# MOVES Task Force Meeting

June 22, 2010 10 am - noon
**Meeting Summary**

**Present:**
Jim Ponticello, VDOT - Co-Chair
Diane Franks, MDE – Co-Chair
Kanti Srikanth, VDOT
Chris Voigt, VDOT
Sonya Lewis-Cheatham, VDEQ
Jessica Daniels, DDOE
Mohamed Khan, MDE
Mark Glaze, FHWA
Paul Heishman, FHWA Resource Center
Austina Casey, DDOT
Sara Tomlinson, BMC

**Staff:**
Mike Clifford, Daivamani (Siva) Sivasailam, Eulalie Lucas, Yu Gao, Erin Morrow, Daniel Son, Anant Choudhary, Joan Rohlfs, Sunil Kumar, Jeff King

**Item 1: Call to Order/Introductions**
The meeting of the Task Force was called to order by the co-chair Diane Franks and was followed by introductions of members and staff.

**Item 2: Review of May 18th Meeting Highlights**
The meeting highlights were accepted with the changes proposed by VDOT.

**Item 3: Updates to MOVES2010 Model/MySQL Training**
Daniel Son reported that MySQL training was held on 6/15/2010, led by John Byun from FHWA Resource Center.  Twenty-one people from COG, MDE, VDEQ, VDOT, and consulting firms attended the training. A PDF file of the presentation slides was uploaded to the MOVES Task Force page.

Siva discussed the EPA's new errata sheet for MOVES2010 which was released in May.  A new default database was also released and is available on EPA's website.  Jim said that VDOT has noticed that evaporative VOC emissions have gone to zero and they have notified EPA.  Eulalie said that COG has experienced the same thing and has also e-mailed the issue to EPA.  Jim said that in a test run for Stafford County, VOC emissions had dropped by an order of magnitude (3 tons to 0.3 tons) when moving from the previous default database to the newly released one. Reinstalling the MOVES model versus just installing the new database did not change the results.  Sonya mentioned a problem with not being able to select evaporative process for methane.  Sunil said that COG is moving to 64-bit Windows 7 and users have experienced longer MOVES runtimes and difficulties with installing MySQL.

**Item 4: Review of MOVES2010 Local Data Inputs**
**Item 4a: Meteorology, Fuels and I/M Inputs:**
Sunil referred to a two-page memo detailing the procedure for developing MET data inputs.  The state air agencies will be providing I/M program and fuel characteristics based on EPA guidance.  As of this time, we do not know the base year for the ozone SIP which is due in December 2013.  The memo details a five month average temperature/humidity over three years approach to calculating MET data inputs that has been discussed at previous meetings.  EPA does not specify the number of months/years that should be used so this approach is based off of the current approach.  Sunil asked the task force to consider two separate proposals, the first being the general five month/three years/two weather stations approach and the second being the specific months of May through September and years 2007-2009 using data from two weather stations (National and Dulles Airports) [both approaches noted appear to be describing the same approach that the Taskforce approved. Please clarify].  If the base year for the SIP happens to fall within the proposed date range, then we will not have to do anything further.  This data would be for the new ozone SIP and future conformit~~ies~~analyses based on that SIP.  Conformity assessments based on the SIPs submitted for the 1997 ozone and PM2.5 standards would be conducted using the MET data use~~d~~ in those SIPs and an EPA-provided converter tool to convert those data to MOVES format. Conformity assessment~~s~~ based on the maintenance plan submitted for the 1971 carbon monoxide (CO) standard would be conducted by converting the maximum and minimum temperatures used in that plan to hourly temperatures required by MOVES using an EPA-provided converter tool. The CO maintenance plan did not use humidity as an input as this was an optional input for Mobile5a, which was used to develop mobile emissions for the CO maintenance plan. Since MOVES requires hourly relative humidity as an input, this data needs to be developed. Sunil proposed using a three month average relative humidity dataset developed using data from December, January, and February for 1990 as the maintenance plan inventory and budget was based on data for these three months for 1990.

Sunil was asked if the EPA required that data from SIP base year be included in the MET data inputs.  Sunil responded that it does not, but we use base year data for other inputs and should do so for MET data in order to be consistent.  Diane said that EPA says that it will be proposing 2011 as the base year based on the 1990 Clean Air Act, but we could use 2007 for photochemical modeling purposes.

Jim noted that in the meeting summary from the May task force meeting, the group had agreed on the proposed approach as long as EPA ~~approves it~~does not issue any further guidance that contradicts it.  There was discussion on whether 2010 data should be included in the three year range.  Sunil said that we currently need data for testing MOVES and when it comes to actually doing modeling for the SIP, we will know the years needed.  Jim agreed that we would be reviewing all inputs for the SIP.

**Item 4b: Transportation Inputs**
Siva spoke to a one-page handout updating the progress developing MOVES inputs.  He specifically referred to transportation inputs which are now mostly completed.  Ramp fractions and speed distributions are still in progress and will be discussed in more detail later in the meeting.  Mike pointed out that we may introduce local start-up which may introduce another

local data.  In a previous meeting, John Byun had told the group that MOVES start emissions are much higher that Mobile 6.  Staff is not far enough along in their assessment for Mike to say whether there would be a recommendation to make any changes to inputs, but this could be updated in the future.

**Item 5: Experience with MOVES2010 Model**
**Item 5A: Sensitivity Analysis Using Local Ramp Percentages**
Eulalie presented a handout with VMT by facility type from the travel demand model which shows VMT associated with ramps.  Currently, for MOVES testing, we are using the default value for ramp travel which is 8% of highway travel.  Charles and Calvert counties have no highway VMT, but the default is still applied.  Staff is looking at the VMT associated with ramps and whether to change from a VMT to a VHT approach.  A sensitivity test showed that decreasing the default ramp percentage lead to a decrease in emissions.  Mike said that we may not be able to develop a VHT approach because ramp capacity can be a tricky business and our travel demand model is not set up that way, However, EPA's guidance indicates that VMT could be used as a surrogate for VHT.  But at a minimum, VMT would be a step forward rather than using default.  There was a question about how MOVES applies the ramp fraction to jurisdictions such as Calvert and Charles which do not have freeways.  Eulalie said that staff would look into that.

**Item 5b: Results of Using Local Vehicle Hours of Travel**
Siva presented a 12 page memo on VHT distribution by speed bins.  This is a new input for MOVES 2010.  The model requires VHT by 16 speed bins as shown in Table 1.  The first speed bin is less than 2.5 mph.  The speed bins then increase by 5 mph intervals with the last one being greater than 75 mph.  Page three of the memo shows the inputs required for each of the 13 vehicle types.  We need to provide VHT for four facility types; by weekday and weekend; by hour; and by 16 speed bins for a total of 2496 distributions.  The actual input files array has 34936 rows.

Siva presented several examples of default VHT data.  Table 2 shows a sample of the default VHT distribution for passenger vehicles.  In Table 3, the VHT distribution for one hour on one facility type is shown for all MOVES vehicle types and speed bins.  There was no variation by vehicle type which makes sense on an urban restricted facility.  Table 4 shows the lack of difference in the default data between weekday and weekend travel for one vehicle type, one hour, on one facility type which raises concern because weekday and weekend flow is very different in the region.  Table 5 looks at rural unrestricted facilities and shows no variation by hour which staff feel is not a good representation of local conditions. Table 6 shows urban-restricted facilities at 5 pm where there is variability in the default for different vehicle types which is good.  Table 7 shows a summary of the staff assessment of the default VHT data.  Table 8 shows the availability and limitations of local data.  Exhibits 1 and 2 show comparisons of MOVES default data to available local data.  Siva was asked about the difference between the INRIX and SkyComp data.  Siva responded that INRIX does not include 1-270/I-70 and it is based on GPS data whereas SkyComp calculates speed from density.

There was discussion as to whether there should be more data gathering in the UPWP to fill in the gaps in the existing local data.  There was also a suggestion to mine state DOT data to see if

speed data may be available.  Mike said that the two-year time frame may be prohibitive for data collection in the short term, but on a longer term basis, there will be care and feeding of the model.  Chris asked ~~if the~~what VHT ~~percentages~~ distributions were assumed for~~change in the~~ forecast years, when there would be more congestion.  Siva responded that they do not change in the default data and that a review is needed, as speeds would be lower. This could be addressed in the post-processor.~~.~~

The committee agreed with the staff assessment that there are examples in the default data that defy common sense and potential for using local data instead of default needs to be studied further.

### Item 5c: Maryland Experience

Mohamed briefed the group on three issues that MDE's has experienced with fuel handling in MOVES.  There are three main issues which MDE has encountered.  The first issue is that the new fuel formulation IDs defined by users, associated with local fuel data, resulted in MOVES run time errors. After several trials, MDE found that the pre-existing fuel formulation IDs work with user-supplied fuel data. Upon inquiry and suggestions, EPA/OTAQ approved this modeling approach. This is recorded as issue #10 in the MOVES Errata Sheet dated May 15, 2010.  The second issue is with modeling fuels in RFG counties.  Baltimore and Washington Areas and few more counties in MD (total 14) come under reformulated gasoline requirements. Going by the definition and modeling of these counties using fuel as reformulated gasoline (RFG) with fuelSubtypeID = 11 ended up with erroneous emission results.  MARAMA modeling inventory conference calls revealed that many states were experiencing the same problem.  Taking a hint from the MOVES Technical Guidance, MDE tested these counties as Gasohol (fuelSubtypeID = 12) and the emission results were found reasonable.  Upon another inquiry, EPA/OTAQ approved the fuel modeling as gasohol.  MDE passed this information individually to various stakeholders such as MWCOG, VA DEQ and as a group to MARAMA.  The third issue is with modeling non-RFG counties. There are 10 counties in MD with no reformulated gasoline requirements. Even though local fuel data shows presence of ethanol in the so called conventional gasoline, modeling of conventional gasoline (fuelSubtypeID = 10) with local ethanol values, resulted in erroneous VOC emission values.  After several consultations with EPA which did not resolve the issue, finally, in EPA's  email dated May 26, 2010 EPA/OTAQ announced the release of a new MOVES default database (MOVESDB20100515) correcting the fuel and a few other issues.

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

Siva presented a status review of the MOVES work program.  Work on ramp fractions and VOC starts will likely be added to the work program.  On the issue of inventory versus rate approach, the task force was in agreement that the inventory approach is the one to use moving forward.

### Item 7: Next Meeting/Agenda Items

Next meeting will be held on July 20, 2010.  Agenda items include: current SIP temperature data converted using the MOVES converter, update on local start emission data, local ramp fraction data, and an update on local VHT.  It was noted that it has been a while since the group was briefed on FHWA research activities.  Mark said that he would check with Cecilia Ho and update

the group.  As this was Mike's last meeting as a member of TPB staff (he will be staying on as a consultant through September), Jim thanked Mike for his expertise and service through the years.

**Item 8: Other Business**
There was no other business.