

# **MOVES Task Force Meeting**

September 21, 2010 10 am - noon

## **Meeting Summary**

### **Present:**

Jim Ponticello, VDOT - Co-Chair  
Chris Voigt, VDOT  
Sonya Lewis-Cheatham, VDEQ  
Jessica Daniels, DDOE  
Mark Glaze, FHWA  
Howard Simons, MDOT  
Randy Carroll, MDE  
Jim Frazier, Michael Baker  
Mohamed Khan, MDE (phone)  
Bob Owolabi, Fairfax Co. DOT (phone)

### **Staff:**

Mike Clifford, Ron Kirby, Daivamani (Siva) Sivasailam, Eulalie Lucas, Yu Gao, Erin Morrow, Daniel Son, Anant Choudhary, JC Park, Dusan Vuksan, Joan Rohlf, Sunil Kumar

### **Item 1: Call to Order/Introductions**

The meeting of the Task Force was called to order by the co-chair Jim Ponticello and was followed by introductions of members and staff.

### **Item 2: Review of July 20<sup>th</sup> Meeting Highlights**

The meeting highlights were accepted with the changes proposed by VDOT.

### **Item 3: MOVES2010 Local Data Inputs**

#### **Item 3a: Speed Distributions**

Siva introduced this item by reminding the task force that at previous meetings, staff has shown that the default MOVES data may not be appropriate for some vehicle types such as refuse trucks, school buses and transit buses. Erin referred to a memo and a handout as she presented local data that staff had received from Fairfax County for refuse trucks and school buses. Tables in each document showed the percentage of VMT in each speed bin for both vehicle types from the local data. Sunil asked about the time period from 5 pm to 5 am. Siva responded that MOVES requires an input for each hour of the day and for those hours, the vehicle is assumed to travel with the traffic stream. Howard asked what percentage of the vehicle fleet is comprised of refuse trucks. Siva responded that it was less than one percent, but they are HDV traveling at a slow speed so emissions are higher. Mike said that what strikes him most about Table 3 is that throughout the day, MOVES default data has refuse trucks travelling with the traffic stream when in reality, most trash trucks are travelling at low speeds. Staff is proposing to substitute more realistic speeds. Siva told the task force that there are more school bus samples available,

all from Fairfax, and that for the time period from 6 pm to 6 am, staff recommends using the traffic stream speeds from the post-processor.

### **Item 3b: SIP Temperatures**

Eulalie referred to a handout which illustrated the results of sensitivity tests with different average speed distributions and SIP temperatures for Montgomery County (analysis year 2005). The bar representing interpolated Mobile6 emissions is on the left of each chart and the subsequent bars present the results of a one-off comparison for the different inputs, and finally on the right is a bar with the emissions results from a composite set of inputs which is the closest that we have to the final set of local inputs to the MOVES model. Sunil had submitted a question to EPA regarding the current three-season approach that COG uses for modeling annual pollutants. EPA responded that it prefers monthly temperatures. Sunil has sent a follow-up question on what the conformity regulations will allow and has not yet received a response. The temperatures are a regional set of temperatures based on data from DCA and IAD submitted in the SIP and converted to MOVES format. It was noted by a task force member that the daily NOx emissions go up and the annual NOx emissions go down with the SIP temperature scenario. Sunil responded that those emissions are based on two different sets of temperatures and looking at the temperature inputs explains the difference.

### **Item 3c: Startup emissions**

Jinchul Park (JC) presented staff's first attempt at overriding EPA's default start rates. Joon Byun had drawn attention to the possibility that MOVES was overestimating start emissions and in a comparison between Mobile6 and MOVES of the percentage of the total trip cycle comprised by start emissions, this appears to be the case for the region. MOVES default start rates for Fairfax County are twice as high (6 starts per day) as local data from the Household Travel Survey (3 starts per day). MOVES bases the number of daily starts on vehicle population whereas Mobile allows users to input trips/day if local data is available. Staff's attempt at overriding start emissions was not successful and a question to EPA has not yet been answered.

### **Item 3d: Heavy Truck Extended Idle Emissions**

Eulalie presented research done on the extended truck idle emissions in MOVES in response to a question at the previous month's meeting on whether jurisdictions that did not have truck stops would have these emissions. Extended truck idle emissions (hoteling) are only for truck stops and jurisdictions that do not have truck stops should have these emissions excluded. Staff knows how to remove these emissions. Eulalie asked for information on official truck stop locations in the region from the local jurisdictions and/or state DOTs. There was some discussion about tour bus idling emissions and whether they were included, but it was noted that the guidance specifically refers to long-haul combination vehicles. Joan suggested that this was an example of MOVES underestimating emissions (bus) and we may want to ask EPA about tour bus idling.

### **Item 3e: Urban/Rural Split**

Yu referred to a memo as he informed the task force that staff believes that the urban/rural splits used for the PEI are outdated. At the Planning Director's Technical Advisory Committee meeting in July, staff was advised to use the most current HPMS information to represent current conditions. Subsequent to the meeting, Prince George's County provided urban/rural splits for

future years based on its own forecast. Staff recommends using the latest HPMS data for current and future years unless forecasts are provided by individual jurisdictions.

#### **Item 4: Distributive Processing**

JC reported on testing EPA's recommendation to use distributive processing to reduce MOVES model runtime. For an ozone day run, there was a 35% times savings using two Windows XP SP3 computers. Network speed is very important. For further work, an optimal set-up needs to be determined.

#### **Item 5: MOVES "Emissions" vs. "Emissions Rate" Approach**

Siva presented a handout comparing the MOVES emissions inventory versus emissions rate approach. Most of the work done by staff to this point has been on the emission inventory approach. One con of MOVES is that rates are reported in 5 mph speed bins which does not allow for the same level of sensitivity when looking at small changes in highway speeds. In Mobile6, staff develops rates by 1 mph increments and applies the postprocessor to a 24-hour speed distribution. A con of the MOVES emissions rate approach is that the runs can take ten times longer and we do not yet have a postprocessor. Siva referred to a bar chart which showed the difference in percentage VMT between the Purple Line Amendment and the 2009 CLRP. The speed differences really stand out in the 1 mph increment as compared to the 5 mph increment. Howard pointed out that we have used 1 mph increments in the past and would hate to go backwards and lose that sensitivity. Sunil said that it may be hard to get 1 mph increments using MOVES because the model is fundamentally different from Mobile6 in its use of vehicle-specific power (VSP) and he does not know if it will be a simple interpolation to get the rates at 1 mph increments. Joan reminded the task force that this was discussed at a meeting in the spring and that Sunil had made the argument that the inventory approach was most compatible with SIP work and furthermore, by forcing MOVES to do what we have used Mobile6 to do, we may not be taking full advantage of MOVES's capabilities. Howard pointed out that there is also a time and cost associated with the rate approach. There was discussion on the time to run the model for emissions rate and whether EPA's updates to the model or distributive processing will help shorten the runtimes.

Sunil reported that in MARAMA conference calls, there was discussion about the differences in emissions (VOC, NOX, PM2.5) in using the rate vs. the inventory approach which illustrates a difference in the way MOVES calculates rates versus how it calculates inventories.

Siva told the group that there are two issues that he thought needed to be considered, but there was no need to make a decision today. The first is that emissions rates are developed by time of day, vehicle type, etc, and staff has not developed VMT at that disaggregate of a level. Secondly, our start emissions are currently based on vehicle trips, but MOVES works with vehicle population so we would need to be consistent with that. Siva stated that we will need guidance from EPA regarding emission rates. Eulalie suggested that it may be possible to come up with a composite vehicle rate. Joan asked how studying the emissions rate approach would affect the schedule for being able to use MOVES for SIP work. Sonya said that SMOKE has a MOVES integration tool.

Chris noted that FHWA staff indicated in a recent discussion that they were working on a model to use with MOVES for conformity. We should determine the utility of their model for our purposes and the schedule for its development, as the use of a federal (DOT) model would help us avoid reinventing the wheel. An update from FHWA at the next meeting could be scheduled. Mark provided additional background and indicated that a model was discussed (including a sensitivity analysis) in a staff presentation the previous week. He stated that the development of the model is still in progress and that he believed that it will be released next month. DOT is coordinating with EPA on the model. When asked about FHWA's work on this issue, Mark responded that right now FHWA is looking at a general approach of using the emissions inventory approach for conformity and SIP applications. Howard pointed out that the need to develop a postprocessor is a drawback, and maybe if we decide to move forward with the emission rate approach, we should look at the possibility if using postprocessors developed by other organizations.

Mike pointed out that there are still some issues that relate to both approaches such as start-up emissions and VMT distributions by vehicle type. If we chose to apply rates, it would have to be by vehicle type and that would be more cumbersome. Another issue with the rate approach is the increase in runtime for MOVES and then after that, the postprocessor would need to be run. The question of how to develop speed distributions for future years has precluded us from testing some of the things that we need to test. It will take a while to specify all of the work tasks, but other areas, including Dallas-Fort Worth (DFW), are going that route.

Jim said that since most of the inputs have been finalized, the rate versus inventory approach is the biggest issue going forward. He asked staff to estimate how much time it would take to study the rate approach and what impact it may have on the schedule for working towards finalizing MOVES for mobile source inventories, especially since we may need to update the SIPs with new mobile budgets. EPA's two year grace period is partly for SIP updates. Jim's main concern would be that the SIP update process would be delayed; however, he feels there are advantages to the rate approach and now is the time to make that decision. Mike responded by saying that it would be a lot of work for a new postprocessor, but he did not want to be the person to tell a TPB member that staff can no longer show the emissions change that result from small changes in speeds. Jim said that Howard's idea to look at others' existing postprocessors is valid. Mohamed said that BMC is going with a postprocessor that an MDOT consultant is developing. He hopes to have something to share with the group at a future meeting. Jim said that this topic will be discussed more at the next meeting.

#### **Item 6: Status Review of MOVES2010 Work Program**

Siva presented a status review of the MOVES work program. Staff is very close to finalizing average speed distribution, work on hoteling, and start emissions. A new item is the rate versus inventory approach. Also, an addition to the current work program is upon the completion of the 2010 CLRP air quality conformity assessment, staff will use the composite inputs to do a production run in MOVES for comparison to the Mobile6 inventories. There was discussion on the time required for the state air agencies to develop fuel program and I/M inputs for testing the 2010 CLRP forecast years. There was also discussion on what the attainment year for the SIP will be, and the time involved in developing network assumptions for each modeled year so we

want to be fairly certain what the attainment year will be before proceeding with input development.

**Item 7: Update on new MOVES Version/State Air Agency Reports on MOVES Model**

Sunil briefed the task force on the 2010a version of the MOVES model that was recently released. MOVES2010a includes updated CAFE standards (for model years 2012-2016) and reductions in GHG because of those new standards. There are also reductions in refueling and sulfur-related emissions associated with the reductions in vehicle fuel consumption. EPA provided an estimate of reductions in criteria pollutants, but it was unclear what modeled years the reductions were from. Mohamed told the group that MARAMA had used 2010a for a Howard County run and VOC emissions went up while NOx emissions went down. He thought that EPA's estimates were ballpark based on national default data.

State Air Agency reports – Mohamed reported that MDE was testing 2010a; VDEQ and DDOE did not have anything to report.

**Item 8: Other Business/Next Meeting/Agenda Items**

VDOT is sponsoring a MOVES training in Charlottesville and there are 10 or 11 spots left.

Meeting adjourned.