

# FACA MOVES Model Review Workgroup

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# EPA MOVES Model

- **MO**tor **V**ehicle **E**missions **S**imulator
- Will replace current models (MOBILE & NONROAD)
- Designed to allow easier incorporation of large amounts of in-use data from a variety of sources
- New software framework
- complex model: uses binning technique based on VSP

# MOVES: what's different?

- Created in response to NRC Study on mobile source emissions modeling (2000)
- **Inventory Estimation:**
  - MOBILE estimates emission factors (grams/mile)
- **Designed for analysis at multiple scales**
- **Emission rates on modal basis**
  - MOBILE rates based on aggregate driving cycles
- **Software framework:**
  - relational database structure allows easier updates
  - Graphical User Interface (GUI) allows easier use
  - Allows multiple-computer processing if desired
- **New data and methodologies**

# **MOVES Development Team**

- **John Koupal**
- **Megan Beardsley**
- **Ed Nam**
- **Gwo Shyu**
- **Dave Brzezinski**
- **Ed Glover**
- **Prashanth Gururaja**
- **Connie Hart**
- **Larry Landman**
- **Harvey Michaels**
- **Sujan Srivastava**
- **Jim Warila**

# **EPA Workgroup Objectives**

- **To evaluate and provide recommendations on the inputs proposed for use in MOVES...**
  - **emission rates**
  - **fleet & activity**
  - **fuel and other adjustments**
- **To evaluate MOVES input and output structures and their usefulness in meeting the needs of modelers developing SIPs and transportation conformity programs**
- **Under FACA structure, workgroup recommendations are made to the MSTRS**

# **MOVES Workgroup Membership**

- **Chairs:**
  - John Koupal, EPA
  - Matt Barth, UC Riverside
- **Industry:**
  - AAM, AIAM, EMA, API
- **Environmental Groups:**
  - NRDC, Environmental Defense
- **State and Local Government:**
  - NACAA, AASHTO, CARB
- **Federal Government:**
  - EPA, FHWA
- **Academia:**
  - UC Riverside, Georgia Tech, NC State, Cornell

# **MOVES Workgroup Process**

- **EPA presents MOVES modeling materials at meetings**
- **Meeting notes are taken and distributed**
- **Workgroup members poll their membership and provide feedback comments**
- **Comments are compiled, summarized, and distributed**
- **Workgroup discusses comments at next meeting with the goal of developing consensus recommendations to be forwarded to MSTRS**
- **Workgroup also reviews draft MOVES reports as they become available**

# 2007 Meeting Dates and Topics

- **May 18<sup>th</sup>:**
  - Fleet & Activity, Light Duty HC/CO/NOx emission rates
- **June 28<sup>th</sup>:**
  - Light Duty PM rates & Kansas City Study
- **August 16<sup>th</sup>:**
  - Evaporative emissions
- **September 18<sup>th</sup>:**
  - Fuel Effects
- **November 8<sup>th</sup>:**
  - Inspection/Maintenance
- **December 13<sup>th</sup>:**
  - Heavy Duty emission rates and Temperature Effects



# **MOVES is largely shaped by data collected since the release of MOBILE6**

- **Activity**
  - in-use vehicle trip patterns
  - VIUS2002
- **Light-Duty Vehicles**
  - thousands of in-use vehicles from I/M programs
  - Kansas City gasoline PM study
  - remote sensing data
- **Heavy-Duty Vehicles**
  - 100 in-use vehicles (E-55 plus)
  - MOBILE6 based on engine certification data

# Comments and Recommendations (1):

- **Workgroup discusses with EPA have been very open and informative**
- **Extensive MOVES framework development has led to “data holes” that need to be filled or estimated**
- **Much of the early phase of development has been focused on “hole filling”**
- **Next phase of development/maintenance should be based on data improvements prioritized by sensitivity analyses**

# Comments and Recommendations (2):

- **Data:** MOVES depends heavily on data and there is a concern of future year predictions (e.g., 2020 forecast)
- EPA team should develop a “**data collection plan**” that would fill data holes in the current phase and provides data into the future for maintenance
- EPA should consider some type of annual **surveillance data collection program**, in addition to relying on I/M data sets, data from rule making projects, programs such as KC project, PEMS, etc.
- EPA should continue to be aggressive in obtaining data from similar or related data collection programs (state DOTs, California Air Resources Board, CRC)

# Comments and Recommendations (3):

- Workgroup has concerns on how EPA is going to **update MOVES** in the future:
  - sources of data
  - version updates on a regular / irregular basis?
  - perhaps consider an annual version release: MOVE2007, MOVES2008, etc.
- EPA should develop a **validation plan** (potentially funded and carried out by other entities):
  - MOBILE6 and EMFAC comparisons
  - remote sensing data
  - tunnel studies

# Comments and Recommendations (4):

- Significant **outreach** should occur with **transportation community** on interfacing MOVES with transportation data and models
  - FHWA is already addressing
  - TRB Workshop in January
- **Sensitivity analyses** should take place to determine future data needs and for potential bin reorganization in the model
- Ensure that future **funding** stream is available for MOVES development and maintenance