

APPENDIX F

Vehicle-related Emissions Calculations

Memo

To: Air Quality Files

From: Erin Morrow, MWCOG/DTP

Date: October 7, 2010

Re: Vehicle Related Emissions: Diurnal and Resting Loss - 2010 CLRP & FY2011-FY2016 TIP

This memo illustrates the calculation of Diurnal and Resting Loss emissions associated with the 2010 CLRP & FY2011-2016 TIP. A detailed description of work regarding emissions factor updates using Mobile6 is contained in a report by Maureen Mullen of E.H. Pechan & Associates, dated January 27, 2003. Adopting the approach developed by E.H. Pechan & Associates emissions rates were developed using version 6.2 of mobile model.

There were no updates to either the vehicle forecast component or the procedure used to calculate these emissions. Vehicle ownership forecasts reflect trends through time for each jurisdiction; using the 2008 vehicle registration data, the slope of the forecast trend line in each jurisdiction was maintained but revised to 'intercept' 2008 conditions. A detailed description of this process can be found in a June 9, 2009 memo from Daivamani Sivasailam in Appendix D. This approach is illustrated on the attached graph for Prince George's County. Table 1 shows summary of vehicle registration forecasts. Also included is a copy of a spreadsheet displaying the calculation of diurnal and resting loss emissions for year 2011 (Table 2). Diurnal and Resting Loss emissions for other milestone years 2002, 2020, 2030, and 2040 are available in the Air Quality Conformity files.

The calculation of these emissions is an off-line process utilizing a spreadsheet format with a very basic calculation:

Number of vehicles by jurisdiction X jurisdiction emissions factor = Emissions

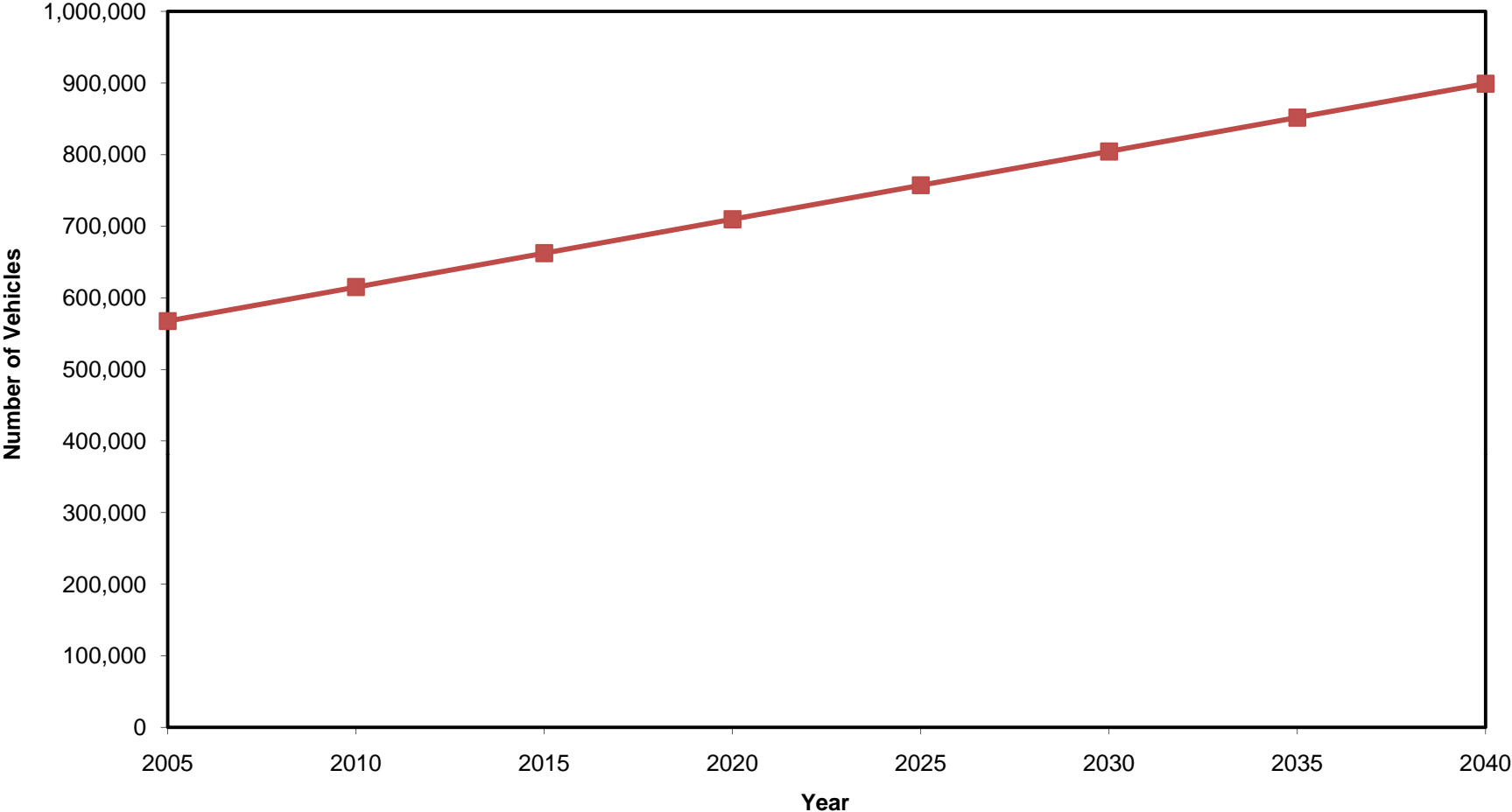
Attachments (3)

Table 1
VEHICLE REGISTRATION FORECASTS BY JURISDICTION (USING 2008 VIN)
REGISTRATION ADJUSTED TO YEAR 2008

Jurisdiction	2005	2008	2011	2020	2030	2040
District of Columbia	239,919	243,164	246,409	256,143	266,959	277,775
Calvert	76,827	87,093	97,359	128,155	162,374	196,592
Charles	119,186	129,719	140,252	171,850	206,959	242,068
Frederick	198,819	215,863	232,907	284,039	340,852	397,665
Montgomery	661,659	706,176	750,693	884,245	1,032,636	1,181,027
Prince George's	567,652	596,053	624,454	709,657	804,327	898,997
Alexandria	129,001	130,742	132,483	137,706	143,509	149,312
Arlington	135,070	136,888	138,706	144,159	150,218	156,278
Fairfax	788,113	831,961	875,809	1,007,352	1,153,511	1,299,669
Loudoun	222,115	243,902	265,689	331,049	403,671	476,294
Prince William	295,047	318,329	341,611	411,459	489,067	566,675
Stafford	104,053	115,721	127,389	162,392	201,285	240,178
Total	3,537,462	3,755,611	3,973,760	4,628,206	5,355,368	6,082,530

The above forecasts are based on 2008 vehicle registration data decoded from raw VIN numbers provided by District of Columbia DMV, Maryland MVA, and Virginia DMV. 2005 registration data were adjusted based on the 2008 numbers.

Vehicle Registration for Prince George's County by Year



MVA 2008 Vehicle Registration data

Table 2
DIURNAL AND RESTING LOSS EMISSIONS
VOC
YEAR 2011

JURISDICTION	TOTAL VEHICLES	FACTORS		EMISSIONS	
		DIURNAL (gm/day/veh)	RESTGL (gm/hr/veh)	DIURNAL (Tons/day)	RESTGL (Tons/day)
District of Columbia	246,409	0.392	1.973	0.104	0.525
Montgomery	750,693	0.326	1.621	0.264	1.315
Prince Georges	624,454	0.429	2.174	0.289	1.467
Frederick	232,907	0.430	2.184	0.108	0.549
Charles	140,252	0.448	2.247	0.068	0.340
Calvert	97,359	0.449	2.320	0.047	0.244
Arlington	138,706	0.346	1.720	0.052	0.258
Alexandria	132,483	0.291	1.443	0.042	0.207
Fairfax	875,809	0.337	1.636	0.319	1.548
Loudoun	265,689	0.326	1.537	0.094	0.441
Prince William	341,611	0.372	1.836	0.137	0.678
Stafford	127,389	0.424	2.224	0.058	0.306
MSA - SUBTOTAL MODELED AREA	3,973,761			1.583	7.877
TOTAL	3,973,761			1.583	7.877

Note: 98% of vehicles, which are gas operated, are used to compute Diurnal and Resting Loss emissions
Based on 2008 vehicle registration