

US EPA ARCHIVE DOCUMENT

MOVES Fleet & Activity Inputs 1999 Base Year

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The word "MOVES" is displayed in a stylized, metallic, three-dimensional font with a glowing effect, set against a dark, gradient background.

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What is “Fleet & Activity Data?”

- **Vehicle Populations & Characteristics**
- **Vehicle Activity Descriptions**
 - Essential to any emissions inventory model
 - NOT data EPA typically collects directly
 - Often based on projections and allocations
 - Important source of uncertainty in emission inventory estimates

Characterizing the Fleet

- **Current difference in how activity and emission data sources characterize vehicles**
 - e.g. HPMS VMT Classes & EPA Certification Classes
 - MOBILE guidance includes external HPMS/EPA mapping
- **MOVES integrates activity and emission data:**
 - Source Types
 - defined by unique activity patterns, based on HPMS classes
 - Source Bins
 - defined by unique emission characteristics
 - MOVES maps between the two classification schemes by model year.

MOVES Source Types

HPMS Vehicle Type	MOVES Source Type
Motorcycle	Motorcycle
Passenger Car	Passenger Car
Other 4-tire, 2 axle	Passenger Truck Light Commercial Truck
Buses	Intercity Bus Transit Bus School Bus
Single Unit Trucks	Refuse Trucks Short-haul Single Unit Long-haul Single Unit Motorhomes
Combination Trucks	Short-haul Combination Long-haul Combination

Source Bins

- **Discriminators by “Pollutant”**

- Energy:

- Fuel Type, Engine Technology, Model Year Group, Loaded Weight, Engine Size

- CH₄ & N₂O:

- Fuel Type, Engine Technology, Model Year Group, Regulatory Class

Characterizing Activity

- **Total Activity**

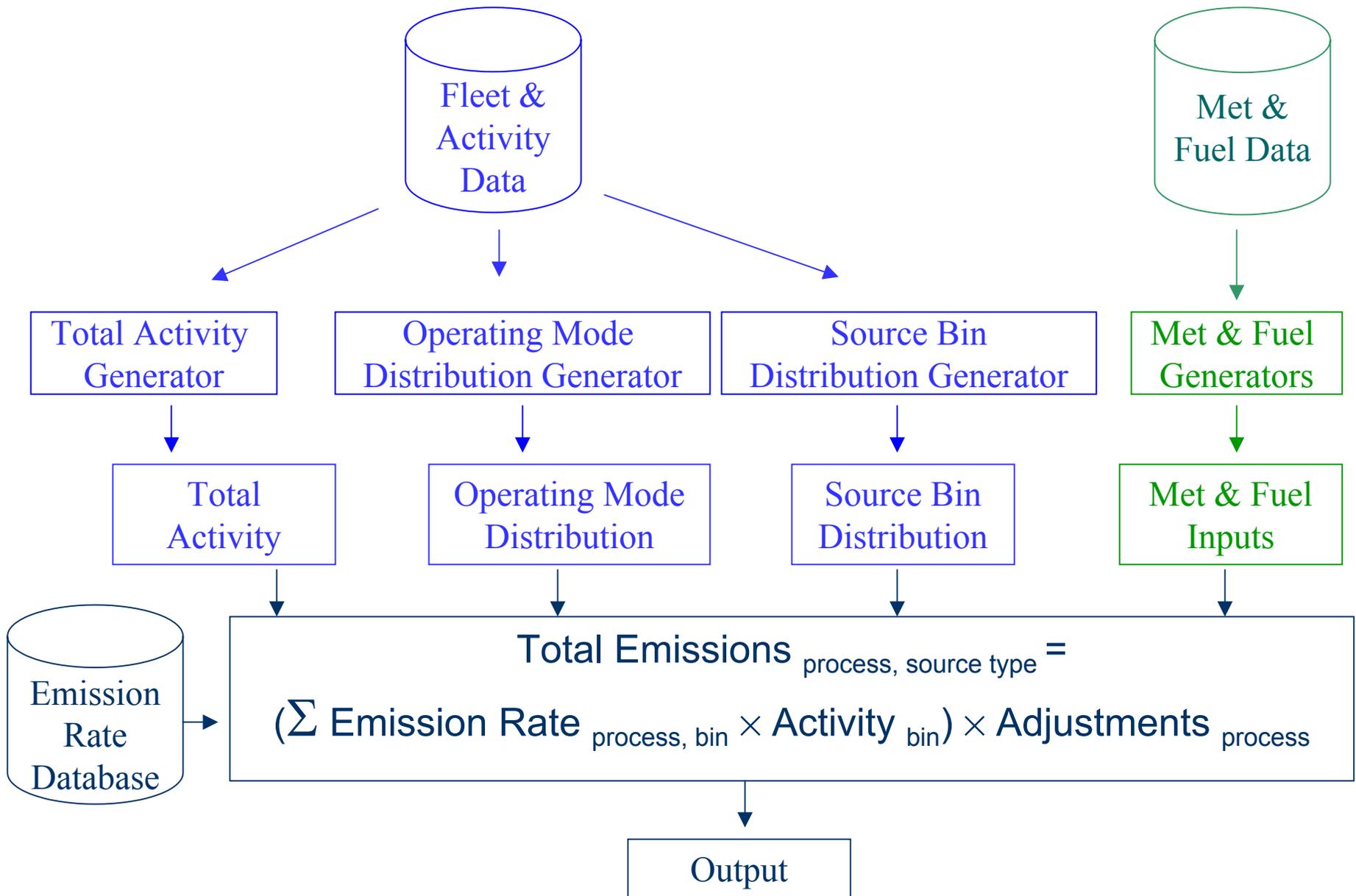
- Population * per-vehicle activity
- Defined on time basis (activity per hour)

- **Operating Mode**

- Division of total activity into sub-categories that differentiate emissions
- Defined by Speed and Vehicle Specific Power

Structure of Fleet & Activity Data in MOVES

- **Default database stores implementation-specific data**
 - In this case -- national macroscale data for MOVES2004
 - Format similar to data sources so relatively easy to obtain & update.
- **Generators convert default data into Core Model Inputs**
 - Highly detailed data in MOVES-specific format
 - Format consistent across implementations



Structure of Fleet & Activity Inputs in MOVES

Total Activity Generator Inputs

- **Generating Analysis Year Populations by Source Type & Age**
 - Base year vehicle populations
 - Scrappage rates
 - Sales growth rates
 - Age distributions

Total Activity Generator Inputs

- **Estimating Travel by Source Type, Age, & Road Type**
 - Base Year VMT by Vehicle Type
 - VMT Growth Rates by Vehicle Type
 - Relative Mileage Accumulation Rates
 - Road type VMT fractions by Source Type

Total Activity Generator Inputs

- **Converting to time basis & allocating activity in time & space**
 - Temporal VMT distributions (Month, Day, Hour)
 - Distribution of Roadway VMT by county
 - Allocations of starts in time & space
 - Allocation of HD extended idle in time & space
 - Average speed distributions

Source Bin Generator Inputs

- **Allocating Source Types to Source Bins by Source Type and Model Year**
 - Fuel/Engine Technology Distributions
 - Regulatory Class Distributions
 - Size/Weight Distributions
 - Model Year Groups

Operating Mode Distribution Generator Inputs

- **Allocating Source Hours Operating to Operating Modes**
 - Average Speed Distributions
 - Driving Schedules
 - VSP coefficients by Source Type
 - average weight
 - rolling, rotating & drag coefficients

Speed & Drive Schedules

- **Average Speed Distributions**
 - By hour, day & roadway type
 - Currently based on MOBILE6
- **Driving Schedules**
 - By source types, roadway type & average speeds
 - Defaults
 - New MHDV and HHDV schedules developed by ERG based on heavy-duty driving surveys
 - MOBILE6 facility cycles used for LD, with new high-speed schedules
 - WVU cycles for urban bus, refuse truck

Where do we get default national data?

- **Polk**-- Registration data, especially used for light duty
- **VIUS97** -- Census survey of truck data
- **FHWA**-- VMT data and registration data
- **NEMS**-- VMT projections
- **Specialized sources:**
 - Federal Transit Administration
 - Recreational Vehicle Industry Assoc.
 - Motorcycle Industry Council
 - School Bus Fleet Magazine
 - etc.

Final Notes

- **Fleet & Activity data are critical inputs to total emission inventory**
- **Like MOBILE6, most data compiled from non-EPA sources**
- **Unlike MOBILE, MOVES is designed to take available data and transform into needed core model inputs**
- **Fleet & Activity Report provides details**