Peter Verschoor

(2) PM10 and PM2.5 Fugitive Dust from Paved Roads

PM10 and PM2.5 fugitive dust from paved roads (re-entrained road dust) was modeled by UDAQ for each of the 17 counties and 86 episode days.
The latest EPA-approved version of AP-42, Chapter 13, "Miscellaneous Sources", Section 13.2.1, "Paved Roads" (January 2011), was used to compute the emission factors for PM10 and PM2.5 fugitive dust.

Key inputs to compute the emission factors are:

Average vehicle weight for each data pair (county, road type); units are tons
Silt loading factor for each road type; units are grams per square meter (gm/m2)
Particle size multiplier "k" for PM10 and PM2.5; (unitless)
Precipitation for each data pair (county, episode day); units are number of hours per episode day with precipitation greater than 0.01 inch.

Vehicle miles traveled (VMT) were identical to VMT used in the MOVES model.

(3) VOC Refueling Emissions Included under Total Hydrocarbons

VOC refueling emissions are included under "Total Hydrocarbon" emissions in the base year inventories created from MOVES201A.

In past inventories modeled using MOBILE6.2, VOC refueling emissions were equal to about 6% of VOC exhaust plus evaporative emissions during a typical winter day.

Separate runs using MOVES2010A will be performed to compute VOC refueling emissions. In a post-model adjustment, these emissions will be subtracted from the on-road inventory and will be moved to the Area Source (Non-point) inventory.