

# MOVES Update

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MOVES



## Acknowledgements

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Development**

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## What Is MOVES?

- **MO**tor **V**ehicle **E**mission **S**imulator
- **New software framework intended to:**
  - Replace MOBILE & NONROAD
  - Expand Capabilities
    - Additional Sources: Aircraft, Commercial Marine, Locomotive
    - Additional Pollutants: Greenhouse Gases
    - Additional Scope: Life Cycle Analysis

# Why A New Modeling Approach?

- **Respond to external review**
  - National Research Council, “Modeling Mobile Source Emissions”
- **Improve the science**
  - New technology provides opportunity to vastly improve emission data
- **Current questions exceed current tools**
  - Analyses at finer scales
  - Life cycle effects
- **Improve the software**

# Key Changes from MOBILE

- **Estimating inventories**
  - MOBILE estimates emission factors (grams/mile)
- **Multi-scale analysis**
- **Emission rates on modal basis**
  - MOBILE rates based on aggregate driving cycles
- **Software framework**
  - Relational database structure
  - Graphical User Interface
  - Object-oriented programming approach

# Implementation Schedule

- **MOVES2004:** May 2004
  - On-road Energy consumption, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O
  - U.S. at county level inventories 1999 forward
  - Well-to-pump (GREET) integration
- **MOVES2005:** February 2005
  - Draft Aircraft, Commercial Marine, Locomotives
  - Vehicle Manufacture/Disposal component
  - Uncertainty Estimation
- **MOVES2006:** January 2006
  - Final Aircraft, Commercial Marine, Locomotives
  - Draft on-road criteria pollutants & toxics
- **MOVES2007:** June 2007
  - Final on-road
  - Draft non-road

## MOVES2004 Features

- **Default energy use and GHG inventories for every county in U.S.**
  - Aggregated state and national level results too
- **Broad range of “what-ifs” and local customization possible**
  - Built-in “wizard” allows user to vary future alternative fuel and advanced technology mix
  - Alternate activity information can be used, e.g.
    - Driving patterns by roadway and average speed
    - VMT scenarios, start and extended idle activity, etc.

# Policy Evaluation Potential

- **Full range of mobile source strategies**
  - Vehicle-based programs
    - Advanced technology and alternative fuel scenarios
    - Reductions/shifts in in-use fleet
  - Fuel programs
  - Transportation programs
    - VMT reduction
    - Speed reductions / traffic smoothing
- **Total energy & inventory projections**
- **Well-to-Wheel analysis**
  - Allows full evaluation of different fuel pathway options

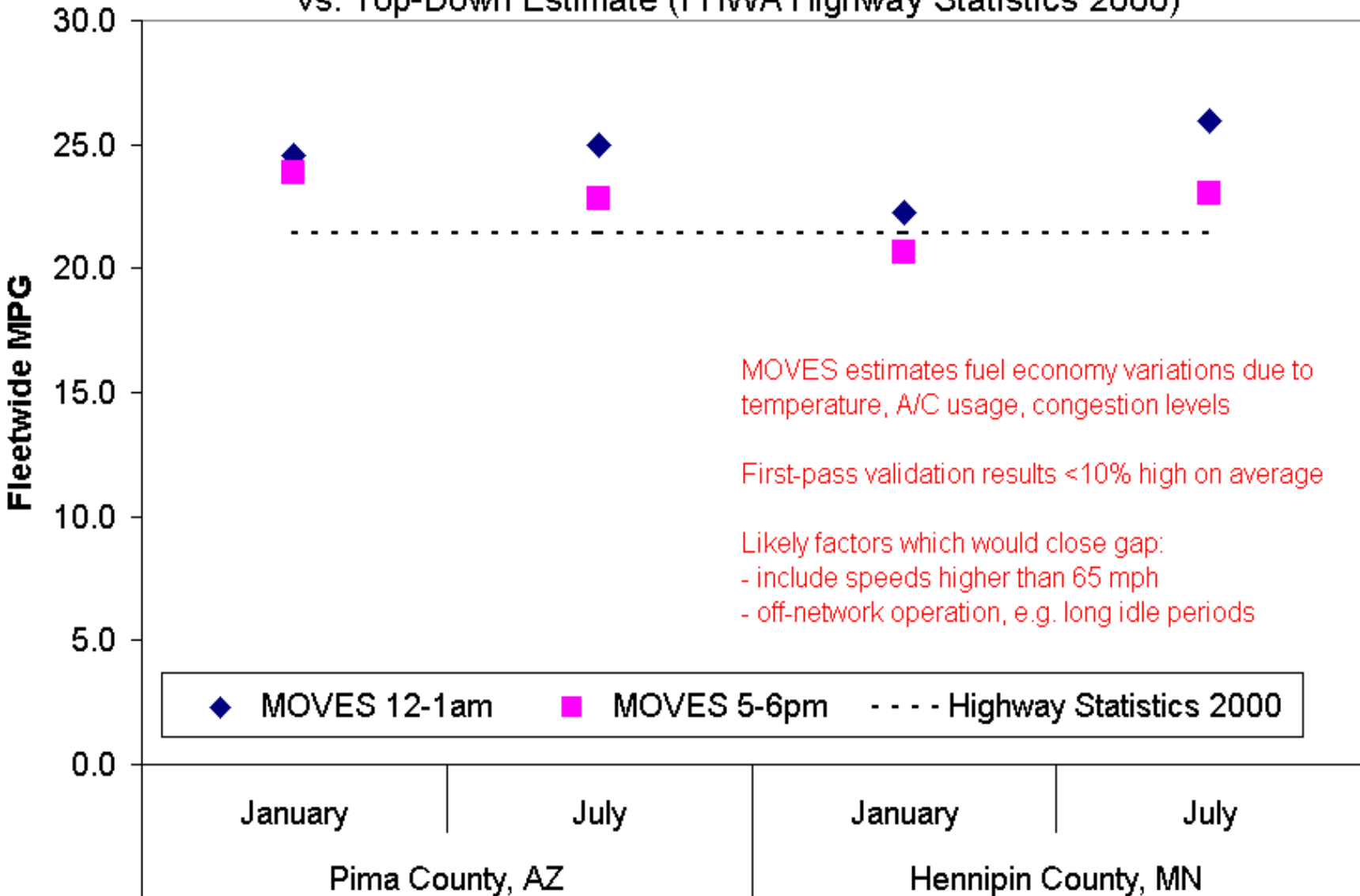


# MOVES2004 Release

- **Draft model and User's Guide (May)**
- **Documentation (June)**
  - Emission input development
  - National default fleet & activity input development
  - Design documentation
  - GREET integration
  - Model results
    - Validation and results
- **Workshop in summer**
- **Will trigger new review process**

### First-Pass Validation:

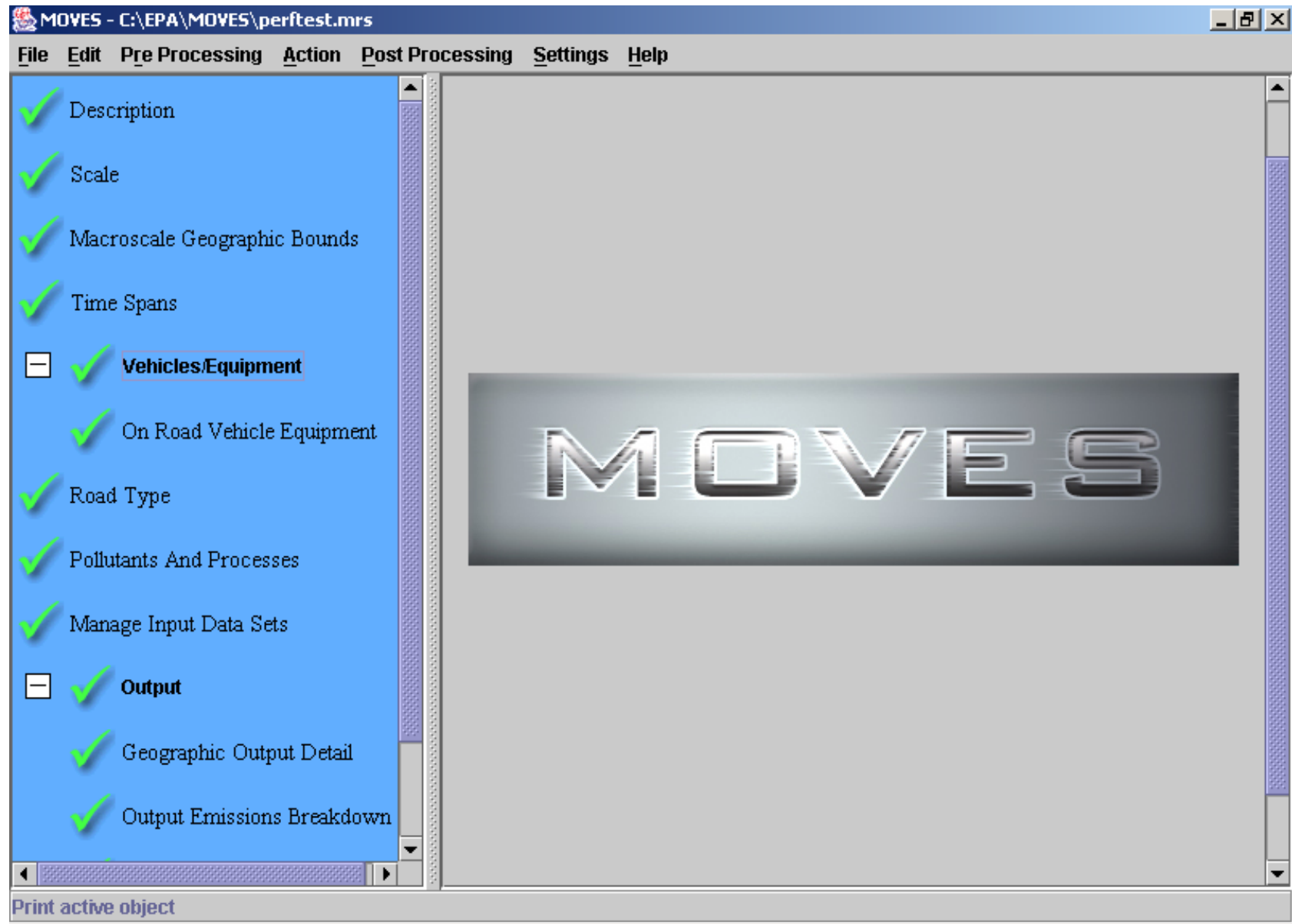
MOVES2004 1999 Fleetwide Passenger Car Fuel Economy Results vs. Top-Down Estimate (FHWA Highway Statistics 2000)



# Working with MOVES

- **Installation package**
  - Includes necessary Java and MySQL components
- **User sets up run specifications through Graphical User Interface**
- **Input and output databases stored in MySQL tables**
  - Can be accessed through MySQL, MySQL GUI, or through ODBC porting to Excel, Access, FoxPro etc.
- **Allows distributed processing on multiple computers for larger scale runs**

# MOVES Interface (Main Window)



## Looking Ahead...

- **MOVES2005**

- Uncertainty estimation
- Aircraft, Commercial Marine, Locomotive
- Vehicle Manufacture/Disposal using GREET

- **MOVES2006**

- High emitter design
- Evaporative emission design
- Data gathering for criteria pollutants and toxics

## MOVES Resources

- **Web site:**
  - <http://www.epa.gov/otaq/ngm.htm>
- **Email Listserver:**
  - EPA-MOBILENEWS
- **Email address:**
  - [newgen@epa.gov](mailto:newgen@epa.gov)