Helping MPOs with MOVES Inputs for Transportation Conformity

Challenges and Solutions

presented to
EPA MOVES Conference

presented by
Cambridge Systematics, Inc.

David Kall

Thanks to: Keli Kemp, Tracy Selin

June 16, 2011

Transportation leadership you can trust.
Overview

- MOVES Transition Support for MPOs for Transportation Conformity
- MOVES Inventory vs. Emission Rate Mode
- MOVES Inputs Data Sources
Florida DOT Systems Planning Office:

- Developed first Air Quality Postprocessor in FL using MOVES as an emission rate model and integrated within Florida Standard Urban Transportation Model Structure (FSUTMS)
- Provided training to FDOT D3 and MPO staff
CS’ MOVES Transition Experience (Cont’d)

Georgia

» Atlanta Regional Commission:
  • Providing guidance on how to update Cube air quality postprocessor to reflect MOVES
  • Provided training to ARC staff on running MOVES, input requirements, and data options.

Tennessee

» Chattanooga TPO – Updating TransCAD air quality postprocessor to reflect MOVES

Indiana

» Indianapolis MPO – Updating TransCAD air quality postprocessor to reflect MOVES
Two Options for Applying MOVES

- **Option 1: MOVES as an Emissions Inventory Model**
  - Requires running of MOVES every time the travel demand model is modified
  - Uses output loaded network from travel demand model

- **Option 2: MOVES as an Emissions Rate Model**
  - Significantly reduces frequency of MOVES runs
  - Uses emissions rates from MOVES as inputs into travel demand model
MOVES Inventory vs. Emission Rate Mode

**Pros for Inventory Mode**
- No need to develop a TDM post-processor to mimic MOVES
- Operating/Parked relationship updated with changes in TDM
- Properly accounts for VOC process 18 & 19 (refueling) and does not require work-around.

**Pros for Emission Rate Mode**
- TDM Post-processor has some advantages
  - Link-level emissions
  - Visualization of results
- Significantly reduces number of MOVES runs for TIP amendments, etc.
- Static set of emission rates for sharing with adjoining MPOs/other applications, e.g. CMAQ
What Options Are Other Regions Using?

- Option 1: MOVES as an Emissions Inventory Model
  - Metropolitan Washington COG (most work has been with MOVES as an inventory model, but still evaluating option 1 v. 2)

- Option 2: MOVES as an Emissions Rates Model
  - Chattanooga, TPO (TN)
  - Atlanta Regional Commission (GA)
  - Florida (statewide)
  - Dallas-Fort Worth (TX)
  - Houston (TX)
  - Salt Lake City (UT)
  - Baltimore (MD)
  - Cincinnati (OH, KY, IN)
Data Requirements for County Data Manager

Local Registration Data Desired

No National Defaults Available in MOVES (Must Use Travel Demand Model or HPMS Data)

Previous MOBILE6 or MOVES National Defaults Generally Available.
## County Data Manager for MOVES Runs

<table>
<thead>
<tr>
<th>County Data Manager Input</th>
<th>Excel Sheet Tab Name</th>
<th>Common Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source (Vehicle) Type Population</strong></td>
<td>sourceTypeYear</td>
<td>Local Registration Data (often needs updated); Often not available for heavy-duty.</td>
</tr>
<tr>
<td><strong>Vehicle Type VMT (by 13 MOVES Vehicle Types)</strong></td>
<td>HPMSVTypeYear</td>
<td>VMT from Travel Demand Model; Statewide Permanent Count Stations</td>
</tr>
<tr>
<td></td>
<td>MonthVMTFraction</td>
<td>National Default or Statewide Fractions</td>
</tr>
<tr>
<td></td>
<td>DayVMTFraction</td>
<td>National Default or Statewide Fractions</td>
</tr>
<tr>
<td></td>
<td>HourVMTFraction</td>
<td>National Defaults or Permanent Count Station Data</td>
</tr>
<tr>
<td><strong>Average Speed Distribution (% of VHT in each 5 mph speed bin)</strong></td>
<td>avgSpeed Distribution</td>
<td>Travel Demand Model</td>
</tr>
<tr>
<td><strong>Road Type Distribution (VMT by 5 MOVES Road Types)</strong></td>
<td>roadType Distribution</td>
<td>Travel Demand Model</td>
</tr>
<tr>
<td><strong>Age Distribution (Vehicle Population by Age of Vehicle)</strong></td>
<td>sourceTypeAge Distribution</td>
<td>Light-Duty Registration Data; MOVES default age distributions for heavy-duty</td>
</tr>
<tr>
<td><strong>Ramp Fraction</strong></td>
<td>RoadType</td>
<td>Travel Demand Model</td>
</tr>
<tr>
<td><strong>Meteorology Data</strong></td>
<td>ZoneMonthHour</td>
<td>MOBILE6 Data Converted</td>
</tr>
<tr>
<td><strong>Fuel (% of Market Share by Fuel Type)</strong></td>
<td>FuelFormulation</td>
<td>National Defaults</td>
</tr>
<tr>
<td></td>
<td>FuelSupply</td>
<td>MOBILE6 Data Converted</td>
</tr>
<tr>
<td><strong>I/M Program</strong></td>
<td>IMCoverage</td>
<td>MOBILE6 Data Converted</td>
</tr>
</tbody>
</table>