

# Release of Draft MOVES2009

Mobile Source Technical Review Subcommittee  
May 13, 2009

John Koupal  
U.S. EPA Office of Transportation and Air Quality

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

# MOVES

- **EPA's new mobile source emission model**
- **New approach driven by NAS recommendations**
- **New data**
  - Assessed millions of LDVs
  - Landmark Gas PM study (Kansas City)
  - Real-world heavy-duty emissions
- **Designed for analysis at multiple scales**
  - National level using default database
  - County level using local inputs
  - Project level using detailed link-based inputs

# Draft MOVES2009

- **Released Draft MOVES2009 last month**
  - On-road criteria, toxic and GHG pollutants
- **For review and comment only**
  - No official use requiring Draft MOVES2009
  - Encouraging comments to be submitted by
- **Working with FHWA to provide significant training opportunities**
- **Final model to be released at end of year**
  - Hard deadline - needed for next round of O<sub>3</sub> and PM SIPs

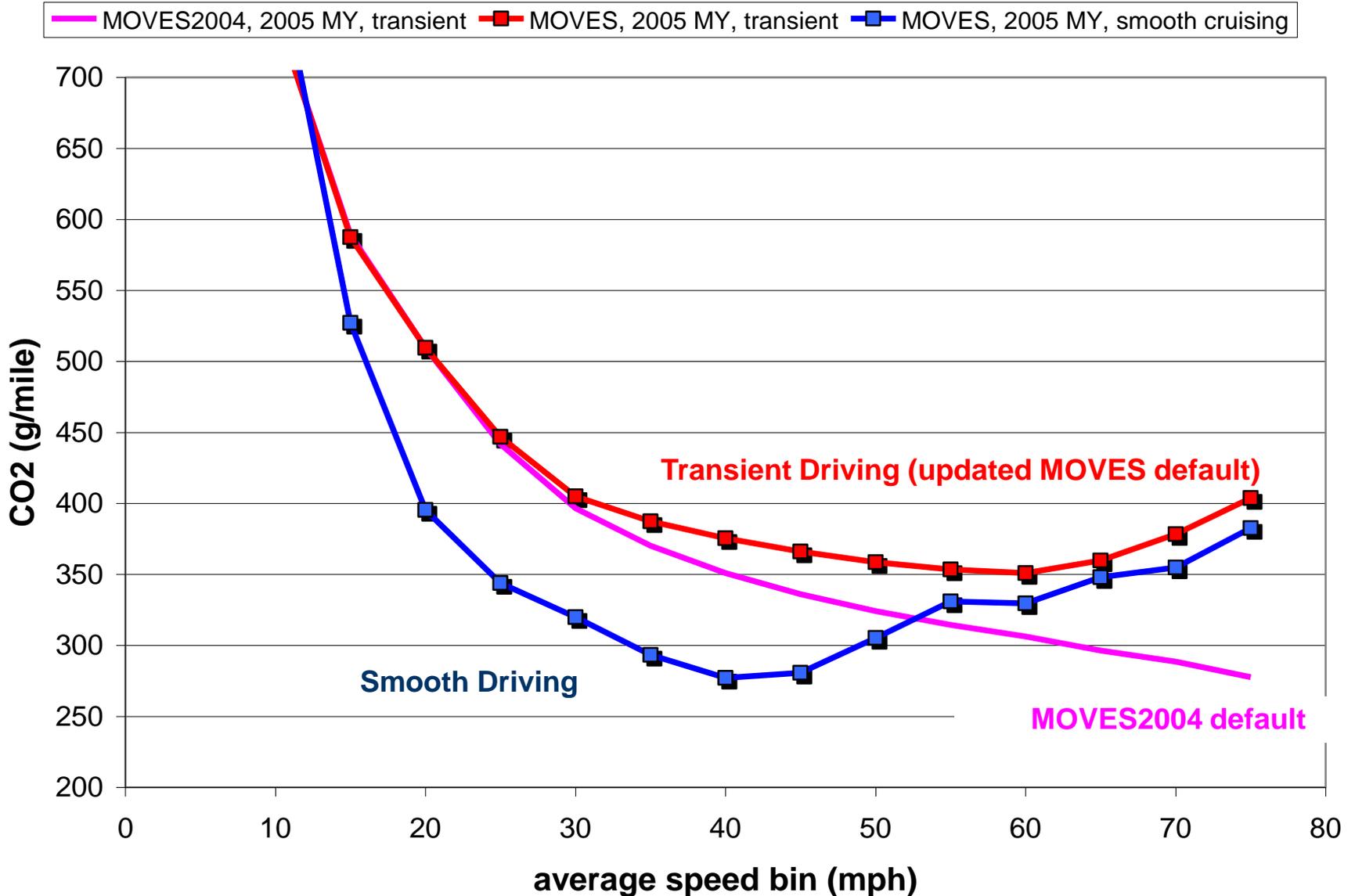
# Planned Review of Draft MOVES2009

- **Public Review**
  - Likely focus on usability & policy questions
- **Formal Peer Review**
  - Under EPA peer review guidelines
  - Focus on science underlying the model
- **FACA MOVES Review Workgroup**
  - Briefed on 4/28, requested workgroup review of model
  - July meeting to focus on workgroup comments
- **Independent Model Validation**
- **Coordinating Research Council (CRC E-68a)**

# MOVES expands ability to quantify driving pattern impacts

- **MOBILE6 was “driving cycle” based**
  - Emissions by speed characterized by set cycles
  - Lacked flexibility to analyze different driving patterns
- **MOVES is “modal” based**
  - Emissions averaged by operating mode “bin”
  - Operating mode bins defined by Vehicle Specific Power (VSP) and instantaneous vehicle speed
  - Allows estimation of emissions from any driving pattern
    - Driving patterns can be defined as the distribution of time spent in each operating mode bin (“operating mode distribution”)

# CO<sub>2</sub> impact of traffic smoothing

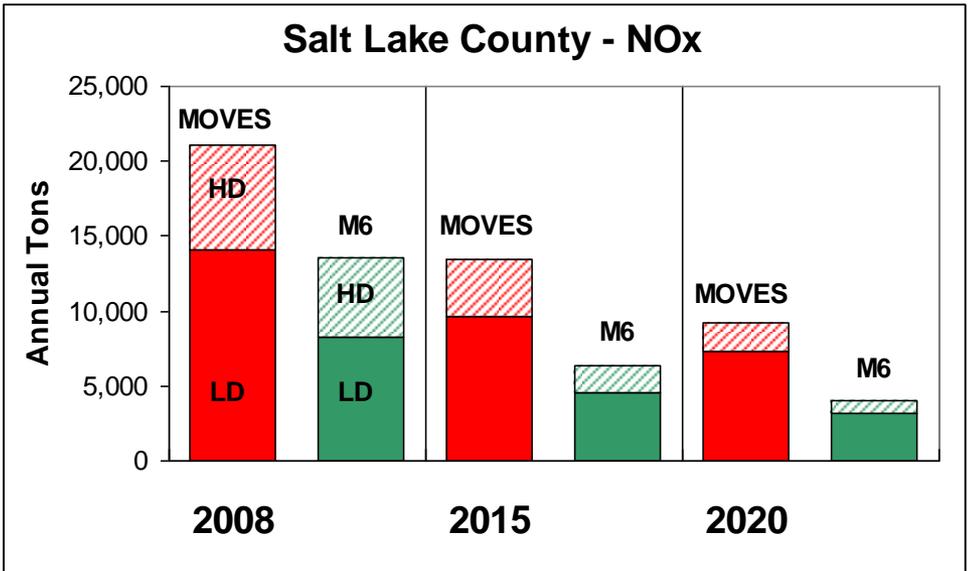
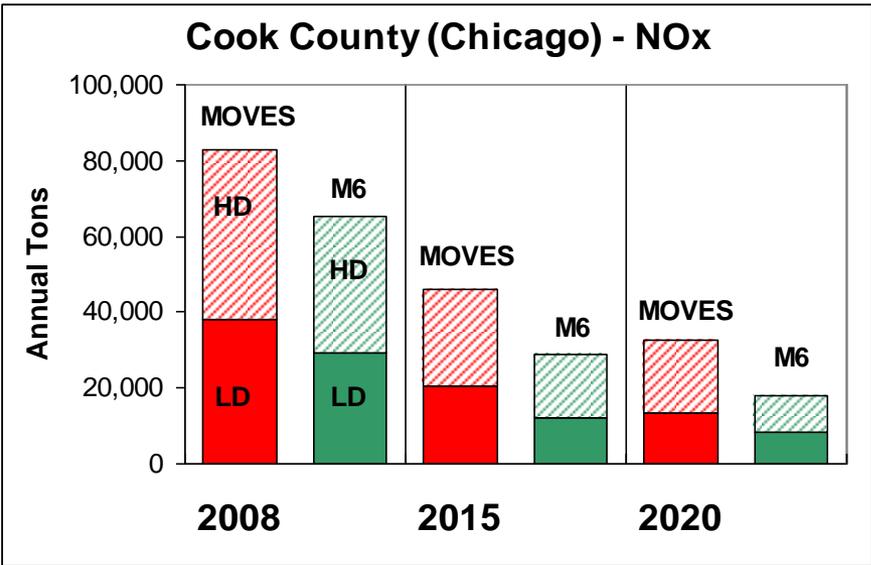
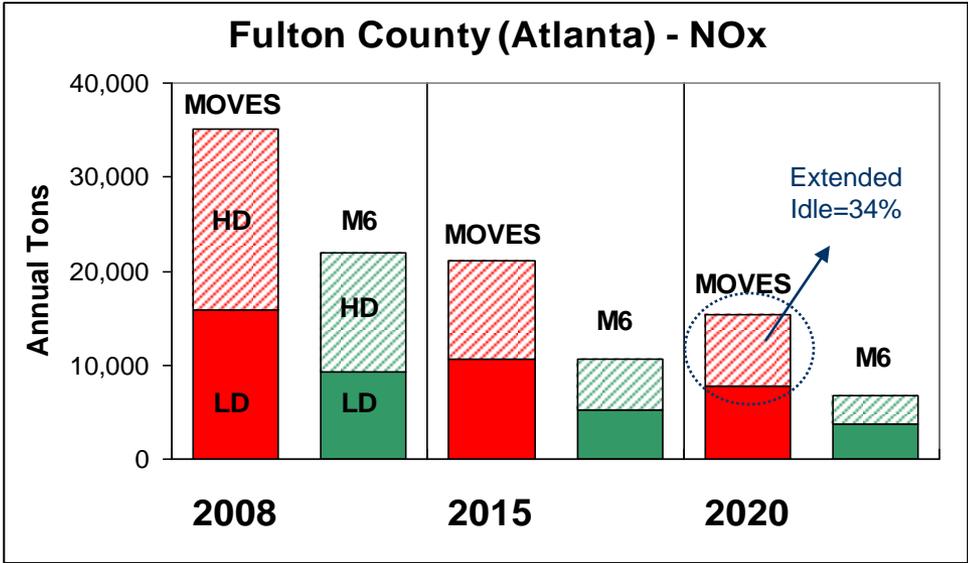


# How does MOVES change our understanding of on-road emissions?

- **Results presented comparing MOVES and MOBILE6 in Chicago, Atlanta, Salt Lake City**
  - O<sub>3</sub> and PM<sub>2.5</sub> nonattainment areas
- **Comparing the cities:**
  - Chicago has younger car/light truck fleet – faster turnover to lower emission vehicles
  - Chicago and Atlanta have high share of heavy-duty traffic; Salt Lake dominated by light duty

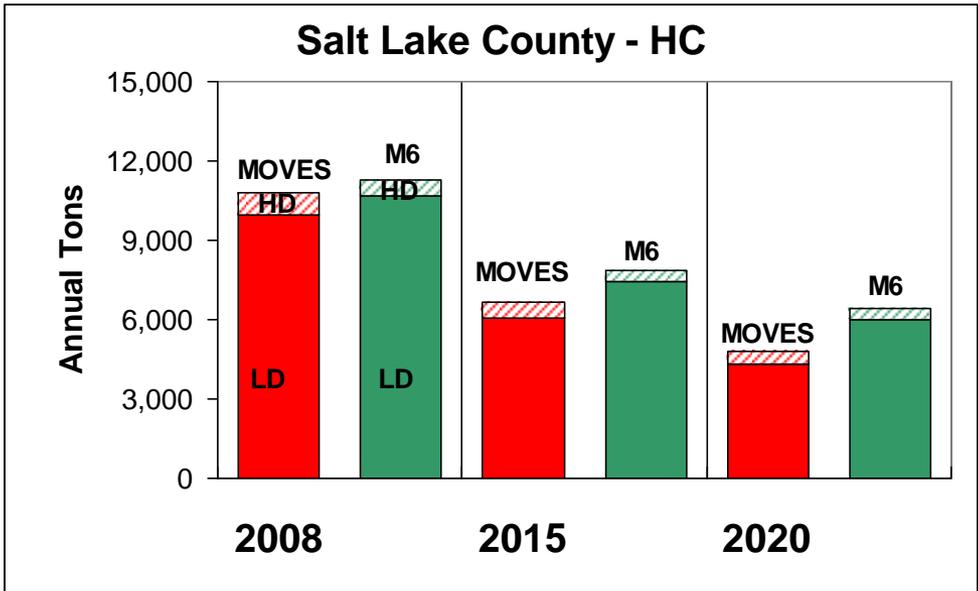
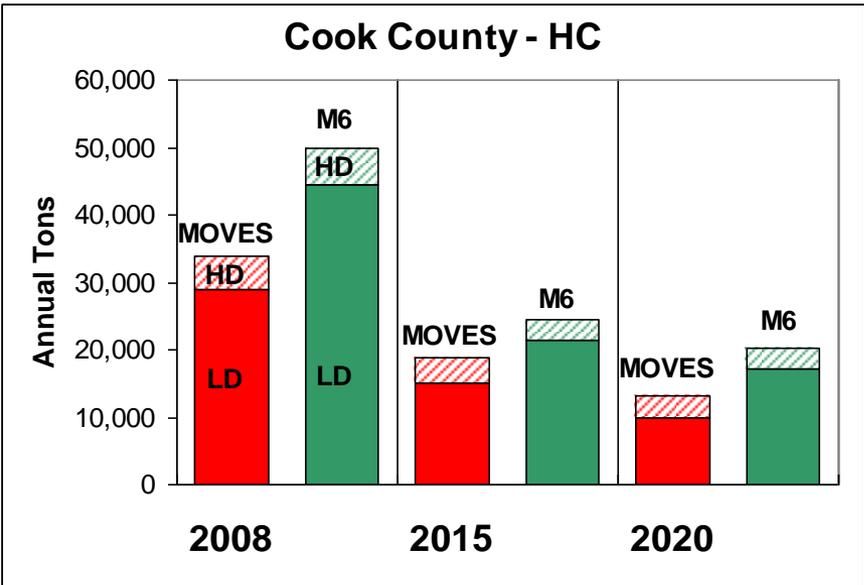
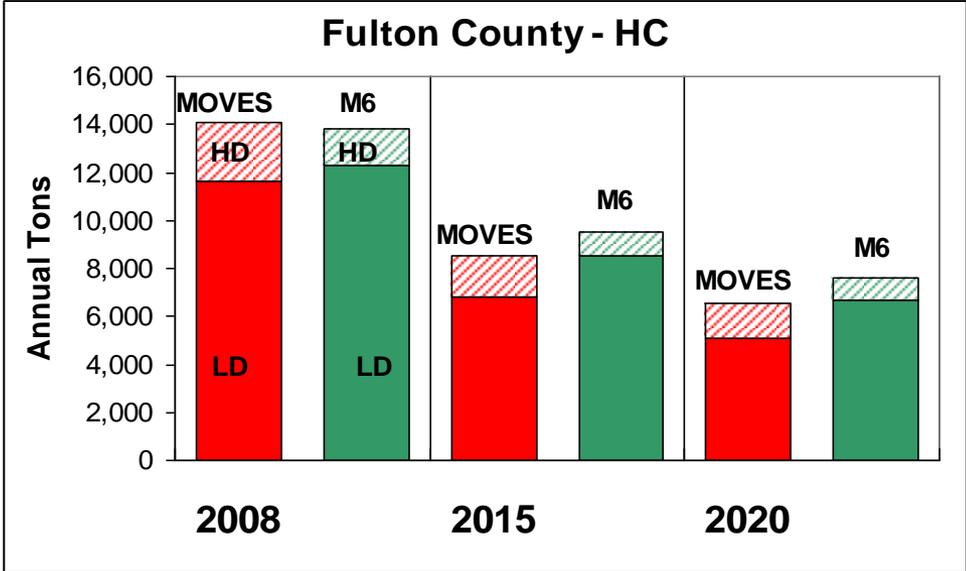
# NO<sub>x</sub>

- I/M program data shows MOBILE6 underestimated NO<sub>x</sub> emissions from light trucks
- On-road data on heavy trucks shows higher emissions than MOBILE6 estimated from cert data
- Extended idle emissions become significant share of heavy-duty inventory in future



# HC

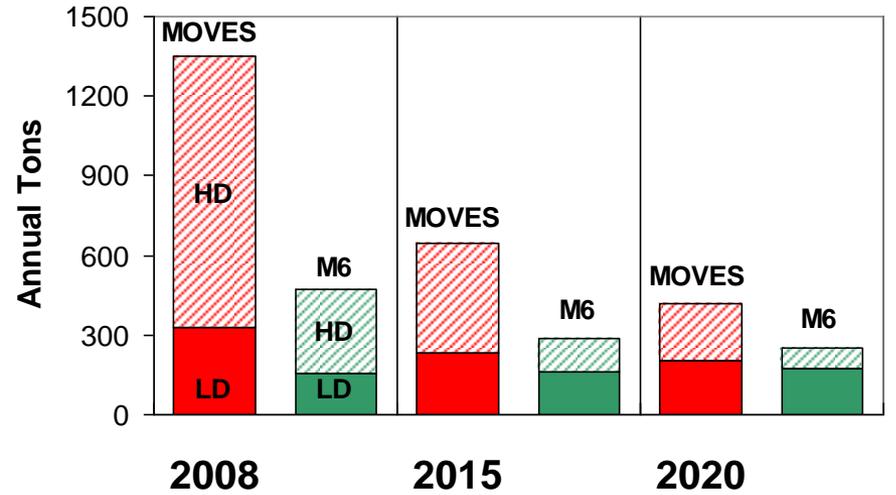
- I/M program data shows MOBILE6 overestimated HC emissions from newer technology cars
- Evaporative emissions on newer technology vehicles very low; re-evaluating leak emissions for final model



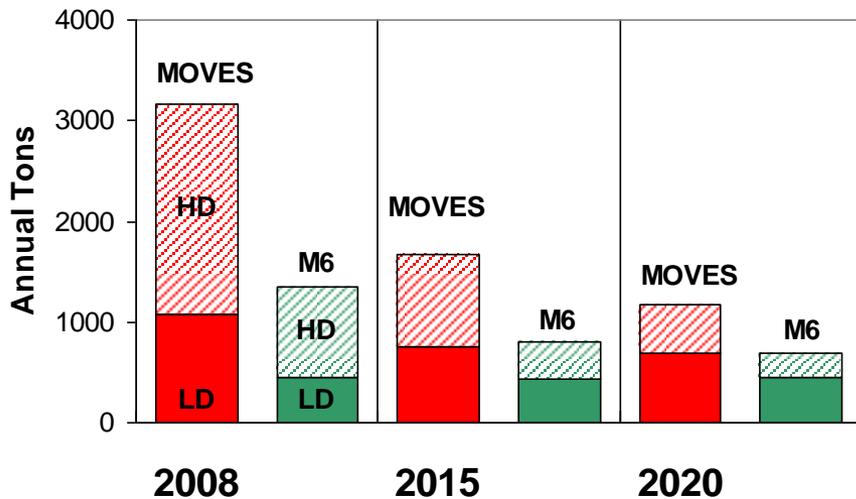
# PM<sub>2.5</sub>

- Kansas City program found high gas PM emissions esp. at cold temps
- New data on heavy trucks shows higher deterioration than MOBILE6
- MOVES accounts for impact of vehicle speed – MOBILE did not

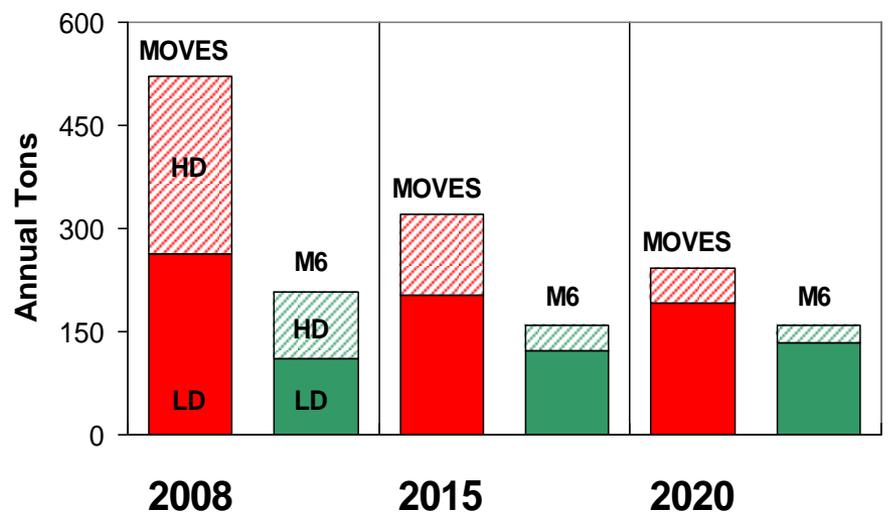
### Fulton County - PM2.5



### Cook County - PM2.5



### Salt Lake County - PM2.5



# What It Means

- **Higher NOx and PM emissions mean mobile sources have bigger role in attainment**
- **Percent reduction from base year is key to attainment analysis**
  - PM2.5 shows higher overall emissions and higher % reductions
    - Effect on attainment demonstrations could be positive
  - NOx shows higher overall emissions but lower % reduction
    - Harder to show attainment
    - Future NOx control measures will have a bigger impact
- **States may need to redo some motor vehicle emissions budgets to meet conformity requirements with MOVES**

## For More Info...

- **MOVES Website:**  
<http://www.epa.gov/otaq/models/moves/index.htm>
- **Email: [mobile@epa.gov](mailto:mobile@epa.gov)**