

# **MOVES2010: Experience to Date**

**MSTRS MOVES Review Work group  
July 31, 2012**

**Gary Dolce**

**U.S. EPA Office of Transportation & Air Quality**

The MOVES logo is presented in a stylized, metallic, three-dimensional font. The letters are white with a dark, shadowed bottom, giving them a sense of depth and weight. The background behind the text is a dark, gradient grey.

**MOVES**



# A Brief History of MOVES

- **MOVES2004 (January 2005)**
  - Established model structure, look & feel
  - Focused on energy & GHG; allowed validation to fuel tax data
- **Draft MOVES2009 (April 2009)**
  - Gave users an early opportunity to learn about and comment on criteria pollutant version of MOVES
- **MOVES2010 (December 2009)**
  - First official release of the MOVES series
  - Required for use in SIPs, and conformity analyses after a 2-year grace period
    - Extended grace period for regional analysis to March 2013

# MOVES2010a

- **Released August 2010**

- Added light duty GHG and fuel economy rules
  - CAFE standards for MY 2008-2011
  - GHG/ CAFE standards for MY 2012-2016
- Changes in GHG emissions, but insignificant changes in criteria pollutants
- Also included some performance and usability improvements
  - Improved methane and ramp algorithms
  - Easier to adapt to LINUX and UNIX systems
- Considered a minor revision for SIP and conformity purposes
  - No new grace period
  - Users could use either MOVES2010 or MOVES2010a

## MOVES2010b

- **Released April 2012**
- **No significant changes in criteria pollutant or GHG emissions**
- **Some changes in air toxics**
  - Some updates to factors used to calculate existing air toxics in MOVES based on new data
  - Addition of air toxics previously available for MOBILE/NMIM, but not in MOVES2010 or MOVES2010a
  - Needed for National Emissions Inventory (NEI)

# MOVES2010b

- **Performance improvements**
  - New debugging features and better error recovery
  - Updated to latest versions of JAVA and MySQL
- **New features**
  - Easier to do multi-county runs at county scale
  - Better functionality for rates option
  - Many other small improvements
- **Considered a minor revision for SIP and conformity purposes**
  - No new grace period
  - Recommend use of MOVES2010b for new work, but don't require user to switch from MOVES2010 or MOVES2010a

## Other Items with the Release of MOVES2010b

- Tools that help convert RunSpecs and user input databases created with previous versions of MOVES2010 to MOVES2010b format
- Updated SIP and Conformity Policy Guidance
- Updated MOVES Technical Guidance
- Spreadsheet converter to ease input of retrofit program data in MOVES

# Feedback Has Informed Improvements in MOVES

- Easier to install
- Improved performance
- Better functionality of rates option
- Easier to use for multiple counties
- Easier to handle vehicle fuel and technology and retrofit inputs
- Improvements to training courses and other outreach

# Process for Informing Users and Getting Feedback

- FACA workgroup
- Peer review of MOVES technical documents
- Guidance documents
- Training courses
- MOVES workshop
- MOVES inbox and FAQ
- Other support to air quality and transportation agencies



# FACA Workgroup and Peer Review

- **FACA Workgroups**

- Met from 2001 to 2010
- Provided important feedback for development of MOVES2010

- **Peer Review of MOVES Technical Reports**

- Light Duty Emission Rates
- Heavy Duty Emission Rates
- Evaporative Emission Calculations
- Gasoline Fuel Effects
- Temperature, Humidity, Air Conditioning, and I/M Adjustments
- Population and Activity Data

# Guidance Documents

- **SIP and Conformity Policy Guidance**

- When to use MOVES for SIPs and transportation conformity analyses
- Originally released December 2009 with MOVES2010
- Updated April 2012 with MOVES2010b release

- **MOVES Technical Guidance**

- Guidance on MOVES RunSpec and CDM inputs for SIPs and regional conformity analyses
- Originally released December 2009 with MOVES2010
- Updated April 2012 with MOVES2010b release

# Guidance Documents

- **Hotspot Guidance for PM**
  - Using MOVES at the project level along with dispersion models for PM hotspots analysis
  - Released December 2010
- **Hotspot Guidance for CO**
  - Using MOVES at the project level for CO hotspot analysis
  - Released December 2010
- **Draft Greenhouse Gas (GHG) Guidance**
  - Using MOVES to estimate GHG emissions and/or energy consumption
  - Release as draft January 2012

# Training Courses

- **Developed and presented with FHWA staff**
- **2-day hands-on training course**
  - First version developed for Draft MOVES2009
    - Presented 20 times to over 600 people prior to MOVES2010
  - Revised after release of MOVES2010
    - Presented 26 times to over 700 people
  - Currently completing third revision of the training
- **3-day PM hotspot training**
  - New course designed to help project planners meet PM hotspot conformity requirements
    - Course covers the use of MOVES together with AQ models
    - Presented 9 times to over 250 people

# MOVES Workshop

- **3-Day workshop in Ann Arbor, June 2011**
- **24 presentations covering technical and policy topics**
- **Over 230 attendees**
- **Considering options for one or two additional workshops before the end of 2013**
  - A technical workshop focused on changes in MOVES2013
  - A workshop focused on development of local input data for SIPs and conformity

## MOVES Inbox and FAQ

- **MOVES inbox ([mobile@epa.gov](mailto:mobile@epa.gov)) is the largest source of user questions and comments**
- **Provided over 2500 responses directly to users**
  - Most responses within a few days but some questions take longer because they require more complex technical analysis
  - Some backlogs when staff are tied up with other MOVES work
- **Posted 65 questions from the inbox on a Frequently Asked Questions (FAQ) page**
  - <http://moves.supportportal.com/ics/support/default.asp?deptID=23024>
  - Currently working to add more questions to the FAQ

# Wide Range of Successful Uses of MOVES

- Numerous states have submitted, or are working on, updated motor vehicle emissions budgets, SIPs, and maintenance plans with MOVES
- Application of SMOKE/MOVES for national inventory and AQ analyses
  - EPA rule analysis
  - 2008 NEI Version 2
- Regional Planning Organizations are conducting regional level analysis using MOVES
- Project sponsors starting to use MOVES for quantitative hotspot analysis

# Wide Range of Successful Uses of MOVES

- **Researchers and policy analysts are using MOVES**
  - Over 20 presentations or posters at 2012 Transportation Research Board conference were MOVES-related
  - About half the mobile source presentations at the 2012 International Emission Inventory Conference are MOVES-related
- **Many international inquiries**
  - Researchers and analysts in Canada, Mexico, Europe, Asia have been interested in adapting MOVES for local use