

Memorandum

May 18, 2010

To: MOVES Task Force

From: Eulalie Lucas 

Department of Transportation Planning

Subject: Results of MOVES2010 Model Sensitivity Tests: (1) Use of Updated Local Input Data for 2005: County Level vs. Custom Domain using local Fuel and I/M programs for Virginia and Early NLEV program, (2) 2005 Winter CO and (3) Maryland Clean Car Program-ZEV

## **I. Introduction**

To address additional updates made to the 2005 local data inputs to MOVES since the last task force meeting, staff prepared revised ozone season emissions estimates which are transmitted in this memo. Staff involved in the development of travel related inputs identified errors in two areas and have updated those inputs; details are outlined in Daivamani Sivasailam's memo dated 5/14/2010. In addition to the travel related changes, Mohammed Khan of MDE staff reminded COG staff of the credits associated with the Early NLEV program which were omitted in our previous MOVES results and therefore are included in these results. VDEQ staff provided COG staff with local I/M and fuel data which are also included in these revised results. Staff also prepared 2005 Wintertime CO for Montgomery County and has included these results in this transmittal. With the exception of these updates all other inputs applied in these MOVES sensitivity tests are consistent with those listed in previous memos presented to this committee.

Results from the revised MOVES runs are shown in the attached tables and graphs. Staff prepared 2005 ozone day emission estimates for the District of Columbia and for Maryland and Virginia counties at two levels: County Level and Custom Domain. Table 1 shows the source for inputs used in all sensitivity tests.

Table 1

	MD and VA	DC
Input Item	Local	Local
Vehicle Age Distribution	X	X
Vehicle Population	X	X
Annual VMT by Jurisdiction and adj. factors	X	X
Annual. VMT Distributed by Vehicle. Type	X	X
Vehicle Type VMT Percentages by Facility Type	X	X
I/M Programs	X	DEF
Fuel Supply	X	DEF
Fuel Formulation	X	DEF
Average Speed Distribution	DEF	DEF
Meteorological Data	X	X

## II. Results

Tables 2 and 3 with accompanying graphs show 2005 VOC and NOX ozone day emissions for Maryland and Virginia computed at the jurisdiction level and at the Custom Domain Level. While differences between the two levels of aggregation are not significant, EPA has suggested in the April 2010, EPA-420-B-10-23 guidance document: ***The County scale is the only scale appropriate for developing emission estimates for SIPs or transportation plan and transportation improvement program (TIP) conformity determination.*** Table 4 compares the computer times associated with each type of run.

Table 4

Comparison of Approximate Computer Run Times

Approach	Ozone Day	Total Time	Annual	Total Time
County Level (County Data Manager)	19 min. per county	1.6 Hrs. for Maryland counties(5)	2.6 Hrs. per county	13.1 Hrs. for MD counties (5)
Custom Domain	19. min. per domain	19 min. per domain	2.6 Hrs. per MD county	2.6 Hrs. MD domain

Table 5 shows 2005 ozone day emissions for the District of Columbia and Table 6 compares 2005 MOBILE6.2 Wintertime CO with MOVES2010 for Montgomery County for 2005.

Table 7 illustrates reductions associated with Maryland's Clean Car program; since reductions impact model year 2011 and beyond, these results are shown for 2030 ozone day. Montgomery County is show here as a sample jurisdiction but results for other Maryland jurisdictions and will be available in the future. The ZEV program was designed to lower evaporative permeation emissions and therefore has a greater impact on VOC than NOx.

### **III. Next Steps**

DTP/DEP staff will continue to update input parameters as data become available. Staff is currently working on the final local input, average speed distribution and will provide an update or results at the next meeting.

Attachments

Table 2. 2005 Maryland Ozone Day VOC and NOx Emissions

	MOVES2010	
	VOC	NOx
MTG	19.5363	50.1710
PG	21.4811	66.9430
FRED	7.0660	28.9091
CLVT	1.9424	4.1866
CHLS	3.3502	8.4646
<b>Summary of 5 Jurisdictions</b>	<b>53.3760</b>	<b>158.6744</b>
<b>Maryland Costum Domain</b>	<b>53.3542</b>	<b>154.7045</b>
Diff	-0.0218	-3.9699
Diff%	-0.04%	-2.50%

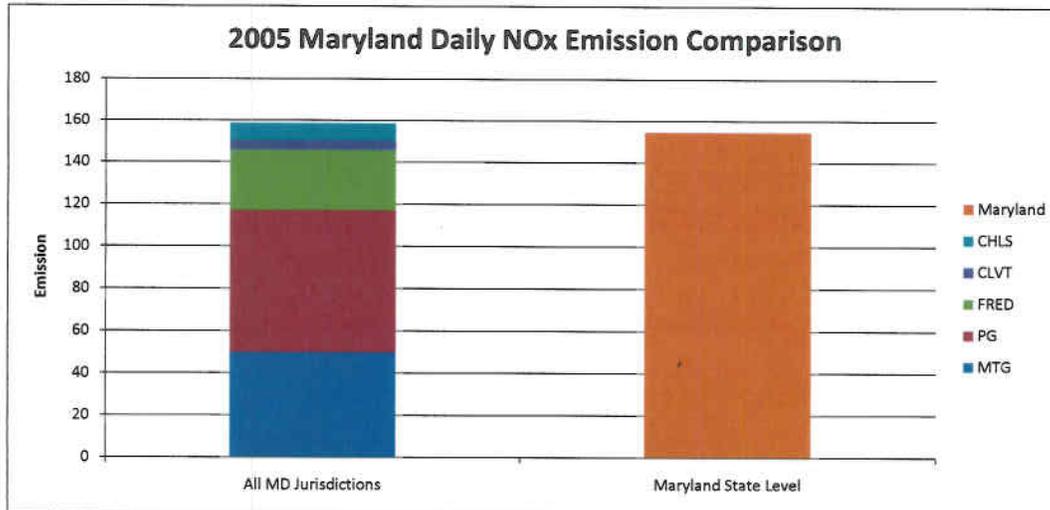
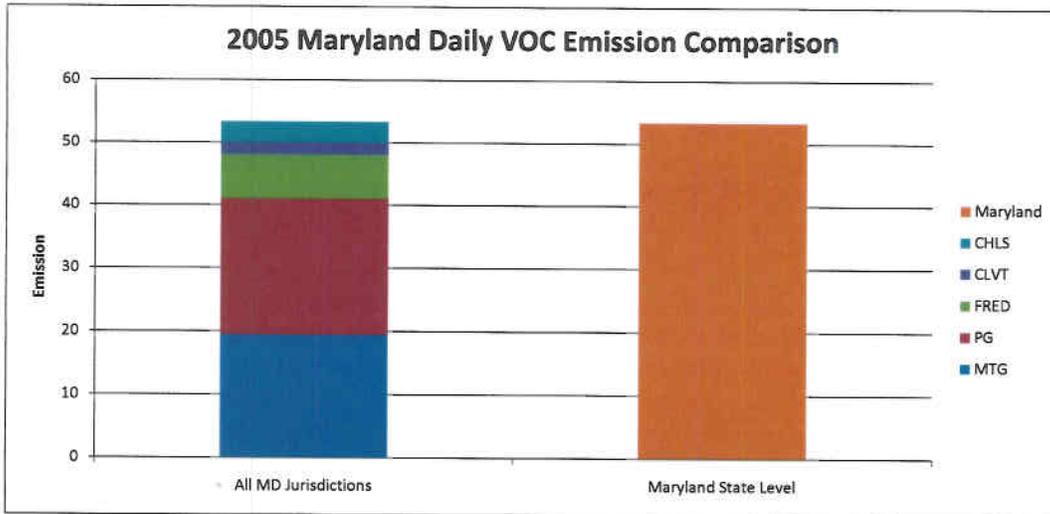


Table 3. 2005 Virginia VOC and NOx Emissions (Daily)

	MOVES2010	
	VOC	NOx
ARL	4.02	9.92
ALEX	2.52	5.15
FFX	22.78	68.69
PW	8.16	26.00
LDN	4.91	13.45
<b>Summary of 5 Jurisdictions</b>	<b>42.39</b>	<b>123.21</b>
<b>Virginia Custom Domain</b>	<b>42.40</b>	<b>122.59</b>
Diff	0.01	-0.63
Diff%	0.02%	-0.51%

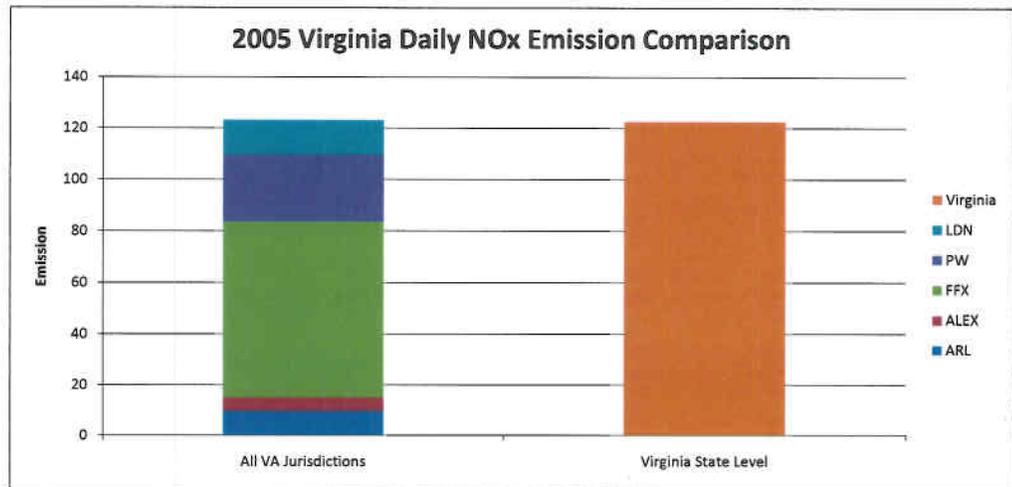
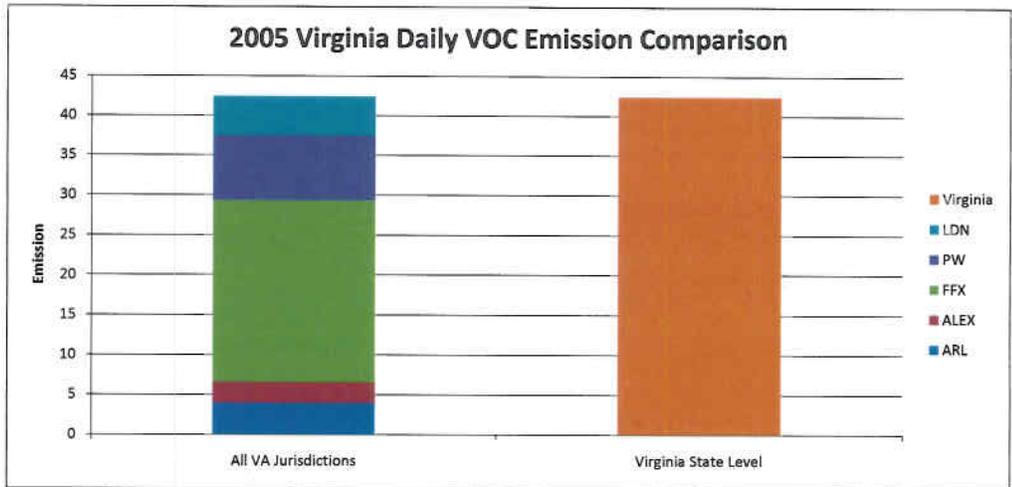


Table 5 2005 District of Columbia Ozone Day VOC and NOx Emissions(tons/day)

	Mobile6		MOVES_Local_4.29	
	VOC	NOx	VOC	NOx
Start	2.2156	1.1670	2.4794	2.7545
Running	5.0379	15.1030	3.6156	23.3764
Start & Running	7.2535	16.2700	6.0949	26.1308
Vehicle Related	1.0900	0.0000	3.2738	0.4384
Bus, Transit, and Auto	0.1644	1.6449	0.0000	0.0000
Total	8.5079	17.9149	9.3688	26.5692

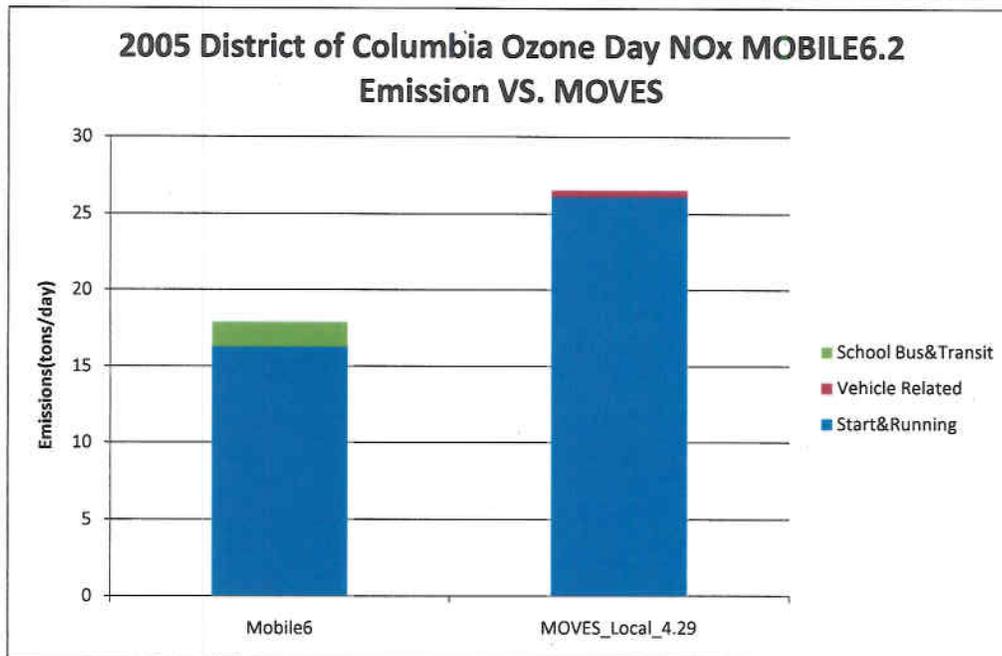
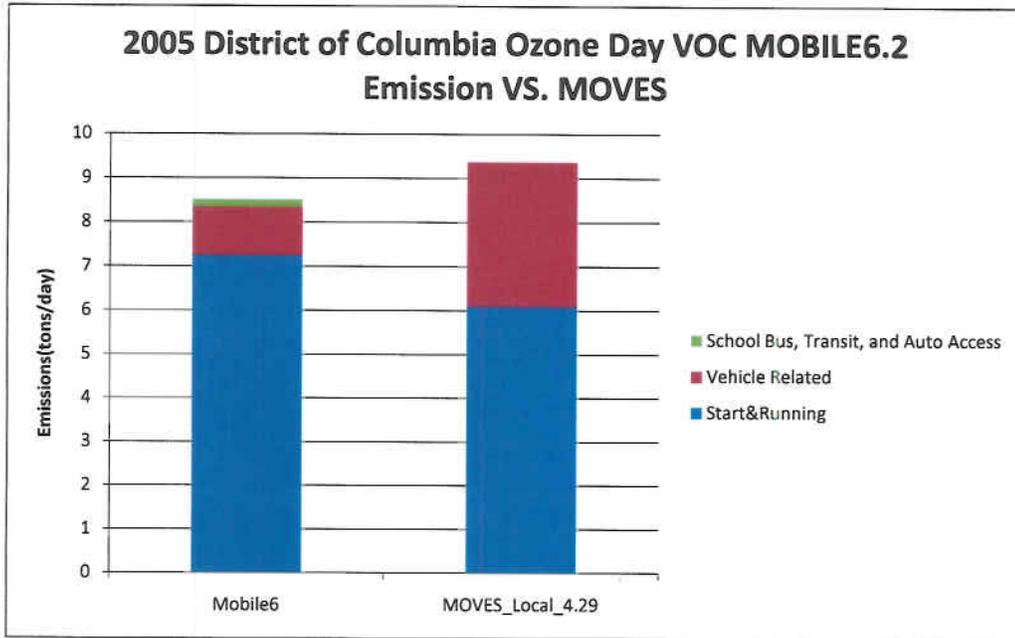


Table 6 2005 MTG Winter CO Comparison Between MOBILE6 and MOVES (T/D)

	MOBILE6	MOVES
Winter CO	390.61	351.69

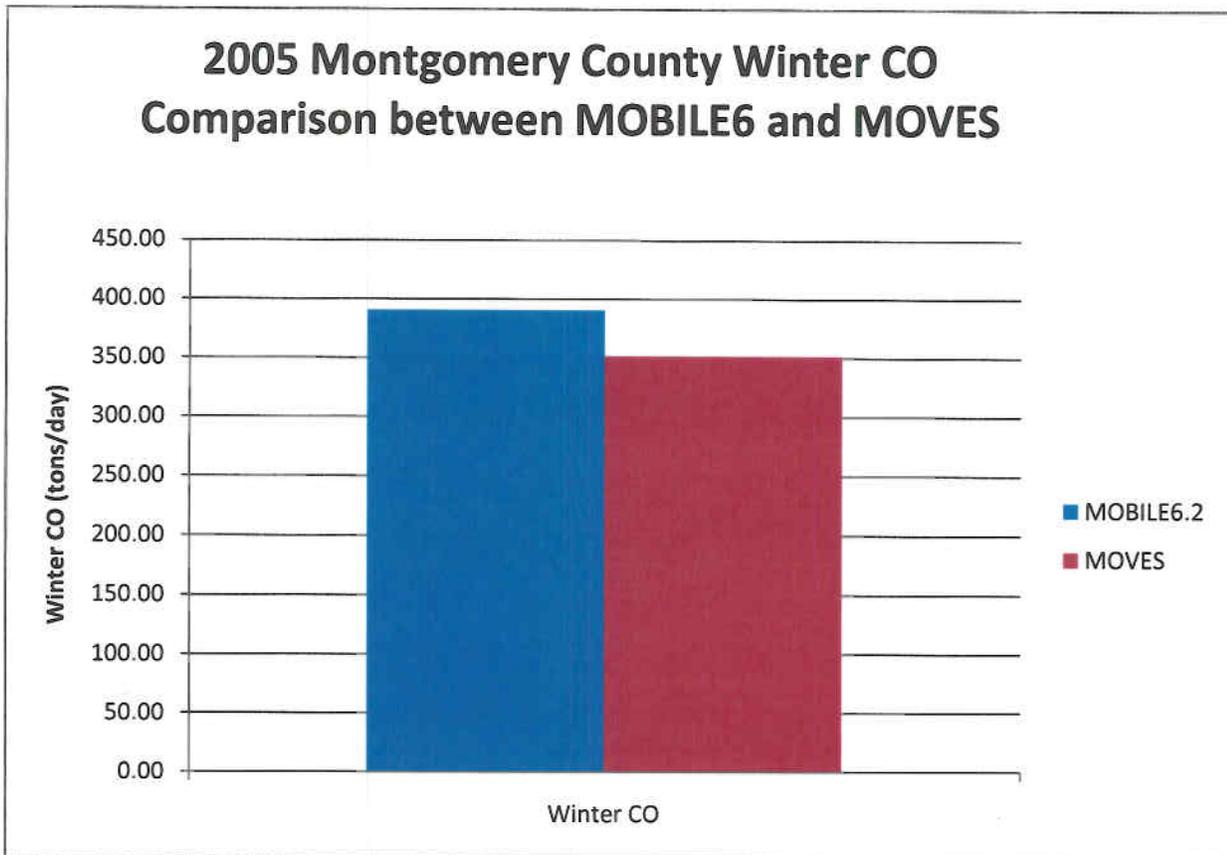


Table 7 2030 Montgomery County VOC and NOx Emissions (Daily)

	Mobile6		MOVES_Local		MC_Local & ZEV	
	VOC	NOx	VOC	NOx	VOC	NOx
Start	1.25	0.36	3.25	2.03	2.57	2.03
Running	4.67	4.72	1.62	10.14	1.32	10.14
Start & Running	5.92	5.08	4.87	12.16	3.89	12.16
Vehicle Related	0.56	0.00	3.26	1.17	2.75	1.17
Bus, Transit, and Auto	0.13	0.24	0.00	0.00	0.00	0.00
Total	6.61	5.32	8.13	13.34	6.63	13.34

