

APPENDIX - A

TERM ANALYSIS INSTRUCTIONS

TERM EMISSIONS REDUCTION CALCULATIONS

This section of the solicitation document contains instructions for analyzing transportation emissions reduction measure (TERM) projects. Starting this fiscal year, in addition to estimating the ozone precursor (VOC and NOx) emissions reductions we will estimate fine particulate matter (PM 2.5) emissions reduction benefits. Section I provides information to estimate VOC and NOx, and Section II provides the necessary information to estimate PM 2.5 emissions.

Section I

Table 1 provides an overview of the three emissions components, namely Start-up (Cold Start), Running, and Hot Soak. The methodology that will be used to analyze TERMS for the 2007 CLRP and FY 2008 - 2013 TIP utilizes the latest travel demand results from the Version 2.1D travel demand model and emissions rate data from the Mobile 6.2 emissions model.

The introduction of the Mobile 6 emissions model offered the potential for a more disaggregate emissions reduction analysis of TERMS. Instead of the 8 different vehicle classes used in the Mobile 5b model, the Mobile 6 model utilizes 28 vehicle classes (the current model version is Mobile 6.2). Four categories of TERMS have been developed utilizing the disaggregate nature of the vehicle classes. The four categories are:

- TERMS impacting the traffic stream (all vehicle types), such as the Signal Optimization TERM, will continue to be analyzed using a regional composite vehicle emissions factor. Tables 2, 3 and 4 display emissions factors for analysis years 2010, 2020 and 2030. Weighted average of arterial and freeway emissions factors are shown in the tables; these factors are plotted in the exhibit 1 and 2.
- TERMS impacting commute trips, such as the Employer Outreach and Telework Resources Center TERM (item # 75 and # 90 on the TERM tracking sheet, page 1-2), will be analyzed using an average light duty vehicle emissions factor composed of emissions factors for several classes of light duty vehicles and for motorcycles. Tables 5, 6, and 7 display emissions factors for commuting vehicle trips for analysis years 2010, 2020 and 2030. Weighted average of arterial and freeway emissions factors are shown in the tables; these factors are plotted in the exhibit 3 and 4.
- TERMS impacting all types of heavy duty diesel vehicles, such as a Diesel Fuel Additive TERM, are considered as engine technology (heavy duty diesel vehicles) category.
- TERMS impacting an individual heavy duty vehicle type of a specific weight class, are categorized as a specific vehicle type, such as school buses, transit buses, tractor trailers. Emissions rates for specific weight classes can be generated as needed.

- TERMS impacting vehicle idling such as roundabouts in place of traffic signals can be analyzed using the individual vehicle type idling emissions factors or the traffic stream idling emissions factors for year 2010, 2020, and 2030 shown in Table 9.

Tables 2 through 7 show Cold Start, Running, Hot Soak emissions factors for VOC and NOx for the analysis years 2010, 2020 and 2030 to be used for analyzing “Traffic Stream” and “Commute” TERMS. Exhibits 1 through 4 show the plots of NOx and VOC running emissions factors for these years. Table 8 shows idling emissions factors for NOx and VOC for different vehicle types and PM factors for heavy duty vehicles for all three analysis year. Table 9 shows the 2005 regional average speeds generated by the post-processor which are used to compute hourly speeds for emissions calculations. Since there is little variation through time, the 2005 speeds may be used for any of the analysis years; use specific speeds for each application, where available. Table 10 provides the Mobile 6 vehicle classifications.

The cost effectiveness calculation methodology is explained following the emissions factors tables and is a primary criterion used to select TERMS. The final section provides an example of a commuting vehicle TERM analysis using the emissions factors included in the tables.

For purpose of determining emissions reductions, the start-up, running, and hot soak portions of each trip must be considered. Table 1 shows the procedure to use in the analysis.

Table 1: Mobile Source Emissions Overview

$$\text{Emissions} = \text{Start up emissions} + \text{Running emissions} + \text{Soak emissions}$$

$$\text{Start-up emissions} = \text{Vehicle Trip Origin} \times \text{Start up emissions rate (Cold start in Grams/Trip)}$$

$$\text{Running emissions} = \text{VMT} \times \text{Running emissions rate (Grams/Mile)}$$

$$\text{Hot Soak emissions} = \text{Trip Destination} \times \text{Hot Soak emission rate (Grams/Trip)}$$

Emissions factors were obtained from the Mobile 6.2 model and are contained herein. NOx emissions do not occur in the hot soak portion of the trip, therefore only VOC factors are shown for this category.

It may be noted that the running emissions factors and cold start/hot soak emissions factors shown in the attached tables were generated using the Mobile 6.2 emissions model with the latest VMT and vehicle registration data as input to the model. These are the factors that were used in the conformity analysis of the 2006 CLRP and FY 2007-2012 TIP. Running emissions factors for speed ranges 1 to 65 mph are shown in the emissions factor tables. If the actual speed for a TERM is known use the appropriate emissions factors, otherwise use emissions factors for average travel speed.

Table 2: 2010 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMS (Mobile6.2)

Emission Type	Speed (mph)	Average 2010 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	2.8807	2.8807	2.8807	1.4222	1.4662	1.4398
Running (g/mi)	2	2.8807	2.8807	2.8807	1.4222	1.4662	1.4398
Running (g/mi)	3	2.2579	2.2577	2.2578	1.3634	1.4073	1.3810
Running (g/mi)	4	1.4792	1.4792	1.4792	1.2898	1.3339	1.3075
Running (g/mi)	5	1.0124	1.0123	1.0123	1.2458	1.2896	1.2633
Running (g/mi)	6	0.8396	0.8309	0.8361	1.1668	1.1817	1.1728
Running (g/mi)	7	0.7159	0.7016	0.7102	1.1103	1.1043	1.1079
Running (g/mi)	8	0.6233	0.6044	0.6158	1.0678	1.0464	1.0592
Running (g/mi)	9	0.5514	0.5291	0.5425	1.0350	1.0013	1.0215
Running (g/mi)	10	0.4940	0.4686	0.4839	1.0088	0.9653	0.9914
Running (g/mi)	11	0.4553	0.4286	0.4446	0.9674	0.9186	0.9479
Running (g/mi)	12	0.4230	0.3950	0.4118	0.9332	0.8796	0.9117
Running (g/mi)	13	0.3960	0.3669	0.3843	0.9039	0.8465	0.8810
Running (g/mi)	14	0.3723	0.3425	0.3604	0.8791	0.8183	0.8547
Running (g/mi)	15	0.3522	0.3215	0.3399	0.8576	0.7937	0.8320
Running (g/mi)	16	0.3322	0.3055	0.3215	0.8359	0.7848	0.8155
Running (g/mi)	17	0.3147	0.2915	0.3054	0.8170	0.7772	0.8011
Running (g/mi)	18	0.2991	0.2790	0.2911	0.8000	0.7702	0.7881
Running (g/mi)	19	0.2849	0.2677	0.2780	0.7848	0.7641	0.7765
Running (g/mi)	20	0.2724	0.2576	0.2665	0.7713	0.7585	0.7662
Running (g/mi)	21	0.2619	0.2494	0.2569	0.7589	0.7530	0.7566
Running (g/mi)	22	0.2524	0.2418	0.2482	0.7475	0.7481	0.7477
Running (g/mi)	23	0.2439	0.2351	0.2404	0.7371	0.7437	0.7397
Running (g/mi)	24	0.2360	0.2290	0.2332	0.7275	0.7396	0.7323
Running (g/mi)	25	0.2286	0.2232	0.2264	0.7188	0.7359	0.7256
Running (g/mi)	26	0.2222	0.2175	0.2203	0.7116	0.7332	0.7202
Running (g/mi)	27	0.2161	0.2124	0.2146	0.7049	0.7307	0.7152
Running (g/mi)	28	0.2105	0.2078	0.2094	0.6987	0.7285	0.7106
Running (g/mi)	29	0.2051	0.2031	0.2043	0.6932	0.7264	0.7065
Running (g/mi)	30	0.2003	0.1989	0.1997	0.6876	0.7245	0.7023
Running (g/mi)	31	0.1955	0.1945	0.1951	0.6850	0.7235	0.7004
Running (g/mi)	32	0.1912	0.1905	0.1909	0.6828	0.7228	0.6988
Running (g/mi)	33	0.1871	0.1865	0.1869	0.6807	0.7219	0.6972
Running (g/mi)	34	0.1831	0.1830	0.1830	0.6786	0.7213	0.6957
Running (g/mi)	35	0.1795	0.1795	0.1795	0.6768	0.7206	0.6943
Running (g/mi)	36	0.1769	0.1769	0.1769	0.6801	0.7239	0.6976
Running (g/mi)	37	0.1740	0.1740	0.1740	0.6833	0.7271	0.7008
Running (g/mi)	38	0.1716	0.1716	0.1716	0.6862	0.7301	0.7037
Running (g/mi)	39	0.1692	0.1692	0.1692	0.6891	0.7331	0.7067
Running (g/mi)	40	0.1671	0.1671	0.1671	0.6918	0.7357	0.7093
Running (g/mi)	41	0.1648	0.1648	0.1648	0.6982	0.7421	0.7157
Running (g/mi)	42	0.1629	0.1629	0.1629	0.7040	0.7479	0.7216
Running (g/mi)	43	0.1607	0.1607	0.1607	0.7098	0.7535	0.7273
Running (g/mi)	44	0.1587	0.1587	0.1587	0.7153	0.7593	0.7329
Running (g/mi)	45	0.1571	0.1571	0.1571	0.7204	0.7643	0.7380
Running (g/mi)	46	0.1553	0.1553	0.1553	0.7296	0.7735	0.7471
Running (g/mi)	47	0.1535	0.1535	0.1535	0.7385	0.7822	0.7560
Running (g/mi)	48	0.1517	0.1517	0.1517	0.7469	0.7908	0.7645
Running (g/mi)	49	0.1501	0.1501	0.1501	0.7549	0.7990	0.7726
Running (g/mi)	50	0.1484	0.1484	0.1484	0.7628	0.8066	0.7803
Running (g/mi)	51	0.1471	0.1471	0.1471	0.7758	0.8199	0.7934
Running (g/mi)	52	0.1458	0.1458	0.1458	0.7886	0.8323	0.8061
Running (g/mi)	53	0.1444	0.1444	0.1444	0.8004	0.8444	0.8180
Running (g/mi)	54	0.1432	0.1432	0.1432	0.8120	0.8561	0.8296
Running (g/mi)	55	0.1418	0.1418	0.1418	0.8233	0.8671	0.8408
Running (g/mi)	56	0.1413	0.1413	0.1413	0.8414	0.8854	0.8590
Running (g/mi)	57	0.1407	0.1407	0.1407	0.8590	0.9028	0.8765
Running (g/mi)	58	0.1402	0.1402	0.1402	0.8758	0.9198	0.8934
Running (g/mi)	59	0.1395	0.1395	0.1395	0.8921	0.9360	0.9096
Running (g/mi)	60	0.1389	0.1389	0.1389	0.9078	0.9518	0.9254
Running (g/mi)	61	0.1385	0.1385	0.1385	0.9331	0.9770	0.9506
Running (g/mi)	62	0.1382	0.1382	0.1382	0.9575	1.0015	0.9751
Running (g/mi)	63	0.1380	0.1380	0.1380	0.9811	1.0251	0.9987
Running (g/mi)	64	0.1377	0.1377	0.1377	1.0038	1.0480	1.0215
Running (g/mi)	65	0.1373	0.1373	0.1373	1.0261	1.0699	1.0436

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.9830	0.5688
Hot Soak Loss (g/trip end)	0.5660	-
Hot Start (g/trip start, Light Duty Only)	0.1673	0.1262

Table 3: 2020 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMS (Mobile6.2)

Emission Type	Speed (mph)	Average 2020 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.5740	1.5740	1.5740	0.4864	0.4900	0.4878
Running (g/mi)	2	1.5740	1.5740	1.5740	0.4864	0.4900	0.4878
Running (g/mi)	3	1.2458	1.2458	1.2458	0.4647	0.4684	0.4662
Running (g/mi)	4	0.8349	0.8349	0.8349	0.4373	0.4409	0.4387
Running (g/mi)	5	0.5886	0.5886	0.5886	0.4210	0.4245	0.4224
Running (g/mi)	6	0.4927	0.4875	0.4906	0.3921	0.3827	0.3883
Running (g/mi)	7	0.4245	0.4153	0.4208	0.3715	0.3525	0.3639
Running (g/mi)	8	0.3732	0.3612	0.3684	0.3561	0.3302	0.3457
Running (g/mi)	9	0.3332	0.3190	0.3275	0.3439	0.3126	0.3314
Running (g/mi)	10	0.3012	0.2853	0.2949	0.3343	0.2987	0.3201
Running (g/mi)	11	0.2782	0.2612	0.2714	0.3195	0.2815	0.3043
Running (g/mi)	12	0.2592	0.2414	0.2521	0.3072	0.2669	0.2911
Running (g/mi)	13	0.2430	0.2248	0.2357	0.2967	0.2548	0.2800
Running (g/mi)	14	0.2292	0.2102	0.2216	0.2877	0.2443	0.2703
Running (g/mi)	15	0.2170	0.1975	0.2092	0.2799	0.2351	0.2620
Running (g/mi)	16	0.2045	0.1873	0.1976	0.2727	0.2336	0.2571
Running (g/mi)	17	0.1934	0.1786	0.1875	0.2660	0.2321	0.2524
Running (g/mi)	18	0.1837	0.1706	0.1784	0.2603	0.2308	0.2485
Running (g/mi)	19	0.1750	0.1636	0.1704	0.2551	0.2295	0.2449
Running (g/mi)	20	0.1671	0.1574	0.1632	0.2504	0.2285	0.2416
Running (g/mi)	21	0.1607	0.1524	0.1574	0.2460	0.2273	0.2385
Running (g/mi)	22	0.1553	0.1483	0.1525	0.2422	0.2264	0.2359
Running (g/mi)	23	0.1498	0.1442	0.1475	0.2385	0.2255	0.2333
Running (g/mi)	24	0.1453	0.1404	0.1433	0.2353	0.2246	0.2310
Running (g/mi)	25	0.1410	0.1371	0.1394	0.2325	0.2239	0.2290
Running (g/mi)	26	0.1369	0.1338	0.1356	0.2297	0.2234	0.2272
Running (g/mi)	27	0.1331	0.1307	0.1321	0.2275	0.2227	0.2256
Running (g/mi)	28	0.1297	0.1275	0.1288	0.2252	0.2225	0.2241
Running (g/mi)	29	0.1264	0.1249	0.1258	0.2233	0.2218	0.2227
Running (g/mi)	30	0.1235	0.1222	0.1229	0.2213	0.2214	0.2213
Running (g/mi)	31	0.1205	0.1199	0.1202	0.2202	0.2213	0.2206
Running (g/mi)	32	0.1179	0.1174	0.1177	0.2192	0.2207	0.2198
Running (g/mi)	33	0.1154	0.1150	0.1152	0.2183	0.2205	0.2191
Running (g/mi)	34	0.1131	0.1127	0.1129	0.2174	0.2204	0.2186
Running (g/mi)	35	0.1106	0.1106	0.1106	0.2166	0.2204	0.2181
Running (g/mi)	36	0.1090	0.1090	0.1090	0.2177	0.2214	0.2192
Running (g/mi)	37	0.1075	0.1075	0.1075	0.2187	0.2224	0.2202
Running (g/mi)	38	0.1061	0.1061	0.1061	0.2196	0.2235	0.2212
Running (g/mi)	39	0.1045	0.1045	0.1045	0.2205	0.2244	0.2221
Running (g/mi)	40	0.1032	0.1032	0.1032	0.2214	0.2252	0.2229
Running (g/mi)	41	0.1017	0.1017	0.1017	0.2235	0.2271	0.2250
Running (g/mi)	42	0.1007	0.1007	0.1007	0.2253	0.2288	0.2267
Running (g/mi)	43	0.0996	0.0996	0.0996	0.2270	0.2305	0.2284
Running (g/mi)	44	0.0983	0.0983	0.0983	0.2285	0.2323	0.2300
Running (g/mi)	45	0.0972	0.0972	0.0972	0.2302	0.2337	0.2316
Running (g/mi)	46	0.0962	0.0962	0.0962	0.2327	0.2363	0.2341
Running (g/mi)	47	0.0951	0.0951	0.0951	0.2351	0.2387	0.2365
Running (g/mi)	48	0.0942	0.0942	0.0942	0.2375	0.2414	0.2390
Running (g/mi)	49	0.0934	0.0934	0.0934	0.2398	0.2435	0.2413
Running (g/mi)	50	0.0925	0.0925	0.0925	0.2421	0.2456	0.2435
Running (g/mi)	51	0.0919	0.0919	0.0919	0.2455	0.2491	0.2470
Running (g/mi)	52	0.0912	0.0912	0.0912	0.2489	0.2525	0.2503
Running (g/mi)	53	0.0906	0.0906	0.0906	0.2521	0.2557	0.2535
Running (g/mi)	54	0.0902	0.0902	0.0902	0.2554	0.2587	0.2567
Running (g/mi)	55	0.0897	0.0897	0.0897	0.2583	0.2620	0.2598
Running (g/mi)	56	0.0897	0.0897	0.0897	0.2630	0.2667	0.2645
Running (g/mi)	57	0.0897	0.0897	0.0897	0.2675	0.2713	0.2690
Running (g/mi)	58	0.0896	0.0896	0.0896	0.2719	0.2755	0.2733
Running (g/mi)	59	0.0894	0.0894	0.0894	0.2763	0.2796	0.2776
Running (g/mi)	60	0.0894	0.0894	0.0894	0.2801	0.2837	0.2815
Running (g/mi)	61	0.0895	0.0895	0.0895	0.2865	0.2901	0.2880
Running (g/mi)	62	0.0898	0.0898	0.0898	0.2925	0.2963	0.2940
Running (g/mi)	63	0.0897	0.0897	0.0897	0.2985	0.3021	0.3000
Running (g/mi)	64	0.0900	0.0900	0.0900	0.3044	0.3080	0.3058
Running (g/mi)	65	0.0900	0.0900	0.0900	0.3100	0.3135	0.3114

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.5488	0.2388
Hot Soak Loss (g/trip end)	0.2792	-
Hot Start (g/trip start, Light Duty Only)	0.0980	0.0558

Table 4: 2030 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMS (Mobile6.2)

Emission Type	Speed (mph)	Average 2030 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.4805	1.4804	1.4804	0.3605	0.3605	0.3605
Running (g/mi)	2	1.4805	1.4804	1.4804	0.3605	0.3605	0.3605
Running (g/mi)	3	1.1714	1.1714	1.1714	0.3437	0.3437	0.3437
Running (g/mi)	4	0.7848	0.7848	0.7848	0.3224	0.3224	0.3224
Running (g/mi)	5	0.5533	0.5532	0.5533	0.3097	0.3096	0.3096
Running (g/mi)	6	0.4632	0.4583	0.4613	0.2873	0.2760	0.2828
Running (g/mi)	7	0.3992	0.3906	0.3958	0.2714	0.2519	0.2636
Running (g/mi)	8	0.3508	0.3399	0.3464	0.2596	0.2338	0.2493
Running (g/mi)	9	0.3134	0.3004	0.3082	0.2502	0.2199	0.2381
Running (g/mi)	10	0.2832	0.2688	0.2774	0.2429	0.2085	0.2292
Running (g/mi)	11	0.2618	0.2464	0.2556	0.2314	0.1952	0.2169
Running (g/mi)	12	0.2439	0.2277	0.2374	0.2220	0.1840	0.2068
Running (g/mi)	13	0.2286	0.2119	0.2219	0.2141	0.1745	0.1982
Running (g/mi)	14	0.2157	0.1983	0.2087	0.2073	0.1662	0.1908
Running (g/mi)	15	0.2043	0.1866	0.1972	0.2013	0.1593	0.1845
Running (g/mi)	16	0.1926	0.1771	0.1864	0.1958	0.1588	0.1810
Running (g/mi)	17	0.1823	0.1685	0.1768	0.1909	0.1583	0.1779
Running (g/mi)	18	0.1730	0.1611	0.1682	0.1866	0.1578	0.1750
Running (g/mi)	19	0.1647	0.1543	0.1605	0.1828	0.1575	0.1727
Running (g/mi)	20	0.1571	0.1483	0.1536	0.1793	0.1571	0.1704
Running (g/mi)	21	0.1514	0.1439	0.1484	0.1760	0.1567	0.1683
Running (g/mi)	22	0.1461	0.1395	0.1435	0.1733	0.1564	0.1665
Running (g/mi)	23	0.1411	0.1359	0.1390	0.1705	0.1559	0.1647
Running (g/mi)	24	0.1368	0.1322	0.1350	0.1682	0.1557	0.1632
Running (g/mi)	25	0.1328	0.1293	0.1314	0.1660	0.1555	0.1618
Running (g/mi)	26	0.1290	0.1260	0.1278	0.1639	0.1552	0.1604
Running (g/mi)	27	0.1255	0.1230	0.1245	0.1622	0.1549	0.1593
Running (g/mi)	28	0.1220	0.1200	0.1212	0.1603	0.1548	0.1581
Running (g/mi)	29	0.1190	0.1174	0.1184	0.1588	0.1547	0.1572
Running (g/mi)	30	0.1161	0.1151	0.1157	0.1575	0.1546	0.1563
Running (g/mi)	31	0.1133	0.1127	0.1131	0.1566	0.1542	0.1556
Running (g/mi)	32	0.1109	0.1106	0.1108	0.1558	0.1538	0.1550
Running (g/mi)	33	0.1085	0.1081	0.1083	0.1548	0.1538	0.1544
Running (g/mi)	34	0.1064	0.1061	0.1063	0.1540	0.1537	0.1539
Running (g/mi)	35	0.1043	0.1043	0.1043	0.1534	0.1534	0.1534
Running (g/mi)	36	0.1025	0.1025	0.1025	0.1542	0.1542	0.1542
Running (g/mi)	37	0.1011	0.1011	0.1011	0.1548	0.1548	0.1548
Running (g/mi)	38	0.0995	0.0995	0.0995	0.1556	0.1556	0.1556
Running (g/mi)	39	0.0983	0.0983	0.0983	0.1562	0.1562	0.1562
Running (g/mi)	40	0.0969	0.0969	0.0969	0.1568	0.1568	0.1568
Running (g/mi)	41	0.0956	0.0956	0.0956	0.1578	0.1578	0.1578
Running (g/mi)	42	0.0944	0.0944	0.0944	0.1591	0.1591	0.1591
Running (g/mi)	43	0.0934	0.0934	0.0934	0.1602	0.1602	0.1602
Running (g/mi)	44	0.0923	0.0923	0.0923	0.1612	0.1612	0.1612
Running (g/mi)	45	0.0913	0.0913	0.0913	0.1622	0.1622	0.1622
Running (g/mi)	46	0.0903	0.0903	0.0903	0.1637	0.1637	0.1637
Running (g/mi)	47	0.0893	0.0893	0.0893	0.1653	0.1653	0.1653
Running (g/mi)	48	0.0884	0.0884	0.0884	0.1666	0.1666	0.1666
Running (g/mi)	49	0.0876	0.0876	0.0876	0.1679	0.1679	0.1679
Running (g/mi)	50	0.0867	0.0867	0.0867	0.1693	0.1693	0.1693
Running (g/mi)	51	0.0860	0.0860	0.0860	0.1713	0.1713	0.1713
Running (g/mi)	52	0.0855	0.0855	0.0855	0.1732	0.1732	0.1732
Running (g/mi)	53	0.0850	0.0850	0.0850	0.1750	0.1750	0.1750
Running (g/mi)	54	0.0844	0.0844	0.0844	0.1768	0.1768	0.1768
Running (g/mi)	55	0.0843	0.0843	0.0843	0.1786	0.1786	0.1786
Running (g/mi)	56	0.0840	0.0840	0.0840	0.1809	0.1809	0.1809
Running (g/mi)	57	0.0839	0.0839	0.0839	0.1836	0.1836	0.1836
Running (g/mi)	58	0.0840	0.0840	0.0840	0.1858	0.1858	0.1858
Running (g/mi)	59	0.0840	0.0840	0.0840	0.1880	0.1880	0.1880
Running (g/mi)	60	0.0841	0.0841	0.0841	0.1903	0.1903	0.1903
Running (g/mi)	61	0.0841	0.0841	0.0841	0.1936	0.1936	0.1936
Running (g/mi)	62	0.0843	0.0843	0.0843	0.1967	0.1967	0.1967
Running (g/mi)	63	0.0845	0.0845	0.0845	0.1996	0.1996	0.1996
Running (g/mi)	64	0.0845	0.0845	0.0845	0.2026	0.2026	0.2026
Running (g/mi)	65	0.0847	0.0847	0.0847	0.2056	0.2056	0.2056

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.4834	0.1716
Hot Soak Loss (g/trip end)	0.2062	-
Hot Start (g/trip start, Light Duty Only)	0.0877	0.0411

Exhibit - 1
VOC MOBILE6.2 RUNNING EMISSION RATES
TRAFFIC STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

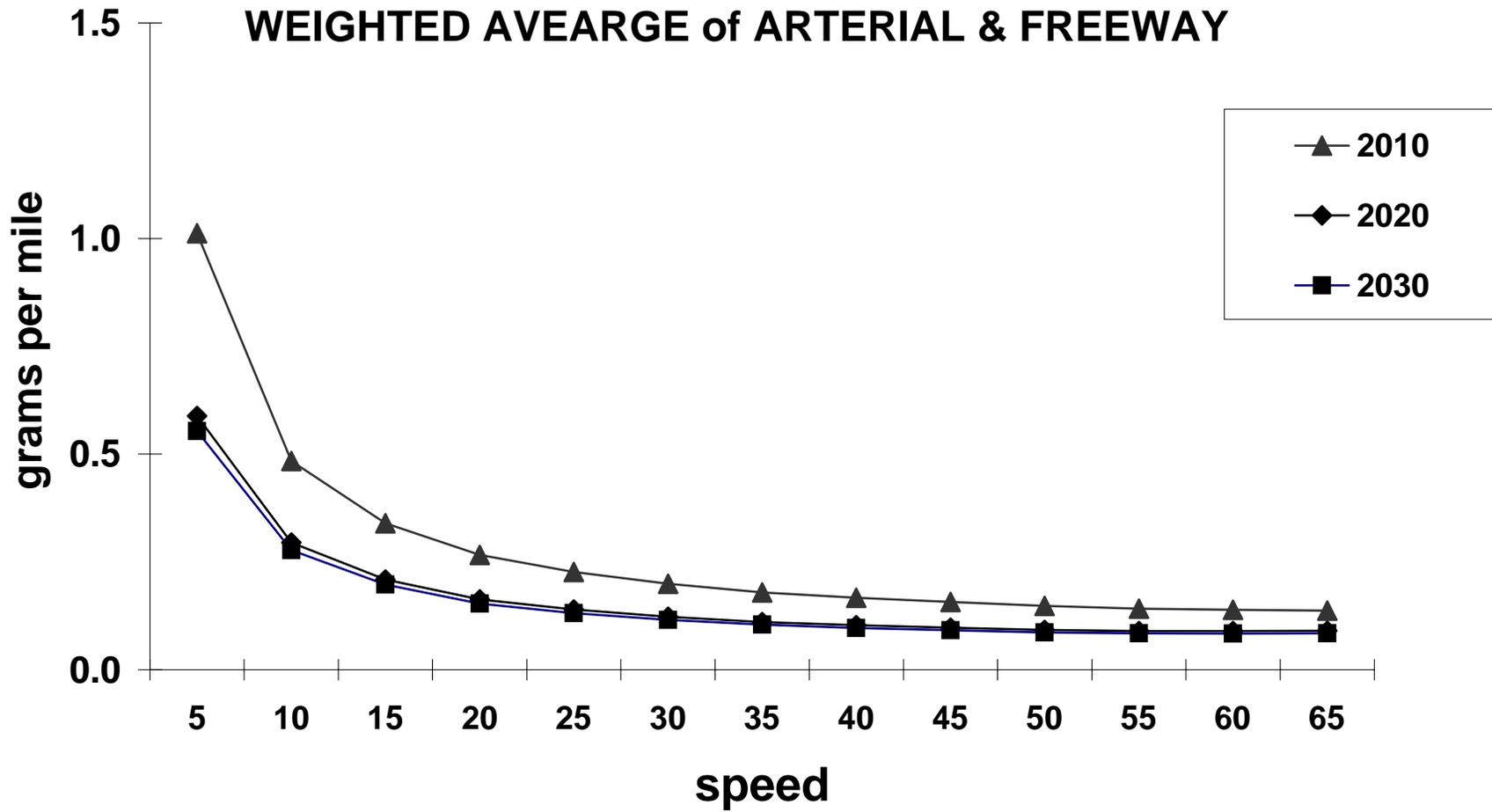


Exhibit - 2
NOx MOBILE6.2 RUNNING EMISSION RATES
TRAFFIC STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

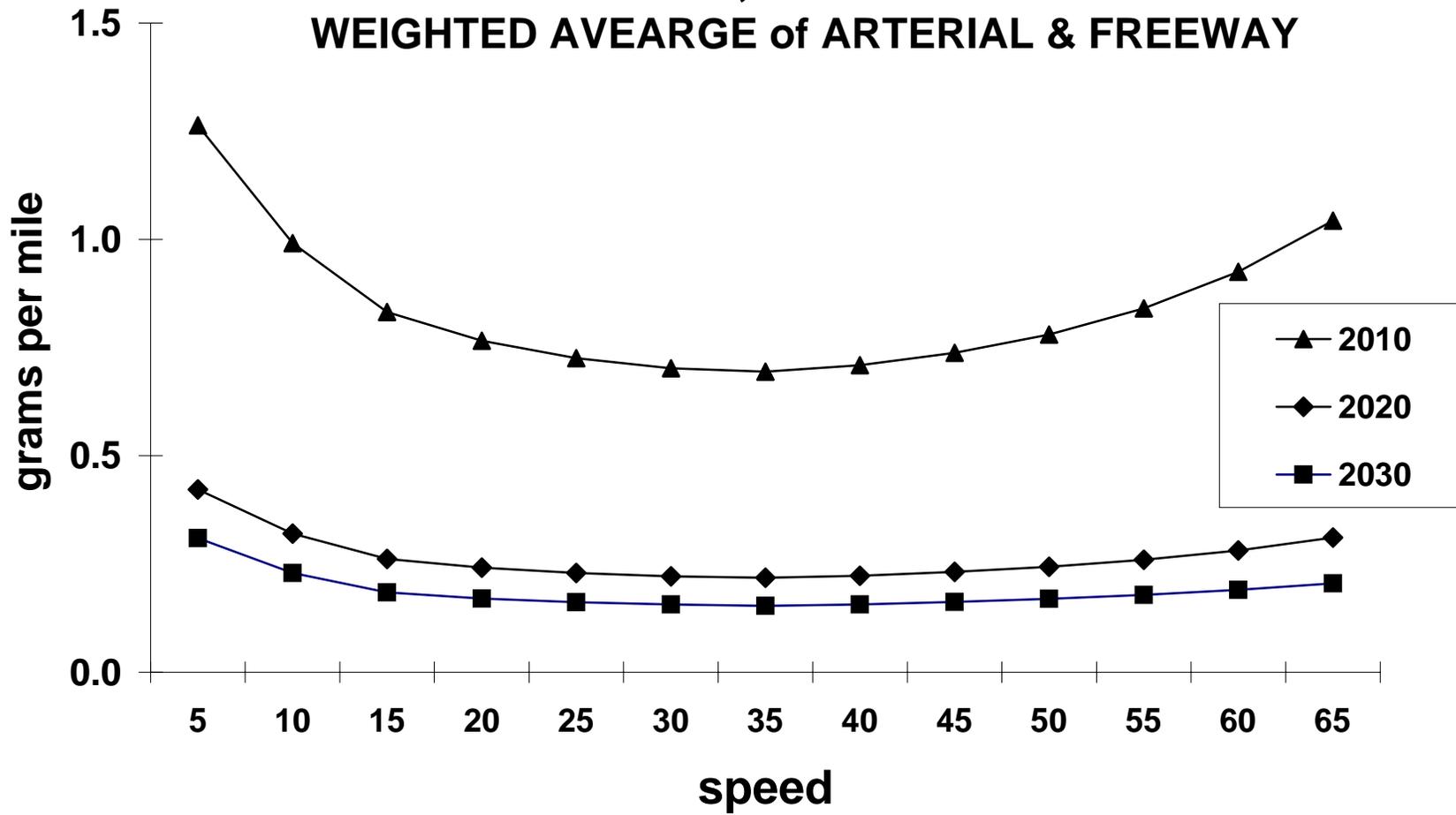


Table 5: 2010 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute"

**TERMS
(Mobile 6.2)**

Emission Type	Speed (mph)	Average 2010 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	2.9542	2.9542	2.9542	0.8639	0.8638	0.8639
Running (g/mi)	2	2.9542	2.9542	2.9542	0.8639	0.8638	0.8639
Running (g/mi)	3	2.3001	2.3001	2.3001	0.8211	0.8211	0.8211
Running (g/mi)	4	1.4826	1.4826	1.4826	0.7674	0.7674	0.7674
Running (g/mi)	5	0.9920	0.9920	0.9920	0.7353	0.7353	0.7353
Running (g/mi)	6	0.8155	0.8062	0.8118	0.6811	0.6493	0.6683
Running (g/mi)	7	0.6896	0.6738	0.6833	0.6423	0.5878	0.6205
Running (g/mi)	8	0.5949	0.5744	0.5867	0.6132	0.5419	0.5847
Running (g/mi)	9	0.5215	0.4967	0.5116	0.5905	0.5058	0.5566
Running (g/mi)	10	0.4626	0.4350	0.4515	0.5726	0.4773	0.5345
Running (g/mi)	11	0.4253	0.3961	0.4136	0.5455	0.4441	0.5049
Running (g/mi)	12	0.3944	0.3636	0.3821	0.5228	0.4162	0.4802
Running (g/mi)	13	0.3680	0.3362	0.3553	0.5035	0.3927	0.4592
Running (g/mi)	14	0.3455	0.3128	0.3324	0.4871	0.3727	0.4413
Running (g/mi)	15	0.3259	0.2923	0.3125	0.4727	0.3553	0.4257
Running (g/mi)	16	0.3072	0.2780	0.2955	0.4601	0.3565	0.4186
Running (g/mi)	17	0.2907	0.2654	0.2806	0.4488	0.3575	0.4123
Running (g/mi)	18	0.2761	0.2542	0.2673	0.4390	0.3583	0.4067
Running (g/mi)	19	0.2629	0.2438	0.2553	0.4299	0.3591	0.4016
Running (g/mi)	20	0.2509	0.2348	0.2445	0.4219	0.3599	0.3971
Running (g/mi)	21	0.2413	0.2276	0.2358	0.4144	0.3603	0.3928
Running (g/mi)	22	0.2329	0.2214	0.2283	0.4079	0.3607	0.3890
Running (g/mi)	23	0.2252	0.2157	0.2214	0.4018	0.3609	0.3855
Running (g/mi)	24	0.2181	0.2104	0.2150	0.3961	0.3613	0.3821
Running (g/mi)	25	0.2113	0.2055	0.2090	0.3909	0.3617	0.3792
Running (g/mi)	26	0.2055	0.2008	0.2036	0.3863	0.3617	0.3764
Running (g/mi)	27	0.2003	0.1964	0.1987	0.3817	0.3618	0.3737
Running (g/mi)	28	0.1954	0.1924	0.1942	0.3773	0.3618	0.3711
Running (g/mi)	29	0.1906	0.1883	0.1897	0.3735	0.3619	0.3689
Running (g/mi)	30	0.1864	0.1851	0.1859	0.3699	0.3620	0.3668
Running (g/mi)	31	0.1824	0.1814	0.1820	0.3675	0.3615	0.3651
Running (g/mi)	32	0.1785	0.1776	0.1781	0.3652	0.3609	0.3635
Running (g/mi)	33	0.1748	0.1742	0.1746	0.3631	0.3603	0.3619
Running (g/mi)	34	0.1714	0.1712	0.1713	0.3611	0.3598	0.3606
Running (g/mi)	35	0.1680	0.1680	0.1680	0.3593	0.3593	0.3593
Running (g/mi)	36	0.1657	0.1657	0.1657	0.3607	0.3607	0.3607
Running (g/mi)	37	0.1635	0.1635	0.1635	0.3620	0.3620	0.3620
Running (g/mi)	38	0.1614	0.1614	0.1614	0.3631	0.3631	0.3631
Running (g/mi)	39	0.1596	0.1596	0.1596	0.3643	0.3643	0.3643
Running (g/mi)	40	0.1577	0.1577	0.1577	0.3653	0.3653	0.3653
Running (g/mi)	41	0.1558	0.1558	0.1558	0.3673	0.3673	0.3673
Running (g/mi)	42	0.1539	0.1539	0.1539	0.3691	0.3691	0.3691
Running (g/mi)	43	0.1523	0.1523	0.1523	0.3708	0.3708	0.3708
Running (g/mi)	44	0.1505	0.1505	0.1505	0.3725	0.3725	0.3725
Running (g/mi)	45	0.1488	0.1488	0.1488	0.3739	0.3739	0.3739
Running (g/mi)	46	0.1473	0.1473	0.1473	0.3759	0.3759	0.3759
Running (g/mi)	47	0.1457	0.1457	0.1457	0.3779	0.3779	0.3779
Running (g/mi)	48	0.1442	0.1442	0.1442	0.3798	0.3798	0.3798
Running (g/mi)	49	0.1428	0.1428	0.1428	0.3815	0.3815	0.3815
Running (g/mi)	50	0.1412	0.1412	0.1412	0.3832	0.3832	0.3832
Running (g/mi)	51	0.1401	0.1401	0.1401	0.3853	0.3853	0.3853
Running (g/mi)	52	0.1388	0.1388	0.1388	0.3874	0.3874	0.3874
Running (g/mi)	53	0.1375	0.1375	0.1375	0.3892	0.3892	0.3892
Running (g/mi)	54	0.1364	0.1364	0.1364	0.3911	0.3911	0.3911
Running (g/mi)	55	0.1352	0.1352	0.1352	0.3929	0.3929	0.3929
Running (g/mi)	56	0.1345	0.1345	0.1345	0.3951	0.3951	0.3951
Running (g/mi)	57	0.1341	0.1341	0.1341	0.3973	0.3973	0.3973
Running (g/mi)	58	0.1335	0.1335	0.1335	0.3993	0.3993	0.3993
Running (g/mi)	59	0.1331	0.1331	0.1331	0.4011	0.4011	0.4011
Running (g/mi)	60	0.1326	0.1326	0.1326	0.4031	0.4031	0.4031
Running (g/mi)	61	0.1320	0.1320	0.1320	0.4052	0.4052	0.4052
Running (g/mi)	62	0.1319	0.1319	0.1319	0.4073	0.4073	0.4073
Running (g/mi)	63	0.1313	0.1313	0.1313	0.4094	0.4094	0.4094
Running (g/mi)	64	0.1311	0.1311	0.1311	0.4113	0.4113	0.4113
Running (g/mi)	65	0.1307	0.1307	0.1307	0.4133	0.4133	0.4133

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty)	0.9831	0.5689
Hot Soak Loss (g/trip end)	0.5569	0.0000
Hot Start (g/trip start, Light Duty)	0.1674	0.1262

Table 6: 2020 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute" TERMS (Mobile 6.2)

Emission Type	Speed (mph)	Average 2020 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.6176	1.6176	1.6176	0.3786	0.3786	0.3786
Running (g/mi)	2	1.6176	1.6176	1.6176	0.3786	0.3786	0.3786
Running (g/mi)	3	1.2700	1.2699	1.2700	0.3595	0.3595	0.3595
Running (g/mi)	4	0.8354	0.8353	0.8354	0.3359	0.3359	0.3359
Running (g/mi)	5	0.5746	0.5746	0.5746	0.3217	0.3217	0.3217
Running (g/mi)	6	0.4765	0.4708	0.4742	0.2974	0.2831	0.2917
Running (g/mi)	7	0.4064	0.3965	0.4025	0.2803	0.2555	0.2704
Running (g/mi)	8	0.3539	0.3406	0.3486	0.2670	0.2346	0.2541
Running (g/mi)	9	0.3128	0.2974	0.3067	0.2569	0.2185	0.2415
Running (g/mi)	10	0.2804	0.2630	0.2735	0.2489	0.2056	0.2316
Running (g/mi)	11	0.2577	0.2392	0.2503	0.2365	0.1908	0.2183
Running (g/mi)	12	0.2395	0.2201	0.2317	0.2265	0.1785	0.2073
Running (g/mi)	13	0.2242	0.2038	0.2160	0.2180	0.1679	0.1980
Running (g/mi)	14	0.2108	0.1900	0.2025	0.2105	0.1590	0.1899
Running (g/mi)	15	0.1989	0.1776	0.1904	0.2044	0.1512	0.1831
Running (g/mi)	16	0.1873	0.1685	0.1798	0.1986	0.1516	0.1798
Running (g/mi)	17	0.1768	0.1604	0.1702	0.1936	0.1524	0.1771
Running (g/mi)	18	0.1675	0.1535	0.1619	0.1891	0.1526	0.1745
Running (g/mi)	19	0.1592	0.1472	0.1544	0.1851	0.1533	0.1724
Running (g/mi)	20	0.1520	0.1414	0.1477	0.1816	0.1535	0.1704
Running (g/mi)	21	0.1463	0.1373	0.1427	0.1784	0.1539	0.1686
Running (g/mi)	22	0.1415	0.1337	0.1384	0.1754	0.1541	0.1669
Running (g/mi)	23	0.1369	0.1303	0.1342	0.1727	0.1543	0.1653
Running (g/mi)	24	0.1326	0.1274	0.1305	0.1704	0.1545	0.1640
Running (g/mi)	25	0.1288	0.1245	0.1271	0.1680	0.1545	0.1626
Running (g/mi)	26	0.1252	0.1217	0.1238	0.1659	0.1547	0.1614
Running (g/mi)	27	0.1219	0.1190	0.1207	0.1639	0.1548	0.1603
Running (g/mi)	28	0.1189	0.1165	0.1179	0.1620	0.1549	0.1592
Running (g/mi)	29	0.1163	0.1144	0.1155	0.1604	0.1550	0.1582
Running (g/mi)	30	0.1135	0.1121	0.1130	0.1587	0.1550	0.1572
Running (g/mi)	31	0.1110	0.1100	0.1106	0.1575	0.1547	0.1564
Running (g/mi)	32	0.1088	0.1079	0.1084	0.1565	0.1545	0.1557
Running (g/mi)	33	0.1063	0.1061	0.1062	0.1555	0.1543	0.1550
Running (g/mi)	34	0.1045	0.1041	0.1043	0.1547	0.1540	0.1544
Running (g/mi)	35	0.1022	0.1022	0.1022	0.1539	0.1539	0.1539
Running (g/mi)	36	0.1011	0.1011	0.1011	0.1545	0.1545	0.1545
Running (g/mi)	37	0.0997	0.0997	0.0997	0.1552	0.1552	0.1552
Running (g/mi)	38	0.0987	0.0987	0.0987	0.1558	0.1558	0.1558
Running (g/mi)	39	0.0974	0.0974	0.0974	0.1565	0.1565	0.1565
Running (g/mi)	40	0.0962	0.0962	0.0962	0.1568	0.1568	0.1568
Running (g/mi)	41	0.0950	0.0950	0.0950	0.1578	0.1578	0.1578
Running (g/mi)	42	0.0941	0.0941	0.0941	0.1586	0.1586	0.1586
Running (g/mi)	43	0.0931	0.0931	0.0931	0.1594	0.1594	0.1594
Running (g/mi)	44	0.0921	0.0921	0.0921	0.1604	0.1604	0.1604
Running (g/mi)	45	0.0911	0.0911	0.0911	0.1611	0.1611	0.1611
Running (g/mi)	46	0.0901	0.0901	0.0901	0.1620	0.1620	0.1620
Running (g/mi)	47	0.0892	0.0892	0.0892	0.1627	0.1627	0.1627
Running (g/mi)	48	0.0886	0.0886	0.0886	0.1636	0.1636	0.1636
Running (g/mi)	49	0.0879	0.0879	0.0879	0.1645	0.1645	0.1645
Running (g/mi)	50	0.0871	0.0871	0.0871	0.1655	0.1655	0.1655
Running (g/mi)	51	0.0866	0.0866	0.0866	0.1665	0.1665	0.1665
Running (g/mi)	52	0.0861	0.0861	0.0861	0.1675	0.1675	0.1675
Running (g/mi)	53	0.0855	0.0855	0.0855	0.1684	0.1684	0.1684
Running (g/mi)	54	0.0850	0.0850	0.0850	0.1692	0.1692	0.1692
Running (g/mi)	55	0.0847	0.0847	0.0847	0.1701	0.1701	0.1701
Running (g/mi)	56	0.0847	0.0847	0.0847	0.1712	0.1712	0.1712
Running (g/mi)	57	0.0847	0.0847	0.0847	0.1722	0.1722	0.1722
Running (g/mi)	58	0.0847	0.0847	0.0847	0.1732	0.1732	0.1732
Running (g/mi)	59	0.0849	0.0849	0.0849	0.1741	0.1741	0.1741
Running (g/mi)	60	0.0847	0.0847	0.0847	0.1750	0.1750	0.1750
Running (g/mi)	61	0.0850	0.0850	0.0850	0.1762	0.1762	0.1762
Running (g/mi)	62	0.0851	0.0851	0.0851	0.1772	0.1772	0.1772
Running (g/mi)	63	0.0852	0.0852	0.0852	0.1784	0.1784	0.1784
Running (g/mi)	64	0.0852	0.0852	0.0852	0.1794	0.1794	0.1794
Running (g/mi)	65	0.0855	0.0855	0.0855	0.1801	0.1801	0.1801

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.5489	0.2388
Hot Soak Loss (g/trip end)	0.2742	0.0000
Hot Start (g/trip start, Light Duty Only)	0.0981	0.0558

Table 7: 2030 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute" TERMS (Mobile 6.2)

Average 2030 Emission Factors (gm/mi)							
Emission Type	Speed (mph)	Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60% Freeway 40%	NOx		Arterial - 60% Freeway 40%
Running (g/mi)	1	1.531	1.531	1.5308	0.328	0.328	0.3277
Running (g/mi)	2	1.531	1.531	1.5308	0.328	0.328	0.3277
Running (g/mi)	3	1.202	1.202	1.2016	0.311	0.311	0.3112
Running (g/mi)	4	0.790	0.790	0.7896	0.291	0.291	0.2905
Running (g/mi)	5	0.543	0.543	0.5426	0.278	0.278	0.2780
Running (g/mi)	6	0.450	0.445	0.4477	0.257	0.244	0.2518
Running (g/mi)	7	0.384	0.374	0.3801	0.242	0.220	0.2331
Running (g/mi)	8	0.334	0.322	0.3292	0.230	0.202	0.2191
Running (g/mi)	9	0.295	0.281	0.2895	0.222	0.188	0.2080
Running (g/mi)	10	0.264	0.248	0.2580	0.214	0.177	0.1994
Running (g/mi)	11	0.244	0.226	0.2367	0.204	0.164	0.1876
Running (g/mi)	12	0.226	0.208	0.2189	0.195	0.153	0.1780
Running (g/mi)	13	0.212	0.193	0.2040	0.187	0.144	0.1699
Running (g/mi)	14	0.199	0.180	0.1910	0.181	0.136	0.1628
Running (g/mi)	15	0.188	0.168	0.1800	0.175	0.129	0.1568
Running (g/mi)	16	0.177	0.160	0.1698	0.170	0.130	0.1541
Running (g/mi)	17	0.167	0.152	0.1609	0.166	0.130	0.1517
Running (g/mi)	18	0.158	0.145	0.1528	0.162	0.131	0.1496
Running (g/mi)	19	0.150	0.139	0.1457	0.159	0.131	0.1476
Running (g/mi)	20	0.143	0.133	0.1392	0.156	0.131	0.1458
Running (g/mi)	21	0.138	0.130	0.1347	0.153	0.131	0.1443
Running (g/mi)	22	0.133	0.126	0.1303	0.150	0.132	0.1428
Running (g/mi)	23	0.129	0.123	0.1265	0.148	0.132	0.1415
Running (g/mi)	24	0.125	0.120	0.1231	0.146	0.132	0.1402
Running (g/mi)	25	0.121	0.117	0.1197	0.144	0.132	0.1390
Running (g/mi)	26	0.118	0.115	0.1168	0.142	0.132	0.1380
Running (g/mi)	27	0.115	0.112	0.1140	0.140	0.132	0.1371
Running (g/mi)	28	0.112	0.110	0.1113	0.139	0.132	0.1361
Running (g/mi)	29	0.109	0.108	0.1086	0.137	0.132	0.1352
Running (g/mi)	30	0.107	0.106	0.1064	0.136	0.132	0.1344
Running (g/mi)	31	0.104	0.103	0.1039	0.135	0.132	0.1337
Running (g/mi)	32	0.102	0.102	0.1021	0.134	0.132	0.1331
Running (g/mi)	33	0.100	0.100	0.1000	0.133	0.132	0.1325
Running (g/mi)	34	0.098	0.098	0.0982	0.132	0.132	0.1318
Running (g/mi)	35	0.096	0.096	0.0963	0.131	0.131	0.1314
Running (g/mi)	36	0.095	0.095	0.0950	0.132	0.132	0.1319
Running (g/mi)	37	0.094	0.094	0.0939	0.133	0.133	0.1325
Running (g/mi)	38	0.093	0.093	0.0928	0.133	0.133	0.1331
Running (g/mi)	39	0.092	0.092	0.0916	0.134	0.134	0.1336
Running (g/mi)	40	0.090	0.090	0.0903	0.134	0.134	0.1341
Running (g/mi)	41	0.089	0.089	0.0894	0.135	0.135	0.1348
Running (g/mi)	42	0.088	0.088	0.0884	0.136	0.136	0.1357
Running (g/mi)	43	0.087	0.087	0.0872	0.136	0.136	0.1363
Running (g/mi)	44	0.087	0.087	0.0865	0.137	0.137	0.1371
Running (g/mi)	45	0.086	0.086	0.0856	0.138	0.138	0.1378
Running (g/mi)	46	0.085	0.085	0.0848	0.139	0.139	0.1385
Running (g/mi)	47	0.084	0.084	0.0839	0.139	0.139	0.1393
Running (g/mi)	48	0.083	0.083	0.0830	0.140	0.140	0.1402
Running (g/mi)	49	0.082	0.082	0.0824	0.141	0.141	0.1408
Running (g/mi)	50	0.082	0.082	0.0815	0.142	0.142	0.1416
Running (g/mi)	51	0.081	0.081	0.0813	0.143	0.143	0.1426
Running (g/mi)	52	0.081	0.081	0.0807	0.143	0.143	0.1434
Running (g/mi)	53	0.080	0.080	0.0803	0.144	0.144	0.1443
Running (g/mi)	54	0.080	0.080	0.0798	0.145	0.145	0.1451
Running (g/mi)	55	0.080	0.080	0.0796	0.146	0.146	0.1458
Running (g/mi)	56	0.079	0.079	0.0795	0.147	0.147	0.1468
Running (g/mi)	57	0.080	0.080	0.0796	0.148	0.148	0.1477
Running (g/mi)	58	0.080	0.080	0.0797	0.149	0.149	0.1485
Running (g/mi)	59	0.080	0.080	0.0798	0.150	0.150	0.1495
Running (g/mi)	60	0.080	0.080	0.0797	0.150	0.150	0.1503
Running (g/mi)	61	0.080	0.080	0.0799	0.151	0.151	0.1512
Running (g/mi)	62	0.080	0.080	0.0801	0.152	0.152	0.1520
Running (g/mi)	63	0.080	0.080	0.0803	0.153	0.153	0.1530
Running (g/mi)	64	0.080	0.080	0.0803	0.154	0.154	0.1537
Running (g/mi)	65	0.081	0.081	0.0808	0.155	0.155	0.1546

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.4835	0.1716
Hot Soak Loss (g/trip end)	0.2038	-
Hot Start (g/trip start, Light Duty Only)	0.0877	0.0411

Exhibit - 3
VOC MOBILE6.2 RUNNING EMISSION RATES
COMMUTE STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

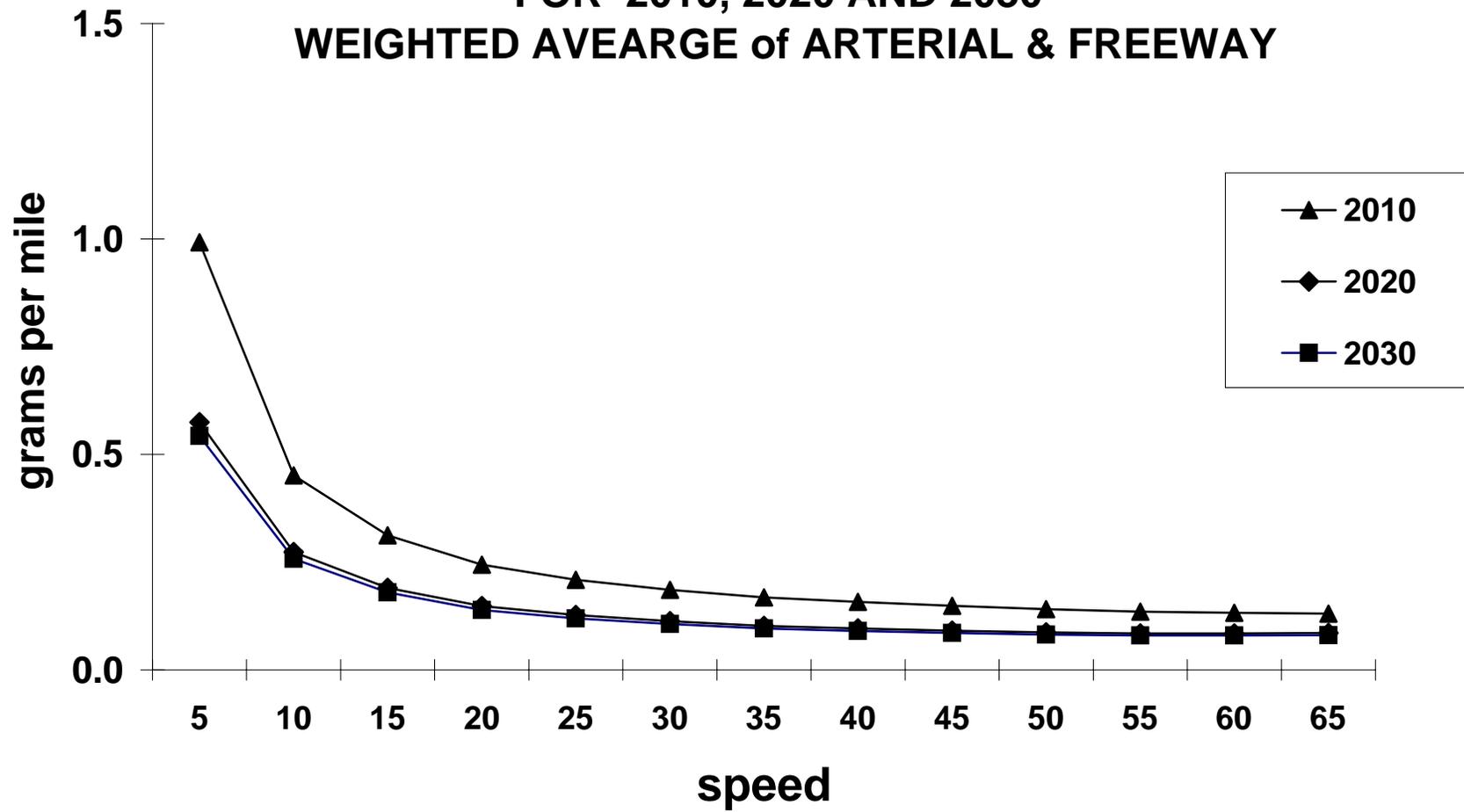


Exhibit - 4
NO_x MOBILE6.2 RUNNING EMISSION RATES
COMMUTE STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

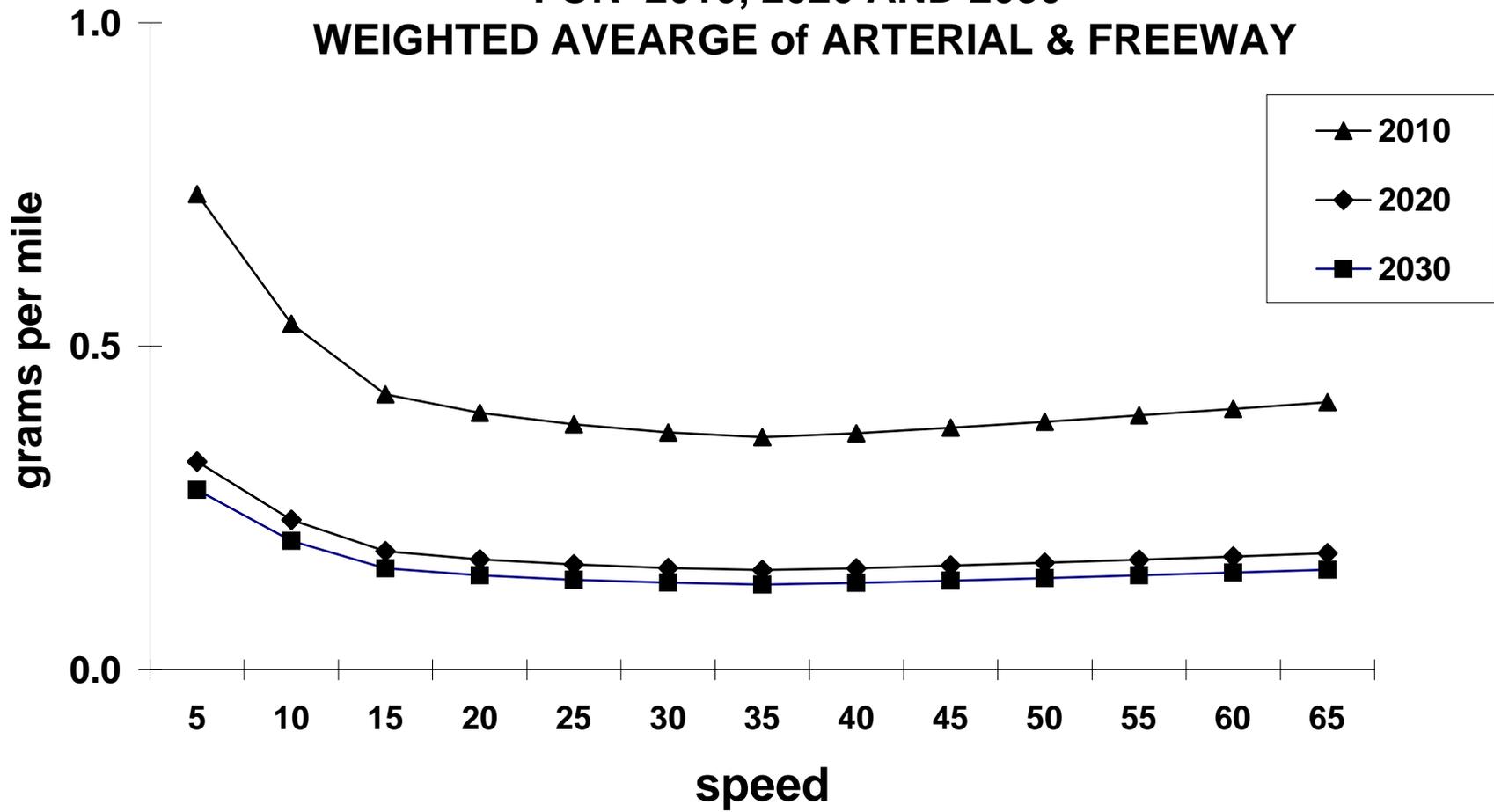


Table - 8 Idling Emissions Factors
(Mobile 6.2)

Vehicle Type	2010			2020			2030		
	VOC (g/hr)	NOx (g/hr)	PM (g/hr)	VOC (g/hr)	NOx (g/hr)	PM (g/hr)	VOC (g/hr)	NOx (g/hr)	PM (g/hr)
LDGV	1.1688	2.3925	-	0.5313	0.9000	-	0.4563	0.7300	-
LDGT12	1.2500	2.1900	-	0.7175	0.8813	-	0.6850	0.7863	-
LDGT34	1.9950	3.0913	-	0.9838	1.3038	-	0.8650	1.1038	-
HDTV	14.3938	4.5063	-	6.1063	1.1400	-	5.1125	0.3263	-
LDDV	0.6225	0.8638	-	0.2925	0.1625	-	0.2575	0.1113	-
LDDT	1.7250	2.0675	-	0.4288	0.3100	-	0.3775	0.2413	-
HDDV	3.1125	32.1350	0.9841	1.8663	6.5875	0.9237	1.6975	1.9863	0.9237
MC	20.2563	1.5825	-	20.2288	1.5825	-	20.2288	1.5825	-
Avg. for all vehicles	1.8401	4.2763	-	1.0011	1.3492	-	0.9213	0.9040	-

Notes:

- 1- NOx & VOC Average rates for all vehicle is weighted by the VMT percentages
- 2- EPA Mobile 6 guidance provides instructions for estimating PM idling rates only for heavy duty vehicles
- 3- PM average shown in the above table are based on the average of three jurisdictions. (District of Columbia, Fairfax County, Montgomery County)

Also for use in the emissions reduction calculations average weighted speed by time period are shown in Table 9 below. The 24 hour regional average weighted speed is 41 miles per hour and should be used for TERMS affecting the entire traffic stream, where site-specific speed data are not available. Please express reductions of VOC and NOx for all years in both kilograms per day and tons per day using a conversion factor of .0011 (# of kg reduced x .0011 = # of tons reduced).

Table 9: Average Weighted Speeds by Hour

Time	Speed (mph)
12-1	48
1-2	49
2-3	49
3-4	49
4-5	48
5-6	45
6-7	41
7-8	38
8-9	39
9-10	41
10-11	43
11-12	42
12-1 PM	40
1-2 PM	42
2-3 PM	42
3-4 PM	41
4-5 PM	40
5-6 PM	39
6-7 PM	40
7-8 PM	42
8-9 PM	43
9-10 PM	44
10-11 PM	45
11-12 MID	45
24 Hour Avg	41

Table 10: Mobile 6 Vehicle Classifications		
Number	Abbreviation	Description
1	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
2	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
3	LDGT2	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
4	LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALW)
5	LDGT4	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALW)
6	HDGV2b	Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR)
7	HDGV3	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
8	HDGV4	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
9	HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
10	HDGV6	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
11	HDGV7	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
12	HDGV8a	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
13	HDGV8b	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
14	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
15	LDDT12	Light-Duty Diesel Trucks 1 and 2 (0-6,000 lbs. GVWR)
16	HDDV2b	Class 2b Heavy-Duty Diesel Vehicles (8,501-10,000 lbs. GVWR)
17	HDDV3	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
18	HDDV4	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
19	HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
20	HDDV6	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
21	HDDV7	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
22	HDDV8a	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
23	HDDV8b	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
24	MC	Motorcycles (Gasoline)
25	HDGB	Gasoline Buses (School, Transit and Urban)
26	HDDBT	Diesel Transit and Urban Buses
27	HDDBS	Diesel School Buses
28	LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)

General Assumptions

The detailed assumptions for the each TERMS varies as per the nature of the TERM. However, some of the assumptions are common to the all the TERMS. Such assumptions included 2010 travel conditions, regional average emissions factors, regional average one way trip length of 15.5 miles etc.

Following tables shows regional data (VT & VMT by purpose, year) obtained from the travel demand model and some of the generic assumptions are the being used for the TERM analysis.

Table 11- Daily Regional Home Based Work Purpose Mode Analysis by Year

YEAR	HBW MOTORIZED PERSON	TOTAL HBW AUTO PSN	TOTAL HBW AUTO DRV	HBW CAROCC	HBW TRANSIT	HBW TRANSIT (%)
2002	4,316,159	3,791,490	3,383,336	1.120	524,669	12.20%
2010	4,985,050	4,378,265	3,898,063	1.120	606,785	12.20%
2020	5,713,760	5,004,517	4,445,790	1.130	709,243	12.40%
2030	6,431,361	5,661,282	5,030,783	1.130	770,079	12.00%

Table 12- Daily Regional Analysis by Year for all Trip Purposes

YEAR	TOTAL MOTORIZED PERSON	TOTAL AUTO PSN	TOTAL AUTO DRV	TOTAL CAROCC	TOTAL TRANSIT	TRANSIT (%)
2002	24,654,844	23,759,891	18,220,519	1.300	894,953	3.60%
2010	28,266,255	27,241,469	20,901,519	1.300	1,024,786	3.60%
2020	31,907,217	30,665,549	23,571,119	1.300	1,241,668	3.90%
2030	35,311,893	33,965,512	26,215,916	1.300	1,346,381	3.80%

Table 13- Daily Regional Vehicle Trips by Purpose by Year

YEAR	WORK & NON-WORK AUTO DRV	TRUCKS (MED + HVY)	MISC + THRU TRIPS	TOTAL VEH. TRIPS	TOTAL VMT
2002	18,220,519	479,095	708,631	19,407,719	149,065,567
2010	20,901,519	557,845	824,585	22,283,534	169,740,561
2020	23,571,119	650,193	952,699	25,173,882	195,371,894
2030	26,215,916	743,855	1,082,348	28,041,954	217,051,064

Source: 2005 CLRP / FY2006-2011 TIP CLRP air quality conformity document

Cost Effectiveness Estimation Procedure

The staff has gathered cost information from the various agencies and cost figures are in today's dollars. The TERMS project cost is expressed in terms of TIP cost and cost per year. The total

cost of project thus includes capital cost, operating cost and maintenance cost. The TIP cost consists of capital cost, and three year of operating cost and maintenance cost. For the cost effectiveness annualized cost has been used. The annualized cost is total cost per year. The following formula shows the procedure.

Consistency between programming agencies in assumptions and methodology for effectiveness estimations is critical for meaningful comparison of different projects around the region. Therefore, please use the following guidelines when calculating the cost effectiveness of your TERM projects. When determining the cost effectiveness, capital costs, operating costs, and revenues should be considered. Projects should be expressed in dollars per ton of reduction for both VOC and NOx. Please use the following series of formulas to compute cost effectiveness:

$$A. \text{ Total Project Cost} = \text{Capital Costs} + \text{Operating Costs} - (\text{Revenues} + \text{Resale Value, if relevant/significant})$$

$$B. \text{ Cost Per Day} = \frac{\text{Total Project Cost}}{\text{Benefit Days per Year} \times \text{Lifespan}}$$

$$C. \text{ Cost Per Ton} = \text{Cost Per Day} / \text{Tons VOC or NOx Reduced Per Day}$$

Where:

Benefit Days per Year = 250 for projects mostly related to work travel (i.e., commuter lots, ridesharing)

365 for projects relating to all travel (e.g. roadway signal systems)

Lifespan¹ = 30 years for park and ride lot (construction)
 100 years for park and ride lot land (right-of-way)
 20 years for roadways
 30 years for bridges
 12 years for roadway signal systems
 20 years for rail signalization
 35 years for structures (i.e., garages)
 12 years for buses
 35 years for railcars
 30 years for locomotives
 10 years for sidewalks

Travel demand model assumptions:

Average one-way trip length for commute trips = 15.5 miles

Average vehicle occupancy = 1.12

¹ These lifespan values were provided by various transit and highway agencies and consultants. If lifespan values necessary for the cost/benefit calculation of any TERM projects are not provided, please contact Daivamani Sivasailam at (202) 962-3226.

Section II

The EPA guidance on fine particulate matter (PM 2.5) emissions requires the region to estimate direct PM 2.5 and NOx emissions as a PM2.5 precursor. In addition these emissions estimations are required on an annual basis and not on a daily basis as in the case of ozone precursors. Direct PM2.5 emission rates are constant for all speeds and are expressed in grams/mile. Direct PM 2.5 has no start-up, soak or other evaporative emissions associated with them. However, NOx as a precursor to PM 2.5 is similar to NOx as a precursor to ozone, and has start-up emissions in addition to running emissions.

The recommended methodology to estimate annual direct PM2.5 and NOx emissions as a PM2.5 precursor is to use an average of the three seasonal emission rates (Jan–April, May–September, & October-December) and apply these average rates to annual VT and VMT to estimate the annual direct PM2.5 and precursor NOx emissions. Direct PM2.5 emissions rates and average seasonal precursor NOx emissions rates for the analysis years 2010, 2020, & 2030 are shown in Tables 14, 15, 16 & 17.

An example of a commuter TERM analysis with PM2.5 and NOx emissions as a PM2.5 precursor is shown on the following pages.

Table-14

Direct PM2.5 Emissions Factors

Scenario	Season	Speed	Facility	Total PM
2010 PM25 - Auto Access	Jan-Apr	35.0	Arterial	0.0115
	May-Sep	35.0	Arterial	0.0115
	Oct-Dec	35.0	Arterial	0.0114
Average				0.0115
2020 PM25 - Auto Access	Jan-Apr	35.0	Arterial	0.0113
	May-Sep	35.0	Arterial	0.0113
	Oct-Dec	35.0	Arterial	0.0113
Average				0.0113
2030 PM25 - Auto Access	Jan-Apr	35.0	Arterial	0.0113
	May-Sep	35.0	Arterial	0.0113
	Oct-Dec	35.0	Arterial	0.0113
Average				0.0113

**Table 15: NOx - 2010 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

Speed	Weighted Factor Jan-Apr NOx (grams/mile)	Weighted Factor May-Sep NOx (grams/mile)	Weighted Factor Oct-Dec NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.9968	0.7555	0.8367	0.8630
2	0.9968	0.7555	0.8367	0.8630
3	0.9532	0.7201	0.8006	0.8246
4	0.8988	0.6757	0.7548	0.7764
5	0.8659	0.6492	0.7274	0.7475
6	0.7931	0.5914	0.6660	0.6835
7	0.7410	0.5501	0.6219	0.6377
8	0.7018	0.5189	0.5891	0.6033
9	0.6714	0.4949	0.5632	0.5765
10	0.6472	0.4755	0.5429	0.5552
11	0.6143	0.4495	0.5151	0.5263
12	0.5868	0.4280	0.4920	0.5023
13	0.5637	0.4097	0.4725	0.4820
14	0.5439	0.3940	0.4557	0.4645
15	0.5266	0.3805	0.4412	0.4494
16	0.5197	0.3746	0.4353	0.4432
17	0.5135	0.3694	0.4302	0.4377
18	0.5080	0.3648	0.4257	0.4328
19	0.5033	0.3606	0.4215	0.4285
20	0.4988	0.3568	0.4178	0.4245
21	0.4948	0.3535	0.4145	0.4209
22	0.4914	0.3504	0.4115	0.4178
23	0.4880	0.3475	0.4089	0.4148
24	0.4851	0.3448	0.4063	0.4121
25	0.4824	0.3426	0.4040	0.4097
26	0.4798	0.3402	0.4019	0.4073
27	0.4776	0.3382	0.4001	0.4053
28	0.4754	0.3361	0.3982	0.4032
29	0.4734	0.3343	0.3966	0.4014
30	0.4716	0.3327	0.3950	0.3998
31	0.4704	0.3314	0.3940	0.3986
32	0.4693	0.3302	0.3931	0.3975
33	0.4684	0.3291	0.3923	0.3966
34	0.4674	0.3280	0.3915	0.3956
35	0.4666	0.3272	0.3907	0.3948
36	0.4690	0.3286	0.3929	0.3968
37	0.4711	0.3302	0.3948	0.3987
38	0.4732	0.3313	0.3965	0.4003
39	0.4752	0.3330	0.3983	0.4022
40	0.4772	0.3342	0.4000	0.4038
41	0.4800	0.3362	0.4026	0.4063
42	0.4829	0.3382	0.4048	0.4086
43	0.4858	0.3401	0.4072	0.4110
44	0.4881	0.3415	0.4096	0.4131
45	0.4906	0.3434	0.4116	0.4152
46	0.4936	0.3455	0.4143	0.4178
47	0.4966	0.3474	0.4167	0.4202
48	0.4994	0.3494	0.4191	0.4226
49	0.5022	0.3512	0.4213	0.4249
50	0.5045	0.3530	0.4235	0.4270
51	0.5077	0.3551	0.4263	0.4297
52	0.5108	0.3573	0.4292	0.4324
53	0.5138	0.3594	0.4315	0.4349
54	0.5168	0.3614	0.4340	0.4374
55	0.5195	0.3634	0.4364	0.4398
56	0.5227	0.3656	0.4392	0.4425
57	0.5259	0.3677	0.4421	0.4452
58	0.5292	0.3698	0.4446	0.4479
59	0.5320	0.3718	0.4471	0.4503
60	0.5347	0.3738	0.4496	0.4527
61	0.5382	0.3761	0.4525	0.4556
62	0.5411	0.3784	0.4552	0.4582
63	0.5440	0.3804	0.4577	0.4607
64	0.5472	0.3821	0.4603	0.4632
65	0.5501	0.3842	0.4627	0.4657

	Jan-Apr	May-Sep	Oct-Dec	Average
Cold Start (g/trip start, Light Duty Only)	0.7816	0.5441	0.6700	0.6652

**Table 16: NOx - 2020 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

Speed	Weighted Factor Jan-Apr NOx (grams/mile)	Weighted Factor May-Sep NOx (grams/mile)	Weighted Factor Oct-Dec NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.2483	0.2029	0.2288	0.2267
2	0.2483	0.2029	0.2288	0.2267
3	0.2377	0.1934	0.2191	0.2167
4	0.2243	0.1815	0.2068	0.2042
5	0.2163	0.1744	0.1996	0.1968
6	0.1979	0.1584	0.1823	0.1795
7	0.1846	0.1472	0.1703	0.1674
8	0.1747	0.1387	0.1611	0.1581
9	0.1671	0.1320	0.1539	0.1510
10	0.1610	0.1267	0.1483	0.1453
11	0.1526	0.1196	0.1405	0.1375
12	0.1456	0.1138	0.1341	0.1312
13	0.1398	0.1087	0.1287	0.1257
14	0.1348	0.1045	0.1240	0.1211
15	0.1305	0.1008	0.1199	0.1171
16	0.1288	0.0992	0.1185	0.1155
17	0.1273	0.0978	0.1170	0.1140
18	0.1260	0.0965	0.1158	0.1128
19	0.1248	0.0954	0.1147	0.1116
20	0.1236	0.0945	0.1137	0.1106
21	0.1227	0.0935	0.1129	0.1097
22	0.1219	0.0928	0.1121	0.1089
23	0.1211	0.0920	0.1113	0.1081
24	0.1203	0.0913	0.1107	0.1074
25	0.1198	0.0907	0.1099	0.1068
26	0.1191	0.0900	0.1095	0.1062
27	0.1186	0.0896	0.1090	0.1057
28	0.1181	0.0890	0.1086	0.1052
29	0.1177	0.0885	0.1081	0.1048
30	0.1172	0.0881	0.1077	0.1043
31	0.1169	0.0878	0.1074	0.1040
32	0.1167	0.0874	0.1073	0.1038
33	0.1164	0.0871	0.1070	0.1035
34	0.1162	0.0868	0.1068	0.1033
35	0.1160	0.0865	0.1066	0.1030
36	0.1167	0.0870	0.1072	0.1036
37	0.1173	0.0874	0.1078	0.1042
38	0.1179	0.0879	0.1084	0.1047
39	0.1185	0.0883	0.1089	0.1053
40	0.1189	0.0886	0.1094	0.1056
41	0.1198	0.0892	0.1102	0.1064
42	0.1206	0.0898	0.1109	0.1071
43	0.1214	0.0903	0.1117	0.1078
44	0.1220	0.0909	0.1124	0.1084
45	0.1227	0.0914	0.1130	0.1090
46	0.1235	0.0920	0.1137	0.1097
47	0.1244	0.0926	0.1145	0.1105
48	0.1252	0.0931	0.1153	0.1112
49	0.1260	0.0937	0.1159	0.1119
50	0.1267	0.0943	0.1166	0.1125
51	0.1276	0.0949	0.1176	0.1134
52	0.1286	0.0955	0.1184	0.1141
53	0.1294	0.0961	0.1192	0.1149
54	0.1302	0.0968	0.1199	0.1156
55	0.1310	0.0974	0.1208	0.1164
56	0.1319	0.0980	0.1216	0.1172
57	0.1329	0.0986	0.1224	0.1180
58	0.1338	0.0993	0.1234	0.1188
59	0.1345	0.0999	0.1241	0.1195
60	0.1354	0.1005	0.1249	0.1203
61	0.1364	0.1011	0.1259	0.1211
62	0.1373	0.1019	0.1268	0.1220
63	0.1382	0.1024	0.1275	0.1227
64	0.1391	0.1031	0.1283	0.1235
65	0.1398	0.1036	0.1291	0.1242

	Jan-Apr	May-Sep	Oct-Dec	Average
Cold Start (g/trip start, Light Duty Only)	0.1968	0.1409	0.1806	0.1727

**Table 17: NOx - 2030 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

Speed	Weighted Factor Jan-Apr NOx (grams/mile)	Weighted Factor May-Sep NOx (grams/mile)	Weighted Factor Oct-Dec NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.2093	0.1763	0.1994	0.1950
2	0.2093	0.1763	0.1994	0.1950
3	0.2003	0.1680	0.1909	0.1864
4	0.1893	0.1576	0.1803	0.1757
5	0.1826	0.1514	0.1740	0.1693
6	0.1668	0.1375	0.1590	0.1544
7	0.1556	0.1275	0.1483	0.1438
8	0.1473	0.1200	0.1403	0.1359
9	0.1408	0.1143	0.1340	0.1297
10	0.1355	0.1097	0.1290	0.1247
11	0.1284	0.1035	0.1223	0.1180
12	0.1225	0.0983	0.1166	0.1125
13	0.1175	0.0939	0.1118	0.1077
14	0.1132	0.0901	0.1077	0.1037
15	0.1096	0.0869	0.1042	0.1002
16	0.1081	0.0856	0.1028	0.0988
17	0.1068	0.0844	0.1015	0.0976
18	0.1057	0.0832	0.1006	0.0965
19	0.1047	0.0823	0.0996	0.0956
20	0.1038	0.0814	0.0987	0.0947
21	0.1032	0.0807	0.0980	0.0940
22	0.1023	0.0799	0.0974	0.0932
23	0.1017	0.0793	0.0967	0.0925
24	0.1011	0.0787	0.0961	0.0920
25	0.1006	0.0781	0.0956	0.0914
26	0.1002	0.0776	0.0952	0.0910
27	0.0997	0.0771	0.0947	0.0905
28	0.0992	0.0767	0.0943	0.0901
29	0.0988	0.0763	0.0939	0.0897
30	0.0985	0.0759	0.0936	0.0893
31	0.0982	0.0755	0.0934	0.0890
32	0.0980	0.0754	0.0932	0.0889
33	0.0978	0.0751	0.0930	0.0886
34	0.0976	0.0748	0.0927	0.0884
35	0.0974	0.0746	0.0925	0.0882
36	0.0981	0.0749	0.0931	0.0887
37	0.0986	0.0754	0.0937	0.0892
38	0.0991	0.0758	0.0942	0.0897
39	0.0996	0.0760	0.0947	0.0901
40	0.1000	0.0765	0.0952	0.0906
41	0.1008	0.0771	0.0959	0.0913
42	0.1015	0.0774	0.0966	0.0918
43	0.1021	0.0779	0.0972	0.0924
44	0.1028	0.0784	0.0978	0.0930
45	0.1034	0.0789	0.0984	0.0935
46	0.1041	0.0793	0.0991	0.0942
47	0.1049	0.0799	0.0998	0.0949
48	0.1056	0.0804	0.1004	0.0955
49	0.1063	0.0808	0.1011	0.0961
50	0.1070	0.0814	0.1018	0.0967
51	0.1078	0.0820	0.1026	0.0974
52	0.1085	0.0826	0.1034	0.0982
53	0.1093	0.0832	0.1041	0.0989
54	0.1101	0.0836	0.1049	0.0995
55	0.1108	0.0841	0.1055	0.1001
56	0.1116	0.0848	0.1063	0.1009
57	0.1124	0.0853	0.1071	0.1016
58	0.1133	0.0859	0.1079	0.1023
59	0.1141	0.0865	0.1086	0.1031
60	0.1148	0.0869	0.1093	0.1037
61	0.1155	0.0876	0.1100	0.1044
62	0.1163	0.0882	0.1108	0.1051
63	0.1173	0.0887	0.1116	0.1059
64	0.1180	0.0893	0.1124	0.1066
65	0.1186	0.0898	0.1131	0.1072

	Jan-Apr	May-Sep	Oct-Dec	Average
Cold Start (g/trip start, Light Duty Only)	0.1410	0.1033	0.1340	0.1261

EXAMPLE OF A COMMUTING VEHICLE TRIP TERM ANALYSIS

Proposal: Construction of 1300 additional Parking Spaces at a Metro Station

Description: 1,300 parking spaces will be constructed at a Metro station. The garages at Metrorail stations are currently experiencing full utilization of all existing parking capacity on a daily basis.

Analysis Tool: Sketch Planning

Assumptions:

- To build 1,300 additional parking spaces at a Metro station to increase capacity at a station. Cost to construct the garage is assumed to be \$2.117 million dollars. Life span: 30 years
- New trips generated due to additional parking spaces will be 2/3 of new spaces.
- Average one-way trip length reduced will be 15.5 miles.
- No cold start benefit, as autos will drive to station.
- NOx & VOC estimation using Mobile 6.2 Emissions factors.

Summary Impacts (2010):

Daily VT Reduction:	0	VT
Daily VMT Reduction:	26,846	VMT
Daily NOx Reductions:	0.0108	tons/day
Daily VOC Reductions:	0.0047	tons/day
Cost Effectiveness (NOx)	26,850	\$/ton
Cost Effectiveness (VOC)	62,200	\$/ton

Emission Impacts for (2010):

1,300 additional spaces

Trip length: 15.5 mile x 2 = 31 mi round trip

2/3 new trips: $2/3 \times 1300 = 866$ trips

866×31 miles = 26,846 VMT

Daily NOx & VOC emission reductions (2010):

NOx Estimation

Cold Start	0	x	$\frac{0.5689 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0000	tons
Running	26,846	x	$\frac{0.3653 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0108	tons
							Total	0.0108 tons

VOC Estimation

Cold Start + Hot soak	0	x	$\frac{1.5400 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0000	tons
Running	26,846	x	$\frac{0.1577 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0047	tons
							Total	0.0047 tons

Methodology for PM2.5 emissions estimation:

Direct PM2.5

Direct PM2.5 emissions factors are available for three seasons (Jan-April, May-Sept., Oct.-Dec). Estimation of direct PM2.5 emissions can be carried out on a seasonal or an annual basis. As PM2.5 seasonal emission factors do not vary significantly, the average of these four seasonal factors is used to estimate annual PM emissions. Please refer Table -14.

The travel demand model and postprocessor use average annual weekday traffic (AAWDT) for analysis. Hence for the analysis of TERMS which are effective 7-days a week, VT and VMT for such TERMS need to be adjusted to reflect average daily traffic (AADT). A factor of 0.95 is used to convert AAWDT volume to AADT volume. For the TERMS that affect only commuter traffic (effective only on weekdays) no adjustment is needed as the VT and VMT reflect average weekday traffic. The formulae for annual direct PM2.5 estimation for these TERMS are shown as below.

For the TERMS effective 365 days:

$$\text{Direct PM2.5 Emissions} = \text{VMT} \times \text{average of seasonal emissions factors} \times \text{weekly VMT adjustment factor} \times \text{days/year.}$$

$$\text{Running } 26,846 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 0.95 \times 365 \text{ days} = 0.1180 \text{ tons}$$

For the TERMS effective only on weekdays:

$$\text{Direct PM2.5 Emissions} = \text{VMT} \times \text{average of seasonal emissions factors} \times \text{days/year.}$$

$$\text{Running } 26,846 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 250 \text{ days} = 0.0851 \text{ Tons}$$

NOx Emissions as a PM 2.5 Precursor:

As conformity assessment criteria for the PM2.5 standards include NOx emissions as a PM 2.5 precursor, we are also required to estimate NOx emissions on seasonal/annual basis. For TERM analysis we follow the annual approach similar to the PM2.5 emission estimation as described above. Emission factors corresponding to 40 mph speed are used to estimate cold start and running NOx precursor emissions. Tables 15-17 show the average of the NOx seasonal emissions factors for years 2010, 2020 and 2030.

For the TERMS effective 365 days:

Cold Start	0	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	0.95	x	365	=	0.0000 Tons
Running	26,846	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	0.95	x	365	=	4.0163 Tons
											4.0163 Tons
Total											

For the TERMS effective only on weekdays:

Cold Start	0	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	250	=	0.0000 Tons	
Running	26,846	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	250	=	2.8956 Tons	
Total										2.8956 Tons

Cost Effectiveness (2010):

Garage cost (assumed): \$2.177 million

$$\text{NOx} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.0108 \text{ t/d}} = \$26,850 / \text{ton}$$

$$\text{VOC} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.047 \text{ t/d}} = \$62,200 / \text{ton}$$

$$\text{PM2.5} = \frac{\$2.177 \text{ million}}{30 \text{ yr} \times 0.1180 \text{ t/yr}} = \$615,000 / \text{ton}$$

Example-2: Implement 10 Neighborhood Circulator Bus Service to Metrorail

Description:

The circulator bus service would operate over an expanded period from 5:30 am to 10:00 am and from 3:00 pm to 8:00 pm on weekdays.

Analysis Tool: Sketch Planning

Assumptions:

- Sketch planning is used as an analysis tool
- Two buses per neighborhood will be required at a cost of \$150,000 per bus, with a useful life of 12 years.
- Anticipated ridership is 150 riders per day per circulator, for a total of 1500 additional transit riders per day.
- Average trip length = 15.5 miles
- The stations where circulator service could be implemented include:
 - ✓ Cheverly station
 - ✓ Deanwood station
 - ✓ Minnesota Ave. station
 - ✓ Vienna/Fairfax – GMU station
 - ✓ Dunn Loring – Merrifield station
 - ✓ Greenbel station
 - ✓ Van Dorn Street station
 - ✓ Addison Road station
 - ✓ Glenmont station
 - ✓ Rhode Island Ave. station
 - ✓ New Carrollton

Summary of Impacts (2010)

Daily VT Reduction:	3,000	VT
Daily VMT Reduction:	46,500	VMT
Daily NOx Reductions:	0.0206	tons/day
Daily VOC Reductions:	0.0139	tons/day
Cost Effectiveness (NOx)	218,387	\$/ton
Cost Effectiveness (VOC)	341,531	\$/ton

Emission Analysis (2010)

Anticipated ridership = 150 riders/day/circulator

150 * 10 = 1500 additional riders

1 rider = 2 trips

1,500 * 2 = 3000 VT

VMT: 3000 x 15.5 = 46500 VMT

Daily Emissions Reduction

NOx Estimation

Cold Start	3,000	x	$\frac{0.5689 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0019	tons
Running	46,500	x	$\frac{0.3653 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0187	tons
					Total		0.0206	tons

VOC Estimation

Cold Start + Hot soak	3,000	x	$\frac{1.5400 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0051	tons
Running	46,500	x	$\frac{0.1577 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0081	tons
					Total		0.0132	tons

Cost Analysis:

Annual Operating Costs (\$100,000/bus): \$1,000,000

Capital Costs: \$150,000/bus x 10 = \$ 1,500,000

Annualized cost: \$1,000,000 + \$1,500,000/12 = \$1,125,000

TIP Cost (2006-2011): \$1,000,000 x 5 + \$1,500,000 = \$6,500,000

Cost Effectiveness (2010):

$$\text{Cost effectiveness NOx} = \frac{\$1,125,000}{250 \times 0.0206} = 218,400 \text{ \$/ton}$$

$$\text{Cost effectiveness VOC} = \frac{\$1,125,000}{250 \times 0.0132} = 341,550 \text{ \$/ton}$$

Direct PM2.5

For the TERMS effective 365 days:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x weekly VMT adjustment factor x days/year.

$$\text{Running } 46,500 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 0.95 \times 365 \text{ days} = 0.2044 \text{ tons}$$

For the TERMS effective only on weekdays:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x days/year.

$$\text{Running } 46,500 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 250 \text{ days} = 0.1474 \text{ Tons}$$

NOx Emissions as a PM 2.5 Precursor:

For the TERMS effective 365 days:

Cold Start	3,000	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	365	=	0.7628 Tons
Running	46,500	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	0.95 x 365	=	6.9566 Tons
Total									7.7193 Tons

For the TERMS effective only on weekdays:

Cold Start	3,000	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	250	=	0.5499 Tons
Running	46,500	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	250	=	5.0155 Tons
Total									5.5655 Tons

Cost Effectiveness (2010):

$$\text{PM2.5} = \frac{\$1.125 \text{ million}}{30 \text{ yr} \times 0.2044 \text{ t/yr}} = \frac{\$5,504,000}{\text{ton}}$$

Example-3: Bus Information Displays with Maps at Bus Stops

Description:

This measure would provide more information at 2,000 Metrobus locations.

Note: WMATA is implementing this TERM

Assumptions

- Sketch planning is used as an analysis tool
- Decrease in waiting time: 2.5 minutes
- Average daily bus ridership: 500,000
- Average daily local bus ridership: 124,000
- Program would be launched in 2008 and continue through 2009
- Average trip length: 15.5 miles

Summary Impact

Daily VT Reduction:	2,210	VT
Daily VMT Reduction:	34,255	VMT
Daily NOx Reductions:	0.0152	tons/day
Daily VOC Reductions:	0.0097	tons/day
Cost Effectiveness (NOx)	26,394	\$/ton
Cost Effectiveness (VOC)	41,276	\$/ton

Emission Analysis

Local bus average daily Ridership	124,000
Average daily WMATA bus ridership	500,000
Average daily regional bus ridership	$500,000 + 124,000 = 624,000$
Total daily person trips	$4,400,000 \text{ (conformity)} \times 0.25 \text{ (HBW)} = 17,600,000$

Regional bus mode share percentage = $624,000 / 17,600,000 = 3.55 \%$

Assumed benefit from the system = 2.5 minute decrease in wait time.

$3.55 \% \rightarrow 4.07\% = 0.52\%$ increase in bus mode share due to decrease in wait time

(Source: William Allen, Mode Choice Model Sensitivity Analysis, April 1993)

WMATA Buses: $500,000 (0.52\%) = 2600$ new trips
VT reductions: $2600 \times 0.85 \text{ SOV} = 2210$

VMT reductions: 2210 x 15.5 miles = 34255

Daily NOx Emission Reductions (2010)

Nox Estimation

Cold Start	2,210	x	$\frac{0.5689 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0014	tons
Running	34,255	x	$\frac{0.3653 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0138	tons
							Total	0.0152 tons

VOC Estimation

Cold Start + Hot Soak	2,210	x	$\frac{1.5400 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	=	0.0038	tons
Running	34,255	x	$\frac{0.1577 \text{ grams}}{1 \text{ mile}}$	x	$\frac{1 \text{ ton}}{907185 \text{ grams}}$	=	0.0060	tons
							Total	0.0097 tons

Cost Analysis

Cost per box = \$120.00

Number of boxes = 2000

Cost for 2000 display boxes = \$240,000

Capital cost per car – \$30,000

Operating Cost for car to change schedule = \$40,000

Life of car – 6 years

Annualized cost – \$240,000 / 3 years + \$30,000/6 years + \$40,000 = \$125,000

TIP Cost: \$240,000 + \$30,000 + \$40,000 x 2 = \$350,000

Cost Effectiveness (2010)

Cost effectiveness NOx	$\frac{\$125,000}{312 \times 0.0152}$	=	26,400	\$/ton
Cost effectiveness VOC	$\frac{\$125,000}{312 \times 0.0097}$	=	41,300	\$/ton

Direct PM2.5

For the TERMS effective 365 days:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x weekly VMT adjustment factor x days/year.

$$\text{Running } 34,255 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 0.95 \times 365 \text{ days} = 0.1506 \text{ tons}$$

For the TERMS effective only on weekdays:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x days/year.

$$\text{Running } 34,255 \times \frac{0.0115 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 250 \text{ days} = 0.1086 \text{ Tons}$$

NOx Emissions as a PM 2.5 Precursor:

For the TERMS effective 365 days:

Cold Start	2,210	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	365	=	0.5606 Tons
Running	34,255	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	0.95 x 365	=	5.1247 Tons
Total									35.6866 Tons

For the TERMS effective only on weekdays:

Cold Start	2,210	x	$\frac{0.6652 \text{ grams}}{1 \text{ trip}}$	x	$\frac{1 \text{ ton}}{907,185 \text{ grams}}$	x	250	=	0.4051 Tons
Running	34,255	x	$\frac{0.3914 \text{ grams}}{1 \text{ mi}}$	x	$\frac{1 \text{ ton}}{907,185}$	x	250	=	3.6948 Tons
Total									4.0999 Tons

Cost Effectiveness (2010):

$$\text{PM2.5} = \frac{\$125,000}{0.1506 \text{ t/yr}} = \$830,200/\text{ton}$$

APPENDIX - B

**TERM REPORTING
INSTRUCTIONS**

TERM REPORTING

Federal regulations require the timely implementation of TERMS (CMAQ funded, non-CMAQ funded and NOx mitigation measures). If the implementation of programmed TERMS falls behind schedule, the regulations state "that all State and local agencies with influence over approvals of funding for TERMS [should give] maximum priority to approval or funding of TERMS over other projects within their control". To address these requirements, please provide a brief statement describing the status of each TERM programmed in previous TIPs. This applies to those projects not yet fully implemented and reported as such in the TERM tracking sheet developed as part of the CLRP and TIP. Include any changes in the scheduling or implementation of these TERMS. Your submissions will be used to update the "TERM Tracking Sheet" for analysis years 2010, 2020 and 2030. For information purposes, the latest "TERM Tracking Sheet" included in 2006 Constrained Long range Plan (CLRP) and FY 2007-FY2012 Transportation Improvement Program (TIP) is attached.

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part A - Daily Ozone Precursor Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	EMISSIONS						Project Category *
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
9	X	1994-99	MDOT	Park & Ride Lot - MD 210/ MD 373	X				2000	2003	0.0006	0.0014	0.0003	0.0006	0.0003	0.0005	C
19	X	1994-99	PRTC	VRE Woodbridge Parking Expansion (add 500 spaces)	X					2002-2003	n/a	n/a	n/a	n/a	n/a	n/a	-
20	X	1994-99	ALEX	King St. Metrorail access improvements			X			2002, '04, '05	0.0011	0.0014	0.0006	0.0006	0.0006	0.0005	C
38	X	1995-00	MDOT	Signal Systems - MD 85 Executive Way to MD 355	X				1996	Pre 2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
39	X	1995-00	MDOT	Signal Systems - MD 355 ,I-70 ramps to Grove Rd.	X				1996	n/a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
44	X	1995-00	MDOT	Signal Systems - MD 410, 62nd Ave. to Riverdale Rd.	X				1996	2002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
48	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0006	0.0014	0.0003	0.0006	0.0003	0.0005	C (TCM)
49	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.0052	0.0133	0.0029	0.0055	0.0026	0.0046	C (TCM)
51	X	1995-00	VDOT	Alexandria Telecommuting Pilot Program	X					2000 & 2001	0.0000	0.0000			0.0000	0.0000	C
52	X	1995-00	VDOT	Fairfax County Bus Shelter (Fairfax Co. TDM program)			X		2000	2001	0.0000	0.0000			0.0000	0.0000	C
54	X	1995-00	VDOT	City of Fairfax Bus Shelters			X		1999	2004	0.0000	0.0005	0.0000	0.0002	0.0000	0.0002	C (TCM)
56	X	1995-00	VDOT	Cherry Hill VRE Access			X			2007	0.0040	0.0114	0.0023	0.0047	0.0020	0.0039	C (TCM)
58	X	1995-00	WMATA	Bus Replacement (172 buses)	X				1998	1998	0.0690	0.2520					SP (TCM)
59	X	1995-00	MCG	Shady Grove West Park and Ride			X		2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
60	X	1995-00	MCG	White Oak Park and Ride			X		2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
61	X	1995-00	MCG	Bicycle Facilities			X		FY99		0.0017	0.0009	0.0010	0.0004	0.0009	0.0003	C
62	X	1995-00	MCG	Pedestrian Facilities to Metrorail			X				0.0029	0.0038	0.0016	0.0016	0.0015	0.0013	C
63	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0023	0.0057	0.0013	0.0024	0.0012	0.0020	C
64	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.0183	0.0493	0.0104	0.0205	0.0093	0.0170	C (TCM)
66	X	1995-00	VDOT	Commuter Lots - District Wide			X		varies	1995, 2000	0.0063	0.0156	0.0036	0.0065	0.0032	0.0054	C
67	X	1995-00	VDOT	I-66 and Stringfellow Rd. Park and Ride	X				2000	2000 end	0.0057	0.0095	0.0032	0.0039	0.0029	0.0033	C
68	X	1995-00	VDOT	Lake Ridge Park and Ride (now called Tacketts Mill lot)	X					1999/2000	0.0000	0.0047	0.0000	0.0020	0.0000	0.0016	C
69	X	1995-00	VDOT	Bicycle Trails and Facilities			X		varies	varies	0.0011	0.0081	0.0006	0.0034	0.0006	0.0028	C
70	X	1995-00	VDOT	Improved Access to Metrorail Stations			X		varies	2000-2010	0.0003	0.0005	0.0002	0.0002	0.0001	0.0002	C
71	X	1995-00	VDOT	I-66 HOV access at Monument Dr.	X					1997	0.0057	0.0095	0.0032	0.0039	0.0029	0.0033	C
72	X	1995-00	DC	Bicycle Facilities		X					0.0137	0.0095	0.0078	0.0039	0.0070	0.0033	C
73	X	1995-00	REGION	COG Regional Ridesharing Support	X					on-going	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part A - Daily Ozone Precursor Emissions

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NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	2010-2030 Emissions						Project Category *	
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030			
											VOC	NOX	VOC	NOX	VOC	NOX		
74	X	1995-00	REGION	M-47 Integrated Ridesharing	X					on-going	0.0381	0.0696	0.0218	0.0290	0.0199	0.0242	C	
75	X	1995-00	REGION	M-92 Telecommuting Support	X					on-going	0.0634	0.1095	0.0361	0.0456	0.0328	0.0380	C	
77		1996-01	VDOT	Duke Street Pedestrian Bridge				2005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	
79	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #85)				X	1999	Summer 2001	0.0011	0.0014	0.0006	0.0006	0.0006	0.0005	C	
81	X	1996-01	VDOT	Arlington County Metrocheck Program	X				1997	1997 Onwards	0.0011	0.0014	0.0006	0.0006	0.0006	0.0005	C	
82	X	1996-01	VDOT	Old Dominion Drive Bike Trail				X	2000	2004	0.0006	0.0005	0.0003	0.0002	0.0003	0.0002	C	
83	X	1996-01	WMATA	Bus Replacement (see line 58, above)	X					1998	Credit taken in line 58, above						SP	
85	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #79)				X	1999	2001	0.0006	0.0005	0.0003	0.0002	0.0003	0.0002	C	
90	X	1996-01	REGION	M-47c Employer Outreach / Guaranteed Ride Home	X					on-going	0.4873	0.8152	0.2767	0.3396	0.2506	0.2822	C	
91	X	1996-01	REGION	M-70a Bicycle Parking				X	1999		0.0040	0.0033	0.0023	0.0014	0.0020	0.0011	C	
92	X	STADIUM ANALYSIS	M-92 Telecommuting Support ¹	Combined with item #75														C
95	X	1997-02	MCG	Germantown Transit Center				X	2004		0.0029	0.0090	0.0016	0.0038	0.0015	0.0031	C (TCM)	
102	X	1997-02	PG	Prince George's County Bus Replacement	X				1998	1998	0.0030	0.0090					SP (TCM)	
106	X	1997-02	VDOT	PRTC Employer Commuting Outreach Program	X					1977 on-going	0.0011	0.0002	0.0006	0.0001	0.0006	0.0001	C	
107	X	1997-02	VDOT	PRTC Multimodal Strategic Marketing Implementation Plan	X					1977 on-going	0.0000	0.0002	0.0000	0.0001	0.0000	0.0001	C	
108	X	1997-02	MDOT	M-103 Taxicab Replacement in Maryland ²	X				2005	Stopped	0.0797	0.2675	0.1340	0.1827	0.3120	0.4810	SP	
109	X	1997-02	REGION	M-70b Employer Outreach for Bicycles	X				1998	on going	0.0013	0.0018	0.0007	0.0007	0.0006	0.0006	C	
110		1997-02	VDOT	M-77b Vanpool Incentive Programs in Virginia				X	1999	delayed	n/a	n/a	n/a	n/a	n/a	n/a	C	
111	X	1998-03	WMATA	Bus Replacement (108 buses)	X				1999	1999	0.0450	0.1617					SP	
112	X	1998-03	MCG	Montgomery County Bus Replacement	X					Ongoing	0.0080	0.0270					SP	
113	X	1998-03	PG	Prince George's County Bus Replacement	X				1998	Ongoing	0.0010	0.0020					SP	
114	X	1998-03	FDC	Frederick County Bus Replacement	X						0.0010	0.0000					SP	
117	X	1998-03	VDOT	Arlington County Four Mile Run Bike Trail				X	1999	delayed	0.0006	0.0005	0.0003	0.0002	0.0003	0.0002	C	
118	X	1998-03	VDOT	Northern Virginia Turn Bays	X				2000	1998	0.0006	0.0009	0.0003	0.0002	0.0003	0.0002	TR	
119	X	1998-03	VDOT	Fairfax City Bus Replacement				X	2001	2003	n/a	n/a					SP	
121	X	1998-03	WMATA	WMATA Bus Replacement (252 buses)	X				2001	2001	0.1060	0.3860					SP	
122	X	97 & 98 TIP	REGION	M-101a Mass Marketing Campaign (Consumer)				X		2005	0.0385	0.0646	0.0219	0.0269	0.0198	0.0224	C	
123	X	1999-04	MDOT	Various Park and Ride Lots(I-270/MD124, 450 & I-170/MD-75, 54 spaces)		X			2001/1999	2001	0.0046	0.0171	0.0026	0.0071	0.0023	0.0059	C	

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part A - Daily Ozone Precursor Emissions

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NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	EMISSIONS						Project Category *
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
124	X	1999-04	MDOT	Signal Systems (197/MD-198, MD-382 TO US-301,US301)	X				2000	2002	0.0070	-0.0017	0.0040	-0.0005	0.0036	-0.0004	TR
125	X	1999-04	VDOT	Transit Center at 7 Corners	X				2002		0.0006	0.0009	0.0003	0.0004	0.0003	0.0003	C
126	X	1999-04	VDOT	Falls Church Clean Diesel Bus Service	X				2000	2003	0.0040	0.0050					SP
127	X	1999-04	VDOT	VA 234 Bike Trail			X		2001	2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
128	X	1999-04	VDOT	PRTC Ridesharing	X				on-going	2000 ongoing	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
130	X	1996-01	VDOT	M-14: I-66 Feeder Bus Fare Buy Down	X					1998 onward	0.0143	0.0261	0.0081	0.0109	0.0073	0.0090	C
131	X	2000-05	MDOT	Various park and Ride Lots	x				2002	2003	0.0040	0.0154	0.0022	0.0064	0.0020	0.0053	C
132	X	2000-05	MDOT	Signal Systems	X				Varies	on-going	0.0017	0.0000	0.0016	0.0000	0.0009	0.0000	TR
133	X	2000-05	VDOT	450 Spaces at Gambrill/Hoos Rds. Park and Ride			X		2002	2004	0.0040	0.0085	0.0023	0.0036	0.0020	0.0029	C
134	X	2000-05	VDOT	300 Spaces at Backlick Rd			X		2003	2006	0.0029	0.0062	0.0016	0.0026	0.0015	0.0021	C
135	X	2000-05	VDOT	Accotink-Gateway Connector Trail			X		2002	2005	0.0040	0.0047	0.0023	0.0020	0.0020	0.0016	C
136	X	2000-05	VDOT	Columbia Pike Trail			X		2000	2001, 2005	0.0034	0.0038	0.0019	0.0016	0.0018	0.0013	C
137	X	2000-05	VDOT	Lee Highway trail			X		2000	2005	0.0017	0.0019	0.0010	0.0008	0.0009	0.0007	C
138	X	2000-05	VDOT	Arlington Bus Shelter Improvements			X		2005	2005	0.0006	0.0005	0.0003	0.0002	0.0003	0.0002	C
139	X	2000-05	VDOT	Pentagon Metrostation Improvements	X					2003	0.0046	0.0081	0.0026	0.0034	0.0023	0.0028	C
140	X	2000-05	MDOT	East/West Intersection Improvements			X		2005	2005	0.0235	0.0119	0.0133	0.0049	0.0120	0.0041	C
141	X	2001-06	Feds	Federal Transit/Ridesharing subsidy	X				on-going		0.0584	0.0905	0.0330	0.0377	0.0298	0.0313	C
142	X	2002-07	WMATA	100 CNG buses	X				2002		0.0000	0.1358					SP (TCM)
143	X	2002-07	WMATA	ULSD with CRT filters			X		on-going		0.2100	0.0000	0.4300	0.0000	0.4300	0.0000	H (TCM)
144	X	2003-08	DC	Replace 23 12 Taxicabs with CNG cabs			X		2005	2006	0.0089	0.0157					H
145	X	2003-08	DC	D.C.Incident Response & TrafficManagement System	X				2005	2004	0.0160	0.0426	0.0091	0.0117	0.0100	0.0168	TR
146	X	2003-08	DC	Bicycle Lane in D. C. (35 Mile)			X		2005	2006	0.0095	0.0085	0.0054	0.0035	0.0049	0.0029	C (TCM)
147	X	2003-08	DC	Bicycle Racks in D. C. (500)	X				2005	2004	0.0013	0.0009	0.0007	0.0004	0.0007	0.0003	C (TCM)
148	X	2003-08	DC	External Bicycle Racks on WMATA Buses in D. C. (600)	X				2005	2003	0.0020	0.0031	0.0011	0.0013	0.0010	0.0011	C (TCM)
149		2003-08	DC	CNG Rental Cars (18)				X	2005		0.0000	0.0002					SP
150	X	2003-08	DC	Sidewalks in D.C. (\$ 5 million)	X				2005	2004	0.0358	0.0555	0.0203	0.0231	0.0183	0.0192	C
151	X	2003-08	DC	CNG Refuse Haulers (2)	X				2005	2004	0.0001	0.0020					H (TCM)
152	X	2003-08	DC	Circulator /Feeder Bus Routes	X				2005	2003	0.0131	0.0200	0.0074	0.0083	0.0067	0.0069	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
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					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
153	X	2003-08	MDOT	Commuter Tax Credit	X				2005	n/a	0.0782	0.1223	0.0442	0.0509	0.0399	0.0423	C
155		2003-08	MDOT	Employer Vanpool Program (WWB)				X	2005		0.0018	0.0041			0.0009	0.0014	C
156	X	2003-08	MDOT	Green Line Link				X	2005	n/a	0.0026	0.0047	0.0014	0.0019	0.0013	0.0016	C
157	X	2003-08	MDOT	Park & Ride Lots - Southern Maryland				X	2005	2005	0.0050	0.0109	0.0028	0.0045	0.0025	0.0038	C
158	X	2003-08	MDOT	Prince George's County- Bus Exp				X	2005	n/a	0.0358	0.0657	0.0203	0.0273	0.0183	0.0227	C
159	X	2003-08	MDOT	MTA - Bus Service Expansion				X	2005	n/a	0.0081	0.0157	0.0046	0.0065	0.0041	0.0054	C
160	X	2003-08	MDOT	Ride- On - Super Discount				X	2005	n/a	0.0009	0.0014	0.0005	0.0006	0.0005	0.0005	C
161	X	2003-08	Regional	Regional Traveler Information Systems				X	2005	VA:2000 before	0.1006	0.5552	0.0572	0.1522	0.0517	0.1147	TR
162	X	2003-08	MDOT	Universal Transportation Access (MD + WMATA)				X	2005	n/a	0.0161	0.0249	0.0091	0.0104	0.0082	0.0086	C
163	X	2003-08	MCG	Construction of 1300 additional Parking Spaces at Grosvenor Metro Garage	X				2004		0.0046	0.0104	0.0026	0.0044	0.0025	0.0036	C (TCM)
164	X	2003-08	MCG	Bethesda Shuttle Bus Services	X				2004		0.0031	0.0048	0.0018	0.0020	0.0016	0.0016	C
165	X	2003-08	MCG	External Bicycle Racks on Ride-On Buses in Montgomery County	X				2004		0.0006	0.0010	0.0003	0.0004	0.0003	0.0003	C
166	X	2003-08	MCG	New CNG Powered Light Duty Vehicle fleet in the County	X				2004		0.0000	0.0001					SP
167	X	2003-08	MCG	Free Bus Service on Selected Routes on I-270	X				2004		0.0011	0.0017	0.0006	0.0007	0.0005	0.0006	C
168	X	2003-08	MCG	Annual Sidewalk Program	X				2004		0.0171	0.0264	0.0096	0.0110	0.0087	0.0091	C
169		2003-08	MDOT	Bethesda Breeze/International Express Metrobus				X	2005	Removed	0.0037	0.0053	0.0021	0.0022	0.0019	0.0018	C
170		2003-08	MDOT	Bethesda-8, Silver Spring Downtown Dasher and Prince Georges Co. Shuttles at 3 PNR lot				X	2005	Removed	0.0088	0.0104	0.0050	0.0043	0.0045	0.0036	C
171		2003-08	MDOT	Proposed Transportation Management District in Montgomery County (Rockville and Gaithersburg)				X	2005	Removed	0.0057	0.0078	0.0032	0.0033	0.0029	0.0027	C
172	X	2003-08	MDOT	Sidewalks (Bikes/Pedestrian) at / near Rail Stations	X				2005	2002	0.0093	0.0147	0.0053	0.0061	0.0047	0.0051	C
173	X	2003-08	MDOT	Neighborhood Sidewalks Improvements (Bike/Pedestrian)	X				2005	2004	0.0032	0.0017	0.0018	0.0007	0.0017	0.0006	C
174	X	2003-08	MDOT	Neighborhood Conservation Program - Neighborhood Sidewalks Improvements (Bikes/Pedestrian)		X			2005	n/a	0.0028	0.0014	0.0016	0.0006	0.0014	0.0005	C
175	X	2003-08	MDOT	Maryland bus Transit Service Expansion	X				2005	2004	0.0141	0.0323	0.0080	0.0134	0.0072	0.0112	C
176	X	2003-08	VDOT	Universal Transportation Access Program				X	2005	2005	0.0012	0.0019	0.0007	0.0008	0.0006	0.0006	C
177	X	2003-08	VDOT	Interactive Rideshare & Kiosk Initiative				X	2005		0.0004	0.0007	0.0002	0.0003	0.0002	0.0002	C
178	X	2003-08	VDOT	Mobile Commuter Stores				X	2005		0.0021	0.0039	0.0012	0.0016	0.0011	0.0014	C
179	X	2003-08	VDOT	Telework Incentive Program (Telework VA) ¹	X				2005	2001	0.0007	0.0012	0.0004	0.0005	0.0004	0.0004	C
180	X	2003-08	VDOT	Commuter Choice				X	2005		0.0010	0.0014	0.0005	0.0006	0.0005	0.0005	C
181	X	2003-08	VDOT	Employer Shuttle Services				X	2005		0.0114	0.0166	0.0064	0.0069	0.0058	0.0057	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
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					FULL	SCALED-BACK	UNDER-WAY	REM			VOC	NOX	VOC	NOX	VOC	NOX	
184	X	2003-08	VDOT	Van Start / Van Save			X		2005	till 2006	0.0014	0.0026			0.0007	0.0009	C
185	X	2003-08	VDOT	Metro Shuttle Bus			X		2005	1999-2005	0.0012	0.0026	0.0007	0.0011	0.0006	0.0009	C
187	X	2003-08	VDOT	VRE Mid-Day Train Service	X				2005	2002	0.0016	0.0029	0.0009	0.0012	0.0008	0.0010	C
190	X	2003-08	VDOT	Employer Vanpool Program (Bridge deck)			X		2005	2004 - 2008	0.0009	0.0019			0.0005	0.0007	C
191	X	2003-08	VDOT	Town of Leesburg P&R Lot			X		2005	2004	0.0019	0.0039	0.0011	0.0016	0.0010	0.0014	C
192	X	2003-08	VDOT	District-wide P&R Lots	X		X		2005	2001-2005	0.0113	0.0224	0.0064	0.0093	0.0057	0.0077	C
193	X	2003-08	VDOT	Additional Parking at 4 Metro stations			X		2005	2001, 2005	0.0145	0.0333	0.0082	0.0139	0.0074	0.0115	C
196	X	2003-08	WMATA	64 CNG Buses (Purchased in 2001)	X				2005	2004	0.0021	0.0870					SP (TCM)
197	X	2003-08	WMATA	250 CNG Buses (175 buses by Dec. 2004; 75 buses by mid 2006)			X		2005	2004-2006	0.0083	0.3400					SP
198	X	2003-08	WMATA	60 Engine Replacement (MY 1992 & 1993 MY buses)	X				2004	2004	0.0138	0.0755					SP
199	X	2003-08	WMATA	Car Sharing Program	X				2005	2004	0.0008	0.0018	0.0004	0.0008	0.0004	0.0006	C
200	X	2003-08	WMATA	Bikes Racks on WMATA Buses in VA (372 Bike Racks)	X				2005	2004	0.0012	0.0019	0.0007	0.0008	0.0006	0.0007	C (TCM)
202		2003-08	MDOT	Fleet Replacement (state auto fleet, gas to hybrid, 250 vehicles)				X	2005		0.0055	0.0133	0.0019	0.0031			SP
203	X	2003-08	MDOT	Replace 55 Montgomery County 10 yr. old buses w/ new CNG buses			X		2005	n/a	0.0000	0.2861	0.0000	0.0657			SP
204		2003-08	MDOT	Neighborhood Bus Shuttle (5 circulator routes)				X	2005		0.0075	0.0122	0.0042	0.0051	0.0038	0.0042	C
205	X	2003-08	MDOT	New Surface Parking at Transit Centers (500 spaces)			X		2005	n/a	0.0026	0.0060	0.0015	0.0025	0.0013	0.0021	C
206		2003-08	MDOT	Additional Bike Lockers at Metro-Stations				X	2005		0.0132	0.0209	0.0075	0.0087	0.0067	0.0072	C
207	X	2003-08	MDOT	Bike Facilities at PnR Lots or other similar location			X		2005	n/a	0.0093	0.0165	0.0053	0.0069	0.0048	0.0057	C
208		2003-08	MDOT	CNG Fueling Stations				X	2005		0.1270	0.1170					SP
209		2003-08	MDOT	Gas cap replacements (ROP Credit)				X	2005		N/A	N/A	N/A	N/A	N/A	N/A	SP
210		2003-08	MDOT	Gas can turnover (ROP Credit)				X	2005		N/A	N/A	N/A	N/A	N/A	N/A	SP
211	X	2003-08	MDOT	External Bicycle Racks on WMATA Buses (486 MD buses)	X				2005	2002	0.0014	0.0022	0.0008	0.0009	0.0007	0.0008	C (TCM)
212	X	2003-08	MDOT	Bike \ Pedestrian Trail - Anacostia River Walk			X		2005	n/a	0.0006	0.0005	0.0003	0.0002	0.0003	0.0002	C
213		2003-08	MDOT	Transit Prioritization - Queue Jumps				X	2005		0.0031	0.0037	0.0017	0.0016	0.0016	0.0013	C
214	X	2003-08	MDOT	Commuter Choice Benefit/Tax Credit - Marketing Expansion	X				2005	Ongoing	0.0546	0.0859	0.0309	0.0358	0.0279	0.0297	C
215	X	2003-08	MDOT	Improvements to Pedestrian Access in TOD areas (4 locations)			X		2005	n/a	0.0060	0.0087	0.0034	0.0036	0.0030	0.0030	C
216	X	2003-08	MDOT	Telecommuting Expansion ¹	X				2005	n/a	0.0645	0.1208	0.0365	0.0503	0.0329	0.0417	C
217		2003-08	MDOT	Replace older Diesel Engine in Public Sector vehicles				X	2005		0.0237	0.1300					H
218	X	2003-08	VDOT	MV-92 Telecommuting Program - Expanded ¹	X				2005	2003	0.0689	0.1290	0.0390	0.0537	0.0352	0.0446	C
219	X	2003-08	VDOT	MV-123 Employer Outreach for Public Sector Employees ²	X				2005	2003	0.0153	0.0237	0.0086	0.0099	0.0078	0.0082	C
220	X	2003-08	REGION	Signal System Optimization			X		2005	2005	0.4246	0.1552	0.2415	0.0425	0.2183	0.0321	TR
Available Emissions Credits											2.352	4.894	1.437	1.130	1.343	0.878	

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES (CLRP Projects Only)
Part A - Daily Ozone Precursor Emissions

Project Category: TR - Traffic Stream, C - Commute, H - Engine Technology (Heavy Dudy Vehicles), SP- Specific Vehicle Type

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				PROJECTED COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/DAY REDUCTION CREDITED						Project Category
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOx	VOC	NOx	VOC	NOx	
221	X	1995-00 TIP	REGION	M-24 Speed Limit Adherence					2010		-0.0146	0.5364	-0.0042	0.2365	0.0010	0.0739	TR
222		1996-01 TIP	MGC	Rock Spring Park Pedestrian Amenities				X			0.0010	0.0040	0.0000	0.0000	0.0000	0.0000	-
223	X	1996-01 TIP	MGC	Olney Transit Center Park and Ride					2015		0.0020	0.0080	0.0009	0.0030	0.0003	0.0007	C
224	X	1996-01 TIP	MGC	Damascus Park and Ride						2003	0.0010	0.0040	0.0004	0.0015	0.0001	0.0003	C
225	X	1996-01 TIP	DC	M-103 Taxicab Replacement (DC)					2015		0.0000	0.0000	0.1745	0.3000	0.3490	0.6000	H
226	X	STADIUM ANALYSIS		M-103 Taxicab Replacement (MD)				X	2008		0.0000	0.0000	0.1560	0.2400	0.1560	0.2400	H
227	X	1997-02 TIP	MDOT	Shady Grove West Transit Center Park and Ride				X			0.0000	0.0100	0.0000	0.0038	0.0000	0.0009	C
228	X	1997-02 TIP	MGC	Olney Transit Center Park and Ride					2015		0.0000	0.0000	0.0004	0.0012	0.0003	0.0007	C
229	X	1997-02 TIP	MGC	White Oak Park and Ride					2008		0.0000	0.0200	0.0000	0.0076	0.0000	0.0017	C
230	X	1997-02 TIP	MGC	Damascus Park and Ride						2003	0.0000	0.0000	0.0002	0.0005	0.0001	0.0003	C
231	X	1997-02 TIP	MGC	Four Corners Transit Center					2015		0.0000	0.0010	0.0000	0.0004	0.0000	0.0001	C
232		1997-02 TIP	MGC	Burtonsville Transit Center				X			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
233	X	1997-02 TIP	MGC	Silver Spring Transit Access							0.0000	0.0010	0.0000	0.0003	0.0000	0.0002	C
234	X	1997-02 TIP	MGC	Shady Grove Parking Construction						2003	0.0050	0.0190	0.0021	0.0072	0.0007	0.0017	C

PLAN TOTAL											-0.0066	0.5894	0.1743	0.5583	0.3516	0.6804
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GRAND TOTAL (Current Measures + CLRP plan)											2.345	5.483	1.612	1.688	1.695	1.558
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DEFINITIONS:

CREDIT TAKEN (X means emissions reduction credits taken):

TIP - Emissions credits are taken for projects being implemented, according to the progress reporting schedules provided by the implementing agencies (contained in Appendix J of Conformity Document). No credit has been taken for projects in which only some components of the measure have been implemented.

CLRP - Credit is taken for each of these elements of the CLRP according to the schedule provided by the implementing agency.

IMPLEMENTATION STATUS:

FULL = project is completed as planned at the time of analysis.

SCALED BACK = project is completed, but at a different level than assumed at the time of analysis (i.e., purchased 50 buses instead of 100)

UNDERWAY = project is not complete, but is close enough that credit may be taken (i.e., under construction, NOT just out for bid)

REMOVED = project no longer expected to be implemented or constructed

COMPLETION DATE:

PROJECTED = project completion date originally expected (i.e., at time of emissions analysis)

ACTUAL = actual year project was open for use, or expected to be open for use if under construction

REMOVED

projects Emissions credits are not counted in total available emissions credits

1 Line items 218, 216, 179, 92 are all credited as part of M-92 Regional Telecommute Support TERM, line item # 75

2 Line item 108 & 219 credits are taken only for year 2010

Projects fully implemented prior to 2000 were removed from the TERM Tracking Sheet

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
9	X	1994-99	MDOT	Park & Ride Lot - MD 210/ MD 373	X				2000	2003	0.0099	0.3565	0.0095	0.1451	0.0095	0.1199	C
19	X	1994-99	PRTC	VRE Woodbridge Parking Expansion (add 500 spaces)	X					2002-2003	n/a	n/a	n/a	n/a	n/a	n/a	-
20	X	1994-99	ALEX	King St. Metrorail access improvements				X		2002, '04, '05	0.0099	0.3565	0.0095	0.1451	0.0095	0.1199	C
38	X	1995-00	MDOT	Signal Systems - MD 85 Executive Way to MD 355	X				1996	Pre 2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
39	X	1995-00	MDOT	Signal Systems - MD 355 ,I-70 ramps to Grove Rd.	X				1996	n/a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
44	X	1995-00	MDOT	Signal Systems - MD 410, 62nd Ave. to Riverdale Rd.	X				1996	2002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
48	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0099	0.3565	0.0095	0.1451	0.0095	0.1199	C (TCM)
49	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.0922	3.3278	0.0891	1.3543	0.0891	1.1191	C (TCM)
51	X	1995-00	VDOT	Alexandria Telecommuting Pilot Program	X					2000 & 2001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
52	X	1995-00	VDOT	Fairfax County Bus Shelter (Fairfax Co. TDM program)				X	2000	2001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
54	X	1995-00	VDOT	City of Fairfax Bus Shelters				X	1999	2004	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C (TCM)
56	X	1995-00	VDOT	Cherry Hill VRE Access				X		2007	0.0791	2.8524	0.0764	1.1608	0.0764	0.9593	C (TCM)
58	X	1995-00	WMATA	Bus Replacement (172 buses)	X				1998	1998	0.9655	34.8307	0.9325	14.1746	0.9325	11.7135	SP (TCM)
59	X	1995-00	MCG	Shady Grove West Park and Ride				X	2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
60	X	1995-00	MCG	White Oak Park and Ride				X	2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
61	X	1995-00	MCG	Bicycle Facilities				X	FY99		0.0066	0.2377	0.0064	0.0967	0.0064	0.0799	C
62	X	1995-00	MCG	Pedestrian Facilities to Metrorail				X			0.0264	0.9508	0.0255	0.3869	0.0255	0.3198	C
63	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0395	1.4262	0.0382	0.5804	0.0382	0.4796	C
64	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.3426	12.3603	0.3309	5.0301	0.3309	4.1568	C (TCM)
66	X	1995-00	VDOT	Commuter Lots - District Wide				X	varies	1995, 2000	0.1087	3.9220	0.1050	1.5961	0.1050	1.3190	C
67	X	1995-00	VDOT	I-66 and Stringfellow Rd. Park and Ride	X				2000	2000 end	0.0659	2.3770	0.0636	0.9673	0.0636	0.7994	C
68	X	1995-00	VDOT	Lake Ridge Park and Ride (now called Tacketts Mill lot)	X					1999/2000	0.0329	1.1885	0.0318	0.4837	0.0318	0.3997	C
69	X	1995-00	VDOT	Bicycle Trails and Facilities				X	varies	varies	0.0560	2.0204	0.0541	0.8222	0.0541	0.6795	C
70	X	1995-00	VDOT	Improved Access to Metrorail Stations				X	varies	2000-2010	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C
71	X	1995-00	VDOT	I-66 HOV access at Monument Dr.	X					1997	0.0659	2.3770	0.0636	0.9673	0.0636	0.7994	C
72	X	1995-00	DC	Bicycle Facilities		X					0.0659	2.3770	0.0636	0.9673	0.0636	0.7994	C
73	X	1995-00	REGION	COG Regional Ridesharing Support	X					on-going	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
74	X	1995-00	REGION	M-47 Integrated Ridesharing	X				on-going	0.5025	17.4290	0.4853	7.0961	0.4853	5.8907	C	
75	X	1995-00	REGION	M-92 Telecommuting Support	X				on-going	0.7777	27.425	0.7511	11.1663	0.7511	9.2494	C	
77		1996-01	VDOT	Duke Street Pedestrian Bridge				2005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	
79	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #85)				1999	Summer 2001	0.0099	0.3565	0.0095	0.1451	0.0095	0.1199	C	
81	X	1996-01	VDOT	Arlington County Metrocheck Program	X			1997	1997 Onwards	0.0099	0.3565	0.0095	0.1451	0.0095	0.1199	C	
82	X	1996-01	VDOT	Old Dominion Drive Bike Trail				2000	2004	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C	
83	X	1996-01	WMATA	Bus Replacement (see line 58, above)	X				1998	Credit taken in line 58, above						SP	
85	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #79)				1999	2001	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C	
90	X	1996-01	REGION	M-47c Employer Outreach / Guaranteed Ride Home	X				on-going	5.7371	204.265	5.5409	83.1721	5.5409	68.8075	C	
91	X	1996-01	REGION	M-70a Bicycle Parking				1999		0.0231	0.8319	0.0223	0.3386	0.0223	0.2798	C	
92	X	STADIUM ANALYSIS		M-92 Telecommuting Support ¹	Combined with item #75												C
95	X	1997-02	MCG	Germantown Transit Center				2004		0.0626	2.2581	0.0605	0.9190	0.0605	0.7594	C (TCM)	
102	X	1997-02	PG	Prince George's County Bus Replacement	X			1998	1998	0.0345	1.2440	0.0333	0.5062	0.0333	0.4183	SP (TCM)	
106	X	1997-02	VDOT	PRTC Employer Commuting Outreach Program	X				1977 on-going	0.0016	0.0594	0.0016	0.0242	0.0016	0.0200	C	
107	X	1997-02	VDOT	PRTC Multimodal Strategic Marketing Implementation Plan	X				1977 on-going	0.0016	0.0594	0.0016	0.0242	0.0016	0.0200	C	
108	X	1997-02	MDOT	M-103 Taxicab Replacement in Maryland ²	X			2005	Stopped	1.0249	36.9731	0.9899	15.0465	0.9899	12.4340	SP	
109	X	1997-02	REGION	M-70b Employer Outreach for Bicycles	X			1998	on going	0.0118	0.4461	0.0114	0.1817	0.0114	0.1491	C	
110		1997-02	VDOT	M-77b Vanpool Incentive Programs in Virginia				1999	delayed	n/a	n/a	n/a	n/a	n/a	n/a	C	
111	X	1998-03	WMATA	Bus Replacement (108 buses)	X			1999	1999	0.6196	22.3497	0.5984	9.0954	0.5984	7.5162	SP	
112	X	1998-03	MCG	Montgomery County Bus Replacement	X				Ongoing	0.1035	3.7319	0.0999	1.5187	0.0999	1.2550	SP	
113	X	1998-03	PG	Prince George's County Bus Replacement	X			1998	Ongoing	0.0077	0.2764	0.0074	0.1125	0.0074	0.0930	SP	
114	X	1998-03	FDC	Frederick County Bus Replacement	X					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	SP	
117	X	1998-03	VDOT	Arlington County Four Mile Run Bike Trail				1999	delayed	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C	
118	X	1998-03	VDOT	Northern Virginia Turn Bays	X			2000	1998	0.0058	0.2092	0.0056	0.0851	0.0056	0.0703	TR	
119	X	1998-03	VDOT	Fairfax City Bus Replacement				2001	2003	n/a	n/a	n/a	n/a	n/a	n/a	SP	
121	X	1998-03	WMATA	WMATA Bus Replacement (252 buses)	X			2001	2001	1.4790	53.3518	1.4284	21.7119	1.4284	17.9421	SP	
122	X	97 & 98 TIP	REGION	M-101a Mass Marketing Campagin (Consumer)		X			2005	0.4554	16.1981	0.4398	6.5955	0.4398	5.4570	C	

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
123	X	1999-04	MDOT	Various Park and Ride Lots(I-270/MD124, 450 & I-170/MD-75, 54 spaces)	X				2001/1999	2001	0.1186	4.2786	0.1146	1.7412	0.1146	1.4389	C
124	X	1999-04	MDOT	Signal Systems (197/MD-198, MD-382 TO US-301,US301)	X				2000	2002	-0.0116	-0.4184	-0.0112	-0.1703	-0.0112	-0.1407	TR
125	X	1999-04	VDOT	Transit Center at 7 Corners	X				2002		0.0066	0.2377	0.0064	0.0967	0.0064	0.0799	C
126	X	1999-04	VDOT	Falls Church Clean Diesel Bus Service	X				2000	2003	0.0192	0.6911	0.0185	0.2812	0.0185	0.2324	SP
127	X	1999-04	VDOT	VA 234 Bike Trail			X		2001	2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
128	X	1999-04	VDOT	PRTC Ridesharing	X				on-going	2000 ongoing	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
130	X	1996-01	VDOT	M-14: I-66 Feeder Bus Fare Buy Down	X					1998 onward	0.1812	6.5367	0.1750	2.6602	0.1750	2.1983	C
131	X	2000-05	MDOT	Various park and Ride Lots	x				2002	2003	0.1071	3.8639	0.1035	1.5725	0.1035	1.2994	C
132	X	2000-05	MDOT	Signal Systems	X				Varies	on-going	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
133	X	2000-05	VDOT	450 Spaces at Gambrill/Hoopes Rds. Park and Ride			X		2002	2004	0.0593	2.1393	0.0573	0.8706	0.0573	0.7194	C
134	X	2000-05	VDOT	300 Spaces at Backlick Rd			X		2003	2006	0.0428	1.5450	0.0414	0.6288	0.0414	0.5196	C
135	X	2000-05	VDOT	Accotink-Gateway Connector Trail			X		2002	2005	0.0329	1.1885	0.0318	0.4837	0.0318	0.3997	C
136	X	2000-05	VDOT	Columbia Pike Trail			X		2000	2001, 2005	0.0264	0.9508	0.0255	0.3869	0.0255	0.3198	C
137	X	2000-05	VDOT	Lee Highway trail			X		2000	2005	0.0132	0.4754	0.0127	0.1935	0.0127	0.1599	C
138	X	2000-05	VDOT	Arlington Bus Shelter Improvements			X		2005	2005	0.0033	0.1188	0.0032	0.0484	0.0032	0.0400	C
139	X	2000-05	VDOT	Pentagon Metrostation Improvements	X					2003	0.0560	2.0204	0.0541	0.8222	0.0541	0.6795	C
140	X	2000-05	MDOT	East/West Intersection Improvements			X		2005	2005	0.0824	2.9712	0.0795	1.2092	0.0795	0.9992	C
141	X	2001-06	Feds	Federal Transit/Ridesharing subsidy	X				on-going		0.6293	22.7002	0.6078	9.2380	0.6078	7.6341	C
142	X	2002-07	WMATA	100 CNG buses	X				2002		0.5203	18.7699	0.5025	7.6386	0.5025	6.3123	SP (TCM)
143	X	2002-07	WMATA	ULSD with CRT filters			X		on-going		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	H (TCM)
144	X	2003-08	DC	Replace 23 12 Taxicabs with CNG cabs			X		2005	2006	0.0602	2.1700					H
145	X	2003-08	DC	D.C.Incident Response & TrafficManagement System	X				2005	2004	0.2859	10.3131	0.2761	4.1970	0.2761	3.4683	TR
146	X	2003-08	DC	Bicycle Lane in D. C. (35 Mile)			X		2005	2006	0.0443	2.1829	0.0428	0.8897	0.0428	0.7095	C (TCM)
147	X	2003-08	DC	Bicycle Racks in D. C. (500)	X				2005	2004	0.0041	0.2486	0.0040	0.1014	0.0040	0.0794	C (TCM)
148	X	2003-08	DC	External Bicycle Racks on WMATA Buses in D. C. (600)	X				2005	2003	0.0214	0.7740	0.0206	0.3152	0.0206	0.2601	C (TCM)
149		2003-08	DC	CNG Rental Cars (18)				X	2005	Removed	0.0008	0.0276					SP
150	X	2003-08	DC	Sidewalks in D.C. (\$ 5 million)	X				2005	2004	0.3818	13.9434	0.3688	5.6779	0.3688	4.6821	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
151	X	2003-08	DC	CNG Refuse Haulers (2)	X				2005	2004	0.0077	0.2764					H (TCM)
152	X	2003-08	DC	Circulator /Feeder Bus Routes	X				2005	2003	0.1373	5.0295	0.1325	2.0481	0.1325	1.6881	C
153	X	2003-08	MDOT	Commuter Tax Credit	X				2005	n/a	0.8434	30.6955	0.8145	12.4995	0.8145	10.3114	C
155		2003-08	MDOT	Employer Vanpool Program (WWB)				X	2005	Removed	0.0312	1.0252	0.0301	0.0417	0.0301	0.0349	C
156	X	2003-08	MDOT	Green Line Link				X	2005	n/a	0.0338	1.1686	0.0326	0.4758	0.0326	0.3951	C
157	X	2003-08	MDOT	Park & Ride Lots - Southern Maryland				X	2005	2008	0.0729	2.4009	0.0703	0.9773	0.0703	0.8170	C
158	X	2003-08	MDOT	Prince George's County- Bus Exp				X	2005	n/a	0.4736	16.3874	0.4578	6.6719	0.4578	5.5404	C
159	X	2003-08	MDOT	MTA - Bus Service Expansion				X	2005	n/a	0.1147	3.9082	0.1108	1.5911	0.1108	1.3240	C
160	X	2003-08	MDOT	Ride- On - Super Discount				X	2005	n/a	0.0097	0.3547	0.0094	0.1445	0.0094	0.1191	C
161	X	2003-08	Regional	Regional Traveler Information Systems				X	2005	VA:2000 before	3.7282	134.4892	3.6007	54.7315	3.6007	45.2286	TR
162	X	2003-08	MDOT	Universal Transportation Access (MD + WMATA)				X	2005	n/a	0.1712	6.2518	0.2414	3.7169	0.2414	3.0650	C
163	X	2003-08	MCG	Construction of 1300 additional Parking Spaces at Grosvenor Metro Garage	X				2004		0.1157	3.7816	0.1653	2.5458	0.1653	2.0993	C (TCM)
164	X	2003-08	MCG	Bethesda Shuttle Bus Services	X				2004		0.0327	1.1987	0.3158	0.4882	0.0316	0.4023	C
165	X	2003-08	MCG	External Bicycle Racks on Ride-On Buses in Montgomery County	X				2004		0.0066	0.2414	0.0064	0.0983	0.0064	0.0811	C
166	X	2003-08	MCG	New CNG Powered Light Duty Vehicle fleet in the County	X				2004		0.0004	0.0138					SP
167	X	2003-08	MCG	Free Bus Service on Selected Routes on I-270	X				2004		0.0114	0.4152	0.0110	0.1691	0.0110	0.1394	C
168	X	2003-08	MCG	Annual Sidewalk Program	X				2004		0.1818	6.6397	0.1756	2.7038	0.1756	2.2296	C
169		2003-08	MDOT	Bethesda Breeze/International Express Metrobus				X	2005	Removed	0.0357	1.3422	0.0345	0.5466	0.0345	0.4491	C
170		2003-08	MDOT	Bethesda-8, Silver Spring Downtown Dasher and Prince Georges Co. Shuttles at 3 PNR lot				X	2005	Removed	0.0645	2.6461	0.0623	1.0779	0.0623	0.8764	C
171		2003-08	MDOT	Proposed Transportation Management District in Montgomery County (Rockville and Gaithersburg)				X	2005	Removed	0.0513	1.9714	0.0495	0.8029	0.0495	0.6579	C
172	X	2003-08	MDOT	Sidewalks (Bikes/Pedestrian) at / near Rail Stations	X				2005	2002	0.1017	3.6896	0.0983	1.5024	0.0983	1.2400	C
173	X	2003-08	MDOT	Neighborhood Sidewalks Improvements (Bike/Pedestrian)	X				2005	2004	0.0039	0.4468	0.0038	0.1823	0.0038	0.1374	C
174	X	2003-08	MDOT	Neighborhood Conservation Program - Neighborhood Sidewalks Improvements (Bikes/Pedestrian)		X			2005	n/a	0.0034	0.3909	0.0033	0.1595	0.0033	0.1202	C
175	X	2003-08	MDOT	Maryland bus Transit Service Expansion	X				2005	2004	0.2449	8.0083	0.2366	3.2599	0.2366	2.7281	C
176	X	2003-08	VDOT	Universal Transportation Access Program				X	2005	2005	0.0129	0.4688	0.0125	0.1909	0.0125	0.1575	C
177	X	2003-08	VDOT	Interactive Rideshare & Kiosk Initiative				X	2005		0.0051	0.1771	0.0049	0.0721	0.0049	0.0599	C
178	X	2003-08	VDOT	Mobile Commuter Stores				X	2005		0.0283	0.9788	0.0273	0.3985	0.0273	0.3297	C

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
179	X	2003-08	VDOT	Telework Incentive Program (Telework VA) ¹	X				2005	2001	0.0083	0.2992	0.0080	0.1218	0.0080	0.1006	C
180	X	2003-08	VDOT	Commuter Choice			X		2005		0.0095	0.3521	0.0091	0.1434	0.0091	0.1179	C
181	X	2003-08	VDOT	Employer Shuttle Services			X		2005		0.1119	4.1792	0.1081	1.7020	0.1081	1.3995	C
184	X	2003-08	VDOT	Van Start / Van Save			X		2005	till 2006	0.0185	0.6399	0.0179	0.2605	0.0179	0.2164	C
185	X	2003-08	VDOT	Metro Shuttle Bus			X		2005	1999-2005	0.0195	0.6403	0.0188	0.2606	0.0188	0.2179	C
187	X	2003-08	VDOT	VRE Mid-Day Train Service	X				2005	2002	0.0211	0.7275	0.0203	0.2962	0.0203	0.2461	C
190	X	2003-08	VDOT	Employer Vanpool Program (Bridge deck)			X		2005	2004 - 2008	0.0139	0.4694	0.0134	0.0000	0.0134	0.0000	C
191	X	2003-08	VDOT	Town of Leesburg P&R Lot			X		2005	2004	0.0290	0.9740	0.0279	0.3966	0.0279	0.3305	C
192	X	2003-08	VDOT	District-wide P&R Lots	X		X		2005	2001-2005	0.1645	5.5666	0.1588	2.2662	0.1588	1.8875	C
193	X	2003-08	VDOT	Additional Parking at 4 Metro stations			X		2005	2001, 2005	0.2527	8.2607	0.2440	3.3626	0.2440	2.8140	C
196	X	2003-08	WMATA	64 CNG Buses (Purchased in 2001)	X				2005	2004	0.3335	12.0304					SP (TCM)
197	X	2003-08	WMATA	250 CNG Buses (175 buses by Dec. 2004; 75 buses by mid 2006)			X		2005	2004-2006	0.0316	46.9938					SP
198	X	2003-08	WMATA	60 Engine Replacement (MY 1992 & 1993 MY buses)	X				2004	2004	0.2892	10.4326					SP
199	X	2003-08	WMATA	Car Sharing Program	X				2005	2004	0.0138	0.4492	0.0133	0.1828	0.0133	0.1530	C
200	X	2003-08	WMATA	Bikes Racks on WMATA Buses in VA (372 Bike Racks)	X				2005	2004	0.0194	0.7026	0.0187	0.2861	0.0184	0.2361	C (TCM)
202		2003-08	MDOT	Fleet Replacement (state auto fleet, gas to hybrid, 250 vehicles)				X	2005	Removed	0.0510	1.8383	0.0492	0.7481	0.0492	0.6182	SP
203	X	2003-08	MDOT	Replace 55 Montgomery County 10 yr. old buses w/ new CNG buses			X		2005	n/a	1.0962	39.5439	1.0587	16.0927	1.0587	13.2986	SP
204		2003-08	MDOT	Neighborhood Bus Shuttle (5 circulator routes)				X	2005	Removed	0.0853	3.0595	0.0824	1.2458	0.0824	1.0296	C
205	X	2003-08	MDOT	New Surface Parking at Transit Centers (500 spaces)			X		2005	n/a	0.0451	1.4784	0.0436	0.6018	0.0436	0.5035	C
206		2003-08	MDOT	Additional Bike Lockers at Metro-Stations				X	2005	Removed	0.1444	5.2364	0.1395	2.1323	0.1395	1.7599	C
207	X	2003-08	MDOT	Bike Facilities at PnR Lots or other similar location			X		2005	n/a	0.1184	4.1347	0.1144	1.6834	0.1144	1.3963	C
208		2003-08	MDOT	CNG Fueling Stations				X	2005	Removed	0.4483	16.1714					SP
209		2003-08	MDOT	Gas cap replacements (ROP Credit)				X	2005	Removed	N/A	N/A	N/A	N/A	N/A	N/A	SP

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES
Part B - Yearly PM 2.5 and Precursor NOx Emissions

* Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		Project Category *
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
210		2003-08	MDOT	Gas can turnover (ROP Credit)				X	2005	Removed	N/A	N/A	N/A	N/A	N/A	N/A	SP
211	X	2003-08	MDOT	External Bicycle Racks on WMATA Buses (486 MD buses)	X				2005	2002	0.0223	0.8100	0.0216	0.3298	0.0216	0.2722	C (TCM)
212	X	2003-08	MDOT	Bike \ Pedestrian Trail - Anacostia River Walk				X	2005	n/a	0.0023	0.1206	0.0022	0.0492	0.0022	0.0389	C
213		2003-08	MDOT	Transit Prioritization - Queue Jumps				X	2005	Removed	0.0233	0.9455	0.0225	0.3851	0.0225	0.3136	C
214	X	2003-08	MDOT	Commuter Choice Benefit/Tax Credit - Marketing Expansion	X				2005	Ongoing	0.5935	21.5571	0.5732	8.7782	0.5732	7.2434	C
215	X	2003-08	MDOT	Improvements to Pedestrian Access in TOD areas (4 locations)				X	2005	n/a	0.0587	2.1898	0.0566	0.8918	0.0566	0.7334	C
216	X	2003-08	MDOT	Telecommuting Expansion ¹	X				2005	n/a	0.8765	30.1378	0.8466	12.2700	0.8466	10.1977	C
217		2003-08	MDOT	Replace older Diesel Engine in Public Sector vehicles				X	2005	Removed	0.4981	17.9682					H
218	X	2003-08	VDOT	MV-92 Telecommuting Program - Expanded ¹	X				2005	2003	0.9361	32.1855	0.9041	13.1037	0.9041	10.8905	C
219	X	2003-08	VDOT	MV-123 Employer Outreach for Public Sector Employees ²	X				2005	2003	0.1629	5.9508	0.1574	2.4232	0.1574	1.9982	C
220	X	2003-08	REGION	Signal System Optimization				X	2005	2005	1.0421	37.5917	1.0065	15.2983	1.0065	12.6420	TR
Available Emissions Credits											25.326	990.642	23.029	358.494	22.745	296.403	

TERM TRACKING SHEET
TRANSPORTATION EMISSION REDUCTION MEASURES (CLRP Projects Only)
Part B - Yearly PM 2.5 and Precursor NOx Emissions

Project Category: TR - Traffic Stream, C - Commute, H - Engine Technology (Heavy Dudy Vehicles), SP- Specific Vehicle Type

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				PROJECTED COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/ANNUM REDUCTION CREDITED						Project Category
					FULL	SCALED-BACK	UNDER-WAY	REMOVED			2010		2020		2030		
											PM2.5	Precursor NOx	PM2.5	Precursor NOx	PM2.5	Precursor NOx	
221	X	1995-00 TIP	REGION	M-24 Speed Limit Adherence					2010		3.7282	134.4889	3.8136	57.9425	1.4355	18.0353	TR
222		1996-01 TIP	MGC	Rock Spring Park Pedestrian Amenities				X			0.0278	1.0029	0.0000	0.0000	0.0000	0.0000	-
223	X	1996-01 TIP	MGC	Olney Transit Center Park and Ride					2015		0.0556	2.0058	0.0490	0.7443	0.0136	0.1705	C
224	X	1996-01 TIP	MGC	Damascus Park and Ride					2003		0.0278	1.0029	0.0245	0.3722	0.0068	0.0852	C
225	X	1996-01 TIP	DC	M-103 Taxicab Replacement (DC)					2015		0.0000	0.0000	4.8375	73.5000	11.6550	146.4300	H
226	X	STADIUM ANALYSIS		M-103 Taxicab Replacement (MD)				X	2008		0.0000	0.0000	3.8700	58.8000	4.6620	58.5720	H
227	X	1997-02 TIP	MDOT	Shady Grove West Transit Center Park and Ride				X			0.0695	2.5073	0.0612	0.9304	0.0170	0.2131	C
228	X	1997-02 TIP	MGC	Olney Transit Center Park and Ride					2015		0.0000	0.0000	0.0201	0.3053	0.0136	0.1705	C
229	X	1997-02 TIP	MGC	White Oak Park and Ride					2008		0.1390	5.0145	0.1225	1.8608	0.0339	0.4262	C
230	X	1997-02 TIP	MGC	Damascus Park and Ride					2003		0.0000	0.0000	0.0075	0.1145	0.0051	0.0639	C
231	X	1997-02 TIP	MGC	Four Corners Transit Center					2015		0.0070	0.2507	0.0061	0.0930	0.0017	0.0213	C
232		1997-02 TIP	MGC	Burtonsville Transit Center				X			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
233	X	1997-02 TIP	MGC	Silver Spring Transit Access							0.0070	0.2507	0.0050	0.0763	0.0034	0.0426	C
234	X	1997-02 TIP	MGC	Shady Grove Parking Construction					2003		0.1321	4.7638	0.1163	1.7677	0.0322	0.4049	C

PLAN TOTAL	4.0966	147.7773	9.0021	136.7766	13.2008	165.8505
GRAND TOTAL (Current Measures + CLRP plan)	29.423	1138.419	32.032	495.271	35.946	462.253

DEFINITIONS:

CREDIT TAKEN (X means emissions reduction credits taken):

TIP - Emissions credits are taken for projects being implemented, according to the progress reporting schedules provided by the implementing agencies (contained in Appendix J of Conformity Document). No credit has been taken for projects in which only some components of the measure have been implemented.

CLRP - Credit is taken for each of these elements of the CLRP according to the schedule provided by the implementing agency.

IMPLEMENTATION STATUS:

FULL = project is completed as planned at the time of analysis.

SCALED BACK = project is completed, but at a different level than assumed at the time of analysis (i.e., purchased 50 buses instead of 100)

UNDERWAY = project is not complete, but is close enough that credit may be taken (i.e., under construction, NOT just out for bid)

REMOVED = project no longer expected to be implemented or constructed

COMPLETION DATE:

PROJECTED = project completion date originally expected (i.e., at time of emissions analysis)

ACTUAL = actual year project was open for use, or expected to be open for use if under construction

REMOVED

projects Emissions credits are not counted in total available emissions credits

1 Line items 218, 216, 179, 92 are all credited as part of M-92 Regional Telecommute Support TERM, line item # 75

2 Line item 108 & 219 credits are taken only for year 2010

Projects fully implemented prior to 2000 were removed from the TERM Tracking Sheet