

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 2006 CLRP and FY 2007 - 2012 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.
- TERMS impacting commuting vehicle 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.
- 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 2010 heavy duty diesel transit and school buses are shown in Table 8; rates for other 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 shows 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 Vehicle” TERMS. Table 8 shows 2010 emissions factors for school and transit buses (heavy duty diesel vehicles). Table 9 shows the 2005 idling emissions factors for the different vehicle types. Table 10 shows the 2005 regional average speeds generated by the post-processor which are used to compute hourly speeds for emissions calculations; use specific speeds for each application, where available. Table 11 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

EMISSIONS=TRAVEL X EMISSIONS RATE

Start-up=Trip Origins X Grams/Trip

Running=VMT X Grams/Mile

Hot Soak=Trip Destination X Grams/Trip

Emissions factors were obtained from the Mobile 6 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 2005 CLRP and FY 2006-2011 TIP. Running emissions factors for speed range 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 | 3.0895 | 3.0284 | 3.0651 | 1.4539 | 1.4539 | 1.4539 |
| Running (g/mi) | 2 | 3.0895 | 3.0284 | 3.0651 | 1.4539 | 1.4539 | 1.4539 |
| Running (g/mi) | 3 | 2.4066 | 2.3701 | 2.3920 | 1.3944 | 1.3944 | 1.3944 |
| Running (g/mi) | 4 | 1.5527 | 1.5478 | 1.5507 | 1.3203 | 1.3203 | 1.3203 |
| Running (g/mi) | 5 | 1.0405 | 1.0543 | 1.0460 | 1.2758 | 1.2758 | 1.2758 |
| Running (g/mi) | 6 | 0.8563 | 0.8645 | 0.8596 | 1.1665 | 1.1665 | 1.1665 |
| Running (g/mi) | 7 | 0.7250 | 0.7290 | 0.7266 | 1.0884 | 1.0884 | 1.0884 |
| Running (g/mi) | 8 | 0.6262 | 0.6272 | 0.6266 | 1.0300 | 1.0300 | 1.0300 |
| Running (g/mi) | 9 | 0.5495 | 0.5483 | 0.5490 | 0.9843 | 0.9843 | 0.9843 |
| Running (g/mi) | 10 | 0.4880 | 0.4850 | 0.4868 | 0.9483 | 0.9483 | 0.9483 |
| Running (g/mi) | 11 | 0.4488 | 0.4435 | 0.4467 | 0.9012 | 0.9012 | 0.9012 |
| Running (g/mi) | 12 | 0.4161 | 0.4086 | 0.4131 | 0.8621 | 0.8621 | 0.8621 |
| Running (g/mi) | 13 | 0.3887 | 0.3792 | 0.3849 | 0.8290 | 0.8290 | 0.8290 |
| Running (g/mi) | 14 | 0.3649 | 0.3540 | 0.3605 | 0.8008 | 0.8008 | 0.8008 |
| Running (g/mi) | 15 | 0.3445 | 0.3323 | 0.3396 | 0.7762 | 0.7762 | 0.7762 |
| Running (g/mi) | 16 | 0.3248 | 0.3158 | 0.3212 | 0.7678 | 0.7678 | 0.7678 |
| Running (g/mi) | 17 | 0.3074 | 0.3012 | 0.3049 | 0.7608 | 0.7608 | 0.7608 |
| Running (g/mi) | 18 | 0.2918 | 0.2880 | 0.2903 | 0.7543 | 0.7543 | 0.7543 |
| Running (g/mi) | 19 | 0.2779 | 0.2764 | 0.2773 | 0.7487 | 0.7487 | 0.7487 |
| Running (g/mi) | 20 | 0.2655 | 0.2660 | 0.2657 | 0.7434 | 0.7434 | 0.7434 |
| Running (g/mi) | 21 | 0.2554 | 0.2575 | 0.2562 | 0.7385 | 0.7385 | 0.7385 |
| Running (g/mi) | 22 | 0.2462 | 0.2498 | 0.2476 | 0.7339 | 0.7339 | 0.7339 |
| Running (g/mi) | 23 | 0.2380 | 0.2428 | 0.2399 | 0.7298 | 0.7298 | 0.7298 |
| Running (g/mi) | 24 | 0.2304 | 0.2362 | 0.2327 | 0.7258 | 0.7258 | 0.7258 |
| Running (g/mi) | 25 | 0.2234 | 0.2302 | 0.2261 | 0.7225 | 0.7225 | 0.7225 |
| Running (g/mi) | 26 | 0.2171 | 0.2245 | 0.2201 | 0.7199 | 0.7199 | 0.7199 |
| Running (g/mi) | 27 | 0.2114 | 0.2192 | 0.2145 | 0.7176 | 0.7176 | 0.7176 |
| Running (g/mi) | 28 | 0.2059 | 0.2141 | 0.2092 | 0.7155 | 0.7155 | 0.7155 |
| Running (g/mi) | 29 | 0.2011 | 0.2093 | 0.2044 | 0.7136 | 0.7136 | 0.7136 |
| Running (g/mi) | 30 | 0.1966 | 0.2053 | 0.2001 | 0.7119 | 0.7119 | 0.7119 |
| Running (g/mi) | 31 | 0.1920 | 0.2004 | 0.1954 | 0.7110 | 0.7110 | 0.7110 |
| Running (g/mi) | 32 | 0.1879 | 0.1962 | 0.1912 | 0.7103 | 0.7103 | 0.7103 |
| Running (g/mi) | 33 | 0.1841 | 0.1922 | 0.1873 | 0.7097 | 0.7097 | 0.7097 |
| Running (g/mi) | 34 | 0.1803 | 0.1883 | 0.1835 | 0.7089 | 0.7089 | 0.7089 |
| Running (g/mi) | 35 | 0.1768 | 0.1847 | 0.1800 | 0.7084 | 0.7084 | 0.7084 |
| Running (g/mi) | 36 | 0.1742 | 0.1819 | 0.1773 | 0.7117 | 0.7117 | 0.7117 |
| Running (g/mi) | 37 | 0.1717 | 0.1791 | 0.1747 | 0.7146 | 0.7146 | 0.7146 |
| Running (g/mi) | 38 | 0.1693 | 0.1766 | 0.1722 | 0.7178 | 0.7178 | 0.7178 |
| Running (g/mi) | 39 | 0.1671 | 0.1740 | 0.1699 | 0.7204 | 0.7204 | 0.7204 |
| Running (g/mi) | 40 | 0.1649 | 0.1716 | 0.1676 | 0.7232 | 0.7232 | 0.7232 |
| Running (g/mi) | 41 | 0.1630 | 0.1694 | 0.1656 | 0.7292 | 0.7292 | 0.7292 |
| Running (g/mi) | 42 | 0.1609 | 0.1670 | 0.1633 | 0.7350 | 0.7350 | 0.7350 |
| Running (g/mi) | 43 | 0.1591 | 0.1650 | 0.1615 | 0.7408 | 0.7408 | 0.7408 |
| Running (g/mi) | 44 | 0.1574 | 0.1631 | 0.1597 | 0.7459 | 0.7459 | 0.7459 |
| Running (g/mi) | 45 | 0.1556 | 0.1611 | 0.1578 | 0.7509 | 0.7509 | 0.7509 |
| Running (g/mi) | 46 | 0.1589 | 0.1589 | 0.1589 | 0.7599 | 0.7599 | 0.7599 |
| Running (g/mi) | 47 | 0.1570 | 0.1570 | 0.1570 | 0.7685 | 0.7685 | 0.7685 |
| Running (g/mi) | 48 | 0.1554 | 0.1554 | 0.1554 | 0.7765 | 0.7765 | 0.7765 |
| Running (g/mi) | 49 | 0.1537 | 0.1537 | 0.1537 | 0.7843 | 0.7843 | 0.7843 |
| Running (g/mi) | 50 | 0.1521 | 0.1521 | 0.1521 | 0.7920 | 0.7920 | 0.7920 |
| Running (g/mi) | 51 | 0.1505 | 0.1505 | 0.1505 | 0.8044 | 0.8044 | 0.8044 |
| Running (g/mi) | 52 | 0.1489 | 0.1489 | 0.1489 | 0.8164 | 0.8164 | 0.8164 |
| Running (g/mi) | 53 | 0.1476 | 0.1476 | 0.1476 | 0.8280 | 0.8280 | 0.8280 |
| Running (g/mi) | 54 | 0.1464 | 0.1464 | 0.1464 | 0.8390 | 0.8390 | 0.8390 |
| Running (g/mi) | 55 | 0.1450 | 0.1450 | 0.1450 | 0.8498 | 0.8498 | 0.8498 |
| Running (g/mi) | 56 | 0.1438 | 0.1438 | 0.1438 | 0.8671 | 0.8671 | 0.8671 |
| Running (g/mi) | 57 | 0.1434 | 0.1434 | 0.1434 | 0.8838 | 0.8838 | 0.8838 |
| Running (g/mi) | 58 | 0.1427 | 0.1427 | 0.1427 | 0.8999 | 0.8999 | 0.8999 |
| Running (g/mi) | 59 | 0.1419 | 0.1419 | 0.1419 | 0.9153 | 0.9153 | 0.9153 |
| Running (g/mi) | 60 | 0.1414 | 0.1414 | 0.1414 | 0.9303 | 0.9303 | 0.9303 |
| Running (g/mi) | 61 | 0.1408 | 0.1408 | 0.1408 | 0.9543 | 0.9543 | 0.9543 |
| Running (g/mi) | 62 | 0.1403 | 0.1403 | 0.1403 | 0.9778 | 0.9778 | 0.9778 |
| Running (g/mi) | 63 | 0.1400 | 0.1400 | 0.1400 | 1.0003 | 1.0003 | 1.0003 |
| Running (g/mi) | 64 | 0.1397 | 0.1397 | 0.1397 | 1.0219 | 1.0219 | 1.0219 |
| Running (g/mi) | 65 | 0.1391 | 0.1391 | 0.1391 | 1.0430 | 1.0430 | 1.0430 |

| Emission Type | VOC | NOx |
|--|--------|--------|
| Cold Start (g/trip start, Light Duty Only) | 0.9659 | 0.5817 |
| Hot Soak Loss (g/trip end) | 0.5799 | - |
| Hot Start (g/trip start, Light Duty Only) | 0.1648 | 0.1271 |

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 | 1.6166 | 1.5876 | 1.6050 | 0.4061 | 0.4846 | 0.4375 |
| Running (g/mi) | 2 | 1.6166 | 1.5876 | 1.6050 | 0.4061 | 0.4846 | 0.4375 |
| Running (g/mi) | 3 | 1.2712 | 1.2562 | 1.2652 | 0.3863 | 0.4632 | 0.4171 |
| Running (g/mi) | 4 | 0.8396 | 0.8419 | 0.8405 | 0.3614 | 0.4362 | 0.3913 |
| Running (g/mi) | 5 | 0.5805 | 0.5933 | 0.5856 | 0.3467 | 0.4198 | 0.3759 |
| Running (g/mi) | 6 | 0.4823 | 0.4912 | 0.4859 | 0.3211 | 0.3781 | 0.3439 |
| Running (g/mi) | 7 | 0.4123 | 0.4185 | 0.4148 | 0.3030 | 0.3483 | 0.3211 |
| Running (g/mi) | 8 | 0.3598 | 0.3639 | 0.3614 | 0.2893 | 0.3260 | 0.3040 |
| Running (g/mi) | 9 | 0.3190 | 0.3215 | 0.3200 | 0.2786 | 0.3085 | 0.2906 |
| Running (g/mi) | 10 | 0.2862 | 0.2875 | 0.2867 | 0.2702 | 0.2947 | 0.2800 |
| Running (g/mi) | 11 | 0.2638 | 0.2634 | 0.2636 | 0.2576 | 0.2776 | 0.2656 |
| Running (g/mi) | 12 | 0.2450 | 0.2432 | 0.2443 | 0.2468 | 0.2635 | 0.2535 |
| Running (g/mi) | 13 | 0.2293 | 0.2261 | 0.2280 | 0.2378 | 0.2513 | 0.2432 |
| Running (g/mi) | 14 | 0.2159 | 0.2117 | 0.2142 | 0.2301 | 0.2409 | 0.2344 |
| Running (g/mi) | 15 | 0.2041 | 0.1990 | 0.2021 | 0.2233 | 0.2321 | 0.2268 |
| Running (g/mi) | 16 | 0.1921 | 0.1891 | 0.1909 | 0.2171 | 0.2305 | 0.2225 |
| Running (g/mi) | 17 | 0.1815 | 0.1800 | 0.1809 | 0.2119 | 0.2291 | 0.2188 |
| Running (g/mi) | 18 | 0.1721 | 0.1720 | 0.1721 | 0.2072 | 0.2281 | 0.2156 |
| Running (g/mi) | 19 | 0.1638 | 0.1650 | 0.1643 | 0.2028 | 0.2270 | 0.2125 |
| Running (g/mi) | 20 | 0.1562 | 0.1587 | 0.1572 | 0.1990 | 0.2261 | 0.2098 |
| Running (g/mi) | 21 | 0.1505 | 0.1538 | 0.1518 | 0.1954 | 0.2250 | 0.2072 |
| Running (g/mi) | 22 | 0.1454 | 0.1493 | 0.1470 | 0.1923 | 0.2243 | 0.2051 |
| Running (g/mi) | 23 | 0.1408 | 0.1453 | 0.1426 | 0.1895 | 0.2234 | 0.2031 |
| Running (g/mi) | 24 | 0.1363 | 0.1415 | 0.1384 | 0.1868 | 0.2227 | 0.2012 |
| Running (g/mi) | 25 | 0.1323 | 0.1383 | 0.1347 | 0.1843 | 0.2219 | 0.1993 |
| Running (g/mi) | 26 | 0.1287 | 0.1347 | 0.1311 | 0.1823 | 0.2214 | 0.1979 |
| Running (g/mi) | 27 | 0.1254 | 0.1316 | 0.1279 | 0.1802 | 0.2210 | 0.1965 |
| Running (g/mi) | 28 | 0.1218 | 0.1286 | 0.1245 | 0.1782 | 0.2205 | 0.1951 |
| Running (g/mi) | 29 | 0.1190 | 0.1258 | 0.1217 | 0.1763 | 0.2203 | 0.1939 |
| Running (g/mi) | 30 | 0.1161 | 0.1231 | 0.1189 | 0.1748 | 0.2198 | 0.1928 |
| Running (g/mi) | 31 | 0.1138 | 0.1206 | 0.1165 | 0.1737 | 0.2195 | 0.1920 |
| Running (g/mi) | 32 | 0.1113 | 0.1179 | 0.1139 | 0.1726 | 0.2194 | 0.1913 |
| Running (g/mi) | 33 | 0.1089 | 0.1158 | 0.1117 | 0.1716 | 0.2192 | 0.1906 |
| Running (g/mi) | 34 | 0.1070 | 0.1137 | 0.1097 | 0.1706 | 0.2190 | 0.1900 |
| Running (g/mi) | 35 | 0.1047 | 0.1116 | 0.1075 | 0.1697 | 0.2186 | 0.1893 |
| Running (g/mi) | 36 | 0.1033 | 0.1098 | 0.1059 | 0.1706 | 0.2197 | 0.1902 |
| Running (g/mi) | 37 | 0.1021 | 0.1082 | 0.1045 | 0.1713 | 0.2206 | 0.1910 |
| Running (g/mi) | 38 | 0.1008 | 0.1067 | 0.1032 | 0.1718 | 0.2217 | 0.1918 |
| Running (g/mi) | 39 | 0.0996 | 0.1054 | 0.1019 | 0.1727 | 0.2227 | 0.1927 |
| Running (g/mi) | 40 | 0.0984 | 0.1041 | 0.1007 | 0.1731 | 0.2235 | 0.1933 |
| Running (g/mi) | 41 | 0.0971 | 0.1024 | 0.0992 | 0.1743 | 0.2253 | 0.1947 |
| Running (g/mi) | 42 | 0.0961 | 0.1012 | 0.0981 | 0.1753 | 0.2272 | 0.1961 |
| Running (g/mi) | 43 | 0.0951 | 0.1000 | 0.0971 | 0.1763 | 0.2287 | 0.1973 |
| Running (g/mi) | 44 | 0.0940 | 0.0990 | 0.0960 | 0.1773 | 0.2303 | 0.1985 |
| Running (g/mi) | 45 | 0.0930 | 0.0978 | 0.0949 | 0.1783 | 0.2318 | 0.1997 |
| Running (g/mi) | 46 | 0.0968 | 0.0968 | 0.0968 | 0.2317 | 0.2343 | 0.2327 |
| Running (g/mi) | 47 | 0.0958 | 0.0958 | 0.0958 | 0.2339 | 0.2366 | 0.2350 |
| Running (g/mi) | 48 | 0.0948 | 0.0948 | 0.0948 | 0.2363 | 0.2388 | 0.2373 |
| Running (g/mi) | 49 | 0.0940 | 0.0940 | 0.0940 | 0.2383 | 0.2409 | 0.2393 |
| Running (g/mi) | 50 | 0.0931 | 0.0931 | 0.0931 | 0.2403 | 0.2429 | 0.2413 |
| Running (g/mi) | 51 | 0.0924 | 0.0924 | 0.0924 | 0.2438 | 0.2464 | 0.2448 |
| Running (g/mi) | 52 | 0.0917 | 0.0917 | 0.0917 | 0.2469 | 0.2496 | 0.2480 |
| Running (g/mi) | 53 | 0.0911 | 0.0911 | 0.0911 | 0.2499 | 0.2525 | 0.2509 |
| Running (g/mi) | 54 | 0.0907 | 0.0907 | 0.0907 | 0.2530 | 0.2556 | 0.2540 |
| Running (g/mi) | 55 | 0.0902 | 0.0902 | 0.0902 | 0.2557 | 0.2584 | 0.2568 |
| Running (g/mi) | 56 | 0.0900 | 0.0900 | 0.0900 | 0.2601 | 0.2628 | 0.2612 |
| Running (g/mi) | 57 | 0.0900 | 0.0900 | 0.0900 | 0.2643 | 0.2668 | 0.2653 |
| Running (g/mi) | 58 | 0.0899 | 0.0899 | 0.0899 | 0.2685 | 0.2711 | 0.2695 |
| Running (g/mi) | 59 | 0.0899 | 0.0899 | 0.0899 | 0.2723 | 0.2748 | 0.2733 |
| Running (g/mi) | 60 | 0.0898 | 0.0898 | 0.0898 | 0.2761 | 0.2787 | 0.2771 |
| Running (g/mi) | 61 | 0.0900 | 0.0900 | 0.0900 | 0.2820 | 0.2846 | 0.2830 |
| Running (g/mi) | 62 | 0.0901 | 0.0901 | 0.0901 | 0.2878 | 0.2903 | 0.2888 |
| Running (g/mi) | 63 | 0.0900 | 0.0900 | 0.0900 | 0.2932 | 0.2959 | 0.2943 |
| Running (g/mi) | 64 | 0.0903 | 0.0903 | 0.0903 | 0.2987 | 0.3012 | 0.2997 |
| Running (g/mi) | 65 | 0.0903 | 0.0903 | 0.0903 | 0.3038 | 0.3063 | 0.3048 |

| Emission Type | VOC | NOx |
|--|--------|--------|
| Cold Start (g/trip start, Light Duty Only) | 0.5387 | 0.2398 |
| Hot Soak Loss (g/trip end) | 0.2629 | - |
| Hot Start (g/trip start, Light Duty Only) | 0.0959 | 0.0552 |

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 | 1.5309 | 1.4981 | 1.5178 | 0.3354 | 0.3598 | 0.3452 |
| Running (g/mi) | 2 | 1.5309 | 1.4981 | 1.5178 | 0.3354 | 0.3598 | 0.3452 |
| Running (g/mi) | 3 | 1.2029 | 1.1847 | 1.1956 | 0.3187 | 0.3429 | 0.3284 |
| Running (g/mi) | 4 | 0.7928 | 0.7925 | 0.7927 | 0.2978 | 0.3217 | 0.3074 |
| Running (g/mi) | 5 | 0.5469 | 0.5574 | 0.5511 | 0.2855 | 0.3090 | 0.2949 |
| Running (g/mi) | 6 | 0.4545 | 0.4618 | 0.4574 | 0.2638 | 0.2755 | 0.2685 |
| Running (g/mi) | 7 | 0.3881 | 0.3934 | 0.3902 | 0.2488 | 0.2514 | 0.2498 |
| Running (g/mi) | 8 | 0.3385 | 0.3422 | 0.3400 | 0.2370 | 0.2334 | 0.2356 |
| Running (g/mi) | 9 | 0.2996 | 0.3022 | 0.3006 | 0.2279 | 0.2194 | 0.2245 |
| Running (g/mi) | 10 | 0.2689 | 0.2703 | 0.2695 | 0.2208 | 0.2083 | 0.2158 |
| Running (g/mi) | 11 | 0.2479 | 0.2479 | 0.2479 | 0.2101 | 0.1949 | 0.2040 |
| Running (g/mi) | 12 | 0.2304 | 0.2290 | 0.2298 | 0.2013 | 0.1838 | 0.1943 |
| Running (g/mi) | 13 | 0.2156 | 0.2132 | 0.2146 | 0.1936 | 0.1743 | 0.1859 |
| Running (g/mi) | 14 | 0.2029 | 0.1996 | 0.2016 | 0.1869 | 0.1662 | 0.1786 |
| Running (g/mi) | 15 | 0.1916 | 0.1875 | 0.1900 | 0.1813 | 0.1589 | 0.1723 |
| Running (g/mi) | 16 | 0.1806 | 0.1780 | 0.1796 | 0.1763 | 0.1587 | 0.1693 |
| Running (g/mi) | 17 | 0.1705 | 0.1697 | 0.1702 | 0.1718 | 0.1579 | 0.1662 |
| Running (g/mi) | 18 | 0.1617 | 0.1622 | 0.1619 | 0.1678 | 0.1577 | 0.1638 |
| Running (g/mi) | 19 | 0.1538 | 0.1553 | 0.1544 | 0.1642 | 0.1574 | 0.1615 |
| Running (g/mi) | 20 | 0.1467 | 0.1492 | 0.1477 | 0.1610 | 0.1568 | 0.1593 |
| Running (g/mi) | 21 | 0.1414 | 0.1447 | 0.1427 | 0.1581 | 0.1567 | 0.1575 |
| Running (g/mi) | 22 | 0.1365 | 0.1404 | 0.1381 | 0.1556 | 0.1564 | 0.1559 |
| Running (g/mi) | 23 | 0.1319 | 0.1367 | 0.1338 | 0.1532 | 0.1558 | 0.1542 |
| Running (g/mi) | 24 | 0.1279 | 0.1330 | 0.1299 | 0.1508 | 0.1556 | 0.1527 |
| Running (g/mi) | 25 | 0.1243 | 0.1299 | 0.1265 | 0.1487 | 0.1554 | 0.1514 |
| Running (g/mi) | 26 | 0.1208 | 0.1268 | 0.1232 | 0.1470 | 0.1552 | 0.1503 |
| Running (g/mi) | 27 | 0.1175 | 0.1238 | 0.1200 | 0.1453 | 0.1549 | 0.1491 |
| Running (g/mi) | 28 | 0.1147 | 0.1209 | 0.1172 | 0.1436 | 0.1547 | 0.1480 |
| Running (g/mi) | 29 | 0.1119 | 0.1184 | 0.1145 | 0.1420 | 0.1546 | 0.1470 |
| Running (g/mi) | 30 | 0.1092 | 0.1158 | 0.1118 | 0.1407 | 0.1544 | 0.1462 |
| Running (g/mi) | 31 | 0.1066 | 0.1132 | 0.1092 | 0.1397 | 0.1542 | 0.1455 |
| Running (g/mi) | 32 | 0.1044 | 0.1109 | 0.1070 | 0.1388 | 0.1539 | 0.1448 |
| Running (g/mi) | 33 | 0.1021 | 0.1088 | 0.1048 | 0.1378 | 0.1537 | 0.1442 |
| Running (g/mi) | 34 | 0.1001 | 0.1066 | 0.1027 | 0.1372 | 0.1536 | 0.1438 |
| Running (g/mi) | 35 | 0.0983 | 0.1047 | 0.1009 | 0.1364 | 0.1534 | 0.1432 |
| Running (g/mi) | 36 | 0.0968 | 0.1029 | 0.0992 | 0.1369 | 0.1541 | 0.1438 |
| Running (g/mi) | 37 | 0.0955 | 0.1015 | 0.0979 | 0.1377 | 0.1548 | 0.1445 |
| Running (g/mi) | 38 | 0.0942 | 0.1000 | 0.0965 | 0.1382 | 0.1555 | 0.1451 |
| Running (g/mi) | 39 | 0.0931 | 0.0986 | 0.0953 | 0.1387 | 0.1560 | 0.1456 |
| Running (g/mi) | 40 | 0.0920 | 0.0974 | 0.0942 | 0.1393 | 0.1567 | 0.1463 |
| Running (g/mi) | 41 | 0.0909 | 0.0959 | 0.0929 | 0.1402 | 0.1579 | 0.1473 |
| Running (g/mi) | 42 | 0.0898 | 0.0948 | 0.0918 | 0.1408 | 0.1589 | 0.1480 |
| Running (g/mi) | 43 | 0.0888 | 0.0937 | 0.0908 | 0.1417 | 0.1600 | 0.1490 |
| Running (g/mi) | 44 | 0.0878 | 0.0925 | 0.0897 | 0.1424 | 0.1611 | 0.1499 |
| Running (g/mi) | 45 | 0.0867 | 0.0914 | 0.0886 | 0.1433 | 0.1621 | 0.1508 |
| Running (g/mi) | 46 | 0.0905 | 0.0905 | 0.0905 | 0.1637 | 0.1637 | 0.1637 |
| Running (g/mi) | 47 | 0.0896 | 0.0896 | 0.0896 | 0.1649 | 0.1649 | 0.1649 |
| Running (g/mi) | 48 | 0.0886 | 0.0886 | 0.0886 | 0.1665 | 0.1665 | 0.1665 |
| Running (g/mi) | 49 | 0.0878 | 0.0878 | 0.0878 | 0.1678 | 0.1678 | 0.1678 |
| Running (g/mi) | 50 | 0.0869 | 0.0869 | 0.0869 | 0.1689 | 0.1689 | 0.1689 |
| Running (g/mi) | 51 | 0.0863 | 0.0863 | 0.0863 | 0.1708 | 0.1708 | 0.1708 |
| Running (g/mi) | 52 | 0.0857 | 0.0857 | 0.0857 | 0.1728 | 0.1728 | 0.1728 |
| Running (g/mi) | 53 | 0.0853 | 0.0853 | 0.0853 | 0.1748 | 0.1748 | 0.1748 |
| Running (g/mi) | 54 | 0.0847 | 0.0847 | 0.0847 | 0.1765 | 0.1765 | 0.1765 |
| Running (g/mi) | 55 | 0.0844 | 0.0844 | 0.0844 | 0.1781 | 0.1781 | 0.1781 |
| Running (g/mi) | 56 | 0.0841 | 0.0841 | 0.0841 | 0.1806 | 0.1806 | 0.1806 |
| Running (g/mi) | 57 | 0.0841 | 0.0841 | 0.0841 | 0.1831 | 0.1831 | 0.1831 |
| Running (g/mi) | 58 | 0.0842 | 0.0842 | 0.0842 | 0.1853 | 0.1853 | 0.1853 |
| Running (g/mi) | 59 | 0.0840 | 0.0840 | 0.0840 | 0.1875 | 0.1875 | 0.1875 |
| Running (g/mi) | 60 | 0.0840 | 0.0840 | 0.0840 | 0.1897 | 0.1897 | 0.1897 |
| Running (g/mi) | 61 | 0.0841 | 0.0841 | 0.0841 | 0.1930 | 0.1930 | 0.1930 |
| Running (g/mi) | 62 | 0.0842 | 0.0842 | 0.0842 | 0.1960 | 0.1960 | 0.1960 |
| Running (g/mi) | 63 | 0.0844 | 0.0844 | 0.0844 | 0.1990 | 0.1990 | 0.1990 |
| Running (g/mi) | 64 | 0.0845 | 0.0845 | 0.0845 | 0.2019 | 0.2019 | 0.2019 |
| Running (g/mi) | 65 | 0.0846 | 0.0846 | 0.0846 | 0.2048 | 0.2048 | 0.2048 |

| Emission Type | VOC | NOx |
|--|--------|--------|
| Cold Start (g/trip start, Light Duty Only) | 0.4716 | 0.172 |
| Hot Soak Loss (g/trip end) | 0.2023 | - |
| Hot Start (g/trip start, Light Duty Only) | 0.0848 | 0.0406 |

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

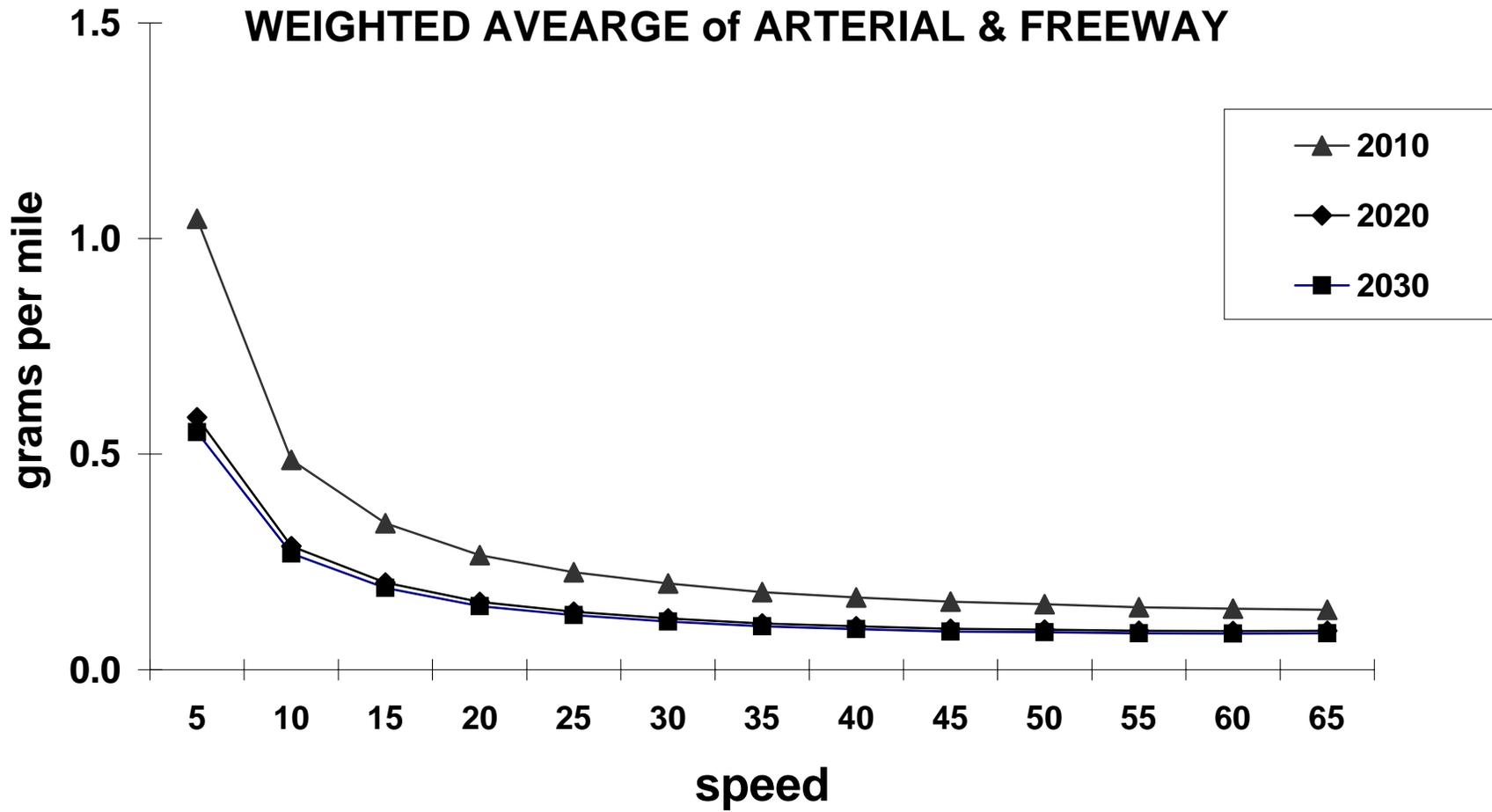


Exhibit - 2
NOx MOBILE6.2 RUNNING EMISSION RATES
TRAFFIC STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

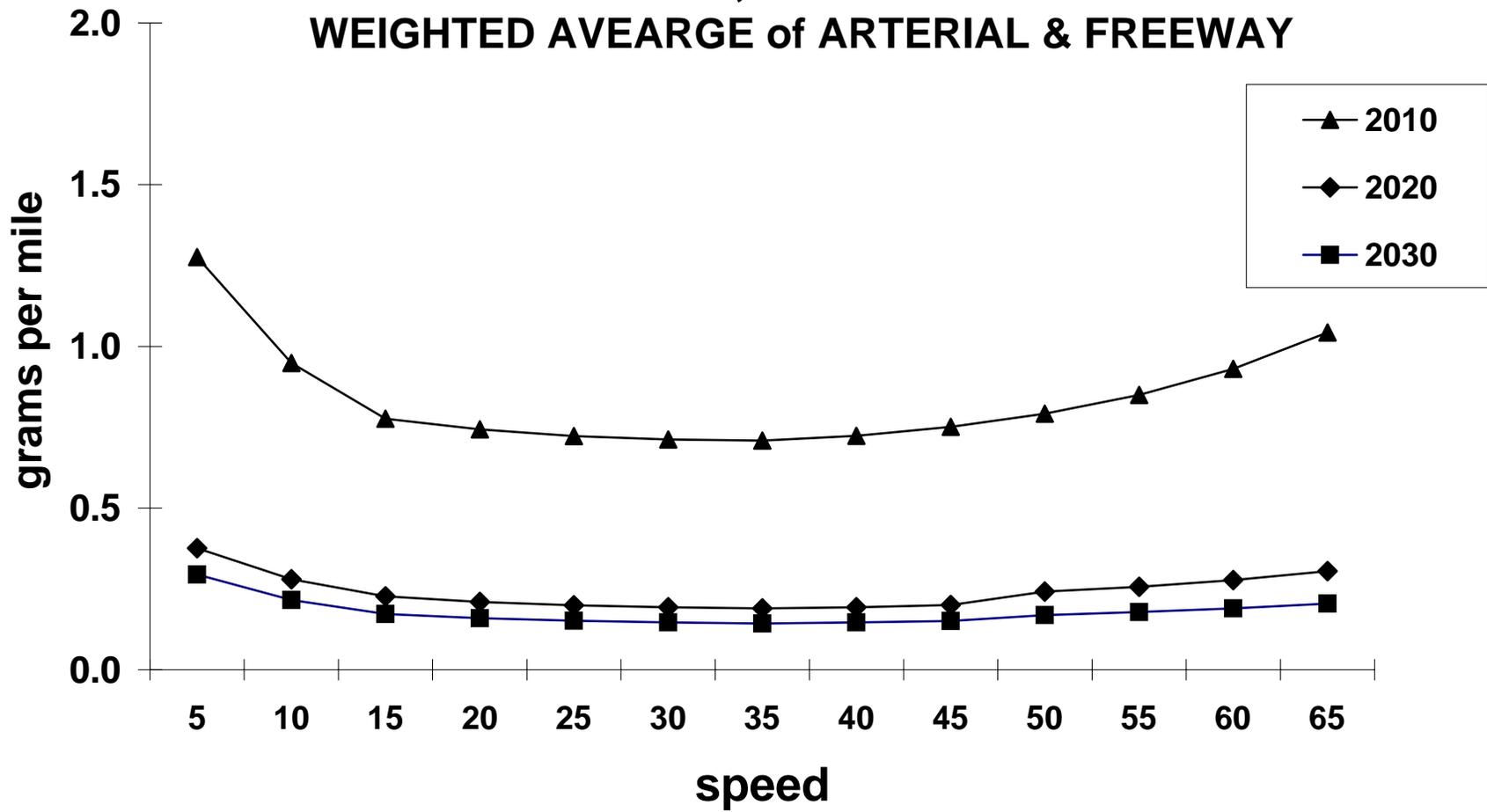


Table 5: 2010 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute"

**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 | 3.1067 | 3.1066 | 3.1067 | 0.9036 | 0.9036 | 0.9036 |
| Running (g/mi) | 2 | 3.1067 | 3.1066 | 3.1067 | 0.9036 | 0.9036 | 0.9036 |
| Running (g/mi) | 3 | 2.4163 | 2.4163 | 2.4163 | 0.8588 | 0.8588 | 0.8588 |
| Running (g/mi) | 4 | 1.5542 | 1.5541 | 1.5542 | 0.8023 | 0.8023 | 0.8023 |
| Running (g/mi) | 5 | 1.0367 | 1.0367 | 1.0367 | 0.7688 | 0.7688 | 0.7688 |
| Running (g/mi) | 6 | 0.8515 | 0.8420 | 0.8477 | 0.7123 | 0.6794 | 0.6991 |
| Running (g/mi) | 7 | 0.7196 | 0.7032 | 0.7130 | 0.6720 | 0.6157 | 0.6495 |
| Running (g/mi) | 8 | 0.6201 | 0.5989 | 0.6116 | 0.6417 | 0.5678 | 0.6121 |
| Running (g/mi) | 9 | 0.5434 | 0.5180 | 0.5332 | 0.6182 | 0.5308 | 0.5832 |
| Running (g/mi) | 10 | 0.4815 | 0.4533 | 0.4702 | 0.5992 | 0.5010 | 0.5599 |
| Running (g/mi) | 11 | 0.4427 | 0.4130 | 0.4308 | 0.5708 | 0.4665 | 0.5291 |
| Running (g/mi) | 12 | 0.4103 | 0.3789 | 0.3977 | 0.5471 | 0.4375 | 0.5033 |
| Running (g/mi) | 13 | 0.3829 | 0.3504 | 0.3699 | 0.5274 | 0.4132 | 0.4817 |
| Running (g/mi) | 14 | 0.3596 | 0.3260 | 0.3462 | 0.5102 | 0.3922 | 0.4630 |
| Running (g/mi) | 15 | 0.3391 | 0.3048 | 0.3254 | 0.4953 | 0.3741 | 0.4468 |
| Running (g/mi) | 16 | 0.3199 | 0.2898 | 0.3079 | 0.4821 | 0.3752 | 0.4393 |
| Running (g/mi) | 17 | 0.3024 | 0.2766 | 0.2921 | 0.4704 | 0.3761 | 0.4327 |
| Running (g/mi) | 18 | 0.2872 | 0.2646 | 0.2782 | 0.4602 | 0.3768 | 0.4268 |
| Running (g/mi) | 19 | 0.2736 | 0.2542 | 0.2658 | 0.4508 | 0.3777 | 0.4216 |
| Running (g/mi) | 20 | 0.2613 | 0.2446 | 0.2546 | 0.4422 | 0.3783 | 0.4166 |
| Running (g/mi) | 21 | 0.2513 | 0.2374 | 0.2457 | 0.4347 | 0.3786 | 0.4123 |
| Running (g/mi) | 22 | 0.2422 | 0.2307 | 0.2376 | 0.4277 | 0.3788 | 0.4081 |
| Running (g/mi) | 23 | 0.2344 | 0.2249 | 0.2306 | 0.4212 | 0.3793 | 0.4044 |
| Running (g/mi) | 24 | 0.2267 | 0.2191 | 0.2237 | 0.4153 | 0.3794 | 0.4009 |
| Running (g/mi) | 25 | 0.2197 | 0.2140 | 0.2174 | 0.4100 | 0.3798 | 0.3979 |
| Running (g/mi) | 26 | 0.2139 | 0.2091 | 0.2120 | 0.4048 | 0.3798 | 0.3948 |
| Running (g/mi) | 27 | 0.2084 | 0.2044 | 0.2068 | 0.4001 | 0.3798 | 0.3920 |
| Running (g/mi) | 28 | 0.2029 | 0.1999 | 0.2017 | 0.3957 | 0.3799 | 0.3894 |
| Running (g/mi) | 29 | 0.1983 | 0.1962 | 0.1975 | 0.3919 | 0.3799 | 0.3871 |
| Running (g/mi) | 30 | 0.1938 | 0.1925 | 0.1933 | 0.3880 | 0.3799 | 0.3848 |
| Running (g/mi) | 31 | 0.1893 | 0.1883 | 0.1889 | 0.3856 | 0.3793 | 0.3831 |
| Running (g/mi) | 32 | 0.1852 | 0.1846 | 0.1850 | 0.3833 | 0.3786 | 0.3814 |
| Running (g/mi) | 33 | 0.1815 | 0.1810 | 0.1813 | 0.3810 | 0.3781 | 0.3798 |
| Running (g/mi) | 34 | 0.1780 | 0.1776 | 0.1778 | 0.3789 | 0.3775 | 0.3783 |
| Running (g/mi) | 35 | 0.1745 | 0.1745 | 0.1745 | 0.3771 | 0.3771 | 0.3771 |
| Running (g/mi) | 36 | 0.1720 | 0.1720 | 0.1720 | 0.3783 | 0.3783 | 0.3783 |
| Running (g/mi) | 37 | 0.1697 | 0.1697 | 0.1697 | 0.3797 | 0.3797 | 0.3797 |
| Running (g/mi) | 38 | 0.1673 | 0.1673 | 0.1673 | 0.3809 | 0.3809 | 0.3809 |
| Running (g/mi) | 39 | 0.1652 | 0.1652 | 0.1652 | 0.3820 | 0.3820 | 0.3820 |
| Running (g/mi) | 40 | 0.1631 | 0.1631 | 0.1631 | 0.3833 | 0.3833 | 0.3833 |
| Running (g/mi) | 41 | 0.1613 | 0.1613 | 0.1613 | 0.3852 | 0.3852 | 0.3852 |
| Running (g/mi) | 42 | 0.1591 | 0.1591 | 0.1591 | 0.3869 | 0.3869 | 0.3869 |
| Running (g/mi) | 43 | 0.1573 | 0.1573 | 0.1573 | 0.3888 | 0.3888 | 0.3888 |
| Running (g/mi) | 44 | 0.1556 | 0.1556 | 0.1556 | 0.3904 | 0.3904 | 0.3904 |
| Running (g/mi) | 45 | 0.1540 | 0.1540 | 0.1540 | 0.3921 | 0.3921 | 0.3921 |
| Running (g/mi) | 46 | 0.1523 | 0.1523 | 0.1523 | 0.3940 | 0.3940 | 0.3940 |
| Running (g/mi) | 47 | 0.1504 | 0.1504 | 0.1504 | 0.3959 | 0.3959 | 0.3959 |
| Running (g/mi) | 48 | 0.1488 | 0.1488 | 0.1488 | 0.3980 | 0.3980 | 0.3980 |
| Running (g/mi) | 49 | 0.1471 | 0.1471 | 0.1471 | 0.3996 | 0.3996 | 0.3996 |
| Running (g/mi) | 50 | 0.1457 | 0.1457 | 0.1457 | 0.4013 | 0.4013 | 0.4013 |
| Running (g/mi) | 51 | 0.1442 | 0.1442 | 0.1442 | 0.4037 | 0.4037 | 0.4037 |
| Running (g/mi) | 52 | 0.1430 | 0.1430 | 0.1430 | 0.4058 | 0.4058 | 0.4058 |
| Running (g/mi) | 53 | 0.1417 | 0.1417 | 0.1417 | 0.4078 | 0.4078 | 0.4078 |
| Running (g/mi) | 54 | 0.1404 | 0.1404 | 0.1404 | 0.4097 | 0.4097 | 0.4097 |
| Running (g/mi) | 55 | 0.1390 | 0.1390 | 0.1390 | 0.4114 | 0.4114 | 0.4114 |
| Running (g/mi) | 56 | 0.1383 | 0.1383 | 0.1383 | 0.4138 | 0.4138 | 0.4138 |
| Running (g/mi) | 57 | 0.1375 | 0.1375 | 0.1375 | 0.4161 | 0.4161 | 0.4161 |
| Running (g/mi) | 58 | 0.1372 | 0.1372 | 0.1372 | 0.4182 | 0.4182 | 0.4182 |
| Running (g/mi) | 59 | 0.1363 | 0.1363 | 0.1363 | 0.4200 | 0.4200 | 0.4200 |
| Running (g/mi) | 60 | 0.1359 | 0.1359 | 0.1359 | 0.4220 | 0.4220 | 0.4220 |
| Running (g/mi) | 61 | 0.1351 | 0.1351 | 0.1351 | 0.4245 | 0.4245 | 0.4245 |
| Running (g/mi) | 62 | 0.1347 | 0.1347 | 0.1347 | 0.4267 | 0.4267 | 0.4267 |
| Running (g/mi) | 63 | 0.1343 | 0.1343 | 0.1343 | 0.4289 | 0.4289 | 0.4289 |
| Running (g/mi) | 64 | 0.1338 | 0.1338 | 0.1338 | 0.4313 | 0.4313 | 0.4313 |
| Running (g/mi) | 65 | 0.1336 | 0.1336 | 0.1336 | 0.4333 | 0.4333 | 0.4333 |

| Emission Type | VOC | NOx |
|---------------------------------------|--------|--------|
| Cold Start (g/trip start, Light Duty) | 0.9659 | 0.5818 |
| Hot Soak Loss (g/trip end) | 0.5705 | - |
| Hot Start (g/trip start, Light Duty) | 0.1649 | 0.1271 |

**Table 6: 2020 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commuter Vehicle"
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 | 1.6246 | 1.6246 | 1.6246 | 0.3849 | 0.3849 | 0.3849 |
| Running (g/mi) | 2 | 1.6246 | 1.6246 | 1.6246 | 0.3849 | 0.3849 | 0.3849 |
| Running (g/mi) | 3 | 1.2752 | 1.2752 | 1.2752 | 0.3654 | 0.3653 | 0.3654 |
| Running (g/mi) | 4 | 0.8390 | 0.8390 | 0.8390 | 0.3413 | 0.3413 | 0.3413 |
| Running (g/mi) | 5 | 0.5769 | 0.5769 | 0.5769 | 0.3270 | 0.3270 | 0.3270 |
| Running (g/mi) | 6 | 0.4783 | 0.4725 | 0.4760 | 0.3024 | 0.2878 | 0.2966 |
| Running (g/mi) | 7 | 0.4079 | 0.3979 | 0.4039 | 0.2847 | 0.2599 | 0.2748 |
| Running (g/mi) | 8 | 0.3552 | 0.3420 | 0.3499 | 0.2716 | 0.2392 | 0.2586 |
| Running (g/mi) | 9 | 0.3142 | 0.2986 | 0.3080 | 0.2614 | 0.2227 | 0.2459 |
| Running (g/mi) | 10 | 0.2814 | 0.2637 | 0.2743 | 0.2532 | 0.2097 | 0.2358 |
| Running (g/mi) | 11 | 0.2590 | 0.2406 | 0.2516 | 0.2407 | 0.1946 | 0.2223 |
| Running (g/mi) | 12 | 0.2406 | 0.2212 | 0.2328 | 0.2305 | 0.1821 | 0.2111 |
| Running (g/mi) | 13 | 0.2249 | 0.2046 | 0.2168 | 0.2219 | 0.1715 | 0.2017 |
| Running (g/mi) | 14 | 0.2116 | 0.1905 | 0.2032 | 0.2145 | 0.1624 | 0.1937 |
| Running (g/mi) | 15 | 0.2000 | 0.1785 | 0.1914 | 0.2078 | 0.1544 | 0.1864 |
| Running (g/mi) | 16 | 0.1882 | 0.1693 | 0.1806 | 0.2021 | 0.1550 | 0.1833 |
| Running (g/mi) | 17 | 0.1777 | 0.1613 | 0.1711 | 0.1971 | 0.1555 | 0.1805 |
| Running (g/mi) | 18 | 0.1685 | 0.1541 | 0.1627 | 0.1928 | 0.1559 | 0.1780 |
| Running (g/mi) | 19 | 0.1602 | 0.1478 | 0.1552 | 0.1886 | 0.1564 | 0.1757 |
| Running (g/mi) | 20 | 0.1528 | 0.1421 | 0.1485 | 0.1849 | 0.1568 | 0.1737 |
| Running (g/mi) | 21 | 0.1474 | 0.1380 | 0.1436 | 0.1817 | 0.1570 | 0.1718 |
| Running (g/mi) | 22 | 0.1424 | 0.1346 | 0.1393 | 0.1787 | 0.1573 | 0.1701 |
| Running (g/mi) | 23 | 0.1375 | 0.1312 | 0.1350 | 0.1760 | 0.1574 | 0.1686 |
| Running (g/mi) | 24 | 0.1335 | 0.1281 | 0.1313 | 0.1735 | 0.1574 | 0.1671 |
| Running (g/mi) | 25 | 0.1296 | 0.1254 | 0.1279 | 0.1711 | 0.1578 | 0.1658 |
| Running (g/mi) | 26 | 0.1261 | 0.1224 | 0.1246 | 0.1688 | 0.1578 | 0.1644 |
| Running (g/mi) | 27 | 0.1227 | 0.1200 | 0.1216 | 0.1669 | 0.1578 | 0.1633 |
| Running (g/mi) | 28 | 0.1194 | 0.1172 | 0.1185 | 0.1651 | 0.1579 | 0.1622 |
| Running (g/mi) | 29 | 0.1166 | 0.1151 | 0.1160 | 0.1633 | 0.1580 | 0.1612 |
| Running (g/mi) | 30 | 0.1139 | 0.1127 | 0.1134 | 0.1618 | 0.1580 | 0.1603 |
| Running (g/mi) | 31 | 0.1116 | 0.1107 | 0.1112 | 0.1606 | 0.1578 | 0.1595 |
| Running (g/mi) | 32 | 0.1091 | 0.1084 | 0.1088 | 0.1595 | 0.1575 | 0.1587 |
| Running (g/mi) | 33 | 0.1070 | 0.1066 | 0.1068 | 0.1587 | 0.1573 | 0.1581 |
| Running (g/mi) | 34 | 0.1048 | 0.1048 | 0.1048 | 0.1577 | 0.1570 | 0.1574 |
| Running (g/mi) | 35 | 0.1030 | 0.1030 | 0.1030 | 0.1568 | 0.1568 | 0.1568 |
| Running (g/mi) | 36 | 0.1017 | 0.1017 | 0.1017 | 0.1575 | 0.1575 | 0.1575 |
| Running (g/mi) | 37 | 0.1004 | 0.1004 | 0.1004 | 0.1582 | 0.1582 | 0.1582 |
| Running (g/mi) | 38 | 0.0990 | 0.0990 | 0.0990 | 0.1587 | 0.1587 | 0.1587 |
| Running (g/mi) | 39 | 0.0978 | 0.0978 | 0.0978 | 0.1593 | 0.1593 | 0.1593 |
| Running (g/mi) | 40 | 0.0968 | 0.0968 | 0.0968 | 0.1598 | 0.1598 | 0.1598 |
| Running (g/mi) | 41 | 0.0957 | 0.0957 | 0.0957 | 0.1608 | 0.1608 | 0.1608 |
| Running (g/mi) | 42 | 0.0948 | 0.0948 | 0.0948 | 0.1615 | 0.1615 | 0.1615 |
| Running (g/mi) | 43 | 0.0935 | 0.0935 | 0.0935 | 0.1623 | 0.1623 | 0.1623 |
| Running (g/mi) | 44 | 0.0926 | 0.0926 | 0.0926 | 0.1632 | 0.1632 | 0.1632 |
| Running (g/mi) | 45 | 0.0916 | 0.0916 | 0.0916 | 0.1640 | 0.1640 | 0.1640 |
| Running (g/mi) | 46 | 0.0908 | 0.0908 | 0.0908 | 0.1650 | 0.1650 | 0.1650 |
| Running (g/mi) | 47 | 0.0899 | 0.0899 | 0.0899 | 0.1659 | 0.1659 | 0.1659 |
| Running (g/mi) | 48 | 0.0890 | 0.0890 | 0.0890 | 0.1666 | 0.1666 | 0.1666 |
| Running (g/mi) | 49 | 0.0883 | 0.0883 | 0.0883 | 0.1674 | 0.1674 | 0.1674 |
| Running (g/mi) | 50 | 0.0876 | 0.0876 | 0.0876 | 0.1683 | 0.1683 | 0.1683 |
| Running (g/mi) | 51 | 0.0871 | 0.0871 | 0.0871 | 0.1693 | 0.1693 | 0.1693 |
| Running (g/mi) | 52 | 0.0866 | 0.0866 | 0.0866 | 0.1704 | 0.1704 | 0.1704 |
| Running (g/mi) | 53 | 0.0860 | 0.0860 | 0.0860 | 0.1714 | 0.1714 | 0.1714 |
| Running (g/mi) | 54 | 0.0856 | 0.0856 | 0.0856 | 0.1723 | 0.1723 | 0.1723 |
| Running (g/mi) | 55 | 0.0851 | 0.0851 | 0.0851 | 0.1731 | 0.1731 | 0.1731 |
| Running (g/mi) | 56 | 0.0850 | 0.0850 | 0.0850 | 0.1742 | 0.1742 | 0.1742 |
| Running (g/mi) | 57 | 0.0852 | 0.0852 | 0.0852 | 0.1752 | 0.1752 | 0.1752 |
| Running (g/mi) | 58 | 0.0851 | 0.0851 | 0.0851 | 0.1762 | 0.1762 | 0.1762 |
| Running (g/mi) | 59 | 0.0852 | 0.0852 | 0.0852 | 0.1771 | 0.1771 | 0.1771 |
| Running (g/mi) | 60 | 0.0851 | 0.0851 | 0.0851 | 0.1781 | 0.1781 | 0.1781 |
| Running (g/mi) | 61 | 0.0852 | 0.0852 | 0.0852 | 0.1791 | 0.1791 | 0.1791 |
| Running (g/mi) | 62 | 0.0853 | 0.0853 | 0.0853 | 0.1802 | 0.1802 | 0.1802 |
| Running (g/mi) | 63 | 0.0855 | 0.0855 | 0.0855 | 0.1812 | 0.1812 | 0.1812 |
| Running (g/mi) | 64 | 0.0855 | 0.0855 | 0.0855 | 0.1822 | 0.1822 | 0.1822 |
| Running (g/mi) | 65 | 0.0857 | 0.0857 | 0.0857 | 0.1833 | 0.1833 | 0.1833 |

| Emission Type | VOC | NOx |
|--|--------|--------|
| Cold Start (g/trip start, Light Duty Only) | 0.5387 | 0.2398 |
| Hot Soak Loss (g/trip end) | 0.2584 | - |
| Hot Start (g/trip start, Light Duty Only) | 0.0959 | 0.0552 |

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 | 1.5399 | 1.5399 | 1.5399 | 0.3285 | 0.3285 | 0.3285 |
| Running (g/mi) | 2 | 1.5399 | 1.5399 | 1.5399 | 0.3285 | 0.3285 | 0.3285 |
| Running (g/mi) | 3 | 1.2078 | 1.2078 | 1.2078 | 0.3119 | 0.3118 | 0.3119 |
| Running (g/mi) | 4 | 0.7929 | 0.7929 | 0.7929 | 0.2913 | 0.2913 | 0.2913 |
| Running (g/mi) | 5 | 0.5439 | 0.5438 | 0.5439 | 0.2788 | 0.2788 | 0.2788 |
| Running (g/mi) | 6 | 0.4509 | 0.4455 | 0.4487 | 0.2575 | 0.2448 | 0.2524 |
| Running (g/mi) | 7 | 0.3843 | 0.3750 | 0.3806 | 0.2423 | 0.2208 | 0.2337 |
| Running (g/mi) | 8 | 0.3342 | 0.3223 | 0.3294 | 0.2309 | 0.2028 | 0.2197 |
| Running (g/mi) | 9 | 0.2954 | 0.2812 | 0.2897 | 0.2219 | 0.1887 | 0.2086 |
| Running (g/mi) | 10 | 0.2646 | 0.2484 | 0.2581 | 0.2149 | 0.1772 | 0.1998 |
| Running (g/mi) | 11 | 0.2439 | 0.2265 | 0.2369 | 0.2042 | 0.1643 | 0.1882 |
| Running (g/mi) | 12 | 0.2263 | 0.2084 | 0.2191 | 0.1953 | 0.1533 | 0.1785 |
| Running (g/mi) | 13 | 0.2114 | 0.1929 | 0.2040 | 0.1878 | 0.1442 | 0.1704 |
| Running (g/mi) | 14 | 0.1987 | 0.1797 | 0.1911 | 0.1815 | 0.1363 | 0.1634 |
| Running (g/mi) | 15 | 0.1878 | 0.1681 | 0.1799 | 0.1758 | 0.1295 | 0.1573 |
| Running (g/mi) | 16 | 0.1768 | 0.1596 | 0.1699 | 0.1709 | 0.1301 | 0.1546 |
| Running (g/mi) | 17 | 0.1669 | 0.1521 | 0.1610 | 0.1665 | 0.1305 | 0.1521 |
| Running (g/mi) | 18 | 0.1583 | 0.1451 | 0.1530 | 0.1626 | 0.1310 | 0.1500 |
| Running (g/mi) | 19 | 0.1504 | 0.1390 | 0.1458 | 0.1592 | 0.1313 | 0.1480 |
| Running (g/mi) | 20 | 0.1434 | 0.1336 | 0.1395 | 0.1563 | 0.1316 | 0.1464 |
| Running (g/mi) | 21 | 0.1383 | 0.1299 | 0.1349 | 0.1533 | 0.1318 | 0.1447 |
| Running (g/mi) | 22 | 0.1336 | 0.1263 | 0.1307 | 0.1505 | 0.1320 | 0.1431 |
| Running (g/mi) | 23 | 0.1291 | 0.1231 | 0.1267 | 0.1482 | 0.1321 | 0.1418 |
| Running (g/mi) | 24 | 0.1253 | 0.1204 | 0.1233 | 0.1460 | 0.1323 | 0.1405 |
| Running (g/mi) | 25 | 0.1216 | 0.1176 | 0.1200 | 0.1440 | 0.1324 | 0.1394 |
| Running (g/mi) | 26 | 0.1182 | 0.1149 | 0.1169 | 0.1422 | 0.1324 | 0.1383 |
| Running (g/mi) | 27 | 0.1151 | 0.1123 | 0.1140 | 0.1405 | 0.1324 | 0.1373 |
| Running (g/mi) | 28 | 0.1123 | 0.1099 | 0.1113 | 0.1389 | 0.1325 | 0.1363 |
| Running (g/mi) | 29 | 0.1096 | 0.1080 | 0.1090 | 0.1373 | 0.1326 | 0.1354 |
| Running (g/mi) | 30 | 0.1070 | 0.1059 | 0.1066 | 0.1360 | 0.1328 | 0.1347 |
| Running (g/mi) | 31 | 0.1046 | 0.1037 | 0.1042 | 0.1350 | 0.1323 | 0.1339 |
| Running (g/mi) | 32 | 0.1023 | 0.1017 | 0.1021 | 0.1341 | 0.1323 | 0.1334 |
| Running (g/mi) | 33 | 0.1003 | 0.0999 | 0.1001 | 0.1333 | 0.1321 | 0.1328 |
| Running (g/mi) | 34 | 0.0982 | 0.0981 | 0.0982 | 0.1323 | 0.1319 | 0.1321 |
| Running (g/mi) | 35 | 0.0965 | 0.0965 | 0.0965 | 0.1314 | 0.1314 | 0.1314 |
| Running (g/mi) | 36 | 0.0950 | 0.0950 | 0.0950 | 0.1323 | 0.1323 | 0.1323 |
| Running (g/mi) | 37 | 0.0940 | 0.0940 | 0.0940 | 0.1329 | 0.1329 | 0.1329 |
| Running (g/mi) | 38 | 0.0927 | 0.0927 | 0.0927 | 0.1333 | 0.1333 | 0.1333 |
| Running (g/mi) | 39 | 0.0916 | 0.0916 | 0.0916 | 0.1339 | 0.1339 | 0.1339 |
| Running (g/mi) | 40 | 0.0905 | 0.0905 | 0.0905 | 0.1343 | 0.1343 | 0.1343 |
| Running (g/mi) | 41 | 0.0894 | 0.0894 | 0.0894 | 0.1351 | 0.1351 | 0.1351 |
| Running (g/mi) | 42 | 0.0883 | 0.0883 | 0.0883 | 0.1358 | 0.1358 | 0.1358 |
| Running (g/mi) | 43 | 0.0874 | 0.0874 | 0.0874 | 0.1364 | 0.1364 | 0.1364 |
| Running (g/mi) | 44 | 0.0865 | 0.0865 | 0.0865 | 0.1373 | 0.1373 | 0.1373 |
| Running (g/mi) | 45 | 0.0854 | 0.0854 | 0.0854 | 0.1379 | 0.1379 | 0.1379 |
| Running (g/mi) | 46 | 0.0849 | 0.0849 | 0.0849 | 0.1388 | 0.1388 | 0.1388 |
| Running (g/mi) | 47 | 0.0839 | 0.0839 | 0.0839 | 0.1394 | 0.1394 | 0.1394 |
| Running (g/mi) | 48 | 0.0832 | 0.0832 | 0.0832 | 0.1403 | 0.1403 | 0.1403 |
| Running (g/mi) | 49 | 0.0824 | 0.0824 | 0.0824 | 0.1410 | 0.1410 | 0.1410 |
| Running (g/mi) | 50 | 0.0818 | 0.0818 | 0.0818 | 0.1418 | 0.1418 | 0.1418 |
| Running (g/mi) | 51 | 0.0812 | 0.0812 | 0.0812 | 0.1428 | 0.1428 | 0.1428 |
| Running (g/mi) | 52 | 0.0808 | 0.0808 | 0.0808 | 0.1437 | 0.1437 | 0.1437 |
| Running (g/mi) | 53 | 0.0802 | 0.0802 | 0.0802 | 0.1443 | 0.1443 | 0.1443 |
| Running (g/mi) | 54 | 0.0798 | 0.0798 | 0.0798 | 0.1452 | 0.1452 | 0.1452 |
| Running (g/mi) | 55 | 0.0795 | 0.0795 | 0.0795 | 0.1459 | 0.1459 | 0.1459 |
| Running (g/mi) | 56 | 0.0794 | 0.0794 | 0.0794 | 0.1469 | 0.1469 | 0.1469 |
| Running (g/mi) | 57 | 0.0794 | 0.0794 | 0.0794 | 0.1478 | 0.1478 | 0.1478 |
| Running (g/mi) | 58 | 0.0794 | 0.0794 | 0.0794 | 0.1488 | 0.1488 | 0.1488 |
| Running (g/mi) | 59 | 0.0794 | 0.0794 | 0.0794 | 0.1496 | 0.1496 | 0.1496 |
| Running (g/mi) | 60 | 0.0794 | 0.0794 | 0.0794 | 0.1503 | 0.1503 | 0.1503 |
| Running (g/mi) | 61 | 0.0796 | 0.0796 | 0.0796 | 0.1512 | 0.1512 | 0.1512 |
| Running (g/mi) | 62 | 0.0799 | 0.0799 | 0.0799 | 0.1522 | 0.1522 | 0.1522 |
| Running (g/mi) | 63 | 0.0800 | 0.0800 | 0.0800 | 0.1531 | 0.1531 | 0.1531 |
| Running (g/mi) | 64 | 0.0801 | 0.0801 | 0.0801 | 0.1540 | 0.1540 | 0.1540 |
| Running (g/mi) | 65 | 0.0802 | 0.0802 | 0.0802 | 0.1549 | 0.1549 | 0.1549 |

| Emission Type | VOC | NOx |
|--|--------|--------|
| Cold Start (g/trip start, Light Duty Only) | 0.4717 | 0.172 |
| Hot Soak Loss (g/trip end) | 0.1995 | - |
| Hot Start (g/trip start, Light Duty Only) | 0.0849 | 0.0406 |

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

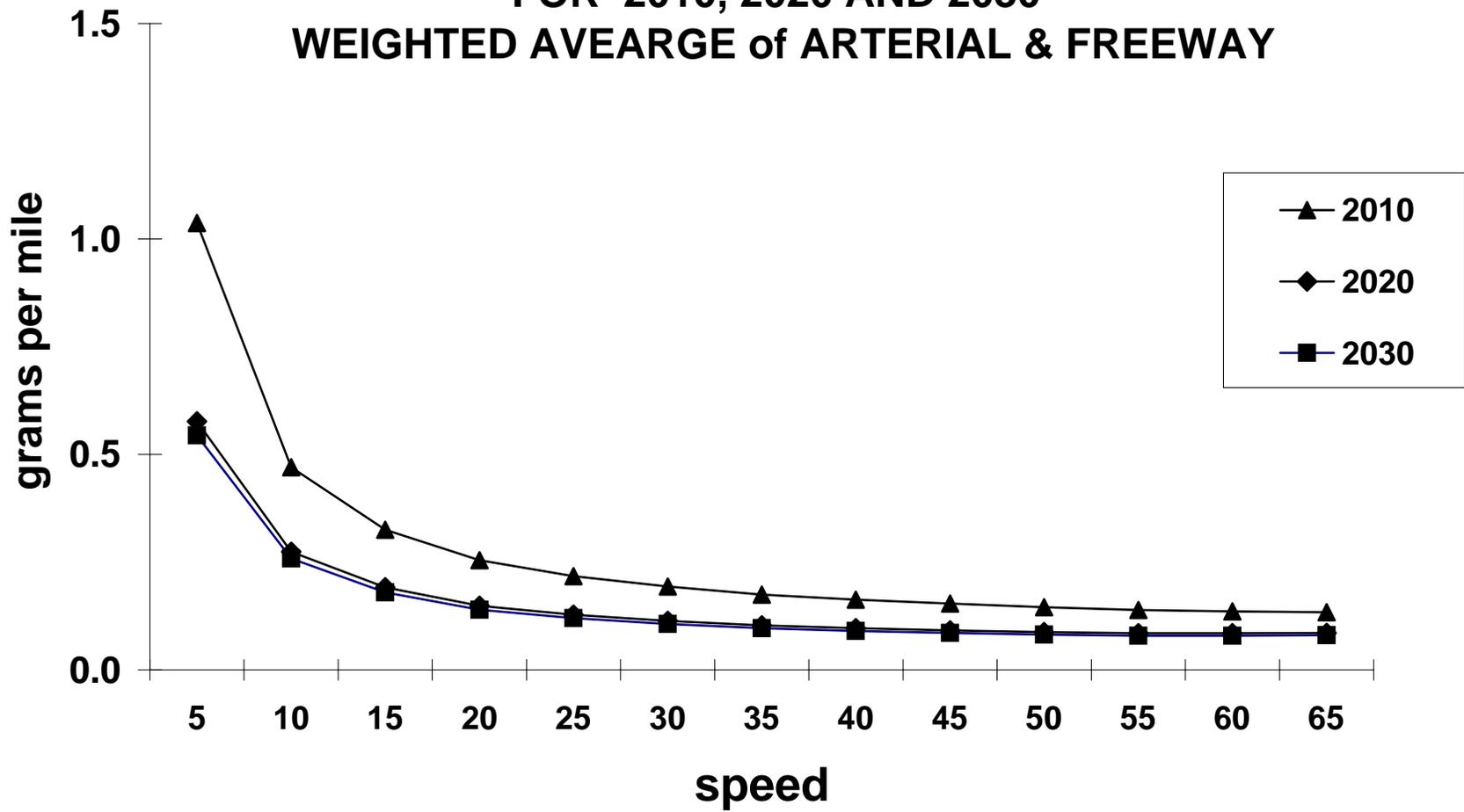


Exhibit - 4
NO_x MOBILE6.2 RUNNING EMISSION RATES
COMMUTE STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVERAGE of ARTERIAL & FREEWAY

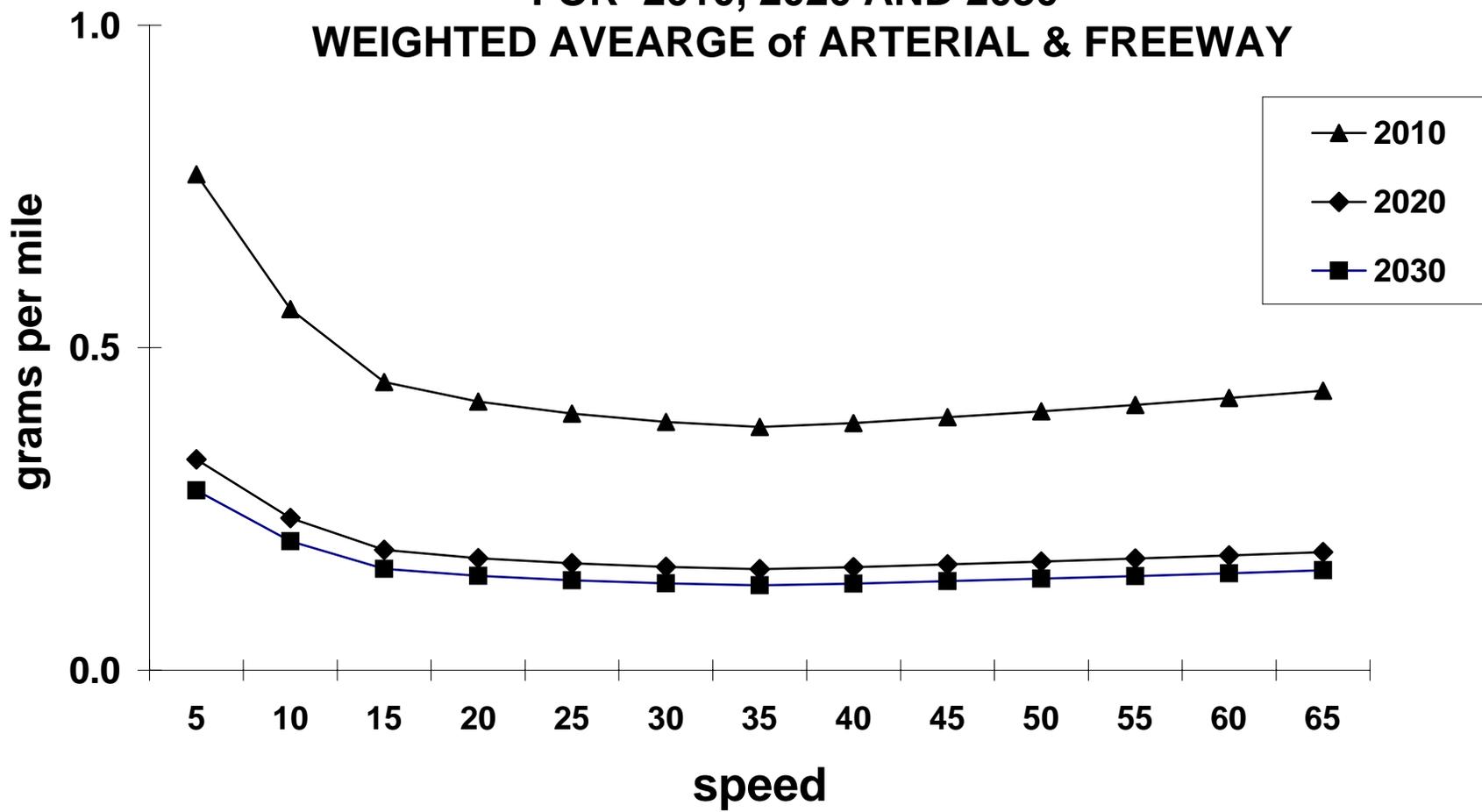


Table - 8 Regional Bus Emissions Factors (Mobile 6.2)

| | | School Bus - 2010 Emissions Factors | | | | | Transit Bus - 2010 Emissions Factors | | | | |
|-------|----------|-------------------------------------|--------|--------|--------|---------|--------------------------------------|--------|--------|--------|---------|
| Speed | Facility | NOx (Grams/mile) | | | | | NOx (Grams/mile) | | | | |
| | | Fall | Spring | Summer | Winter | Average | Fall | Spring | Summer | Winter | Average |
| 1.00 | Arterial | 11.803 | 12.748 | 12.748 | 13.402 | 12.675 | 18.423 | 19.704 | 19.704 | 20.476 | 19.577 |
| 2.00 | Arterial | 11.803 | 12.748 | 12.748 | 13.402 | 12.675 | 18.423 | 19.704 | 19.704 | 20.476 | 19.577 |
| 3.00 | Arterial | 11.402 | 12.317 | 12.317 | 12.949 | 12.246 | 17.796 | 19.029 | 19.029 | 19.775 | 18.907 |
| 4.00 | Arterial | 10.901 | 11.778 | 11.778 | 12.383 | 11.710 | 17.013 | 18.186 | 18.186 | 18.899 | 18.071 |
| 5.00 | Arterial | 10.601 | 11.455 | 11.454 | 12.043 | 11.388 | 16.544 | 17.68 | 17.68 | 18.373 | 17.569 |
| 6.00 | Arterial | 9.995 | 10.803 | 10.803 | 11.358 | 10.740 | 15.596 | 16.66 | 16.66 | 17.312 | 16.557 |
| 7.00 | Arterial | 9.563 | 10.338 | 10.337 | 10.869 | 10.277 | 14.919 | 15.931 | 15.931 | 16.555 | 15.834 |
| 8.00 | Arterial | 9.238 | 9.989 | 9.988 | 10.502 | 9.929 | 14.411 | 15.384 | 15.384 | 15.987 | 15.292 |
| 9.00 | Arterial | 8.986 | 9.717 | 9.717 | 10.217 | 9.659 | 14.016 | 14.959 | 14.959 | 15.545 | 14.870 |
| 10.0 | Arterial | 8.784 | 9.5 | 9.499 | 9.989 | 9.443 | 13.701 | 14.619 | 14.619 | 15.191 | 14.533 |
| 11.0 | Arterial | 8.446 | 9.136 | 9.135 | 9.606 | 9.081 | 13.171 | 14.048 | 14.048 | 14.598 | 13.966 |
| 12.0 | Arterial | 8.164 | 8.833 | 8.832 | 9.288 | 8.779 | 12.729 | 13.572 | 13.572 | 14.104 | 13.494 |
| 12.9 | Arterial | 8.007 | 8.663 | 8.663 | 9.11 | 8.611 | 12.483 | 13.307 | 13.307 | 13.828 | 13.231 |
| 13.0 | Arterial | 7.925 | 8.576 | 8.575 | 9.018 | 8.524 | 12.355 | 13.17 | 13.17 | 13.685 | 13.095 |
| 14.0 | Arterial | 7.721 | 8.356 | 8.356 | 8.787 | 8.305 | 12.035 | 12.824 | 12.824 | 13.327 | 12.753 |
| 15.0 | Arterial | 7.544 | 8.165 | 8.165 | 8.587 | 8.115 | 11.757 | 12.525 | 12.525 | 13.016 | 12.456 |
| 16.0 | Arterial | 7.337 | 7.943 | 7.942 | 8.353 | 7.894 | 11.432 | 12.175 | 12.175 | 12.652 | 12.109 |
| 17.0 | Arterial | 7.154 | 7.746 | 7.746 | 8.146 | 7.698 | 11.145 | 11.866 | 11.866 | 12.331 | 11.802 |
| 18.0 | Arterial | 6.991 | 7.571 | 7.571 | 7.962 | 7.524 | 10.89 | 11.591 | 11.591 | 12.045 | 11.529 |
| 19.0 | Arterial | 6.846 | 7.415 | 7.415 | 7.798 | 7.369 | 10.661 | 11.346 | 11.346 | 11.79 | 11.286 |
| 20.0 | Arterial | 6.715 | 7.274 | 7.274 | 7.65 | 7.228 | 10.456 | 11.124 | 11.124 | 11.56 | 11.066 |
| 21.0 | Arterial | 6.592 | 7.142 | 7.141 | 7.511 | 7.097 | 10.261 | 10.915 | 10.915 | 11.342 | 10.858 |
| 22.0 | Arterial | 6.479 | 7.021 | 7.021 | 7.384 | 6.976 | 10.084 | 10.724 | 10.724 | 11.144 | 10.669 |
| 23.0 | Arterial | 6.377 | 6.911 | 6.91 | 7.269 | 6.867 | 9.923 | 10.55 | 10.55 | 10.963 | 10.497 |
| 24.0 | Arterial | 6.283 | 6.81 | 6.809 | 7.162 | 6.766 | 9.775 | 10.391 | 10.391 | 10.797 | 10.339 |
| 25.0 | Arterial | 6.196 | 6.717 | 6.716 | 7.065 | 6.674 | 9.638 | 10.244 | 10.244 | 10.645 | 10.193 |
| 26.0 | Arterial | 6.134 | 6.65 | 6.65 | 6.995 | 6.607 | 9.54 | 10.138 | 10.138 | 10.534 | 10.088 |
| 27.0 | Arterial | 6.077 | 6.589 | 6.588 | 6.93 | 6.546 | 9.448 | 10.039 | 10.039 | 10.432 | 9.990 |
| 28.0 | Arterial | 6.023 | 6.531 | 6.531 | 6.87 | 6.489 | 9.363 | 9.948 | 9.948 | 10.337 | 9.899 |
| 29.0 | Arterial | 5.973 | 6.478 | 6.478 | 6.814 | 6.436 | 9.284 | 9.862 | 9.862 | 10.248 | 9.814 |
| 30.0 | Arterial | 5.927 | 6.428 | 6.428 | 6.762 | 6.386 | 9.21 | 9.783 | 9.783 | 10.166 | 9.736 |
| 31.0 | Arterial | 5.916 | 6.416 | 6.416 | 6.749 | 6.374 | 9.191 | 9.762 | 9.762 | 10.144 | 9.715 |
| 32.0 | Arterial | 5.905 | 6.405 | 6.405 | 6.738 | 6.363 | 9.173 | 9.742 | 9.742 | 10.124 | 9.695 |
| 33.0 | Arterial | 5.895 | 6.395 | 6.394 | 6.727 | 6.353 | 9.155 | 9.724 | 9.724 | 10.104 | 9.677 |
| 34.0 | Arterial | 5.886 | 6.385 | 6.384 | 6.716 | 6.343 | 9.139 | 9.706 | 9.706 | 10.086 | 9.659 |
| 34.6 | Arterial | 6.066 | 6.567 | 6.567 | 6.909 | 6.527 | 9.265 | 9.977 | 9.977 | 10.369 | 9.897 |
| 35.0 | Arterial | 5.877 | 6.376 | 6.375 | 6.707 | 6.334 | 9.124 | 9.69 | 9.69 | 10.069 | 9.643 |
| 36.0 | Arterial | 5.913 | 6.415 | 6.414 | 6.748 | 6.373 | 9.179 | 9.749 | 9.749 | 10.131 | 9.702 |
| 37.0 | Arterial | 5.947 | 6.452 | 6.452 | 6.787 | 6.410 | 9.231 | 9.805 | 9.805 | 10.189 | 9.758 |
| 38.0 | Arterial | 5.98 | 6.487 | 6.487 | 6.824 | 6.445 | 9.28 | 9.858 | 9.858 | 10.244 | 9.810 |
| 39.0 | Arterial | 6.011 | 6.521 | 6.52 | 6.859 | 6.478 | 9.326 | 9.908 | 9.908 | 10.296 | 9.860 |
| 40.0 | Arterial | 6.04 | 6.553 | 6.552 | 6.893 | 6.510 | 9.371 | 9.956 | 9.956 | 10.345 | 9.907 |
| 41.0 | Arterial | 6.126 | 6.646 | 6.645 | 6.991 | 6.602 | 9.504 | 10.099 | 10.099 | 10.494 | 10.049 |
| 42.0 | Arterial | 6.208 | 6.735 | 6.734 | 7.084 | 6.690 | 9.63 | 10.235 | 10.235 | 10.636 | 10.184 |
| 43.0 | Arterial | 6.287 | 6.82 | 6.819 | 7.173 | 6.775 | 9.751 | 10.365 | 10.365 | 10.771 | 10.313 |
| 44.0 | Arterial | 6.362 | 6.9 | 6.9 | 7.259 | 6.855 | 9.867 | 10.49 | 10.49 | 10.9 | 10.437 |
| 45.0 | Arterial | 6.433 | 6.978 | 6.977 | 7.34 | 6.932 | 9.977 | 10.608 | 10.608 | 11.024 | 10.554 |
| 46.0 | Arterial | 6.578 | 7.134 | 7.134 | 7.504 | 7.088 | 10.202 | 10.85 | 10.85 | 11.275 | 10.794 |
| 47.0 | Arterial | 6.717 | 7.284 | 7.284 | 7.662 | 7.237 | 10.417 | 11.082 | 11.082 | 11.516 | 11.024 |
| 48.0 | Arterial | 6.851 | 7.428 | 7.427 | 7.813 | 7.380 | 10.623 | 11.304 | 11.304 | 11.747 | 11.245 |
| 49.0 | Arterial | 6.978 | 7.566 | 7.565 | 7.958 | 7.517 | 10.821 | 11.517 | 11.517 | 11.968 | 11.456 |
| 50.0 | Arterial | 7.101 | 7.698 | 7.697 | 8.097 | 7.648 | 11.011 | 11.722 | 11.722 | 12.181 | 11.659 |
| 51.0 | Arterial | 7.321 | 7.935 | 7.934 | 8.346 | 7.884 | 11.352 | 12.09 | 12.09 | 12.563 | 12.024 |
| 52.0 | Arterial | 7.532 | 8.163 | 8.163 | 8.586 | 8.111 | 11.681 | 12.443 | 12.443 | 12.931 | 12.375 |
| 53.0 | Arterial | 7.736 | 8.383 | 8.382 | 8.817 | 8.330 | 11.997 | 12.784 | 12.784 | 13.284 | 12.712 |
| 54.0 | Arterial | 7.932 | 8.594 | 8.593 | 9.039 | 8.540 | 12.301 | 13.112 | 13.112 | 13.625 | 13.038 |
| 55.0 | Arterial | 8.121 | 8.798 | 8.797 | 9.253 | 8.742 | 12.595 | 13.427 | 13.427 | 13.953 | 13.351 |
| 56.0 | Arterial | 8.442 | 9.144 | 9.144 | 9.618 | 9.087 | 13.095 | 13.966 | 13.966 | 14.513 | 13.885 |
| 57.0 | Arterial | 8.753 | 9.479 | 9.478 | 9.969 | 9.420 | 13.577 | 14.486 | 14.486 | 15.053 | 14.401 |
| 58.0 | Arterial | 9.052 | 9.802 | 9.801 | 10.309 | 9.741 | 14.044 | 14.988 | 14.988 | 15.575 | 14.899 |
| 59.0 | Arterial | 9.342 | 10.114 | 10.113 | 10.637 | 10.052 | 14.494 | 15.473 | 15.473 | 16.079 | 15.380 |
| 60.0 | Arterial | 9.622 | 10.415 | 10.415 | 10.954 | 10.352 | 14.929 | 15.941 | 15.941 | 16.566 | 15.844 |
| 61.0 | Arterial | 10.088 | 10.918 | 10.917 | 11.482 | 10.851 | 15.655 | 16.723 | 16.723 | 17.379 | 16.620 |
| 62.0 | Arterial | 10.539 | 11.404 | 11.403 | 11.993 | 11.335 | 16.358 | 17.48 | 17.48 | 18.165 | 17.371 |
| 63.0 | Arterial | 10.976 | 11.875 | 11.874 | 12.488 | 11.803 | 17.038 | 18.213 | 18.213 | 18.926 | 18.098 |
| 64.0 | Arterial | 11.4 | 12.331 | 12.33 | 12.967 | 12.257 | 17.697 | 18.922 | 18.922 | 19.664 | 18.801 |
| 65.0 | Arterial | 11.81 | 12.773 | 12.772 | 13.432 | 12.697 | 18.336 | 19.61 | 19.61 | 20.379 | 19.484 |

Table - 9 Idling Emissions Factors
(Mobile 6.2)

| Vehicle Type | 2010 | | 2020 | | 2030 | |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | VOC g/hr | NOx g/hr | VOC g/hr | NOx g/hr | VOC g/hr | NOx g/hr |
| LDGV | 9.6651 | 2.3954 | 4.3599 | 0.9148 | 4.0684 | 0.7378 |
| LDGTI | 6.5328 | 1.5969 | 3.4216 | 0.6695 | 3.2873 | 0.5900 |
| LDGT2 | 6.7310 | 2.3083 | 3.6049 | 0.9356 | 3.4794 | 0.8284 |
| LDGT3 | 11.4874 | 3.6390 | 5.0824 | 1.4696 | 4.6046 | 1.1015 |
| LDGT4 | 11.8429 | 4.8790 | 5.2671 | 2.0739 | 4.7379 | 1.5790 |
| HDGV2b | 9.4946 | 3.6206 | 4.6296 | 0.6830 | 4.2228 | 0.3013 |
| HDGV3 | 8.6358 | 3.7389 | 4.5176 | 0.7799 | 4.1096 | 0.3895 |
| HDGV4 | 11.6249 | 3.8614 | 4.0569 | 0.6418 | 3.7393 | 0.3460 |
| HDGV5 | 9.8565 | 4.1175 | 4.2470 | 0.7439 | 3.9029 | 0.3978 |
| HDGV6 | 9.7355 | 4.0719 | 4.2379 | 0.7371 | 3.8946 | 0.3934 |
| HDGV7 | 10.9438 | 4.5546 | 4.4706 | 0.8218 | 4.0914 | 0.4466 |
| HDGV8a | 12.7324 | 5.0636 | 4.6026 | 0.8748 | 4.2121 | 0.4728 |
| HDGV8b | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LDDV | 0.8690 | 1.4690 | 0.3303 | 0.2361 | 0.2578 | 0.1111 |
| LDDT12 | 6.5330 | 9.5539 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| HDDV2B | 1.1451 | 9.3678 | 0.8161 | 1.7991 | 0.7871 | 0.8863 |
| HDDV3 | 1.2406 | 9.8459 | 0.9196 | 1.7421 | 0.8980 | 0.9946 |
| HDDV4 | 1.5478 | 12.9703 | 1.1010 | 2.7450 | 1.0505 | 1.2146 |
| HDDV5 | 1.7014 | 13.9043 | 1.2005 | 2.9804 | 1.1354 | 1.3133 |
| HDDV6 | 2.1443 | 16.9770 | 1.4581 | 3.0949 | 1.4010 | 1.5705 |
| HDDV7 | 2.6385 | 21.0884 | 1.8024 | 3.8310 | 1.7356 | 1.9471 |
| HDDV8a | 2.7226 | 23.9020 | 2.0505 | 4.0945 | 1.9868 | 2.2081 |
| HDDV8b | 3.2054 | 28.3073 | 2.2950 | 5.0476 | 2.1849 | 2.4613 |
| MC | 21.5073 | 1.5834 | 21.5073 | 1.5834 | 21.5073 | 1.5834 |
| HDGB | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| HDDBT | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| HDDBS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LDDT34 | 2.1999 | 2.8725 | 0.8290 | 0.8055 | 0.5894 | 0.4901 |
| All vehicles | 8.3116 | 3.7739 | 4.0261 | 1.2155 | 3.7831 | 0.9163 |

Also for use in the emissions reduction calculations are average weighted speed by time period for 2005, shown in Table 10 below. The 24 hour average weighted speed for 2005 is 41 miles per hour and should be used for TERMS affecting the entire traffic stream, where site-specific speed data are not available. For commute vehicle TERMS, 40 mph peak period average speed should be used. 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 10: 2005 Average Weighted Speeds by Time Period

| Time | 2005 |
|-------------|-------------|
| 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 11: Mobile 6 Vehicle Classifications

| <i>Number</i> | <i>Abbreviation</i> | <i>Description</i> |
|---------------|---------------------|---|
| 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. ALVW) |
| 5 | LDGT4 | Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW) |
| 6 | HDBG2b | Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR) |
| 7 | HDBG3 | Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR) |
| 8 | HDBG4 | Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR) |
| 9 | HDBG5 | Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR) |
| 10 | HDBG6 | Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR) |
| 11 | HDBG7 | Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR) |
| 12 | HDBG8a | Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR) |
| 13 | HDBG8b | 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) |
| | | |

COST EFFECTIVENESS ESTIMATION PROCEDURES

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:

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

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

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

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

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 precursor emissions. In addition these emissions estimations are required on an annual basis and not on 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 precursor for PM 2.5 is similar to NOx precursor for ozone and has start up emissions in addition to running emissions.

The recommended methodology to estimate annual direct PM2.5 and NOx precursor emissions is to use an average of the four seasonal emission rates (Winter, Spring, Summer, and Fall) and apply these average rates to annual VT and VMT to estimate the annual direct PM2.5 and NOx precursor emissions. Direct PM2.5 emissions rates and average seasonal NOx precursor emissions rates for the analysis years 2010, 2020, & 2030 are shown in Table 12, 13, 14 & 15.

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

Table-12

Direct PM2.5 Emissions Factors

| | Season | Speed | Facility | Total PM |
|---------------------------------|--------|-------|----------|---------------|
| 2010 PM2.5 - Auto Access | WINTER | 35.0 | Arterial | 0.0118 |
| | SPRING | 35.0 | Arterial | 0.0117 |
| | SUMMER | 35.0 | Arterial | 0.0117 |
| | FALL | 35.0 | Arterial | 0.0116 |
| Average | | | | 0.0117 |
| 2020 PM2.5 - Auto Access | WINTER | 35.0 | Arterial | 0.0113 |
| | SPRING | 35.0 | Arterial | 0.0113 |
| | SUMMER | 35.0 | Arterial | 0.0113 |
| | FALL | 35.0 | Arterial | 0.0113 |
| Average | | | | 0.0113 |
| 2030 PM2.5 - Auto Access | WINTER | 35.0 | Arterial | 0.0113 |
| | SPRING | 35.0 | Arterial | 0.0113 |
| | SUMMER | 35.0 | Arterial | 0.0113 |
| | FALL | 35.0 | Arterial | 0.0113 |
| Average | | | | 0.0113 |

**Table 13: NOx Precursor - 2010 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

| Speed | Weighted Factor Winter NOx (grams/mile) | Weighted Factor Spring NOx (grams/mile) | Weighted Factor Summer NOx (grams/mile) | Weighted Factor Fall NOx (grams/mile) | Average of Seasonal Factors (grams/mile) |
|-------|---|---|---|---|---|
| 1 | 0.9272 | 0.7932 | 0.8232 | 0.7428 | 0.8216 |
| 2 | 0.9272 | 0.7932 | 0.8232 | 0.7428 | 0.8216 |
| 3 | 0.8873 | 0.7590 | 0.7840 | 0.7107 | 0.7852 |
| 4 | 0.8372 | 0.7162 | 0.7347 | 0.6706 | 0.7397 |
| 5 | 0.8071 | 0.6904 | 0.7051 | 0.6464 | 0.7123 |
| 6 | 0.7383 | 0.6317 | 0.6424 | 0.5911 | 0.6509 |
| 7 | 0.6891 | 0.5896 | 0.5976 | 0.5518 | 0.6070 |
| 8 | 0.6522 | 0.5581 | 0.5639 | 0.5222 | 0.5741 |
| 9 | 0.6236 | 0.5337 | 0.5377 | 0.4992 | 0.5486 |
| 10 | 0.6007 | 0.5140 | 0.5169 | 0.4809 | 0.5281 |
| 11 | 0.5696 | 0.4875 | 0.4888 | 0.4559 | 0.5004 |
| 12 | 0.5434 | 0.4654 | 0.4656 | 0.4351 | 0.4774 |
| 13 | 0.5214 | 0.4463 | 0.4458 | 0.4175 | 0.4578 |
| 14 | 0.5026 | 0.4305 | 0.4287 | 0.4023 | 0.4410 |
| 15 | 0.4864 | 0.4163 | 0.4142 | 0.3892 | 0.4265 |
| 16 | 0.4799 | 0.4109 | 0.4077 | 0.3840 | 0.4206 |
| 17 | 0.4739 | 0.4058 | 0.4019 | 0.3794 | 0.4152 |
| 18 | 0.4688 | 0.4014 | 0.3967 | 0.3752 | 0.4105 |
| 19 | 0.4641 | 0.3974 | 0.3920 | 0.3715 | 0.4063 |
| 20 | 0.4601 | 0.3940 | 0.3879 | 0.3681 | 0.4025 |
| 21 | 0.4563 | 0.3908 | 0.3842 | 0.3652 | 0.3991 |
| 22 | 0.4528 | 0.3879 | 0.3805 | 0.3626 | 0.3960 |
| 23 | 0.4499 | 0.3851 | 0.3776 | 0.3601 | 0.3932 |
| 24 | 0.4471 | 0.3828 | 0.3745 | 0.3578 | 0.3905 |
| 25 | 0.4444 | 0.3807 | 0.3718 | 0.3558 | 0.3882 |
| 26 | 0.4420 | 0.3786 | 0.3691 | 0.3537 | 0.3859 |
| 27 | 0.4399 | 0.3767 | 0.3669 | 0.3519 | 0.3838 |
| 28 | 0.4380 | 0.3750 | 0.3648 | 0.3503 | 0.3820 |
| 29 | 0.4359 | 0.3733 | 0.3626 | 0.3489 | 0.3802 |
| 30 | 0.4341 | 0.3718 | 0.3606 | 0.3474 | 0.3785 |
| 31 | 0.4329 | 0.3710 | 0.3593 | 0.3465 | 0.3774 |
| 32 | 0.4320 | 0.3701 | 0.3580 | 0.3457 | 0.3765 |
| 33 | 0.4311 | 0.3692 | 0.3566 | 0.3450 | 0.3755 |
| 34 | 0.4301 | 0.3683 | 0.3555 | 0.3442 | 0.3745 |
| 35 | 0.4293 | 0.3676 | 0.3547 | 0.3435 | 0.3738 |
| 36 | 0.4316 | 0.3696 | 0.3558 | 0.3454 | 0.3756 |
| 37 | 0.4338 | 0.3716 | 0.3574 | 0.3471 | 0.3775 |
| 38 | 0.4359 | 0.3733 | 0.3588 | 0.3487 | 0.3792 |
| 39 | 0.4380 | 0.3751 | 0.3599 | 0.3503 | 0.3808 |
| 40 | 0.4400 | 0.3767 | 0.3614 | 0.3519 | 0.3825 |
| 41 | 0.4430 | 0.3792 | 0.3634 | 0.3543 | 0.3850 |
| 42 | 0.4459 | 0.3817 | 0.3653 | 0.3564 | 0.3873 |
| 43 | 0.4485 | 0.3840 | 0.3672 | 0.3587 | 0.3896 |
| 44 | 0.4512 | 0.3863 | 0.3688 | 0.3607 | 0.3918 |
| 45 | 0.4536 | 0.3884 | 0.3705 | 0.3627 | 0.3938 |
| 46 | 0.4565 | 0.3910 | 0.3725 | 0.3653 | 0.3963 |
| 47 | 0.4596 | 0.3934 | 0.3745 | 0.3676 | 0.3988 |
| 48 | 0.4624 | 0.3958 | 0.3763 | 0.3699 | 0.4011 |
| 49 | 0.4650 | 0.3982 | 0.3783 | 0.3720 | 0.4034 |
| 50 | 0.4676 | 0.4002 | 0.3802 | 0.3741 | 0.4055 |
| 51 | 0.4709 | 0.4031 | 0.3828 | 0.3766 | 0.4084 |
| 52 | 0.4738 | 0.4057 | 0.3848 | 0.3791 | 0.4109 |
| 53 | 0.4768 | 0.4083 | 0.3868 | 0.3814 | 0.4133 |
| 54 | 0.4797 | 0.4106 | 0.3888 | 0.3838 | 0.4157 |
| 55 | 0.4824 | 0.4130 | 0.3908 | 0.3860 | 0.4181 |
| 56 | 0.4857 | 0.4158 | 0.3930 | 0.3888 | 0.4208 |
| 57 | 0.4889 | 0.4185 | 0.3953 | 0.3911 | 0.4235 |
| 58 | 0.4920 | 0.4211 | 0.3974 | 0.3936 | 0.4260 |
| 59 | 0.4949 | 0.4238 | 0.3996 | 0.3960 | 0.4286 |
| 60 | 0.4978 | 0.4260 | 0.4017 | 0.3984 | 0.4310 |
| 61 | 0.5013 | 0.4289 | 0.4040 | 0.4009 | 0.4338 |
| 62 | 0.5044 | 0.4317 | 0.4063 | 0.4035 | 0.4365 |
| 63 | 0.5074 | 0.4344 | 0.4085 | 0.4060 | 0.4391 |
| 64 | 0.5106 | 0.4369 | 0.4109 | 0.4085 | 0.4417 |
| 65 | 0.5135 | 0.4396 | 0.4130 | 0.4108 | 0.4442 |

| | Winter | Spring | Summer | Fall | Average |
|---|--------|--------|--------|--------|---------|
| Cold Start (g/trip start, Light Duty Only) | 0.6841 | 0.6168 | 0.5696 | 0.5823 | 0.6132 |

**Table 14: NOx Precursor - 2020 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

| Speed | Weighted Factor Winter NOx (grams/mile) | Weighted Factor Spring NOx (grams/mile) | Weighted Factor Summer NOx (grams/mile) | Weighted Factor Fall NOx (grams/mile) | Average of Seasonal Factors (grams/mile) |
|-------|---|---|---|---|---|
| 1 | 0.3609 | 0.3234 | 0.3466 | 0.3119 | 0.3357 |
| 2 | 0.3609 | 0.3234 | 0.3466 | 0.3119 | 0.3357 |
| 3 | 0.3457 | 0.3098 | 0.3297 | 0.2986 | 0.3209 |
| 4 | 0.3266 | 0.2926 | 0.3091 | 0.2821 | 0.3026 |
| 5 | 0.3150 | 0.2823 | 0.2965 | 0.2722 | 0.2915 |
| 6 | 0.2879 | 0.2580 | 0.2697 | 0.2484 | 0.2660 |
| 7 | 0.2685 | 0.2405 | 0.2502 | 0.2316 | 0.2477 |
| 8 | 0.2539 | 0.2273 | 0.2359 | 0.2191 | 0.2341 |
| 9 | 0.2424 | 0.2174 | 0.2247 | 0.2094 | 0.2235 |
| 10 | 0.2335 | 0.2092 | 0.2155 | 0.2015 | 0.2149 |
| 11 | 0.2212 | 0.1983 | 0.2035 | 0.1909 | 0.2035 |
| 12 | 0.2109 | 0.1891 | 0.1936 | 0.1819 | 0.1939 |
| 13 | 0.2023 | 0.1813 | 0.1850 | 0.1744 | 0.1857 |
| 14 | 0.1947 | 0.1746 | 0.1778 | 0.1679 | 0.1788 |
| 15 | 0.1884 | 0.1688 | 0.1715 | 0.1624 | 0.1728 |
| 16 | 0.1857 | 0.1666 | 0.1688 | 0.1601 | 0.1703 |
| 17 | 0.1837 | 0.1646 | 0.1663 | 0.1582 | 0.1682 |
| 18 | 0.1816 | 0.1627 | 0.1642 | 0.1566 | 0.1663 |
| 19 | 0.1799 | 0.1613 | 0.1622 | 0.1551 | 0.1646 |
| 20 | 0.1783 | 0.1597 | 0.1605 | 0.1537 | 0.1630 |
| 21 | 0.1771 | 0.1586 | 0.1589 | 0.1524 | 0.1617 |
| 22 | 0.1756 | 0.1575 | 0.1574 | 0.1513 | 0.1605 |
| 23 | 0.1744 | 0.1565 | 0.1561 | 0.1503 | 0.1593 |
| 24 | 0.1734 | 0.1554 | 0.1549 | 0.1493 | 0.1583 |
| 25 | 0.1724 | 0.1546 | 0.1538 | 0.1485 | 0.1573 |
| 26 | 0.1717 | 0.1538 | 0.1528 | 0.1478 | 0.1565 |
| 27 | 0.1707 | 0.1532 | 0.1518 | 0.1471 | 0.1557 |
| 28 | 0.1700 | 0.1523 | 0.1509 | 0.1464 | 0.1549 |
| 29 | 0.1693 | 0.1517 | 0.1501 | 0.1458 | 0.1542 |
| 30 | 0.1687 | 0.1512 | 0.1492 | 0.1453 | 0.1536 |
| 31 | 0.1683 | 0.1509 | 0.1487 | 0.1448 | 0.1532 |
| 32 | 0.1678 | 0.1504 | 0.1480 | 0.1444 | 0.1526 |
| 33 | 0.1674 | 0.1501 | 0.1475 | 0.1442 | 0.1523 |
| 34 | 0.1672 | 0.1498 | 0.1471 | 0.1439 | 0.1520 |
| 35 | 0.1667 | 0.1495 | 0.1464 | 0.1437 | 0.1516 |
| 36 | 0.1677 | 0.1503 | 0.1473 | 0.1445 | 0.1525 |
| 37 | 0.1687 | 0.1513 | 0.1480 | 0.1451 | 0.1533 |
| 38 | 0.1696 | 0.1521 | 0.1485 | 0.1461 | 0.1541 |
| 39 | 0.1705 | 0.1530 | 0.1493 | 0.1470 | 0.1550 |
| 40 | 0.1713 | 0.1537 | 0.1498 | 0.1477 | 0.1556 |
| 41 | 0.1727 | 0.1549 | 0.1505 | 0.1488 | 0.1567 |
| 42 | 0.1739 | 0.1559 | 0.1515 | 0.1498 | 0.1578 |
| 43 | 0.1751 | 0.1569 | 0.1525 | 0.1508 | 0.1588 |
| 44 | 0.1762 | 0.1579 | 0.1534 | 0.1516 | 0.1598 |
| 45 | 0.1774 | 0.1589 | 0.1540 | 0.1526 | 0.1607 |
| 46 | 0.1785 | 0.1600 | 0.1550 | 0.1537 | 0.1618 |
| 47 | 0.1797 | 0.1611 | 0.1558 | 0.1548 | 0.1629 |
| 48 | 0.1810 | 0.1622 | 0.1568 | 0.1558 | 0.1640 |
| 49 | 0.1824 | 0.1632 | 0.1576 | 0.1568 | 0.1650 |
| 50 | 0.1834 | 0.1642 | 0.1585 | 0.1578 | 0.1660 |
| 51 | 0.1848 | 0.1656 | 0.1595 | 0.1592 | 0.1673 |
| 52 | 0.1861 | 0.1668 | 0.1605 | 0.1604 | 0.1685 |
| 53 | 0.1876 | 0.1681 | 0.1617 | 0.1616 | 0.1698 |
| 54 | 0.1888 | 0.1692 | 0.1627 | 0.1627 | 0.1709 |
| 55 | 0.1899 | 0.1703 | 0.1636 | 0.1637 | 0.1719 |
| 56 | 0.1915 | 0.1716 | 0.1648 | 0.1648 | 0.1732 |
| 57 | 0.1929 | 0.1728 | 0.1658 | 0.1662 | 0.1744 |
| 58 | 0.1943 | 0.1739 | 0.1668 | 0.1673 | 0.1756 |
| 59 | 0.1954 | 0.1751 | 0.1678 | 0.1684 | 0.1767 |
| 60 | 0.1967 | 0.1761 | 0.1686 | 0.1695 | 0.1777 |
| 61 | 0.1982 | 0.1778 | 0.1697 | 0.1707 | 0.1791 |
| 62 | 0.1996 | 0.1790 | 0.1708 | 0.1721 | 0.1804 |
| 63 | 0.2009 | 0.1800 | 0.1718 | 0.1732 | 0.1815 |
| 64 | 0.2023 | 0.1811 | 0.1729 | 0.1742 | 0.1826 |
| 65 | 0.2037 | 0.1824 | 0.1740 | 0.1752 | 0.1838 |

| | Winter | Spring | Summer | Fall | Average |
|---|--------|--------|--------|--------|---------|
| Cold Start (g/trip start, Light Duty Only) | 0.274 | 0.2529 | 0.2329 | 0.2422 | 0.2505 |

**Table 15: NOx Precursor - 2030 Running, Cold Start Average Emissions
Factors for Commute TERMS (Mobile 6.2)
(Seasonal Average)**

| Speed | Weighted Factor Winter NOx (grams/mile) | Weighted Factor Spring NOx (grams/mile) | Weighted Factor Summer NOx (grams/mile) | Weighted Factor Fall NOx (grams/mile) | Average of Seasonal Factors (grams/mile) |
|-------|---|---|---|---|---|
| 1 | 0.2967 | 0.2709 | 0.2955 | 0.2684 | 0.2829 |
| 2 | 0.2967 | 0.2709 | 0.2955 | 0.2684 | 0.2829 |
| 3 | 0.2842 | 0.2596 | 0.2811 | 0.2570 | 0.2705 |
| 4 | 0.2686 | 0.2453 | 0.2635 | 0.2427 | 0.2550 |
| 5 | 0.2594 | 0.2368 | 0.2527 | 0.2343 | 0.2458 |
| 6 | 0.2367 | 0.2162 | 0.2296 | 0.2140 | 0.2241 |
| 7 | 0.2205 | 0.2015 | 0.2129 | 0.1994 | 0.2086 |
| 8 | 0.2085 | 0.1905 | 0.2003 | 0.1883 | 0.1969 |
| 9 | 0.1992 | 0.1820 | 0.1907 | 0.1799 | 0.1880 |
| 10 | 0.1916 | 0.1750 | 0.1828 | 0.1731 | 0.1806 |
| 11 | 0.1813 | 0.1657 | 0.1724 | 0.1637 | 0.1708 |
| 12 | 0.1726 | 0.1580 | 0.1638 | 0.1559 | 0.1626 |
| 13 | 0.1654 | 0.1513 | 0.1565 | 0.1494 | 0.1557 |
| 14 | 0.1593 | 0.1458 | 0.1503 | 0.1438 | 0.1498 |
| 15 | 0.1539 | 0.1409 | 0.1449 | 0.1389 | 0.1447 |
| 16 | 0.1519 | 0.1390 | 0.1425 | 0.1371 | 0.1426 |
| 17 | 0.1501 | 0.1373 | 0.1404 | 0.1355 | 0.1408 |
| 18 | 0.1485 | 0.1359 | 0.1384 | 0.1341 | 0.1392 |
| 19 | 0.1469 | 0.1345 | 0.1368 | 0.1327 | 0.1377 |
| 20 | 0.1457 | 0.1333 | 0.1354 | 0.1315 | 0.1365 |
| 21 | 0.1447 | 0.1324 | 0.1340 | 0.1305 | 0.1354 |
| 22 | 0.1435 | 0.1314 | 0.1327 | 0.1295 | 0.1343 |
| 23 | 0.1427 | 0.1306 | 0.1317 | 0.1287 | 0.1334 |
| 24 | 0.1418 | 0.1297 | 0.1306 | 0.1279 | 0.1325 |
| 25 | 0.1411 | 0.1289 | 0.1296 | 0.1272 | 0.1317 |
| 26 | 0.1402 | 0.1284 | 0.1286 | 0.1266 | 0.1309 |
| 27 | 0.1396 | 0.1278 | 0.1280 | 0.1259 | 0.1303 |
| 28 | 0.1390 | 0.1270 | 0.1271 | 0.1253 | 0.1296 |
| 29 | 0.1384 | 0.1266 | 0.1264 | 0.1249 | 0.1290 |
| 30 | 0.1380 | 0.1260 | 0.1258 | 0.1243 | 0.1285 |
| 31 | 0.1376 | 0.1258 | 0.1252 | 0.1239 | 0.1281 |
| 32 | 0.1373 | 0.1255 | 0.1247 | 0.1237 | 0.1278 |
| 33 | 0.1368 | 0.1253 | 0.1243 | 0.1233 | 0.1274 |
| 34 | 0.1366 | 0.1250 | 0.1237 | 0.1231 | 0.1271 |
| 35 | 0.1363 | 0.1248 | 0.1232 | 0.1228 | 0.1268 |
| 36 | 0.1372 | 0.1256 | 0.1239 | 0.1236 | 0.1276 |
| 37 | 0.1381 | 0.1262 | 0.1247 | 0.1244 | 0.1284 |
| 38 | 0.1390 | 0.1271 | 0.1252 | 0.1254 | 0.1292 |
| 39 | 0.1397 | 0.1279 | 0.1257 | 0.1258 | 0.1298 |
| 40 | 0.1404 | 0.1282 | 0.1262 | 0.1265 | 0.1303 |
| 41 | 0.1415 | 0.1292 | 0.1271 | 0.1275 | 0.1313 |
| 42 | 0.1425 | 0.1302 | 0.1279 | 0.1285 | 0.1323 |
| 43 | 0.1435 | 0.1312 | 0.1286 | 0.1294 | 0.1332 |
| 44 | 0.1445 | 0.1322 | 0.1291 | 0.1304 | 0.1341 |
| 45 | 0.1455 | 0.1330 | 0.1301 | 0.1311 | 0.1349 |
| 46 | 0.1466 | 0.1341 | 0.1308 | 0.1321 | 0.1359 |
| 47 | 0.1477 | 0.1351 | 0.1316 | 0.1331 | 0.1369 |
| 48 | 0.1488 | 0.1360 | 0.1324 | 0.1341 | 0.1378 |
| 49 | 0.1498 | 0.1368 | 0.1331 | 0.1350 | 0.1387 |
| 50 | 0.1507 | 0.1377 | 0.1341 | 0.1358 | 0.1396 |
| 51 | 0.1521 | 0.1388 | 0.1351 | 0.1370 | 0.1408 |
| 52 | 0.1532 | 0.1400 | 0.1360 | 0.1380 | 0.1418 |
| 53 | 0.1544 | 0.1411 | 0.1366 | 0.1390 | 0.1428 |
| 54 | 0.1556 | 0.1421 | 0.1373 | 0.1400 | 0.1438 |
| 55 | 0.1566 | 0.1429 | 0.1383 | 0.1410 | 0.1447 |
| 56 | 0.1578 | 0.1442 | 0.1393 | 0.1420 | 0.1458 |
| 57 | 0.1590 | 0.1454 | 0.1403 | 0.1432 | 0.1470 |
| 58 | 0.1605 | 0.1464 | 0.1412 | 0.1442 | 0.1481 |
| 59 | 0.1615 | 0.1474 | 0.1422 | 0.1452 | 0.1491 |
| 60 | 0.1626 | 0.1484 | 0.1428 | 0.1461 | 0.1500 |
| 61 | 0.1637 | 0.1495 | 0.1438 | 0.1476 | 0.1512 |
| 62 | 0.1649 | 0.1506 | 0.1448 | 0.1488 | 0.1523 |
| 63 | 0.1663 | 0.1517 | 0.1457 | 0.1498 | 0.1534 |
| 64 | 0.1674 | 0.1527 | 0.1465 | 0.1508 | 0.1544 |
| 65 | 0.1685 | 0.1537 | 0.1473 | 0.1518 | 0.1553 |

| | Winter | Spring | Summer | Fall | Average |
|---|--------|--------|--------|-------|---------|
| Cold Start (g/trip start, Light Duty Only) | 0.1929 | 0.1818 | 0.1679 | 0.179 | 0.1804 |

EXAMPLE OF A COMMUTING VEHICLE TRIP TERM ANALYSIS

Construction of 1300 additional Parking Spaces at a Metro Station

Description: 1,300 parking spaces will be constructed at Grosvenor 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:

- Montgomery County will build 1,300 additional parking spaces at Grosvenor Metro station to increase capacity at the station. Funding is estimated at \$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 Emissions factors.

Summary Impacts (2010):

| | | |
|---------------------------|--------|-----------|
| Daily VT Reduction: | - | VT |
| Daily VMT Reduction: | 26,846 | VMT |
| Daily NOx Reductions: | 0.0113 | tons/day |
| Daily VOC Reductions: | 0.0048 | tons/day |
| PM Reductions (per year): | 0.0866 | tons/year |

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

| | | | | | | | |
|------------|--------|---|---|---|---|---|--------------|
| Cold Start | 0 | x | $\frac{0.5818 \text{ grams}}{1 \text{ trip}}$ | x | $\frac{1 \text{ ton}}{907,185 \text{ grams}}$ | = | 0.00000 tons |
| Running | 26,846 | x | $\frac{0.3833 \text{ grams}}{1 \text{ mi}}$ | x | $\frac{1 \text{ ton}}{907,185}$ | = | 0.0113 tons |
| | | | | | Total NOx | | 0.0113 tons |

VOC

| | | | | | | | |
|--------------------------|--------|---|--|---|---|---|-------------|
| Cold Start + Hot Soak | 0 | x | $\frac{1.536 \text{ grams}}{1 \text{ trip}}$ | x | $\frac{1 \text{ ton}}{907,185 \text{ grams}}$ | = | 0.0000 tons |
| Running | 26,846 | x | $\frac{0.1631 \text{ grams}}{1 \text{ mi}}$ | x | $\frac{1 \text{ ton}}{907,185}$ | = | 0.0048 tons |
| | | | | | Total VOC | | 0.0048 tons |

Methodology for PM2.5 emissions estimation:

Direct PM2.5

Direct PM2.5 emissions factors are available for winter, spring, summer and fall seasons. 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 -12.

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:

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

$$\text{Running } 26,846 \times \frac{0.0117 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 0.95 \times 365 \text{ days} = 0.1201 \text{ tons}$$

For the TERMS effective only on weekdays:

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

$$\text{Running } 26,846 \times \frac{0.0117 \text{ grams}}{1 \text{ mi}} \times \frac{1 \text{ ton}}{907,185 \text{ grams}} \times 250 \text{ days} = 0.0866 \text{ tons}$$

NOx precursor emissions estimation:

As conformity assessment criteria for the PM2.5 standards include NOx precursor emissions, we are also required to estimate NOx precursor 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 speed 40 mph are used to estimate cold start and running NOx precursor emissions. Tables 13-15 show the average of the NOx precursor seasonal emissions factors for years 2010, 2020 and 2030.

For the TERMS effective 365 days:

| | | | | | | | | | |
|------------|--------|---|---|---|---|---|------------|---|-------------|
| Cold Start | 0 | x | $\frac{0.6132 \text{ grams}}{1 \text{ trip}}$ | x | $\frac{1 \text{ ton}}{907,185 \text{ grams}}$ | x | 365 | = | 0.0000 tons |
| Running | 26,846 | x | $\frac{0.3825 \text{ grams}}{1 \text{ mi}}$ | x | $\frac{1 \text{ ton}}{907,185}$ | x | 0.95 x 365 | = | 3.9249 tons |
| Total | | | | | | | | | 3.9249 tons |

For the TERMS effective only on weekdays:

| | | | | | | | | | |
|------------|--------|---|---|---|---|---|-----|---|-------------|
| Cold Start | 0 | x | $\frac{0.6132 \text{ grams}}{1 \text{ trip}}$ | x | $\frac{1 \text{ ton}}{907,185 \text{ grams}}$ | x | 250 | = | 0.0000 tons |
| Running | 26,846 | x | $\frac{0.3825 \text{ grams}}{1 \text{ mi}}$ | x | $\frac{1 \text{ ton}}{907,185}$ | x | 250 | = | 2.8298 tons |
| Total | | | | | | | | | 2.8298 tons |

Cost Effectiveness (2010):

Garage cost (given): \$2.177 million

$$\text{NOx} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.0113 \text{ t/d}} = \$25,700 / \text{ton}$$

$$\text{VOC} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.005 \text{ t/d}} = \$60,500 / \text{ton}$$

$$\text{PM2.5} = \frac{\$2.177 \text{ million}}{30 \text{ yr} \times 0.1201 \text{ t/yr}} = \$750,000 / \text{ton}$$

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, last year's "TERM Tracking Sheet" is attached.

TERM TRACKING SHEET - CURRENT MEASURES
IMPLEMENTATION: YEAR 2000 AND LATER
Credits are taken in Air Quality Conformity Analysis FY 2005-2010

* 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/DAY REDUCTION CREDITED | | | | | | 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 | 0.0004 | 0.0006 | 0.0004 | 0.0006 | 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 | 0.0007 | 0.0006 | 0.0008 | 0.0009 | 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 | 0.0004 | 0.0006 | 0.0012 | 0.0018 | C (TCM) |
| 49 | X | 1995-00 | MDOT | MARC Expansion Coaches | X | | | | 1999 | 2004 | 0.0052 | 0.0133 | 0.0033 | 0.0055 | 0.0054 | 0.0145 | C (TCM) |
| 51 | X | 1995-00 | VDOT | Alexandria Telecommuting Pilot Program | X | | | | | 2000 & 2001 | 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 | | | | | C |
| 54 | X | 1995-00 | VDOT | City of Fairfax Bus Shelters | | | | X | 1999 | 2004 | 0.0000 | 0.0005 | 0.0000 | 0.0002 | 0.0000 | 0.0000 | C (TCM) |
| 56 | X | 1995-00 | VDOT | Cherry Hill VRE Access | | | | X | | 2007 | 0.0040 | 0.0114 | 0.0026 | 0.0047 | 0.0023 | 0.0047 | 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 | 0.0030 | C |
| 60 | X | 1995-00 | MCG | White Oak Park and Ride | | | | X | 2010 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0059 | C |
| 61 | X | 1995-00 | MCG | Bicycle Facilities | | | | X | FY99 | | 0.0017 | 0.0009 | 0.0011 | 0.0004 | 0.0012 | 0.0006 | C |
| 62 | X | 1995-00 | MCG | Pedestrian Facilities to Metrorail | | | | X | | | 0.0029 | 0.0038 | 0.0018 | 0.0016 | 0.0015 | 0.0021 | C |
| 63 | X | 1995-00 | MDOT | MARC Replacement Coaches | X | | | | 1999 | 2004 | 0.0023 | 0.0057 | 0.0015 | 0.0024 | 0.0031 | 0.0059 | C |
| 64 | X | 1995-00 | MDOT | MARC Expansion Coaches | X | | | | 1999 | 2004 | 0.0183 | 0.0493 | 0.0118 | 0.0205 | 0.0283 | 0.0482 | C (TCM) |
| 66 | X | 1995-00 | VDOT | Commuter Lots - District Wide | | | | X | varies | 1995, 2000 | 0.0063 | 0.0156 | 0.0040 | 0.0065 | 0.0062 | 0.0157 | C |
| 67 | X | 1995-00 | VDOT | I-66 and Stringfellow Rd. Park and Ride | X | | | | 2000 | 2000 end | 0.0057 | 0.0095 | 0.0037 | 0.0039 | 0.0039 | 0.0059 | 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 | 0.0030 | C |
| 69 | X | 1995-00 | VDOT | Bicycle Trails and Facilities | | | | X | varies | varies | 0.0011 | 0.0081 | 0.0007 | 0.0034 | 0.0074 | 0.0053 | C |
| 70 | X | 1995-00 | VDOT | Improved Accesses to Metrorail Stations | | | | X | varies | 2000-2010 | 0.0003 | 0.0005 | 0.0002 | 0.0002 | 0.0004 | 0.0006 | C |
| 71 | X | 1995-00 | VDOT | I-66 HOV access at Monument Dr. | X | | | | | 1997 | 0.0057 | 0.0095 | 0.0037 | 0.0039 | 0.0004 | 0.0059 | C |
| 72 | X | 1995-00 | DC | Bicycle Facilities | | | | X | | | 0.0137 | 0.0095 | 0.0088 | 0.0039 | 0.0093 | 0.0065 | 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 - CURRENT MEASURES
IMPLEMENTATION: YEAR 2000 AND LATER
Credits are taken in Air Quality Conformity Analysis FY 2005-2010

* 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/DAY REDUCTION CREDITED | | | | | | 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 | 0.0264 | 0.0493 | 0.0165 | 0.0206 | 0.0139 | 0.0172 | C |
| 75 | X | 1995-00 | REGION | M-92 Telecommuting Support | X | | | | | on-going | 0.2069 | 0.3951 | 0.1763 | 0.2256 | 0.1889 | 0.2374 | 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) | | | | 1999 | Summer 2001 | 0.0011 | 0.0014 | 0.0007 | 0.0006 | 0.0008 | 0.0009 | | C |
| 81 | X | 1996-01 | VDOT | Arlington County Metrocheck Program | X | | | 1997 | 1997 Onwards | 0.0011 | 0.0014 | 0.0007 | 0.0006 | 0.0004 | 0.0009 | | C |
| 82 | X | 1996-01 | VDOT | Old Dominion Drive Bike Trail | | | | 2000 | 2004 | 0.0006 | 0.0005 | 0.0004 | 0.0002 | 0.0004 | 0.0003 | | 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 | 0.0006 | 0.0005 | 0.0004 | 0.0002 | 0.0004 | 0.0009 | | C |
| 90 | X | 1996-01 | REGION | M-47c Employer Outreach / Guaranteed Ride Home | X | | | | | on-going | 0.3460 | 0.5748 | 0.2209 | 0.2395 | 0.1777 | 0.1989 | C |
| 91 | X | 1996-01 | REGION | M-70a Bicycle Parking | | | | 1999 | | | 0.0040 | 0.0033 | 0.0026 | 0.0014 | 0.0039 | 0.0030 | C |
| 92 | X | | | M-92 Telecommuting Support ¹ | Combined with item #75 | | | | | | | | | | | | C |
| 95 | X | 1997-02 | MCG | Germantown Transit Center | | | | 2004 | | | 0.0029 | 0.0090 | 0.0018 | 0.0038 | 0.0019 | 0.0053 | 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 | 0.0007 | 0.0001 | 0.0008 | 0.0000 | 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 | 0.0003 | C |
| 108 | X | 1997-02 | MDOT | M-103 Taxicab Replacement in Maryland ² | | X | | 1999 | On-going | 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 | 0.0007 | 0.0007 | 0.0005 | 0.0003 | 0.0003 | 0.0002 | | 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 | 0.0450 | 0.1617 | | | | | | SP |
| 112 | X | 1998-03 | MCG | Montgomery County Bus Replacement | X | | | | | 0.0080 | 0.0270 | | | | | | SP |
| 113 | X | 1998-03 | PG | Prince George's County Bus Replacement | X | | | 1998 | 1998 | 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 | | | | 1999 | delayed | 0.0006 | 0.0005 | 0.0004 | 0.0002 | 0.0004 | 0.0003 | | C |
| 118 | X | 1998-03 | VDOT | Northern Virginia Turn Bays | X | | | 2000 | 1998 | 0.0006 | 0.0008 | 0.0004 | 0.0003 | 0.0008 | 0.0003 | | TR |
| 119 | X | 1998-03 | VDOT | Fairfax City Bus Replacement | | | | 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) | | | | | | Underway | 0.1479 | 0.2237 | 0.0952 | 0.0973 | 0.0752 | 0.0807 | 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 | 0.0029 | 0.0071 | 0.0039 | 0.0136 | | C |

TERM TRACKING SHEET - CURRENT MEASURES
IMPLEMENTATAION: YEAR 2000 AND LATER
Credits are taken in Air Quality Conformity Analysis FY 2005-2010

* 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/DAY REDUCTION CREDITED | | | | | | 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 | 0.0047 | -0.0008 | 0.0079 | -0.0014 | TR |
| 125 | X | 1999-04 | VDOT | Transit Center at 7 Corners | X | | | | 2002 | | 0.0006 | 0.0009 | 0.0004 | 0.0004 | 0.0004 | 0.0006 | 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 | 0.0092 | 0.0109 | 0.0081 | 0.0124 | C |
| 131 | X | 2000-05 | MDOT | Various park and Ride Lots | x | | | | 2002 | 2003 | 0.0040 | 0.0154 | 0.0025 | 0.0064 | 0.0038 | 0.0119 | C |
| 132 | X | 2000-05 | MDOT | Signal Systems | X | | | | Varies | on-going | 0.0017 | 0.0000 | 0.1244 | 0.0000 | 0.0007 | 0.0000 | TR |
| 133 | X | 2000-05 | VDOT | 450 Spaces at Gambrill/Hoos Rds. Park and Ride | | | X | | 2002 | 2004 | 0.0040 | 0.0085 | 0.0026 | 0.0036 | 0.0021 | 0.0041 | C |
| 134 | X | 2000-05 | VDOT | 300 Spaces at Backlick Rd | | | X | | 2003 | 2006 | 0.0029 | 0.0062 | 0.0018 | 0.0026 | 0.0015 | 0.0030 | C |
| 135 | X | 2000-05 | VDOT | Accotink-Gateway Connector Trail | | | X | | 2002 | 2005 | 0.0040 | 0.0047 | 0.0026 | 0.0020 | 0.0018 | 0.0020 | C |
| 136 | X | 2000-05 | VDOT | Columbia Pike Trail | | | X | | 2000 | 2001, 2005 | 0.0034 | 0.0038 | 0.0022 | 0.0016 | 0.0014 | 0.0015 | C |
| 137 | X | 2000-05 | VDOT | Lee Highway trail | | | X | | 2000 | 2005 | 0.0017 | 0.0019 | 0.0011 | 0.0008 | 0.0006 | 0.0008 | C |
| 138 | X | 2000-05 | VDOT | Arlington Bus Shelter Improvements | | | X | | 2005 | 2005 | 0.0006 | 0.0005 | 0.0004 | 0.0002 | 0.0002 | 0.0002 | C |
| 139 | X | 2000-05 | VDOT | Pentagon Metrostation Improvements | X | | | | | 2003 | 0.0046 | 0.0081 | 0.0029 | 0.0034 | 0.0022 | 0.0033 | C |
| 140 | X | 2000-05 | MDOT | East/West Intersection Improvements | | | X | | 2005 | 2005 | 0.0235 | 0.0119 | 0.0151 | 0.0049 | 0.0859 | 0.0337 | C |
| 141 | X | 2001-06 | Feds | Federal Transit/Ridesharing subsidy | X | | | | on-going | | 0.0584 | 0.0905 | 0.0375 | 0.0377 | 0.0286 | 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 | 0.0161 | 0.0414 | 0.0108 | 0.0206 | 0.0100 | 0.0168 | TR |
| 146 | X | 2003-08 | DC | Bicycle Lane in D. C. (35 Mile) | | | X | | 2005 | 2006 | 0.0095 | 0.0085 | 0.0061 | 0.0035 | 0.0046 | 0.0029 | C (TCM) |
| 147 | X | 2003-08 | DC | Bicycle Racks in D. C. (500) | X | | | | 2005 | 2004 | 0.0013 | 0.0009 | 0.0008 | 0.0004 | 0.0006 | 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 | 0.0013 | 0.0013 | 0.0010 | 0.0011 | C (TCM) |
| 149 | | 2003-08 | DC | CNG Rental Cars (18) | | | | X | 2005 | Removed | 0.0000 | 0.0002 | | | | | SP |
| 150 | X | 2003-08 | DC | Sidewalks in D.C. (\$ 5 million) | X | | | | 2005 | 2004 | 0.0358 | 0.0555 | 0.0230 | 0.0231 | 0.0182 | 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 | 0.0084 | 0.0083 | 0.0066 | 0.0069 | C |

TERM TRACKING SHEET - CURRENT MEASURES
IMPLEMENTATION: YEAR 2000 AND LATER
Credits are taken in Air Quality Conformity Analysis FY 2005-2010

* 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/DAY REDUCTION CREDITED | | | | | | Project Category * |
|-----|--------------|--------------|----------|---|-----------------------|-------------|-----------|-----|--------------------------|------------------------|-----------------------------|--------|--------|--------|--------|--------|--------------------|
| | | | | | 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 | 0.0502 | 0.0509 | 0.0398 | 0.0422 | C |
| 155 | | 2003-08 | MDOT | Employer Vanpool Program (WWB) | | | | X | 2005 | Removed | 0.0018 | 0.0041 | | | | | C |
| 156 | X | 2003-08 | MDOT | Green Line Link | | | X | | 2005 | n/a | 0.0026 | 0.0047 | 0.0016 | 0.0019 | 0.0013 | 0.0016 | C |
| 157 | X | 2003-08 | MDOT | Park & Ride Lots - Southern Maryland | | | X | | 2005 | 2003/2005 | 0.0050 | 0.0109 | 0.0032 | 0.0045 | 0.0026 | 0.0038 | C |
| 158 | X | 2003-08 | MDOT | Prince George's County- Bus Exp | | | X | | 2005 | n/a | 0.0359 | 0.0657 | 0.0230 | 0.0273 | 0.0186 | 0.0228 | C |
| 159 | X | 2003-08 | MDOT | MTA - Bus Service Expansion | | | X | | 2005 | n/a | 0.0081 | 0.0157 | 0.0052 | 0.0065 | 0.0042 | 0.0054 | C |
| 160 | X | 2003-08 | MDOT | Ride- On - Super Discount | | | X | | 2005 | n/a | 0.0009 | 0.0014 | 0.0006 | 0.0006 | 0.0005 | 0.0005 | C |
| 161 | X | 2003-08 | Regional | Regional Traveler Information Systems | | | X | | 2005 | | 0.1012 | 0.5401 | 0.0682 | 0.2686 | 0.0686 | 0.2195 | TR |
| 162 | X | 2003-08 | MDOT | Universal Transportation Access (MD + WMATA) | | | X | | 2005 | n/a | 0.0161 | 0.0249 | 0.0103 | 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 | 0.0029 | 0.0044 | 0.0025 | 0.0036 | C (TCM) |
| 164 | X | 2003-08 | MCG | Bethesda Shuttle Bus Services | X | | | | 2004 | | 0.0031 | 0.0048 | 0.0020 | 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 | 0.0004 | 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 | 0.0007 | 0.0007 | 0.0005 | 0.0006 | C |
| 168 | X | 2003-08 | MCG | Annual Sidewalk Program | X | | | | 2004 | | 0.0171 | 0.0264 | 0.0110 | 0.0110 | 0.0087 | 0.0091 | C |
| 169 | X | 2003-08 | MDOT | Bethesda Breeze/International Express Metrobus | | | X | | 2005 | n/a | 0.0037 | 0.0053 | 0.0024 | 0.0022 | 0.0019 | 0.0018 | C |
| 170 | X | 2003-08 | MDOT | Bethesda-8, Silver Spring Downtown Dasher and Prince Georges Co. Shuttles at 3 PNR lot | | | X | | 2005 | n/a | 0.0088 | 0.0104 | 0.0057 | 0.0043 | 0.0043 | 0.0036 | C |
| 171 | | 2003-08 | MDOT | Proposed Transportation Management District in Montgomery County (Rockville and Gaithersburg) | | | | X | 2005 | Removed | 0.0057 | 0.0078 | 0.0037 | 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 | 0.0060 | 0.0061 | 0.0047 | 0.0051 | C |
| 173 | X | 2003-08 | MDOT | Neighborhood Sidewalks Improvements (Bike/Pedestrian) | X | | | | 2005 | 2004 | 0.0032 | 0.0017 | 0.0021 | 0.0007 | 0.0015 | 0.0005 | C |
| 174 | X | 2003-08 | MDOT | Neighborhood Conservation Program - Neighborhood Sidewalks Improvements (Bikes/Pedestrian) | | X | | | 2005 | n/a | 0.0028 | 0.0014 | 0.0018 | 0.0006 | 0.0013 | 0.0005 | C |
| 175 | X | 2003-08 | MDOT | Maryland bus Transit Service Expansion | X | | | | 2005 | 2004 | 0.0141 | 0.0323 | 0.0091 | 0.0134 | 0.0076 | 0.0112 | C |
| 176 | X | 2003-08 | VDOT | Universal Transportation Access Program | | | X | | 2005 | 2005 | 0.0012 | 0.0019 | 0.0008 | 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 | 0.0014 | 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 | 0.0005 | 0.0005 | 0.0004 | 0.0004 | C |
| 180 | X | 2003-08 | VDOT | Commuter Choice | | | X | | 2005 | | 0.0010 | 0.0014 | 0.0006 | 0.0006 | 0.0005 | 0.0005 | C |
| 181 | X | 2003-08 | VDOT | Employer Shuttle Services | | | X | | 2005 | | 0.0114 | 0.0186 | 0.0073 | 0.0069 | 0.0057 | 0.0057 | C |

TERM TRACKING SHEET - CURRENT MEASURES
IMPLEMENTATION: YEAR 2000 AND LATER
Credits are taken in Air Quality Conformity Analysis FY 2005-2010

* 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/DAY REDUCTION CREDITED | | | | | | Project Category * |
|------------------------------------|--------------|--------------|--------|---|-----------------------|-------------|-----------|-----|--------------------------|------------------------|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------------|
| | | | | | FULL | SCALED-BACK | UNDER-WAY | REM | | | 2010 | | 2020 | | 2030 | | |
| | | | | | | | | | | | VOC | NOX | VOC | NOX | VOC | NOX | |
| 184 | X | 2003-08 | VDOT | Van Start / Van Save | | | X | | 2005 | till 2006 | 0.0014 | 0.0026 | | | | | C |
| 185 | X | 2003-08 | VDOT | Metro Shuttle Bus | | | X | | 2005 | 1999-2005 | 0.0012 | 0.0026 | 0.0008 | 0.0011 | 0.0006 | 0.0009 | C |
| 187 | X | 2003-08 | VDOT | VRE Mid-Day Train Service | X | | | | 2005 | 2002 | 0.0016 | 0.0029 | 0.0010 | 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 | | | | | C |
| 191 | X | 2003-08 | VDOT | Town of Leesburg P&R Lot | | | X | | 2005 | 2004 | 0.0019 | 0.0039 | 0.0012 | 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 | 0.0072 | 0.0093 | 0.0059 | 0.0078 | C |
| 193 | X | 2003-08 | VDOT | Additional Parking at 4 Metro stations | | | X | | 2005 | 2001, 2005 | 0.0145 | 0.0333 | 0.0093 | 0.0139 | 0.0078 | 0.0116 | 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 | 0.0005 | 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 | 0.0008 | 0.0008 | 0.0006 | 0.0007 | C (TCM) |
| 202 | | 2003-08 | MDOT | Fleet Replacement (state auto fleet, gas to hybrid, 250 vehicles) | | | | X | 2005 | Removed | 0.0055 | 0.0133 | 0.0022 | 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 | Removed | 0.0075 | 0.0122 | 0.0048 | 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 | 0.0017 | 0.0025 | 0.0014 | 0.0021 | C |
| 206 | | 2003-08 | MDOT | Additional Bike Lockers at Metro-Stations | | | | X | 2005 | Removed | 0.0132 | 0.0209 | 0.0085 | 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 | 0.0166 | 0.0060 | 0.0069 | 0.0048 | 0.0057 | C |
| 208 | | 2003-08 | MDOT | CNG Fueling Stations | | | | X | 2005 | Removed | 0.1270 | 0.1170 | | | | | 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 |
| 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 | 0.0014 | 0.0022 | 0.0009 | 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 | 0.0004 | 0.0002 | 0.0003 | 0.0002 | C |
| 213 | | 2003-08 | MDOT | Transit Prioritization - Queue Jumps | | | | X | 2005 | Removed | 0.0031 | 0.0037 | 0.0020 | 0.0016 | 0.0015 | 0.0013 | C |
| 214 | X | 2003-08 | MDOT | Commuter Choice Benefit/Tax Credit - Marketing Expansion | | | X | | 2005 | n/a | 0.0546 | 0.0859 | 0.0351 | 0.0358 | 0.0278 | 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 | 0.0038 | 0.0036 | 0.0030 | 0.0030 | C |
| 216 | X | 2003-08 | MDOT | Telecommuting Expansion ¹ | X | | | | 2005 | n/a | 0.0645 | 0.1208 | 0.0414 | 0.0503 | 0.0336 | 0.0419 | C |
| 217 | | 2003-08 | MDOT | Replace older Diesel Engine in Public Sector vehicles | | | | X | 2005 | Removed | 0.0237 | 0.1300 | | | | | H |
| 218 | X | 2003-08 | VDOT | MV-92 Telecommuting Program - Expanded ¹ | X | | | | 2005 | 2003 | 0.0689 | 0.1291 | 0.0442 | 0.0537 | 0.0359 | 0.0447 | C |
| 219 | X | 2003-08 | VDOT | MV-123 Employer Outreach for Public Sector Employees ² | X | | | | 2005 | 2003 | 0.0153 | 0.0237 | 0.0098 | 0.0099 | 0.0078 | 0.0082 | C |
| 220 | X | 2003-08 | REGION | Signal System Optimization | | | X | | 2005 | 2005 | 0.4272 | 0.1510 | 0.2879 | 0.0751 | 0.2896 | 0.0613 | TR |
| Available Emissions Credits | | | | | | | | | | | 2.467 | 5.072 | 1.826 | 1.436 | 1.689 | 1.319 | |

TRANSPORTATION EMISSION REDUCTION MEASURES (CLRP Projects Only)

Credited in Air Quality Conformity Analyses (calendar years 1993-2004)
(TRACKING SHEET)

Project Category: TR - Traffic Stream, C - Commute, H - Engine Technology (Heavy Duty 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 | | | | | | | 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 | | | | | | | 0.0000 | 0.0000 | 0.0004 | 0.0012 | 0.0003 | 0.0007 | C |
| 229 | X | 1997-02 TIP | MGC | White Oak Park and Ride | | | | | | | 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 | 0.5994 | 0.1743 | 0.5621 | 0.3516 | 0.6804 |
|------------|---------|--------|--------|--------|--------|--------|

| | | | | | | |
|--|-------|-------|-------|-------|-------|-------|
| GRAND TOTAL (Current Measures + CLRP plan) | 2.460 | 5.671 | 2.000 | 1.998 | 2.041 | 1.999 |
|--|-------|-------|-------|-------|-------|-------|

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