FACA MOVES Model Review
Workgroup

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EPA MOVES Model

- **MOtor Vehicle Emissions Simulator**

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