

Appendix I

EMISSION SENSITIVITY TABLES (All Vehicles Combined)

This appendix presents tables of the following emission factors for all highway mobile sources combined, for several calendar years between 1990 and 2020:

1. Average exhaust emission factors for various ambient temperatures, cold/hot start VMT weightings, and for a range of average speed combinations.
2. Average emission factors by component under FTP cold/hot start VMT weightings (20.6/27.3/20.6) and FTP average speed (19.6 mph) for different levels of fuel volatility (in psi), and for a range of "typical" ambient temperature profiles.

Also included is a compilation of the average national emission factors as generated from the standard test conditions and other scenarios that can be used to assess the sensitivity of emission factors to changing input conditions. All emission factors are expressed in units of grams of pollutant per vehicle mile traveled, with the exception of idle emission factors which are in units of grams of pollutant per hour. The exhaust hydrocarbon (HC) emissions are expressed as non-methane hydrocarbon (NMHC) emissions, and the evaporative HC emissions include crankcase emissions.

The emission factors presented in this section are intended primarily to assist in the estimation of mobile source emissions for large areas, such as an air quality control region or the entire nation. Use of the computational techniques presented in this volume is also recommended for the derivation of localized emission estimates (such as in air quality modeling) and for evaluation of air pollutant control strategies.

Emission estimates are affected by many factors that vary with geographic location and the estimation conditions. The more significant factors include average speed, percentage of vehicle miles traveled (VMT) in cold/hot start vehicle operation, percentage of travel by vehicle type, average ambient temperature profile, and level of fuel volatility. The virtually limitless number of combinations and permutations possible among these variables precludes presentation here of emission factors for all possible sets of conditions. The emission factors presented here are thus limited to a finite number of cases. The presentation is also characterized by the following features:

1. The VMT mixes are calculated from MOBILE5 and are tabulated below.

| Calendar Year | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1980 | 0.708 | 0.129 | 0.085 | 0.015 | 0.006 | 0.001 | 0.045 | 0.010 |
| 1988 | 0.708 | 0.128 | 0.086 | 0.015 | 0.013 | 0.004 | 0.036 | 0.010 |
| 1990 | 0.710 | 0.127 | 0.086 | 0.015 | 0.013 | 0.004 | 0.034 | 0.010 |
| 1995 | 0.703 | 0.122 | 0.085 | 0.015 | 0.023 | 0.011 | 0.030 | 0.010 |
| 2000 | 0.693 | 0.116 | 0.085 | 0.015 | 0.035 | 0.017 | 0.029 | 0.010 |
| 2010 | 0.685 | 0.112 | 0.086 | 0.015 | 0.043 | 0.021 | 0.029 | 0.010 |

2. Each of the exhaust emission factor tables (designated by 1.x) represents one average speed. Emissions are presented for seven different speeds: 2.5, 5.0, 10.0, 19.6, 35.0, 55.0, and 65.0 mph. Each table includes six calendar years: 1990, 1995, 2000, 2005, 2010, and 2020. For each calendar year, 35 emission factors are provided (five temperatures and seven sets of operating mode fractions). The temperatures are: 0°, 25°, 50°, 75°, and 100°F. The seven operating mode combinations are listed below in MOBILE5 input codes together with a descriptive explanation of each code designation.

| | MOBILE5 Input Code | Descriptive Explanation |
|----|--------------------|--|
| 1. | 0/0/0 | 100% Stabilized |
| 2. | 0/100/0 | 100% Hot Start |
| 3. | 100/0/100 | 100% Cold Start |
| 4. | 50/0/50 | 50% Cold Start, 50% Stabilized |
| 5. | 0/50/0 | 50% Hot Start, 50% Stabilized |
| 6. | 50/50/50 | 50% Cold Start, 50% Hot Start |
| 7. | 20.6/27.3/20.6 | 20.6% Cold Start, 52.1% Stabilized, and 27.3% Hot Start (FTP conditions) |

3. For the emission factors by component tables (designated by 2.x), all emissions are based on FTP operating mode with 19.6 mph average speed. Each table represents one typical ambient temperature profile. The given temperature profile in MOBILE5 determines the temperatures used to correct all emission factors for temperature effects: exhaust HC, CO, and NO_x, and evaporative hot soak, diurnal, refueling, resting loss, and running loss emissions. The four temperature profiles used are listed below.

| Descriptive Name of Temperature Profile | Temperature in °F | | | | |
|--|-------------------|---------|----------------------|-----------------------|------------------------------|
| | Diurnal Emissions | | Exhaust Emissions | Hot Soak Emissions | Running Loss Emissions |
| | Minimum | Maximum | | | |
| 1 FTP Conditions | 60.0 | 84.0 | 78.1 | 80.2 | 81.0 |
| 2 ASTM Class A | 66.9 | 95.1 | 88.3 | 90.3 | 91.3 |
| 3 ASTM Class B | 71.2 | 91.6 | 87.0 | 88.1 | 88.8 |
| 4 ASTM Class C | 65.9 | 85.0 | 80.6 | 81.8 | 82.5 |

4. Each table presents emission factors for six calendar years (1990, 1995, 2000, 2005, 2010, and 2020). Under each calendar year, emission factors are presented for the following six fuel volatility levels: 7.0, 8.0, 9.0, 10.0, 10.4, and 11.5 psi RVP.

The seven emissions components are:

Combined NMHC emissions (includes exhaust, evaporative, refueling, running loss, and resting loss emissions)

Exhaust NMHC

Evaporative NMHC (includes diurnal and hot soak emissions)

Refueling loss NMHC

Running loss NMHC

Exhaust carbon monoxide (CO)

Exhaust oxides of nitrogen (NO_x)

TABLE 1.01

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|-------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 20.19 | 16.90 | 14.22 | 12.04 | 17.03 |
| 1990 | 0.0 | 100.0 | 0.0 | 21.30 | 19.43 | 17.86 | 16.53 | 23.16 |
| 1990 | 100.0 | 0.0 | 100.0 | 197.77 | 100.05 | 51.60 | 27.20 | 23.20 |
| 1990 | 50.0 | 0.0 | 50.0 | 90.50 | 49.67 | 28.86 | 17.91 | 19.39 |
| 1990 | 0.0 | 50.0 | 0.0 | 20.52 | 17.79 | 15.56 | 13.72 | 19.30 |
| 1990 | 50.0 | 50.0 | 50.0 | 109.54 | 59.74 | 34.73 | 21.87 | 23.18 |
| 1990 | 20.6 | 27.3 | 20.6 | 49.13 | 30.79 | 20.94 | 15.35 | 19.24 |
| 1995 | 0.0 | 0.0 | 0.0 | 14.56 | 12.02 | 9.96 | 8.28 | 10.26 |
| 1995 | 0.0 | 100.0 | 0.0 | 17.23 | 14.95 | 13.05 | 11.45 | 13.62 |
| 1995 | 100.0 | 0.0 | 100.0 | 148.27 | 72.83 | 36.43 | 18.62 | 17.52 |
| 1995 | 50.0 | 0.0 | 50.0 | 68.03 | 36.20 | 20.39 | 12.28 | 13.03 |
| 1995 | 0.0 | 50.0 | 0.0 | 15.44 | 13.04 | 11.07 | 9.44 | 11.47 |
| 1995 | 50.0 | 50.0 | 50.0 | 82.75 | 43.89 | 24.74 | 15.04 | 15.57 |
| 1995 | 20.6 | 27.3 | 20.6 | 36.90 | 22.46 | 14.82 | 10.55 | 12.05 |
| 2000 | 0.0 | 0.0 | 0.0 | 11.90 | 9.69 | 7.92 | 6.49 | 7.47 |
| 2000 | 0.0 | 100.0 | 0.0 | 14.84 | 12.59 | 10.71 | 9.14 | 9.88 |
| 2000 | 100.0 | 0.0 | 100.0 | 106.00 | 53.69 | 27.58 | 14.41 | 14.10 |
| 2000 | 50.0 | 0.0 | 50.0 | 49.03 | 26.91 | 15.50 | 9.45 | 9.91 |
| 2000 | 0.0 | 50.0 | 0.0 | 12.75 | 10.59 | 8.82 | 7.37 | 8.24 |
| 2000 | 50.0 | 50.0 | 50.0 | 60.42 | 33.14 | 19.15 | 11.77 | 11.99 |
| 2000 | 20.6 | 27.3 | 20.6 | 27.47 | 17.17 | 11.47 | 8.15 | 8.86 |
| 2005 | 0.0 | 0.0 | 0.0 | 10.66 | 8.64 | 7.02 | 5.72 | 6.24 |
| 2005 | 0.0 | 100.0 | 0.0 | 13.68 | 11.48 | 9.65 | 8.12 | 8.24 |
| 2005 | 100.0 | 0.0 | 100.0 | 83.88 | 44.11 | 23.42 | 12.60 | 12.62 |
| 2005 | 50.0 | 0.0 | 50.0 | 39.13 | 22.29 | 13.22 | 8.22 | 8.53 |
| 2005 | 0.0 | 50.0 | 0.0 | 11.47 | 9.45 | 7.81 | 6.47 | 6.82 |
| 2005 | 50.0 | 50.0 | 50.0 | 48.78 | 27.79 | 16.53 | 10.36 | 10.43 |
| 2005 | 20.6 | 27.3 | 20.6 | 22.61 | 14.57 | 9.92 | 7.10 | 7.44 |
| 2010 | 0.0 | 0.0 | 0.0 | 10.35 | 8.37 | 6.79 | 5.52 | 6.01 |
| 2010 | 0.0 | 100.0 | 0.0 | 13.29 | 11.15 | 9.36 | 7.87 | 7.97 |
| 2010 | 100.0 | 0.0 | 100.0 | 77.84 | 41.61 | 22.41 | 12.20 | 12.20 |
| 2010 | 50.0 | 0.0 | 50.0 | 36.40 | 21.07 | 12.65 | 7.93 | 8.21 |
| 2010 | 0.0 | 50.0 | 0.0 | 11.11 | 9.15 | 7.55 | 6.24 | 6.55 |
| 2010 | 50.0 | 50.0 | 50.0 | 45.57 | 26.38 | 15.89 | 10.04 | 10.09 |
| 2010 | 20.6 | 27.3 | 20.6 | 21.26 | 13.88 | 9.52 | 6.84 | 7.15 |
| 2020 | 0.0 | 0.0 | 0.0 | 10.22 | 8.27 | 6.70 | 5.45 | 5.93 |
| 2020 | 0.0 | 100.0 | 0.0 | 13.11 | 10.98 | 9.22 | 7.75 | 7.84 |
| 2020 | 100.0 | 0.0 | 100.0 | 74.14 | 40.06 | 21.78 | 11.96 | 11.97 |
| 2020 | 50.0 | 0.0 | 50.0 | 34.79 | 20.36 | 12.33 | 7.78 | 8.06 |
| 2020 | 0.0 | 50.0 | 0.0 | 10.95 | 9.01 | 7.43 | 6.14 | 6.45 |
| 2020 | 50.0 | 50.0 | 50.0 | 43.63 | 25.52 | 15.50 | 9.85 | 9.90 |
| 2020 | 20.6 | 27.3 | 20.6 | 20.50 | 13.51 | 9.32 | 6.72 | 7.02 |

TABLE 1.01: EXHAUST NMHC AT 2.5 MPH

TABLE 1.02

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|-------|-------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 11.32 | 9.53 | 8.07 | 6.87 | 9.54 |
| 1990 | 0.0 | 100.0 | 0.0 | 11.90 | 10.87 | 10.00 | 9.27 | 12.83 |
| 1990 | 100.0 | 0.0 | 100.0 | 106.15 | 54.03 | 28.11 | 15.01 | 12.87 |
| 1990 | 50.0 | 0.0 | 50.0 | 48.87 | 27.07 | 15.92 | 10.02 | 10.81 |
| 1990 | 0.0 | 50.0 | 0.0 | 11.49 | 10.00 | 8.77 | 7.76 | 10.76 |
| 1990 | 50.0 | 50.0 | 50.0 | 59.03 | 32.45 | 19.06 | 12.14 | 12.85 |
| 1990 | 20.6 | 27.3 | 20.6 | 26.77 | 16.96 | 11.66 | 8.65 | 10.73 |
| 1995 | 0.0 | 0.0 | 0.0 | 8.14 | 6.76 | 5.63 | 4.71 | 5.79 |
| 1995 | 0.0 | 100.0 | 0.0 | 9.58 | 8.33 | 7.29 | 6.41 | 7.60 |
| 1995 | 100.0 | 0.0 | 100.0 | 79.67 | 39.38 | 19.87 | 10.30 | 9.73 |
| 1995 | 50.0 | 0.0 | 50.0 | 36.73 | 19.72 | 11.24 | 6.87 | 7.29 |
| 1995 | 0.0 | 50.0 | 0.0 | 8.62 | 7.30 | 6.22 | 5.33 | 6.44 |
| 1995 | 50.0 | 50.0 | 50.0 | 44.63 | 23.85 | 13.58 | 8.35 | 8.66 |
| 1995 | 20.6 | 27.3 | 20.6 | 20.09 | 12.35 | 8.24 | 5.93 | 6.76 |
| 2000 | 0.0 | 0.0 | 0.0 | 6.73 | 5.51 | 4.52 | 3.72 | 4.28 |
| 2000 | 0.0 | 100.0 | 0.0 | 8.34 | 7.08 | 6.04 | 5.17 | 5.59 |
| 2000 | 100.0 | 0.0 | 100.0 | 57.73 | 29.40 | 15.23 | 8.06 | 7.90 |
| 2000 | 50.0 | 0.0 | 50.0 | 26.84 | 14.85 | 8.64 | 5.34 | 5.61 |
| 2000 | 0.0 | 50.0 | 0.0 | 7.19 | 5.99 | 5.01 | 4.20 | 4.69 |
| 2000 | 50.0 | 50.0 | 50.0 | 33.03 | 18.24 | 10.63 | 6.61 | 6.74 |
| 2000 | 20.6 | 27.3 | 20.6 | 15.16 | 9.56 | 6.45 | 4.63 | 5.03 |
| 2005 | 0.0 | 0.0 | 0.0 | 6.09 | 4.96 | 4.05 | 3.32 | 3.62 |
| 2005 | 0.0 | 100.0 | 0.0 | 7.75 | 6.52 | 5.49 | 4.64 | 4.72 |
| 2005 | 100.0 | 0.0 | 100.0 | 46.23 | 24.43 | 13.07 | 7.11 | 7.13 |
| 2005 | 50.0 | 0.0 | 50.0 | 21.69 | 12.45 | 7.45 | 4.70 | 4.87 |
| 2005 | 0.0 | 50.0 | 0.0 | 6.53 | 5.40 | 4.48 | 3.73 | 3.93 |
| 2005 | 50.0 | 50.0 | 50.0 | 26.99 | 15.47 | 9.28 | 5.87 | 5.92 |
| 2005 | 20.6 | 27.3 | 20.6 | 12.64 | 8.21 | 5.64 | 4.08 | 4.27 |
| 2010 | 0.0 | 0.0 | 0.0 | 5.94 | 4.83 | 3.94 | 3.22 | 3.49 |
| 2010 | 0.0 | 100.0 | 0.0 | 7.57 | 6.36 | 5.36 | 4.52 | 4.58 |
| 2010 | 100.0 | 0.0 | 100.0 | 43.12 | 23.15 | 12.55 | 6.91 | 6.91 |
| 2010 | 50.0 | 0.0 | 50.0 | 20.29 | 11.83 | 7.17 | 4.55 | 4.71 |
| 2010 | 0.0 | 50.0 | 0.0 | 6.36 | 5.25 | 4.35 | 3.62 | 3.80 |
| 2010 | 50.0 | 50.0 | 50.0 | 25.34 | 14.76 | 8.95 | 5.71 | 5.75 |
| 2010 | 20.6 | 27.3 | 20.6 | 11.95 | 7.86 | 5.44 | 3.95 | 4.12 |
| 2020 | 0.0 | 0.0 | 0.0 | 5.89 | 4.79 | 3.90 | 3.19 | 3.46 |
| 2020 | 0.0 | 100.0 | 0.0 | 7.49 | 6.29 | 5.29 | 4.46 | 4.52 |
| 2020 | 100.0 | 0.0 | 100.0 | 41.21 | 22.36 | 12.24 | 6.79 | 6.80 |
| 2020 | 50.0 | 0.0 | 50.0 | 19.47 | 11.47 | 7.01 | 4.48 | 4.64 |
| 2020 | 0.0 | 50.0 | 0.0 | 6.30 | 5.20 | 4.30 | 3.58 | 3.75 |
| 2020 | 50.0 | 50.0 | 50.0 | 24.35 | 14.32 | 8.77 | 5.63 | 5.66 |
| 2020 | 20.6 | 27.3 | 20.6 | 11.57 | 7.68 | 5.35 | 3.90 | 4.07 |

TABLE 1.02: EXHAUST NMHC AT 5.0 MPH

TABLE 1.03

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|-------|-------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 6.16 | 5.20 | 4.41 | 3.77 | 5.16 |
| 1990 | 0.0 | 100.0 | 0.0 | 6.51 | 5.93 | 5.44 | 5.03 | 6.86 |
| 1990 | 100.0 | 0.0 | 100.0 | 56.73 | 28.88 | 15.06 | 8.09 | 7.01 |
| 1990 | 50.0 | 0.0 | 50.0 | 26.20 | 14.54 | 8.59 | 5.44 | 5.87 |
| 1990 | 0.0 | 50.0 | 0.0 | 6.27 | 5.46 | 4.79 | 4.24 | 5.79 |
| 1990 | 50.0 | 50.0 | 50.0 | 31.62 | 17.41 | 10.25 | 6.56 | 6.94 |
| 1990 | 20.6 | 27.3 | 20.6 | 14.42 | 9.16 | 6.33 | 4.71 | 5.79 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.61 | 3.83 | 3.20 | 2.69 | 3.27 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.44 | 4.72 | 4.13 | 3.63 | 4.26 |
| 1995 | 100.0 | 0.0 | 100.0 | 44.13 | 21.88 | 11.10 | 5.80 | 5.52 |
| 1995 | 50.0 | 0.0 | 50.0 | 20.40 | 11.00 | 6.31 | 3.89 | 4.13 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.88 | 4.14 | 3.53 | 3.03 | 3.63 |
| 1995 | 50.0 | 50.0 | 50.0 | 24.79 | 13.30 | 7.62 | 4.72 | 4.89 |
| 1995 | 20.6 | 27.3 | 20.6 | 11.21 | 6.93 | 4.65 | 3.37 | 3.82 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.96 | 3.25 | 2.67 | 2.21 | 2.52 |
| 2000 | 0.0 | 100.0 | 0.0 | 4.90 | 4.17 | 3.56 | 3.04 | 3.27 |
| 2000 | 100.0 | 0.0 | 100.0 | 33.13 | 16.95 | 8.83 | 4.72 | 4.64 |
| 2000 | 50.0 | 0.0 | 50.0 | 15.45 | 8.60 | 5.04 | 3.14 | 3.30 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.23 | 3.53 | 2.96 | 2.49 | 2.76 |
| 2000 | 50.0 | 50.0 | 50.0 | 19.01 | 10.56 | 6.19 | 3.88 | 3.96 |
| 2000 | 20.6 | 27.3 | 20.6 | 8.78 | 5.57 | 3.78 | 2.73 | 2.96 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.67 | 3.00 | 2.46 | 2.03 | 2.20 |
| 2005 | 0.0 | 100.0 | 0.0 | 4.65 | 3.92 | 3.31 | 2.80 | 2.85 |
| 2005 | 100.0 | 0.0 | 100.0 | 27.23 | 14.45 | 7.77 | 4.26 | 4.28 |
| 2005 | 50.0 | 0.0 | 50.0 | 12.82 | 7.40 | 4.47 | 2.84 | 2.95 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.93 | 3.26 | 2.71 | 2.27 | 2.39 |
| 2005 | 50.0 | 50.0 | 50.0 | 15.94 | 9.19 | 5.54 | 3.54 | 3.57 |
| 2005 | 20.6 | 27.3 | 20.6 | 7.51 | 4.91 | 3.40 | 2.47 | 2.59 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.61 | 2.94 | 2.41 | 1.98 | 2.14 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.57 | 3.85 | 3.25 | 2.75 | 2.79 |
| 2010 | 100.0 | 0.0 | 100.0 | 25.59 | 13.79 | 7.52 | 4.17 | 4.18 |
| 2010 | 50.0 | 0.0 | 50.0 | 12.09 | 7.08 | 4.32 | 2.77 | 2.86 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.86 | 3.19 | 2.65 | 2.21 | 2.32 |
| 2010 | 50.0 | 50.0 | 50.0 | 15.08 | 8.82 | 5.38 | 3.46 | 3.48 |
| 2010 | 20.6 | 27.3 | 20.6 | 7.16 | 4.74 | 3.30 | 2.41 | 2.52 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.59 | 2.93 | 2.40 | 1.97 | 2.13 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.54 | 3.82 | 3.22 | 2.73 | 2.76 |
| 2020 | 100.0 | 0.0 | 100.0 | 24.57 | 13.37 | 7.35 | 4.11 | 4.12 |
| 2020 | 50.0 | 0.0 | 50.0 | 11.65 | 6.90 | 4.25 | 2.74 | 2.84 |
| 2020 | 0.0 | 50.0 | 0.0 | 3.83 | 3.17 | 2.64 | 2.20 | 2.31 |
| 2020 | 50.0 | 50.0 | 50.0 | 14.55 | 8.60 | 5.29 | 3.42 | 3.44 |
| 2020 | 20.6 | 27.3 | 20.6 | 6.96 | 4.65 | 3.26 | 2.39 | 2.49 |

TABLE 1.03: EXHAUST NMHC AT 10.0 MPH

TABLE 1.04

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|-------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.43 | 2.90 | 2.46 | 2.11 | 2.85 |
| 1990 | 0.0 | 100.0 | 0.0 | 3.67 | 3.33 | 3.05 | 2.82 | 3.80 |
| 1990 | 100.0 | 0.0 | 100.0 | 32.51 | 16.47 | 8.55 | 4.57 | 3.99 |
| 1990 | 50.0 | 0.0 | 50.0 | 14.97 | 8.26 | 4.85 | 3.06 | 3.29 |
| 1990 | 0.0 | 50.0 | 0.0 | 3.50 | 3.05 | 2.68 | 2.37 | 3.20 |
| 1990 | 50.0 | 50.0 | 50.0 | 18.09 | 9.90 | 5.80 | 3.69 | 3.89 |
| 1990 | 20.6 | 27.3 | 20.6 | 8.19 | 5.17 | 3.56 | 2.64 | 3.22 |
| 1995 | 0.0 | 0.0 | 0.0 | 2.72 | 2.27 | 1.89 | 1.59 | 1.91 |
| 1995 | 0.0 | 100.0 | 0.0 | 3.25 | 2.82 | 2.46 | 2.16 | 2.50 |
| 1995 | 100.0 | 0.0 | 100.0 | 26.63 | 13.21 | 6.70 | 3.50 | 3.34 |
| 1995 | 50.0 | 0.0 | 50.0 | 12.27 | 6.61 | 3.78 | 2.33 | 2.46 |
| 1995 | 0.0 | 50.0 | 0.0 | 2.90 | 2.46 | 2.10 | 1.80 | 2.12 |
| 1995 | 50.0 | 50.0 | 50.0 | 14.94 | 8.02 | 4.58 | 2.83 | 2.92 |
| 1995 | 20.6 | 27.3 | 20.6 | 6.72 | 4.14 | 2.77 | 2.00 | 2.25 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.48 | 2.03 | 1.67 | 1.39 | 1.57 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.09 | 2.63 | 2.24 | 1.92 | 2.04 |
| 2000 | 100.0 | 0.0 | 100.0 | 20.98 | 10.75 | 5.61 | 2.99 | 2.95 |
| 2000 | 50.0 | 0.0 | 50.0 | 9.76 | 5.43 | 3.19 | 1.98 | 2.08 |
| 2000 | 0.0 | 50.0 | 0.0 | 2.65 | 2.21 | 1.86 | 1.56 | 1.72 |
| 2000 | 50.0 | 50.0 | 50.0 | 12.03 | 6.69 | 3.93 | 2.46 | 2.50 |
| 2000 | 20.6 | 27.3 | 20.6 | 5.53 | 3.51 | 2.38 | 1.72 | 1.85 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.38 | 1.94 | 1.59 | 1.31 | 1.43 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.03 | 2.55 | 2.16 | 1.83 | 1.86 |
| 2005 | 100.0 | 0.0 | 100.0 | 17.82 | 9.47 | 5.09 | 2.80 | 2.80 |
| 2005 | 50.0 | 0.0 | 50.0 | 8.36 | 4.83 | 2.91 | 1.85 | 1.92 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.55 | 2.12 | 1.76 | 1.47 | 1.55 |
| 2005 | 50.0 | 50.0 | 50.0 | 10.42 | 6.01 | 3.63 | 2.31 | 2.33 |
| 2005 | 20.6 | 27.3 | 20.6 | 4.89 | 3.20 | 2.21 | 1.61 | 1.68 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.35 | 1.92 | 1.57 | 1.29 | 1.40 |
| 2010 | 0.0 | 100.0 | 0.0 | 2.99 | 2.52 | 2.13 | 1.81 | 1.83 |
| 2010 | 100.0 | 0.0 | 100.0 | 16.90 | 9.10 | 4.96 | 2.75 | 2.75 |
| 2010 | 50.0 | 0.0 | 50.0 | 7.96 | 4.66 | 2.84 | 1.82 | 1.88 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.52 | 2.09 | 1.74 | 1.45 | 1.52 |
| 2010 | 50.0 | 50.0 | 50.0 | 9.94 | 5.81 | 3.55 | 2.28 | 2.29 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.70 | 3.11 | 2.16 | 1.58 | 1.65 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.34 | 1.91 | 1.57 | 1.29 | 1.40 |
| 2020 | 0.0 | 100.0 | 0.0 | 2.98 | 2.51 | 2.12 | 1.80 | 1.82 |
| 2020 | 100.0 | 0.0 | 100.0 | 16.30 | 8.86 | 4.87 | 2.72 | 2.72 |
| 2020 | 50.0 | 0.0 | 50.0 | 7.71 | 4.56 | 2.80 | 1.80 | 1.87 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.51 | 2.08 | 1.73 | 1.44 | 1.51 |
| 2020 | 50.0 | 50.0 | 50.0 | 9.64 | 5.69 | 3.49 | 2.26 | 2.27 |
| 2020 | 20.6 | 27.3 | 20.6 | 4.59 | 3.06 | 2.14 | 1.57 | 1.64 |

TABLE 1.04: EXHAUST NMHC AT 19.6 MPH

TABLE 1.05

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start VMT Percentages | | | Combined for Eight Vehicle Types @ Ambient Temperature | | | | |
|--------------|-----------------------------------|-------|-------|---|------|------|------|------|
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 2.00 | 1.69 | 1.44 | 1.23 | 1.65 |
| 1990 | 0.0 | 100.0 | 0.0 | 2.17 | 1.97 | 1.80 | 1.66 | 2.21 |
| 1990 | 100.0 | 0.0 | 100.0 | 19.90 | 9.98 | 5.13 | 2.71 | 2.38 |
| 1990 | 50.0 | 0.0 | 50.0 | 9.14 | 4.98 | 2.89 | 1.81 | 1.93 |
| 1990 | 0.0 | 50.0 | 0.0 | 2.06 | 1.79 | 1.57 | 1.39 | 1.86 |
| 1990 | 50.0 | 50.0 | 50.0 | 11.04 | 5.98 | 3.46 | 2.18 | 2.29 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.95 | 3.09 | 2.11 | 1.55 | 1.88 |
| 1995 | 0.0 | 0.0 | 0.0 | 1.67 | 1.39 | 1.16 | 0.97 | 1.16 |
| 1995 | 0.0 | 100.0 | 0.0 | 2.01 | 1.74 | 1.51 | 1.33 | 1.52 |
| 1995 | 100.0 | 0.0 | 100.0 | 16.77 | 8.25 | 4.15 | 2.14 | 2.05 |
| 1995 | 50.0 | 0.0 | 50.0 | 7.72 | 4.12 | 2.34 | 1.43 | 1.50 |
| 1995 | 0.0 | 50.0 | 0.0 | 1.78 | 1.51 | 1.29 | 1.10 | 1.29 |
| 1995 | 50.0 | 50.0 | 50.0 | 9.39 | 4.99 | 2.83 | 1.74 | 1.78 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.21 | 2.57 | 1.71 | 1.23 | 1.37 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.50 | 1.23 | 1.01 | 0.84 | 0.94 |
| 2000 | 0.0 | 100.0 | 0.0 | 1.87 | 1.59 | 1.36 | 1.16 | 1.23 |
| 2000 | 100.0 | 0.0 | 100.0 | 12.92 | 6.58 | 3.41 | 1.81 | 1.78 |
| 2000 | 50.0 | 0.0 | 50.0 | 6.00 | 3.32 | 1.93 | 1.20 | 1.25 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.61 | 1.34 | 1.12 | 0.94 | 1.03 |
| 2000 | 50.0 | 50.0 | 50.0 | 7.40 | 4.09 | 2.38 | 1.49 | 1.51 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.39 | 2.14 | 1.45 | 1.04 | 1.12 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.41 | 1.15 | 0.95 | 0.78 | 0.85 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.80 | 1.52 | 1.28 | 1.09 | 1.11 |
| 2005 | 100.0 | 0.0 | 100.0 | 10.72 | 5.68 | 3.04 | 1.66 | 1.67 |
| 2005 | 50.0 | 0.0 | 50.0 | 5.03 | 2.89 | 1.74 | 1.10 | 1.14 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.51 | 1.26 | 1.05 | 0.88 | 0.92 |
| 2005 | 50.0 | 50.0 | 50.0 | 6.26 | 3.60 | 2.16 | 1.38 | 1.38 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.93 | 1.91 | 1.32 | 0.96 | 1.00 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.38 | 1.13 | 0.93 | 0.76 | 0.83 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.76 | 1.49 | 1.26 | 1.07 | 1.08 |
| 2010 | 100.0 | 0.0 | 100.0 | 10.05 | 5.40 | 2.94 | 1.62 | 1.63 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.73 | 2.76 | 1.68 | 1.07 | 1.11 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.48 | 1.23 | 1.02 | 0.86 | 0.90 |
| 2010 | 50.0 | 50.0 | 50.0 | 5.91 | 3.44 | 2.10 | 1.35 | 1.35 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.78 | 1.84 | 1.28 | 0.93 | 0.97 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.37 | 1.12 | 0.92 | 0.76 | 0.82 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.75 | 1.47 | 1.25 | 1.06 | 1.07 |
| 2020 | 100.0 | 0.0 | 100.0 | 9.63 | 5.23 | 2.87 | 1.60 | 1.60 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.55 | 2.69 | 1.65 | 1.06 | 1.10 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.47 | 1.22 | 1.01 | 0.85 | 0.89 |
| 2020 | 50.0 | 50.0 | 50.0 | 5.69 | 3.35 | 2.06 | 1.33 | 1.34 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.70 | 1.80 | 1.26 | 0.93 | 0.96 |

TABLE 1.05: EXHAUST NMHC AT 35.0 MPH

TABLE 1.06

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 1.54 | 1.30 | 1.11 | 0.95 | 1.26 |
| 1990 | 0.0 | 100.0 | 0.0 | 1.69 | 1.53 | 1.39 | 1.28 | 1.69 |
| 1990 | 100.0 | 0.0 | 100.0 | 15.73 | 7.84 | 4.00 | 2.10 | 1.84 |
| 1990 | 50.0 | 0.0 | 50.0 | 7.21 | 3.91 | 2.25 | 1.40 | 1.49 |
| 1990 | 0.0 | 50.0 | 0.0 | 1.59 | 1.38 | 1.21 | 1.07 | 1.42 |
| 1990 | 50.0 | 50.0 | 50.0 | 8.71 | 4.68 | 2.70 | 1.69 | 1.77 |
| 1990 | 20.6 | 27.3 | 20.6 | 3.89 | 2.41 | 1.63 | 1.20 | 1.44 |
| 1995 | 0.0 | 0.0 | 0.0 | 1.32 | 1.09 | 0.91 | 0.76 | 0.91 |
| 1995 | 0.0 | 100.0 | 0.0 | 1.59 | 1.37 | 1.20 | 1.04 | 1.19 |
| 1995 | 100.0 | 0.0 | 100.0 | 13.42 | 6.57 | 3.28 | 1.68 | 1.61 |
| 1995 | 50.0 | 0.0 | 50.0 | 6.18 | 3.28 | 1.85 | 1.12 | 1.18 |
| 1995 | 0.0 | 50.0 | 0.0 | 1.41 | 1.19 | 1.01 | 0.87 | 1.01 |
| 1995 | 50.0 | 50.0 | 50.0 | 7.51 | 3.97 | 2.24 | 1.37 | 1.40 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.35 | 2.04 | 1.35 | 0.97 | 1.08 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.16 | 0.95 | 0.79 | 0.65 | 0.73 |
| 2000 | 0.0 | 100.0 | 0.0 | 1.46 | 1.24 | 1.05 | 0.90 | 0.95 |
| 2000 | 100.0 | 0.0 | 100.0 | 10.18 | 5.16 | 2.66 | 1.40 | 1.38 |
| 2000 | 50.0 | 0.0 | 50.0 | 4.73 | 2.60 | 1.51 | 0.93 | 0.97 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.25 | 1.04 | 0.87 | 0.73 | 0.80 |
| 2000 | 50.0 | 50.0 | 50.0 | 5.82 | 3.20 | 1.86 | 1.15 | 1.17 |
| 2000 | 20.6 | 27.3 | 20.6 | 2.66 | 1.67 | 1.12 | 0.81 | 0.86 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.08 | 0.88 | 0.72 | 0.60 | 0.65 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.38 | 1.16 | 0.98 | 0.83 | 0.85 |
| 2005 | 100.0 | 0.0 | 100.0 | 8.30 | 4.38 | 2.34 | 1.27 | 1.27 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.89 | 2.23 | 1.34 | 0.84 | 0.87 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.16 | 0.96 | 0.80 | 0.67 | 0.70 |
| 2005 | 50.0 | 50.0 | 50.0 | 4.84 | 2.77 | 1.66 | 1.05 | 1.06 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.26 | 1.47 | 1.01 | 0.73 | 0.76 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.05 | 0.86 | 0.70 | 0.58 | 0.63 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.34 | 1.13 | 0.96 | 0.81 | 0.82 |
| 2010 | 100.0 | 0.0 | 100.0 | 7.72 | 4.14 | 2.24 | 1.24 | 1.24 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.63 | 2.11 | 1.28 | 0.82 | 0.84 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.13 | 0.93 | 0.78 | 0.65 | 0.68 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.53 | 2.63 | 1.60 | 1.02 | 1.03 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.13 | 1.40 | 0.97 | 0.71 | 0.74 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.04 | 0.85 | 0.70 | 0.57 | 0.62 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.33 | 1.12 | 0.95 | 0.80 | 0.81 |
| 2020 | 100.0 | 0.0 | 100.0 | 7.36 | 3.99 | 2.19 | 1.22 | 1.22 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.47 | 2.05 | 1.25 | 0.81 | 0.83 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.11 | 0.92 | 0.77 | 0.64 | 0.67 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.34 | 2.56 | 1.57 | 1.01 | 1.01 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.06 | 1.37 | 0.96 | 0.70 | 0.73 |

TABLE 1.06: EXHAUST NMHC AT 55.0 MPH

TABLE 1.07

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|-------|------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 2.65 | 2.23 | 1.88 | 1.60 | 2.20 |
| 1990 | 0.0 | 100.0 | 0.0 | 2.56 | 2.33 | 2.13 | 1.97 | 2.68 |
| 1990 | 100.0 | 0.0 | 100.0 | 24.26 | 12.16 | 6.22 | 3.25 | 2.80 |
| 1990 | 50.0 | 0.0 | 50.0 | 11.96 | 6.49 | 3.74 | 2.30 | 2.46 |
| 1990 | 0.0 | 50.0 | 0.0 | 2.61 | 2.27 | 1.99 | 1.75 | 2.40 |
| 1990 | 50.0 | 50.0 | 50.0 | 13.41 | 7.24 | 4.18 | 2.61 | 2.74 |
| 1990 | 20.6 | 27.3 | 20.6 | 6.45 | 4.00 | 2.70 | 1.97 | 2.41 |
| 1995 | 0.0 | 0.0 | 0.0 | 2.07 | 1.71 | 1.42 | 1.19 | 1.44 |
| 1995 | 0.0 | 100.0 | 0.0 | 2.18 | 1.90 | 1.65 | 1.45 | 1.70 |
| 1995 | 100.0 | 0.0 | 100.0 | 18.98 | 9.27 | 4.61 | 2.35 | 2.21 |
| 1995 | 50.0 | 0.0 | 50.0 | 9.47 | 5.01 | 2.81 | 1.69 | 1.77 |
| 1995 | 0.0 | 50.0 | 0.0 | 2.11 | 1.78 | 1.52 | 1.30 | 1.55 |
| 1995 | 50.0 | 50.0 | 50.0 | 10.58 | 5.58 | 3.13 | 1.90 | 1.96 |
| 1995 | 20.6 | 27.3 | 20.6 | 5.13 | 3.10 | 2.04 | 1.45 | 1.64 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.67 | 1.36 | 1.12 | 0.92 | 1.05 |
| 2000 | 0.0 | 100.0 | 0.0 | 1.83 | 1.56 | 1.33 | 1.14 | 1.22 |
| 2000 | 100.0 | 0.0 | 100.0 | 13.21 | 6.66 | 3.41 | 1.78 | 1.74 |
| 2000 | 50.0 | 0.0 | 50.0 | 6.70 | 3.66 | 2.10 | 1.28 | 1.34 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.72 | 1.43 | 1.20 | 1.00 | 1.11 |
| 2000 | 50.0 | 50.0 | 50.0 | 7.52 | 4.11 | 2.37 | 1.46 | 1.48 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.75 | 2.34 | 1.56 | 1.11 | 1.20 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.47 | 1.20 | 0.98 | 0.80 | 0.87 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.65 | 1.39 | 1.18 | 1.00 | 1.01 |
| 2005 | 100.0 | 0.0 | 100.0 | 10.18 | 5.34 | 2.84 | 1.53 | 1.53 |
| 2005 | 50.0 | 0.0 | 50.0 | 5.24 | 2.98 | 1.77 | 1.11 | 1.14 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.52 | 1.26 | 1.05 | 0.87 | 0.92 |
| 2005 | 50.0 | 50.0 | 50.0 | 5.91 | 3.37 | 2.01 | 1.26 | 1.27 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.03 | 1.96 | 1.34 | 0.96 | 1.00 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.40 | 1.14 | 0.93 | 0.76 | 0.83 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.58 | 1.33 | 1.13 | 0.95 | 0.96 |
| 2010 | 100.0 | 0.0 | 100.0 | 9.23 | 4.94 | 2.67 | 1.47 | 1.46 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.77 | 2.77 | 1.67 | 1.05 | 1.09 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.45 | 1.20 | 1.00 | 0.83 | 0.87 |
| 2010 | 50.0 | 50.0 | 50.0 | 5.41 | 3.14 | 1.90 | 1.21 | 1.21 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.80 | 1.83 | 1.26 | 0.92 | 0.95 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.38 | 1.13 | 0.92 | 0.75 | 0.82 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.55 | 1.31 | 1.11 | 0.94 | 0.95 |
| 2020 | 100.0 | 0.0 | 100.0 | 8.73 | 4.73 | 2.58 | 1.43 | 1.43 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.53 | 2.66 | 1.62 | 1.03 | 1.07 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.43 | 1.18 | 0.98 | 0.82 | 0.86 |
| 2020 | 50.0 | 50.0 | 50.0 | 5.14 | 3.02 | 1.84 | 1.18 | 1.19 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.68 | 1.78 | 1.23 | 0.90 | 0.94 |

TABLE 1.07: EXHAUST NMHC AT 65.0 MPH

TABLE 1.08

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|---------|--------|--------|--------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 309.79 | 242.47 | 192.42 | 154.94 | 323.68 |
| 1990 | 0.0 | 100.0 | 0.0 | 277.98 | 242.19 | 214.21 | 192.47 | 322.05 |
| 1990 | 100.0 | 0.0 | 100.0 | 1713.74 | 1077.70 | 661.09 | 365.76 | 308.97 |
| 1990 | 50.0 | 0.0 | 50.0 | 865.67 | 575.63 | 380.75 | 240.27 | 322.13 |
| 1990 | 0.0 | 50.0 | 0.0 | 301.04 | 245.34 | 203.30 | 171.45 | 325.57 |
| 1990 | 50.0 | 50.0 | 50.0 | 995.86 | 659.94 | 437.65 | 279.11 | 315.51 |
| 1990 | 20.6 | 27.3 | 20.6 | 533.29 | 380.99 | 275.90 | 199.22 | 324.85 |
| 1995 | 0.0 | 0.0 | 0.0 | 270.23 | 196.62 | 144.74 | 107.99 | 170.59 |
| 1995 | 0.0 | 100.0 | 0.0 | 261.60 | 215.19 | 178.47 | 149.44 | 212.55 |
| 1995 | 100.0 | 0.0 | 100.0 | 916.13 | 635.12 | 421.91 | 246.25 | 240.73 |
| 1995 | 50.0 | 0.0 | 50.0 | 520.36 | 367.40 | 253.69 | 163.53 | 199.79 |
| 1995 | 0.0 | 50.0 | 0.0 | 266.07 | 203.81 | 158.24 | 124.68 | 187.91 |
| 1995 | 50.0 | 50.0 | 50.0 | 588.87 | 425.15 | 300.19 | 197.84 | 226.64 |
| 1995 | 20.6 | 27.3 | 20.6 | 370.89 | 270.84 | 197.02 | 140.12 | 192.54 |
| 2000 | 0.0 | 0.0 | 0.0 | 240.70 | 167.76 | 117.84 | 83.58 | 107.81 |
| 2000 | 0.0 | 100.0 | 0.0 | 230.35 | 186.03 | 150.75 | 122.66 | 158.55 |
| 2000 | 100.0 | 0.0 | 100.0 | 527.25 | 395.20 | 282.59 | 180.68 | 187.42 |
| 2000 | 50.0 | 0.0 | 50.0 | 339.57 | 247.53 | 176.25 | 118.09 | 135.24 |
| 2000 | 0.0 | 50.0 | 0.0 | 226.74 | 168.04 | 125.93 | 95.51 | 123.94 |
| 2000 | 50.0 | 50.0 | 50.0 | 378.80 | 290.61 | 216.67 | 151.67 | 172.98 |
| 2000 | 20.6 | 27.3 | 20.6 | 272.65 | 199.90 | 145.68 | 103.89 | 127.54 |
| 2005 | 0.0 | 0.0 | 0.0 | 228.28 | 156.02 | 107.22 | 74.23 | 81.75 |
| 2005 | 0.0 | 100.0 | 0.0 | 216.95 | 173.92 | 139.64 | 112.33 | 137.37 |
| 2005 | 100.0 | 0.0 | 100.0 | 366.05 | 294.31 | 223.83 | 154.12 | 163.57 |
| 2005 | 50.0 | 0.0 | 50.0 | 264.30 | 197.14 | 143.70 | 99.45 | 107.37 |
| 2005 | 0.0 | 50.0 | 0.0 | 209.50 | 152.81 | 112.59 | 83.86 | 97.54 |
| 2005 | 50.0 | 50.0 | 50.0 | 291.50 | 234.11 | 181.74 | 133.23 | 150.47 |
| 2005 | 20.6 | 27.3 | 20.6 | 231.15 | 169.91 | 124.22 | 89.20 | 100.18 |
| 2010 | 0.0 | 0.0 | 0.0 | 225.11 | 153.15 | 104.71 | 72.06 | 77.83 |
| 2010 | 0.0 | 100.0 | 0.0 | 211.33 | 169.42 | 135.99 | 109.33 | 132.67 |
| 2010 | 100.0 | 0.0 | 100.0 | 331.10 | 269.07 | 208.20 | 148.04 | 156.12 |
| 2010 | 50.0 | 0.0 | 50.0 | 247.69 | 184.61 | 135.18 | 94.88 | 101.15 |
| 2010 | 0.0 | 50.0 | 0.0 | 203.91 | 148.21 | 108.79 | 80.72 | 92.54 |
| 2010 | 50.0 | 50.0 | 50.0 | 271.21 | 219.25 | 172.10 | 128.68 | 144.39 |
| 2010 | 20.6 | 27.3 | 20.6 | 220.85 | 161.91 | 118.37 | 85.37 | 94.56 |
| 2020 | 0.0 | 0.0 | 0.0 | 222.92 | 151.46 | 103.42 | 71.11 | 76.73 |
| 2020 | 0.0 | 100.0 | 0.0 | 207.77 | 166.60 | 133.75 | 107.55 | 130.38 |
| 2020 | 100.0 | 0.0 | 100.0 | 315.55 | 257.47 | 200.38 | 143.90 | 151.84 |
| 2020 | 50.0 | 0.0 | 50.0 | 239.88 | 178.68 | 131.00 | 92.36 | 98.46 |
| 2020 | 0.0 | 50.0 | 0.0 | 200.70 | 145.70 | 106.85 | 79.22 | 90.72 |
| 2020 | 50.0 | 50.0 | 50.0 | 261.66 | 212.03 | 167.07 | 125.73 | 141.11 |
| 2020 | 20.6 | 27.3 | 20.6 | 215.74 | 157.99 | 115.51 | 83.46 | 92.39 |

TABLE 1.08: EXHAUST CO AT 2.5 MPH

TABLE 1.09

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|-----------------------------------|--------|--------|--------|--------|
| | VMT PCCN | Percentages | | ----- @ Ambient Temperature ----- | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 167.88 | 132.58 | 106.26 | 86.48 | 176.77 |
| 1990 | 0.0 | 100.0 | 0.0 | 150.77 | 131.97 | 117.26 | 105.81 | 176.47 |
| 1990 | 100.0 | 0.0 | 100.0 | 906.10 | 571.86 | 352.39 | 196.51 | 168.50 |
| 1990 | 50.0 | 0.0 | 50.0 | 459.79 | 307.49 | 204.93 | 130.88 | 175.49 |
| 1990 | 0.0 | 50.0 | 0.0 | 162.91 | 133.74 | 111.67 | 94.90 | 177.77 |
| 1990 | 50.0 | 50.0 | 50.0 | 528.43 | 351.92 | 234.82 | 151.16 | 172.49 |
| 1990 | 20.6 | 27.3 | 20.6 | 285.00 | 205.09 | 149.82 | 109.42 | 177.17 |
| 1995 | 0.0 | 0.0 | 0.0 | 147.34 | 107.96 | 80.18 | 60.47 | 95.01 |
| 1995 | 0.0 | 100.0 | 0.0 | 142.49 | 117.66 | 98.00 | 82.42 | 117.64 |
| 1995 | 100.0 | 0.0 | 100.0 | 493.65 | 343.20 | 228.41 | 133.42 | 132.18 |
| 1995 | 50.0 | 0.0 | 50.0 | 280.77 | 199.06 | 138.08 | 89.55 | 110.22 |
| 1995 | 0.0 | 50.0 | 0.0 | 144.67 | 111.45 | 87.11 | 69.16 | 104.13 |
| 1995 | 50.0 | 50.0 | 50.0 | 318.07 | 230.43 | 163.20 | 107.92 | 124.91 |
| 1995 | 20.6 | 27.3 | 20.6 | 200.72 | 147.32 | 107.80 | 77.24 | 106.47 |
| 2000 | 0.0 | 0.0 | 0.0 | 134.66 | 94.35 | 66.75 | 47.79 | 61.62 |
| 2000 | 0.0 | 100.0 | 0.0 | 128.76 | 104.28 | 84.77 | 69.22 | 89.64 |
| 2000 | 100.0 | 0.0 | 100.0 | 290.86 | 218.69 | 156.77 | 100.51 | 105.20 |
| 2000 | 50.0 | 0.0 | 50.0 | 188.11 | 137.64 | 98.42 | 66.35 | 76.46 |
| 2000 | 0.0 | 50.0 | 0.0 | 126.65 | 94.27 | 71.03 | 54.22 | 70.40 |
| 2000 | 50.0 | 50.0 | 50.0 | 209.81 | 161.49 | 120.77 | 84.87 | 97.42 |
| 2000 | 20.6 | 27.3 | 20.6 | 151.64 | 111.63 | 81.76 | 58.70 | 72.30 |
| 2005 | 0.0 | 0.0 | 0.0 | 129.37 | 88.83 | 61.45 | 42.92 | 47.48 |
| 2005 | 0.0 | 100.0 | 0.0 | 122.84 | 98.72 | 79.50 | 64.18 | 78.53 |
| 2005 | 100.0 | 0.0 | 100.0 | 206.52 | 166.14 | 126.51 | 87.33 | 92.96 |
| 2005 | 50.0 | 0.0 | 50.0 | 149.42 | 111.72 | 81.71 | 56.86 | 61.64 |
| 2005 | 0.0 | 50.0 | 0.0 | 118.69 | 86.92 | 64.37 | 48.24 | 56.24 |
| 2005 | 50.0 | 50.0 | 50.0 | 164.68 | 132.43 | 103.00 | 75.75 | 85.75 |
| 2005 | 20.6 | 27.3 | 20.6 | 130.82 | 96.48 | 70.84 | 51.19 | 57.67 |
| 2010 | 0.0 | 0.0 | 0.0 | 128.20 | 87.60 | 60.25 | 41.79 | 45.22 |
| 2010 | 0.0 | 100.0 | 0.0 | 120.32 | 96.66 | 77.79 | 62.72 | 76.01 |
| 2010 | 100.0 | 0.0 | 100.0 | 187.80 | 152.74 | 118.35 | 84.39 | 89.09 |
| 2010 | 50.0 | 0.0 | 50.0 | 140.85 | 105.24 | 77.32 | 54.56 | 58.25 |
| 2010 | 0.0 | 50.0 | 0.0 | 116.20 | 84.76 | 62.51 | 46.64 | 53.46 |
| 2010 | 50.0 | 50.0 | 50.0 | 154.06 | 124.70 | 98.07 | 73.56 | 82.55 |
| 2010 | 20.6 | 27.3 | 20.6 | 125.74 | 92.47 | 67.88 | 49.24 | 54.58 |
| 2020 | 0.0 | 0.0 | 0.0 | 127.36 | 86.92 | 59.73 | 41.42 | 44.76 |
| 2020 | 0.0 | 100.0 | 0.0 | 118.73 | 95.41 | 76.80 | 61.94 | 74.98 |
| 2020 | 100.0 | 0.0 | 100.0 | 179.65 | 146.73 | 114.39 | 82.43 | 87.06 |
| 2020 | 50.0 | 0.0 | 50.0 | 136.95 | 102.29 | 75.28 | 53.39 | 57.00 |
| 2020 | 0.0 | 50.0 | 0.0 | 114.80 | 83.66 | 61.66 | 45.99 | 52.65 |
| 2020 | 50.0 | 50.0 | 50.0 | 149.19 | 121.07 | 95.60 | 72.18 | 81.02 |
| 2020 | 20.6 | 27.3 | 20.6 | 123.31 | 90.61 | 66.54 | 48.38 | 53.58 |

TABLE 1.09: EXHAUST CO AT 5.0 MPH

TABLE 1.10

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|--------|--------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 88.28 | 69.82 | 56.07 | 45.75 | 91.80 |
| 1990 | 0.0 | 100.0 | 0.0 | 80.31 | 70.16 | 62.18 | 55.92 | 92.21 |
| 1990 | 100.0 | 0.0 | 100.0 | 463.92 | 295.07 | 182.76 | 101.75 | 89.53 |
| 1990 | 50.0 | 0.0 | 50.0 | 236.77 | 159.45 | 106.80 | 68.31 | 91.83 |
| 1990 | 0.0 | 50.0 | 0.0 | 85.95 | 70.60 | 58.98 | 50.13 | 92.47 |
| 1990 | 50.0 | 50.0 | 50.0 | 272.11 | 182.62 | 122.47 | 78.83 | 90.87 |
| 1990 | 20.6 | 27.3 | 20.6 | 147.96 | 107.06 | 78.52 | 57.46 | 92.36 |
| 1995 | 0.0 | 0.0 | 0.0 | 81.61 | 59.78 | 44.43 | 33.56 | 51.75 |
| 1995 | 0.0 | 100.0 | 0.0 | 79.33 | 65.49 | 54.49 | 45.76 | 64.76 |
| 1995 | 100.0 | 0.0 | 100.0 | 268.19 | 188.07 | 125.49 | 72.65 | 73.38 |
| 1995 | 50.0 | 0.0 | 50.0 | 152.89 | 109.02 | 75.78 | 48.96 | 60.36 |
| 1995 | 0.0 | 50.0 | 0.0 | 79.97 | 61.61 | 48.17 | 38.26 | 56.82 |
| 1995 | 50.0 | 50.0 | 50.0 | 173.76 | 126.78 | 89.99 | 59.21 | 69.07 |
| 1995 | 20.6 | 27.3 | 20.6 | 109.95 | 80.98 | 59.34 | 42.47 | 58.15 |
| 2000 | 0.0 | 0.0 | 0.0 | 79.39 | 55.62 | 39.37 | 28.23 | 35.86 |
| 2000 | 0.0 | 100.0 | 0.0 | 75.94 | 61.52 | 50.03 | 40.85 | 52.60 |
| 2000 | 100.0 | 0.0 | 100.0 | 168.02 | 127.18 | 91.44 | 58.51 | 61.78 |
| 2000 | 50.0 | 0.0 | 50.0 | 109.21 | 80.20 | 57.46 | 38.73 | 44.55 |
| 2000 | 0.0 | 50.0 | 0.0 | 74.46 | 55.42 | 41.78 | 31.92 | 41.01 |
| 2000 | 50.0 | 50.0 | 50.0 | 121.98 | 94.35 | 70.73 | 49.68 | 57.19 |
| 2000 | 20.6 | 27.3 | 20.6 | 88.56 | 65.32 | 47.90 | 34.42 | 42.10 |
| 2005 | 0.0 | 0.0 | 0.0 | 78.57 | 54.00 | 37.42 | 26.20 | 28.96 |
| 2005 | 0.0 | 100.0 | 0.0 | 74.47 | 59.90 | 48.28 | 39.01 | 47.68 |
| 2005 | 100.0 | 0.0 | 100.0 | 124.87 | 100.52 | 76.54 | 52.79 | 56.29 |
| 2005 | 50.0 | 0.0 | 50.0 | 90.43 | 67.65 | 49.51 | 34.47 | 37.39 |
| 2005 | 0.0 | 50.0 | 0.0 | 71.95 | 52.74 | 39.11 | 29.36 | 34.18 |
| 2005 | 50.0 | 50.0 | 50.0 | 99.67 | 80.21 | 62.41 | 45.90 | 51.99 |
| 2005 | 20.6 | 27.3 | 20.6 | 79.24 | 58.48 | 42.98 | 31.09 | 35.02 |
| 2010 | 0.0 | 0.0 | 0.0 | 78.54 | 53.72 | 37.01 | 25.73 | 27.82 |
| 2010 | 0.0 | 100.0 | 0.0 | 73.65 | 59.20 | 47.67 | 38.47 | 46.54 |
| 2010 | 100.0 | 0.0 | 100.0 | 114.47 | 93.21 | 72.28 | 51.57 | 54.50 |
| 2010 | 50.0 | 0.0 | 50.0 | 86.06 | 64.36 | 47.33 | 33.45 | 35.72 |
| 2010 | 0.0 | 50.0 | 0.0 | 71.16 | 51.96 | 38.36 | 28.67 | 32.81 |
| 2010 | 50.0 | 50.0 | 50.0 | 94.06 | 76.20 | 59.98 | 45.02 | 50.52 |
| 2010 | 20.6 | 27.3 | 20.6 | 76.92 | 56.62 | 41.61 | 30.23 | 33.49 |
| 2020 | 0.0 | 0.0 | 0.0 | 78.36 | 53.55 | 36.86 | 25.63 | 27.67 |
| 2020 | 0.0 | 100.0 | 0.0 | 73.02 | 58.71 | 47.29 | 38.18 | 46.14 |
| 2020 | 100.0 | 0.0 | 100.0 | 110.07 | 90.02 | 70.26 | 50.68 | 53.59 |
| 2020 | 50.0 | 0.0 | 50.0 | 84.11 | 62.90 | 46.36 | 32.94 | 35.17 |
| 2020 | 0.0 | 50.0 | 0.0 | 70.65 | 51.54 | 38.03 | 28.42 | 32.49 |
| 2020 | 50.0 | 50.0 | 50.0 | 91.55 | 74.36 | 58.78 | 44.43 | 49.86 |
| 2020 | 20.6 | 27.3 | 20.6 | 75.82 | 55.77 | 41.02 | 29.88 | 33.07 |

TABLE 1.10: EXHAUST CO AT 10.0 MPH

TABLE 1.11

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|--------|-------|-------|-------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 47.85 | 37.68 | 30.14 | 24.51 | 48.83 |
| 1990 | 0.0 | 100.0 | 0.0 | 43.86 | 38.17 | 33.69 | 30.17 | 49.29 |
| 1990 | 100.0 | 0.0 | 100.0 | 252.35 | 161.47 | 99.97 | 54.74 | 48.61 |
| 1990 | 50.0 | 0.0 | 50.0 | 128.59 | 86.82 | 58.01 | 36.64 | 49.12 |
| 1990 | 0.0 | 50.0 | 0.0 | 46.60 | 38.14 | 31.75 | 26.90 | 49.19 |
| 1990 | 50.0 | 50.0 | 50.0 | 148.11 | 99.82 | 66.83 | 42.46 | 48.95 |
| 1990 | 20.6 | 27.3 | 20.6 | 80.29 | 58.10 | 42.47 | 30.81 | 49.23 |
| 1995 | 0.0 | 0.0 | 0.0 | 47.92 | 34.79 | 25.61 | 19.16 | 28.85 |
| 1995 | 0.0 | 100.0 | 0.0 | 46.74 | 38.43 | 31.83 | 26.58 | 37.05 |
| 1995 | 100.0 | 0.0 | 100.0 | 158.30 | 111.76 | 74.30 | 41.89 | 42.59 |
| 1995 | 50.0 | 0.0 | 50.0 | 89.55 | 63.93 | 44.16 | 27.94 | 34.11 |
| 1995 | 0.0 | 50.0 | 0.0 | 46.71 | 35.75 | 27.76 | 21.90 | 31.89 |
| 1995 | 50.0 | 50.0 | 50.0 | 102.52 | 75.09 | 53.06 | 34.24 | 39.82 |
| 1995 | 20.6 | 27.3 | 20.6 | 64.28 | 47.23 | 34.37 | 24.26 | 32.70 |
| 2000 | 0.0 | 0.0 | 0.0 | 51.19 | 35.60 | 24.99 | 17.74 | 22.02 |
| 2000 | 0.0 | 100.0 | 0.0 | 48.88 | 39.49 | 32.01 | 26.04 | 33.19 |
| 2000 | 100.0 | 0.0 | 100.0 | 107.38 | 81.64 | 58.62 | 37.10 | 39.17 |
| 2000 | 50.0 | 0.0 | 50.0 | 69.70 | 51.15 | 36.48 | 24.31 | 27.65 |
| 2000 | 0.0 | 50.0 | 0.0 | 47.74 | 35.33 | 26.47 | 20.09 | 25.37 |
| 2000 | 50.0 | 50.0 | 50.0 | 78.13 | 60.56 | 45.31 | 31.57 | 36.18 |
| 2000 | 20.6 | 27.3 | 20.6 | 56.62 | 41.63 | 30.36 | 21.61 | 26.05 |
| 2005 | 0.0 | 0.0 | 0.0 | 52.78 | 36.10 | 24.86 | 17.28 | 18.96 |
| 2005 | 0.0 | 100.0 | 0.0 | 49.87 | 40.04 | 32.20 | 25.96 | 31.65 |
| 2005 | 100.0 | 0.0 | 100.0 | 84.02 | 67.57 | 51.30 | 35.15 | 37.41 |
| 2005 | 50.0 | 0.0 | 50.0 | 60.65 | 45.24 | 32.96 | 22.77 | 24.59 |
| 2005 | 0.0 | 50.0 | 0.0 | 48.16 | 35.16 | 25.95 | 19.38 | 22.46 |
| 2005 | 50.0 | 50.0 | 50.0 | 66.94 | 53.80 | 41.75 | 30.55 | 34.53 |
| 2005 | 20.6 | 27.3 | 20.6 | 53.08 | 39.03 | 28.55 | 20.52 | 23.00 |
| 2010 | 0.0 | 0.0 | 0.0 | 53.42 | 36.39 | 24.94 | 17.22 | 18.57 |
| 2010 | 0.0 | 100.0 | 0.0 | 49.98 | 40.11 | 32.23 | 25.95 | 31.39 |
| 2010 | 100.0 | 0.0 | 100.0 | 77.78 | 63.32 | 49.03 | 34.85 | 36.83 |
| 2010 | 50.0 | 0.0 | 50.0 | 58.43 | 43.60 | 31.96 | 22.46 | 23.96 |
| 2010 | 0.0 | 50.0 | 0.0 | 48.29 | 35.14 | 25.84 | 19.22 | 21.97 |
| 2010 | 50.0 | 50.0 | 50.0 | 63.88 | 51.72 | 40.63 | 30.40 | 34.11 |
| 2010 | 20.6 | 27.3 | 20.6 | 52.21 | 38.32 | 28.06 | 20.28 | 22.43 |
| 2020 | 0.0 | 0.0 | 0.0 | 53.54 | 36.44 | 24.95 | 17.23 | 18.56 |
| 2020 | 0.0 | 100.0 | 0.0 | 49.80 | 39.97 | 32.13 | 25.87 | 31.27 |
| 2020 | 100.0 | 0.0 | 100.0 | 75.20 | 61.49 | 47.93 | 34.47 | 36.44 |
| 2020 | 50.0 | 0.0 | 50.0 | 57.42 | 42.85 | 31.48 | 22.26 | 23.73 |
| 2020 | 0.0 | 50.0 | 0.0 | 48.19 | 35.04 | 25.75 | 19.15 | 21.87 |
| 2020 | 50.0 | 50.0 | 50.0 | 62.50 | 50.73 | 40.03 | 30.17 | 33.85 |
| 2020 | 20.6 | 27.3 | 20.6 | 51.74 | 37.95 | 27.81 | 20.15 | 22.27 |

TABLE 1.11: EXHAUST CO AT 19.6 MPH

TABLE 1.12

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|-------|-------|-------|-------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 29.67 | 23.12 | 18.30 | 14.73 | 28.59 |
| 1990 | 0.0 | 100.0 | 0.0 | 28.07 | 24.14 | 21.04 | 18.61 | 29.72 |
| 1990 | 100.0 | 0.0 | 100.0 | 151.70 | 98.19 | 61.28 | 33.54 | 30.25 |
| 1990 | 50.0 | 0.0 | 50.0 | 78.40 | 53.31 | 35.71 | 22.42 | 29.61 |
| 1990 | 0.0 | 50.0 | 0.0 | 29.38 | 23.80 | 19.60 | 16.43 | 29.24 |
| 1990 | 50.0 | 50.0 | 50.0 | 89.89 | 61.17 | 41.16 | 26.08 | 29.99 |
| 1990 | 20.6 | 27.3 | 20.6 | 49.53 | 35.91 | 26.18 | 18.84 | 29.43 |
| 1995 | 0.0 | 0.0 | 0.0 | 29.46 | 21.35 | 15.66 | 11.66 | 17.39 |
| 1995 | 0.0 | 100.0 | 0.0 | 28.97 | 23.73 | 19.57 | 16.27 | 22.50 |
| 1995 | 100.0 | 0.0 | 100.0 | 91.97 | 65.35 | 44.02 | 25.61 | 26.11 |
| 1995 | 50.0 | 0.0 | 50.0 | 53.56 | 38.41 | 26.76 | 17.24 | 20.92 |
| 1995 | 0.0 | 50.0 | 0.0 | 29.08 | 22.19 | 17.17 | 13.48 | 19.44 |
| 1995 | 50.0 | 50.0 | 50.0 | 60.47 | 44.54 | 31.79 | 20.94 | 24.31 |
| 1995 | 20.6 | 27.3 | 20.6 | 39.16 | 28.82 | 21.05 | 14.96 | 20.00 |
| 2000 | 0.0 | 0.0 | 0.0 | 28.09 | 19.58 | 13.77 | 9.80 | 12.26 |
| 2000 | 0.0 | 100.0 | 0.0 | 26.87 | 21.70 | 17.59 | 14.31 | 18.28 |
| 2000 | 100.0 | 0.0 | 100.0 | 58.17 | 44.28 | 31.96 | 20.51 | 21.66 |
| 2000 | 50.0 | 0.0 | 50.0 | 38.27 | 28.13 | 20.15 | 13.56 | 15.47 |
| 2000 | 0.0 | 50.0 | 0.0 | 26.40 | 19.57 | 14.68 | 11.15 | 14.16 |
| 2000 | 50.0 | 50.0 | 50.0 | 42.52 | 32.99 | 24.77 | 17.41 | 19.97 |
| 2000 | 20.6 | 27.3 | 20.6 | 31.22 | 22.99 | 16.82 | 12.04 | 14.57 |
| 2005 | 0.0 | 0.0 | 0.0 | 26.93 | 18.45 | 12.74 | 8.88 | 9.78 |
| 2005 | 0.0 | 100.0 | 0.0 | 25.44 | 20.43 | 16.44 | 13.27 | 16.19 |
| 2005 | 100.0 | 0.0 | 100.0 | 42.64 | 34.34 | 26.14 | 18.00 | 19.18 |
| 2005 | 50.0 | 0.0 | 50.0 | 30.97 | 23.15 | 16.91 | 11.74 | 12.71 |
| 2005 | 0.0 | 50.0 | 0.0 | 24.66 | 18.03 | 13.33 | 9.98 | 11.59 |
| 2005 | 50.0 | 50.0 | 50.0 | 34.04 | 27.39 | 21.29 | 15.63 | 17.69 |
| 2005 | 20.6 | 27.3 | 20.6 | 27.15 | 20.00 | 14.67 | 10.58 | 11.89 |
| 2010 | 0.0 | 0.0 | 0.0 | 26.57 | 18.13 | 12.44 | 8.62 | 9.30 |
| 2010 | 0.0 | 100.0 | 0.0 | 24.81 | 19.93 | 16.03 | 12.92 | 15.62 |
| 2010 | 100.0 | 0.0 | 100.0 | 38.68 | 31.49 | 24.39 | 17.35 | 18.34 |
| 2010 | 50.0 | 0.0 | 50.0 | 29.11 | 21.74 | 15.95 | 11.24 | 11.99 |
| 2010 | 0.0 | 50.0 | 0.0 | 24.04 | 17.51 | 12.90 | 9.61 | 10.99 |
| 2010 | 50.0 | 50.0 | 50.0 | 31.75 | 25.71 | 20.21 | 15.14 | 16.98 |
| 2010 | 20.6 | 27.3 | 20.6 | 26.00 | 19.10 | 14.01 | 10.15 | 11.23 |
| 2020 | 0.0 | 0.0 | 0.0 | 26.37 | 17.97 | 12.32 | 8.53 | 9.20 |
| 2020 | 0.0 | 100.0 | 0.0 | 24.45 | 19.65 | 15.81 | 12.75 | 15.40 |
| 2020 | 100.0 | 0.0 | 100.0 | 37.01 | 30.25 | 23.57 | 16.94 | 17.91 |
| 2020 | 50.0 | 0.0 | 50.0 | 28.29 | 21.12 | 15.52 | 10.99 | 11.72 |
| 2020 | 0.0 | 50.0 | 0.0 | 23.72 | 17.26 | 12.71 | 9.47 | 10.81 |
| 2020 | 50.0 | 50.0 | 50.0 | 30.73 | 24.95 | 19.69 | 14.84 | 16.66 |
| 2020 | 20.6 | 27.3 | 20.6 | 25.48 | 18.70 | 13.72 | 9.96 | 11.01 |

TABLE 1.12: EXHAUST CO AT 35.0 MPH

TABLE 1.13

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|-------|-------|-------|-------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 24.91 | 19.44 | 15.42 | 12.44 | 23.67 |
| 1990 | 0.0 | 100.0 | 0.0 | 23.89 | 20.49 | 17.81 | 15.70 | 24.82 |
| 1990 | 100.0 | 0.0 | 100.0 | 121.60 | 79.29 | 49.89 | 27.62 | 25.49 |
| 1990 | 50.0 | 0.0 | 50.0 | 63.79 | 43.71 | 29.51 | 18.71 | 24.73 |
| 1990 | 0.0 | 50.0 | 0.0 | 24.84 | 20.13 | 16.58 | 13.89 | 24.32 |
| 1990 | 50.0 | 50.0 | 50.0 | 72.74 | 49.89 | 33.85 | 21.66 | 25.16 |
| 1990 | 20.6 | 27.3 | 20.6 | 40.87 | 29.81 | 21.86 | 15.83 | 24.52 |
| 1995 | 0.0 | 0.0 | 0.0 | 23.94 | 17.47 | 12.92 | 9.70 | 14.55 |
| 1995 | 0.0 | 100.0 | 0.0 | 23.61 | 19.37 | 16.00 | 13.32 | 18.53 |
| 1995 | 100.0 | 0.0 | 100.0 | 70.92 | 50.61 | 34.49 | 20.70 | 21.37 |
| 1995 | 50.0 | 0.0 | 50.0 | 42.37 | 30.56 | 21.53 | 14.19 | 17.41 |
| 1995 | 0.0 | 50.0 | 0.0 | 23.80 | 18.25 | 14.19 | 11.19 | 16.21 |
| 1995 | 50.0 | 50.0 | 50.0 | 47.26 | 34.99 | 25.25 | 17.01 | 19.95 |
| 1995 | 20.6 | 27.3 | 20.6 | 31.47 | 23.30 | 17.17 | 12.38 | 16.68 |
| 2000 | 0.0 | 0.0 | 0.0 | 20.65 | 14.53 | 10.33 | 7.45 | 9.52 |
| 2000 | 0.0 | 100.0 | 0.0 | 19.78 | 16.02 | 13.03 | 10.65 | 13.74 |
| 2000 | 100.0 | 0.0 | 100.0 | 42.12 | 32.07 | 23.29 | 15.22 | 16.19 |
| 2000 | 50.0 | 0.0 | 50.0 | 28.10 | 20.74 | 14.98 | 10.25 | 11.87 |
| 2000 | 0.0 | 50.0 | 0.0 | 19.56 | 14.60 | 11.03 | 8.45 | 10.90 |
| 2000 | 50.0 | 50.0 | 50.0 | 30.95 | 24.05 | 18.16 | 12.93 | 14.96 |
| 2000 | 20.6 | 27.3 | 20.6 | 23.04 | 17.06 | 12.59 | 9.12 | 11.22 |
| 2005 | 0.0 | 0.0 | 0.0 | 18.36 | 12.68 | 8.83 | 6.23 | 6.95 |
| 2005 | 0.0 | 100.0 | 0.0 | 17.36 | 13.98 | 11.29 | 9.15 | 11.20 |
| 2005 | 100.0 | 0.0 | 100.0 | 28.76 | 23.23 | 17.77 | 12.36 | 13.24 |
| 2005 | 50.0 | 0.0 | 50.0 | 21.10 | 15.85 | 11.66 | 8.19 | 8.95 |
| 2005 | 0.0 | 50.0 | 0.0 | 16.90 | 12.43 | 9.26 | 6.99 | 8.17 |
| 2005 | 50.0 | 50.0 | 50.0 | 23.06 | 18.61 | 14.53 | 10.75 | 12.22 |
| 2005 | 20.6 | 27.3 | 20.6 | 18.57 | 13.75 | 10.16 | 7.40 | 8.39 |
| 2010 | 0.0 | 0.0 | 0.0 | 17.63 | 12.10 | 8.38 | 5.86 | 6.35 |
| 2010 | 0.0 | 100.0 | 0.0 | 16.45 | 13.25 | 10.69 | 8.65 | 10.45 |
| 2010 | 100.0 | 0.0 | 100.0 | 25.56 | 20.83 | 16.17 | 11.56 | 12.24 |
| 2010 | 50.0 | 0.0 | 50.0 | 19.33 | 14.49 | 10.69 | 7.59 | 8.12 |
| 2010 | 0.0 | 50.0 | 0.0 | 15.99 | 11.71 | 8.68 | 6.52 | 7.46 |
| 2010 | 50.0 | 50.0 | 50.0 | 21.00 | 17.04 | 13.43 | 10.10 | 11.35 |
| 2010 | 20.6 | 27.3 | 20.6 | 17.29 | 12.76 | 9.41 | 6.87 | 7.62 |
| 2020 | 0.0 | 0.0 | 0.0 | 17.33 | 11.88 | 8.22 | 5.75 | 6.23 |
| 2020 | 0.0 | 100.0 | 0.0 | 16.04 | 12.92 | 10.44 | 8.45 | 10.20 |
| 2020 | 100.0 | 0.0 | 100.0 | 24.22 | 19.80 | 15.45 | 11.14 | 11.80 |
| 2020 | 50.0 | 0.0 | 50.0 | 18.58 | 13.91 | 10.28 | 7.33 | 7.84 |
| 2020 | 0.0 | 50.0 | 0.0 | 15.60 | 11.42 | 8.46 | 6.35 | 7.26 |
| 2020 | 50.0 | 50.0 | 50.0 | 20.13 | 16.36 | 12.94 | 9.80 | 11.00 |
| 2020 | 20.6 | 27.3 | 20.6 | 16.75 | 12.35 | 9.11 | 6.67 | 7.39 |

TABLE 1.13: EXHAUST CO AT 55.0 MPH

TABLE 1.14

LOW ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|--------|--------|-------|-------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 71.01 | 55.21 | 43.54 | 34.86 | 70.64 |
| 1990 | 0.0 | 100.0 | 0.0 | 61.43 | 52.96 | 46.34 | 41.19 | 67.27 |
| 1990 | 100.0 | 0.0 | 100.0 | 346.80 | 220.78 | 137.17 | 76.99 | 66.62 |
| 1990 | 50.0 | 0.0 | 50.0 | 185.89 | 124.79 | 83.21 | 52.84 | 69.95 |
| 1990 | 0.0 | 50.0 | 0.0 | 67.89 | 54.94 | 45.22 | 37.87 | 69.78 |
| 1990 | 50.0 | 50.0 | 50.0 | 204.12 | 136.87 | 91.75 | 59.09 | 66.95 |
| 1990 | 20.6 | 27.3 | 20.6 | 116.58 | 83.73 | 60.83 | 43.96 | 70.06 |
| 1995 | 0.0 | 0.0 | 0.0 | 59.99 | 43.71 | 32.20 | 24.00 | 38.10 |
| 1995 | 0.0 | 100.0 | 0.0 | 54.29 | 44.54 | 36.84 | 30.75 | 43.78 |
| 1995 | 100.0 | 0.0 | 100.0 | 175.88 | 122.49 | 82.81 | 50.71 | 50.03 |
| 1995 | 50.0 | 0.0 | 50.0 | 108.17 | 76.75 | 53.66 | 35.57 | 43.67 |
| 1995 | 0.0 | 50.0 | 0.0 | 57.92 | 44.37 | 34.42 | 27.07 | 40.84 |
| 1995 | 50.0 | 50.0 | 50.0 | 115.08 | 83.51 | 59.82 | 40.73 | 46.90 |
| 1995 | 20.6 | 27.3 | 20.6 | 78.80 | 57.75 | 42.31 | 30.51 | 42.03 |
| 2000 | 0.0 | 0.0 | 0.0 | 44.63 | 31.35 | 22.22 | 15.90 | 21.37 |
| 2000 | 0.0 | 100.0 | 0.0 | 39.48 | 31.95 | 25.96 | 21.20 | 27.86 |
| 2000 | 100.0 | 0.0 | 100.0 | 90.11 | 67.13 | 48.29 | 31.73 | 32.90 |
| 2000 | 50.0 | 0.0 | 50.0 | 62.10 | 45.28 | 32.48 | 22.19 | 25.88 |
| 2000 | 0.0 | 50.0 | 0.0 | 41.48 | 30.92 | 23.31 | 17.78 | 23.72 |
| 2000 | 50.0 | 50.0 | 50.0 | 64.80 | 49.54 | 37.13 | 26.47 | 30.38 |
| 2000 | 20.6 | 27.3 | 20.6 | 50.01 | 36.78 | 26.99 | 19.49 | 24.49 |
| 2005 | 0.0 | 0.0 | 0.0 | 36.15 | 24.84 | 17.19 | 12.01 | 13.41 |
| 2005 | 0.0 | 100.0 | 0.0 | 31.75 | 25.50 | 20.52 | 16.56 | 20.35 |
| 2005 | 100.0 | 0.0 | 100.0 | 52.85 | 42.65 | 32.67 | 22.84 | 24.36 |
| 2005 | 50.0 | 0.0 | 50.0 | 41.12 | 30.82 | 22.64 | 15.87 | 17.29 |
| 2005 | 0.0 | 50.0 | 0.0 | 32.78 | 24.02 | 17.79 | 13.33 | 15.65 |
| 2005 | 50.0 | 50.0 | 50.0 | 42.30 | 34.07 | 26.60 | 19.70 | 22.35 |
| 2005 | 20.6 | 27.3 | 20.6 | 36.18 | 26.72 | 19.66 | 14.25 | 16.16 |
| 2010 | 0.0 | 0.0 | 0.0 | 33.31 | 22.75 | 15.63 | 10.84 | 11.76 |
| 2010 | 0.0 | 100.0 | 0.0 | 28.69 | 23.06 | 18.57 | 14.98 | 18.20 |
| 2010 | 100.0 | 0.0 | 100.0 | 45.16 | 36.69 | 28.41 | 20.27 | 21.40 |
| 2010 | 50.0 | 0.0 | 50.0 | 36.12 | 26.97 | 19.81 | 13.98 | 14.94 |
| 2010 | 0.0 | 50.0 | 0.0 | 29.66 | 21.63 | 15.95 | 11.90 | 13.68 |
| 2010 | 50.0 | 50.0 | 50.0 | 36.93 | 29.87 | 23.49 | 17.63 | 19.80 |
| 2010 | 20.6 | 27.3 | 20.6 | 32.25 | 23.71 | 17.40 | 12.62 | 14.01 |
| 2020 | 0.0 | 0.0 | 0.0 | 32.29 | 22.01 | 15.11 | 10.46 | 11.34 |
| 2020 | 0.0 | 100.0 | 0.0 | 27.57 | 22.17 | 17.86 | 14.42 | 17.49 |
| 2020 | 100.0 | 0.0 | 100.0 | 42.10 | 34.29 | 26.67 | 19.15 | 20.23 |
| 2020 | 50.0 | 0.0 | 50.0 | 34.19 | 25.50 | 18.73 | 13.25 | 14.16 |
| 2020 | 0.0 | 50.0 | 0.0 | 28.53 | 20.78 | 15.31 | 11.42 | 13.10 |
| 2020 | 50.0 | 50.0 | 50.0 | 34.83 | 28.23 | 22.26 | 16.79 | 18.86 |
| 2020 | 20.6 | 27.3 | 20.6 | 30.79 | 22.60 | 16.58 | 12.04 | 13.36 |

TABLE 1.14: EXHAUST CO AT 65.0 MPH

TABLE 1.15

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 5.41 | 4.87 | 4.43 | 4.05 | 3.89 |
| 1990 | 0.0 | 100.0 | 0.0 | 6.76 | 5.99 | 5.37 | 4.85 | 4.46 |
| 1990 | 100.0 | 0.0 | 100.0 | 6.35 | 5.91 | 5.52 | 5.19 | 4.79 |
| 1990 | 50.0 | 0.0 | 50.0 | 5.95 | 5.45 | 5.03 | 4.68 | 4.39 |
| 1990 | 0.0 | 50.0 | 0.0 | 6.17 | 5.50 | 4.95 | 4.50 | 4.22 |
| 1990 | 50.0 | 50.0 | 50.0 | 6.56 | 5.95 | 5.44 | 5.02 | 4.63 |
| 1990 | 20.6 | 27.3 | 20.6 | 6.05 | 5.46 | 4.97 | 4.56 | 4.28 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.90 | 4.37 | 3.93 | 3.57 | 3.60 |
| 1995 | 0.0 | 100.0 | 0.0 | 6.12 | 5.33 | 4.68 | 4.15 | 4.03 |
| 1995 | 100.0 | 0.0 | 100.0 | 5.68 | 5.27 | 4.91 | 4.58 | 4.44 |
| 1995 | 50.0 | 0.0 | 50.0 | 5.38 | 4.90 | 4.49 | 4.13 | 4.08 |
| 1995 | 0.0 | 50.0 | 0.0 | 5.61 | 4.93 | 4.37 | 3.91 | 3.87 |
| 1995 | 50.0 | 50.0 | 50.0 | 5.90 | 5.30 | 4.79 | 4.37 | 4.24 |
| 1995 | 20.6 | 27.3 | 20.6 | 5.49 | 4.90 | 4.41 | 3.99 | 3.95 |
| 2000 | 0.0 | 0.0 | 0.0 | 4.31 | 3.85 | 3.47 | 3.14 | 3.24 |
| 2000 | 0.0 | 100.0 | 0.0 | 5.32 | 4.62 | 4.05 | 3.58 | 3.54 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.92 | 4.55 | 4.23 | 3.93 | 3.87 |
| 2000 | 50.0 | 0.0 | 50.0 | 4.69 | 4.27 | 3.90 | 3.59 | 3.61 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.89 | 4.30 | 3.81 | 3.40 | 3.44 |
| 2000 | 50.0 | 50.0 | 50.0 | 5.12 | 4.59 | 4.14 | 3.76 | 3.71 |
| 2000 | 20.6 | 27.3 | 20.6 | 4.79 | 4.27 | 3.84 | 3.47 | 3.50 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.86 | 3.46 | 3.11 | 2.82 | 2.94 |
| 2005 | 0.0 | 100.0 | 0.0 | 4.75 | 4.13 | 3.61 | 3.18 | 3.18 |
| 2005 | 100.0 | 0.0 | 100.0 | 4.41 | 4.07 | 3.77 | 3.50 | 3.47 |
| 2005 | 50.0 | 0.0 | 50.0 | 4.19 | 3.82 | 3.49 | 3.20 | 3.25 |
| 2005 | 0.0 | 50.0 | 0.0 | 4.37 | 3.85 | 3.41 | 3.04 | 3.10 |
| 2005 | 50.0 | 50.0 | 50.0 | 4.58 | 4.10 | 3.69 | 3.34 | 3.33 |
| 2005 | 20.6 | 27.3 | 20.6 | 4.28 | 3.82 | 3.43 | 3.10 | 3.16 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.68 | 3.30 | 2.97 | 2.69 | 2.82 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.54 | 3.94 | 3.45 | 3.04 | 3.04 |
| 2010 | 100.0 | 0.0 | 100.0 | 4.23 | 3.91 | 3.61 | 3.35 | 3.33 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.01 | 3.65 | 3.34 | 3.06 | 3.11 |
| 2010 | 0.0 | 50.0 | 0.0 | 4.17 | 3.67 | 3.25 | 2.90 | 2.97 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.39 | 3.92 | 3.53 | 3.19 | 3.18 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.09 | 3.65 | 3.28 | 2.96 | 3.02 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.61 | 3.24 | 2.93 | 2.66 | 2.78 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.45 | 3.87 | 3.39 | 2.99 | 3.00 |
| 2020 | 100.0 | 0.0 | 100.0 | 4.14 | 3.82 | 3.54 | 3.28 | 3.26 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.93 | 3.58 | 3.28 | 3.01 | 3.06 |
| 2020 | 0.0 | 50.0 | 0.0 | 4.09 | 3.61 | 3.20 | 2.86 | 2.92 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.30 | 3.85 | 3.46 | 3.14 | 3.13 |
| 2020 | 20.6 | 27.3 | 20.6 | 4.00 | 3.58 | 3.22 | 2.91 | 2.97 |

TABLE 1.15: EXHAUST NO_x AT 2.5 MPH

TABLE 1.16

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 4.74 | 4.28 | 3.90 | 3.59 | 3.42 |
| 1990 | 0.0 | 100.0 | 0.0 | 5.89 | 5.25 | 4.72 | 4.29 | 3.91 |
| 1990 | 100.0 | 0.0 | 100.0 | 5.55 | 5.17 | 4.84 | 4.55 | 4.18 |
| 1990 | 50.0 | 0.0 | 50.0 | 5.20 | 4.78 | 4.42 | 4.11 | 3.84 |
| 1990 | 0.0 | 50.0 | 0.0 | 5.39 | 4.82 | 4.36 | 3.98 | 3.70 |
| 1990 | 50.0 | 50.0 | 50.0 | 5.72 | 5.21 | 4.78 | 4.42 | 4.04 |
| 1990 | 20.6 | 27.3 | 20.6 | 5.28 | 4.78 | 4.37 | 4.02 | 3.75 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.18 | 3.74 | 3.38 | 3.08 | 3.09 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.17 | 4.53 | 4.00 | 3.57 | 3.45 |
| 1995 | 100.0 | 0.0 | 100.0 | 4.82 | 4.48 | 4.18 | 3.91 | 3.78 |
| 1995 | 50.0 | 0.0 | 50.0 | 4.57 | 4.17 | 3.83 | 3.54 | 3.49 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.75 | 4.20 | 3.74 | 3.37 | 3.32 |
| 1995 | 50.0 | 50.0 | 50.0 | 4.99 | 4.50 | 4.09 | 3.74 | 3.62 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.66 | 4.17 | 3.77 | 3.43 | 3.38 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.64 | 3.27 | 2.95 | 2.69 | 2.76 |
| 2000 | 0.0 | 100.0 | 0.0 | 4.46 | 3.89 | 3.42 | 3.04 | 3.01 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.13 | 3.84 | 3.57 | 3.33 | 3.28 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.94 | 3.60 | 3.30 | 3.05 | 3.06 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.11 | 3.63 | 3.23 | 2.90 | 2.92 |
| 2000 | 50.0 | 50.0 | 50.0 | 4.29 | 3.86 | 3.49 | 3.18 | 3.14 |
| 2000 | 20.6 | 27.3 | 20.6 | 4.02 | 3.61 | 3.25 | 2.95 | 2.97 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.24 | 2.91 | 2.63 | 2.40 | 2.49 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.96 | 3.45 | 3.04 | 2.69 | 2.69 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.68 | 3.41 | 3.16 | 2.94 | 2.92 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.51 | 3.20 | 2.94 | 2.70 | 2.74 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.65 | 3.23 | 2.87 | 2.57 | 2.62 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.82 | 3.43 | 3.10 | 2.82 | 2.81 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.58 | 3.21 | 2.89 | 2.62 | 2.67 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.09 | 2.78 | 2.51 | 2.29 | 2.39 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.78 | 3.30 | 2.90 | 2.57 | 2.57 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.53 | 3.27 | 3.03 | 2.82 | 2.80 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.36 | 3.06 | 2.81 | 2.58 | 2.62 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.48 | 3.08 | 2.74 | 2.46 | 2.51 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.66 | 3.28 | 2.96 | 2.69 | 2.68 |
| 2010 | 20.6 | 27.3 | 20.6 | 3.41 | 3.06 | 2.76 | 2.50 | 2.55 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.03 | 2.73 | 2.48 | 2.26 | 2.35 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.70 | 3.24 | 2.85 | 2.53 | 2.53 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.46 | 3.20 | 2.97 | 2.76 | 2.74 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.29 | 3.01 | 2.76 | 2.54 | 2.58 |
| 2020 | 0.0 | 50.0 | 0.0 | 3.41 | 3.02 | 2.70 | 2.42 | 2.47 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.58 | 3.22 | 2.91 | 2.64 | 2.64 |
| 2020 | 20.6 | 27.3 | 20.6 | 3.35 | 3.01 | 2.71 | 2.46 | 2.51 |

TABLE 1.16: EXHAUST NO_x AT 5.0 MPH

TABLE 1.17

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|------|------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 4.17 | 3.76 | 3.42 | 3.14 | 2.98 |
| 1990 | 0.0 | 100.0 | 0.0 | 5.22 | 4.64 | 4.17 | 3.78 | 3.42 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.90 | 4.56 | 4.26 | 4.01 | 3.65 |
| 1990 | 50.0 | 0.0 | 50.0 | 4.59 | 4.21 | 3.89 | 3.62 | 3.36 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.76 | 4.26 | 3.84 | 3.50 | 3.23 |
| 1990 | 50.0 | 50.0 | 50.0 | 5.06 | 4.60 | 4.22 | 3.89 | 3.54 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.66 | 4.22 | 3.84 | 3.53 | 3.27 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.65 | 3.27 | 2.94 | 2.68 | 2.68 |
| 1995 | 0.0 | 100.0 | 0.0 | 4.54 | 3.97 | 3.50 | 3.12 | 3.01 |
| 1995 | 100.0 | 0.0 | 100.0 | 4.22 | 3.92 | 3.65 | 3.41 | 3.29 |
| 1995 | 50.0 | 0.0 | 50.0 | 4.00 | 3.65 | 3.35 | 3.09 | 3.03 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.17 | 3.67 | 3.27 | 2.93 | 2.88 |
| 1995 | 50.0 | 50.0 | 50.0 | 4.38 | 3.94 | 3.58 | 3.27 | 3.15 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.08 | 3.65 | 3.29 | 2.99 | 2.94 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.17 | 2.85 | 2.57 | 2.33 | 2.40 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.90 | 3.40 | 2.98 | 2.65 | 2.62 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.61 | 3.35 | 3.11 | 2.90 | 2.85 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.44 | 3.14 | 2.88 | 2.65 | 2.66 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.59 | 3.17 | 2.81 | 2.52 | 2.54 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.76 | 3.37 | 3.05 | 2.77 | 2.73 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.52 | 3.15 | 2.83 | 2.57 | 2.59 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.83 | 2.54 | 2.29 | 2.08 | 2.17 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.46 | 3.02 | 2.65 | 2.34 | 2.34 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.22 | 2.97 | 2.76 | 2.56 | 2.55 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.07 | 2.80 | 2.56 | 2.35 | 2.39 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.19 | 2.82 | 2.50 | 2.24 | 2.28 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.34 | 2.99 | 2.70 | 2.45 | 2.44 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.13 | 2.80 | 2.52 | 2.28 | 2.32 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.69 | 2.42 | 2.19 | 1.99 | 2.08 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.31 | 2.88 | 2.53 | 2.23 | 2.24 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.09 | 2.85 | 2.64 | 2.45 | 2.44 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.93 | 2.67 | 2.45 | 2.25 | 2.29 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.04 | 2.69 | 2.39 | 2.14 | 2.18 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.20 | 2.87 | 2.59 | 2.34 | 2.34 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.98 | 2.67 | 2.40 | 2.18 | 2.22 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.64 | 2.38 | 2.15 | 1.96 | 2.05 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.24 | 2.83 | 2.48 | 2.20 | 2.20 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.02 | 2.79 | 2.59 | 2.40 | 2.39 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.87 | 2.62 | 2.40 | 2.21 | 2.24 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.98 | 2.64 | 2.35 | 2.10 | 2.15 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.13 | 2.81 | 2.54 | 2.30 | 2.30 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.92 | 2.62 | 2.36 | 2.14 | 2.19 |

TABLE 1.17: EXHAUST NO_x AT 10.0 MPH

TABLE 1.18

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.74 | 3.35 | 3.03 | 2.77 | 2.60 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.74 | 4.20 | 3.75 | 3.38 | 3.03 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.40 | 4.09 | 3.82 | 3.59 | 3.25 |
| 1990 | 50.0 | 0.0 | 50.0 | 4.12 | 3.77 | 3.47 | 3.22 | 2.97 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.30 | 3.83 | 3.43 | 3.11 | 2.85 |
| 1990 | 50.0 | 50.0 | 50.0 | 4.57 | 4.14 | 3.79 | 3.49 | 3.14 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.20 | 3.78 | 3.43 | 3.14 | 2.89 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.27 | 2.90 | 2.60 | 2.35 | 2.35 |
| 1995 | 0.0 | 100.0 | 0.0 | 4.11 | 3.57 | 3.13 | 2.77 | 2.66 |
| 1995 | 100.0 | 0.0 | 100.0 | 3.79 | 3.51 | 3.27 | 3.05 | 2.92 |
| 1995 | 50.0 | 0.0 | 50.0 | 3.59 | 3.26 | 2.98 | 2.74 | 2.68 |
| 1995 | 0.0 | 50.0 | 0.0 | 3.75 | 3.29 | 2.91 | 2.60 | 2.54 |
| 1995 | 50.0 | 50.0 | 50.0 | 3.95 | 3.54 | 3.20 | 2.91 | 2.79 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.67 | 3.27 | 2.93 | 2.65 | 2.59 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.84 | 2.53 | 2.27 | 2.05 | 2.11 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.52 | 3.05 | 2.66 | 2.35 | 2.32 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.25 | 3.00 | 2.78 | 2.59 | 2.54 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.09 | 2.81 | 2.57 | 2.35 | 2.36 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.23 | 2.84 | 2.50 | 2.23 | 2.24 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.38 | 3.03 | 2.72 | 2.47 | 2.43 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.16 | 2.82 | 2.52 | 2.27 | 2.29 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.54 | 2.27 | 2.04 | 1.84 | 1.92 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.13 | 2.71 | 2.37 | 2.08 | 2.08 |
| 2005 | 100.0 | 0.0 | 100.0 | 2.90 | 2.67 | 2.47 | 2.29 | 2.27 |
| 2005 | 50.0 | 0.0 | 50.0 | 2.76 | 2.51 | 2.28 | 2.09 | 2.12 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.88 | 2.53 | 2.23 | 1.98 | 2.02 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.01 | 2.69 | 2.42 | 2.18 | 2.17 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.82 | 2.51 | 2.25 | 2.02 | 2.06 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.42 | 2.16 | 1.95 | 1.76 | 1.84 |
| 2010 | 0.0 | 100.0 | 0.0 | 2.99 | 2.59 | 2.26 | 1.99 | 1.99 |
| 2010 | 100.0 | 0.0 | 100.0 | 2.79 | 2.57 | 2.37 | 2.19 | 2.18 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.64 | 2.40 | 2.19 | 2.00 | 2.04 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.75 | 2.41 | 2.13 | 1.90 | 1.94 |
| 2010 | 50.0 | 50.0 | 50.0 | 2.89 | 2.58 | 2.32 | 2.09 | 2.09 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.69 | 2.40 | 2.15 | 1.93 | 1.98 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.37 | 2.13 | 1.91 | 1.73 | 1.81 |
| 2020 | 0.0 | 100.0 | 0.0 | 2.93 | 2.54 | 2.22 | 1.96 | 1.96 |
| 2020 | 100.0 | 0.0 | 100.0 | 2.72 | 2.51 | 2.32 | 2.15 | 2.13 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.59 | 2.35 | 2.14 | 1.96 | 2.00 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.69 | 2.37 | 2.10 | 1.87 | 1.91 |
| 2020 | 50.0 | 50.0 | 50.0 | 2.83 | 2.53 | 2.27 | 2.05 | 2.05 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.63 | 2.35 | 2.11 | 1.90 | 1.94 |

TABLE 1.18: EXHAUST NO_x AT 19.6 MPH

TABLE 1.19

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|------|------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.79 | 3.38 | 3.04 | 2.76 | 2.58 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.86 | 4.28 | 3.81 | 3.41 | 3.04 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.47 | 4.15 | 3.88 | 3.64 | 3.28 |
| 1990 | 50.0 | 0.0 | 50.0 | 4.19 | 3.82 | 3.51 | 3.25 | 2.98 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.40 | 3.89 | 3.48 | 3.13 | 2.85 |
| 1990 | 50.0 | 50.0 | 50.0 | 4.66 | 4.22 | 3.84 | 3.53 | 3.16 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.29 | 3.85 | 3.47 | 3.16 | 2.89 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.33 | 2.94 | 2.62 | 2.35 | 2.35 |
| 1995 | 0.0 | 100.0 | 0.0 | 4.22 | 3.65 | 3.18 | 2.79 | 2.67 |
| 1995 | 100.0 | 0.0 | 100.0 | 3.88 | 3.58 | 3.32 | 3.09 | 2.96 |
| 1995 | 50.0 | 0.0 | 50.0 | 3.67 | 3.32 | 3.02 | 2.76 | 2.70 |
| 1995 | 0.0 | 50.0 | 0.0 | 3.85 | 3.36 | 2.95 | 2.61 | 2.55 |
| 1995 | 50.0 | 50.0 | 50.0 | 4.05 | 3.61 | 3.25 | 2.94 | 2.82 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.76 | 3.33 | 2.97 | 2.67 | 2.61 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.87 | 2.55 | 2.27 | 2.04 | 2.10 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.59 | 3.09 | 2.69 | 2.35 | 2.32 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.30 | 3.04 | 2.81 | 2.60 | 2.55 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.14 | 2.84 | 2.58 | 2.36 | 2.36 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.29 | 2.87 | 2.52 | 2.23 | 2.24 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.44 | 3.07 | 2.75 | 2.48 | 2.43 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.21 | 2.85 | 2.54 | 2.28 | 2.29 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.56 | 2.28 | 2.03 | 1.83 | 1.91 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.18 | 2.74 | 2.38 | 2.08 | 2.08 |
| 2005 | 100.0 | 0.0 | 100.0 | 2.94 | 2.70 | 2.49 | 2.30 | 2.28 |
| 2005 | 50.0 | 0.0 | 50.0 | 2.79 | 2.53 | 2.29 | 2.09 | 2.13 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.91 | 2.55 | 2.24 | 1.98 | 2.02 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.06 | 2.72 | 2.43 | 2.19 | 2.18 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.85 | 2.53 | 2.25 | 2.02 | 2.06 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.44 | 2.17 | 1.94 | 1.75 | 1.83 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.03 | 2.62 | 2.27 | 1.99 | 1.99 |
| 2010 | 100.0 | 0.0 | 100.0 | 2.82 | 2.59 | 2.38 | 2.20 | 2.18 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.67 | 2.42 | 2.19 | 2.00 | 2.04 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.78 | 2.43 | 2.14 | 1.89 | 1.94 |
| 2010 | 50.0 | 50.0 | 50.0 | 2.93 | 2.60 | 2.33 | 2.09 | 2.09 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.72 | 2.41 | 2.15 | 1.93 | 1.97 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.38 | 2.13 | 1.91 | 1.72 | 1.80 |
| 2020 | 0.0 | 100.0 | 0.0 | 2.96 | 2.56 | 2.23 | 1.95 | 1.95 |
| 2020 | 100.0 | 0.0 | 100.0 | 2.75 | 2.53 | 2.33 | 2.15 | 2.13 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.61 | 2.36 | 2.15 | 1.96 | 1.99 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.71 | 2.38 | 2.09 | 1.86 | 1.90 |
| 2020 | 50.0 | 50.0 | 50.0 | 2.86 | 2.54 | 2.28 | 2.05 | 2.04 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.66 | 2.36 | 2.11 | 1.89 | 1.94 |

TABLE 1.19: EXHAUST NO_x AT 35.0 MPH

TABLE 1.20

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|------|------|------|------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 5.17 | 4.61 | 4.14 | 3.75 | 3.49 |
| 1990 | 0.0 | 100.0 | 0.0 | 6.70 | 5.91 | 5.25 | 4.71 | 4.17 |
| 1990 | 100.0 | 0.0 | 100.0 | 6.17 | 5.72 | 5.33 | 5.01 | 4.49 |
| 1990 | 50.0 | 0.0 | 50.0 | 5.72 | 5.21 | 4.78 | 4.42 | 4.03 |
| 1990 | 0.0 | 50.0 | 0.0 | 6.00 | 5.31 | 4.74 | 4.27 | 3.87 |
| 1990 | 50.0 | 50.0 | 50.0 | 6.43 | 5.81 | 5.29 | 4.86 | 4.33 |
| 1990 | 20.6 | 27.3 | 20.6 | 5.85 | 5.24 | 4.73 | 4.31 | 3.92 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.41 | 3.89 | 3.47 | 3.11 | 3.11 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.62 | 4.86 | 4.24 | 3.73 | 3.56 |
| 1995 | 100.0 | 0.0 | 100.0 | 5.15 | 4.76 | 4.41 | 4.11 | 3.92 |
| 1995 | 50.0 | 0.0 | 50.0 | 4.83 | 4.38 | 3.98 | 3.65 | 3.56 |
| 1995 | 0.0 | 50.0 | 0.0 | 5.08 | 4.43 | 3.90 | 3.46 | 3.37 |
| 1995 | 50.0 | 50.0 | 50.0 | 5.39 | 4.81 | 4.33 | 3.92 | 3.74 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.95 | 4.39 | 3.92 | 3.52 | 3.44 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.72 | 3.30 | 2.95 | 2.65 | 2.73 |
| 2000 | 0.0 | 100.0 | 0.0 | 4.65 | 4.02 | 3.49 | 3.07 | 3.02 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.28 | 3.95 | 3.65 | 3.38 | 3.31 |
| 2000 | 50.0 | 0.0 | 50.0 | 4.04 | 3.66 | 3.33 | 3.05 | 3.05 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.23 | 3.70 | 3.25 | 2.88 | 2.90 |
| 2000 | 50.0 | 50.0 | 50.0 | 4.47 | 3.98 | 3.57 | 3.22 | 3.16 |
| 2000 | 20.6 | 27.3 | 20.6 | 4.14 | 3.67 | 3.28 | 2.94 | 2.95 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.26 | 2.91 | 2.60 | 2.34 | 2.45 |
| 2005 | 0.0 | 100.0 | 0.0 | 4.05 | 3.50 | 3.04 | 2.66 | 2.66 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.74 | 3.45 | 3.18 | 2.94 | 2.92 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.54 | 3.21 | 2.92 | 2.66 | 2.71 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.69 | 3.23 | 2.85 | 2.53 | 2.58 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.90 | 3.47 | 3.11 | 2.80 | 2.79 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.61 | 3.21 | 2.87 | 2.58 | 2.63 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.09 | 2.76 | 2.47 | 2.23 | 2.34 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.84 | 3.32 | 2.89 | 2.53 | 2.54 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.58 | 3.29 | 3.03 | 2.80 | 2.78 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.37 | 3.05 | 2.78 | 2.54 | 2.58 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.50 | 3.07 | 2.71 | 2.40 | 2.46 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.71 | 3.31 | 2.96 | 2.67 | 2.66 |
| 2010 | 20.6 | 27.3 | 20.6 | 3.43 | 3.05 | 2.73 | 2.45 | 2.50 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.02 | 2.70 | 2.43 | 2.19 | 2.30 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.75 | 3.25 | 2.83 | 2.48 | 2.49 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.48 | 3.21 | 2.96 | 2.73 | 2.71 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.28 | 2.98 | 2.71 | 2.48 | 2.53 |
| 2020 | 0.0 | 50.0 | 0.0 | 3.42 | 3.00 | 2.65 | 2.36 | 2.41 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.62 | 3.23 | 2.89 | 2.61 | 2.60 |
| 2020 | 20.6 | 27.3 | 20.6 | 3.35 | 2.98 | 2.67 | 2.40 | 2.45 |

TABLE 1.20: EXHAUST NO_x AT 55.0 MPH

TABLE 1.21

LOW ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 6.98 | 6.23 | 5.61 | 5.08 | 4.76 |
| 1990 | 0.0 | 100.0 | 0.0 | 9.10 | 8.04 | 7.16 | 6.43 | 5.72 |
| 1990 | 100.0 | 0.0 | 100.0 | 8.37 | 7.77 | 7.26 | 6.82 | 6.13 |
| 1990 | 50.0 | 0.0 | 50.0 | 7.72 | 7.04 | 6.47 | 5.98 | 5.47 |
| 1990 | 0.0 | 50.0 | 0.0 | 8.09 | 7.17 | 6.41 | 5.79 | 5.26 |
| 1990 | 50.0 | 50.0 | 50.0 | 8.74 | 7.91 | 7.21 | 6.63 | 5.92 |
| 1990 | 20.6 | 27.3 | 20.6 | 7.89 | 7.08 | 6.40 | 5.84 | 5.33 |
| 1995 | 0.0 | 0.0 | 0.0 | 5.88 | 5.20 | 4.64 | 4.18 | 4.18 |
| 1995 | 0.0 | 100.0 | 0.0 | 7.52 | 6.51 | 5.69 | 5.02 | 4.80 |
| 1995 | 100.0 | 0.0 | 100.0 | 6.87 | 6.36 | 5.91 | 5.51 | 5.27 |
| 1995 | 50.0 | 0.0 | 50.0 | 6.41 | 5.82 | 5.31 | 4.87 | 4.75 |
| 1995 | 0.0 | 50.0 | 0.0 | 6.74 | 5.90 | 5.20 | 4.63 | 4.51 |
| 1995 | 50.0 | 50.0 | 50.0 | 7.19 | 6.44 | 5.80 | 5.26 | 5.04 |
| 1995 | 20.6 | 27.3 | 20.6 | 6.57 | 5.84 | 5.22 | 4.71 | 4.60 |
| 2000 | 0.0 | 0.0 | 0.0 | 4.89 | 4.35 | 3.90 | 3.51 | 3.61 |
| 2000 | 0.0 | 100.0 | 0.0 | 6.12 | 5.30 | 4.62 | 4.07 | 4.00 |
| 2000 | 100.0 | 0.0 | 100.0 | 5.63 | 5.20 | 4.82 | 4.47 | 4.38 |
| 2000 | 50.0 | 0.0 | 50.0 | 5.29 | 4.80 | 4.38 | 4.01 | 4.02 |
| 2000 | 0.0 | 50.0 | 0.0 | 5.54 | 4.85 | 4.28 | 3.81 | 3.83 |
| 2000 | 50.0 | 50.0 | 50.0 | 5.87 | 5.25 | 4.72 | 4.27 | 4.19 |
| 2000 | 20.6 | 27.3 | 20.6 | 5.41 | 4.81 | 4.31 | 3.88 | 3.90 |
| 2005 | 0.0 | 0.0 | 0.0 | 4.24 | 3.79 | 3.40 | 3.08 | 3.21 |
| 2005 | 0.0 | 100.0 | 0.0 | 5.26 | 4.56 | 3.97 | 3.49 | 3.49 |
| 2005 | 100.0 | 0.0 | 100.0 | 4.86 | 4.49 | 4.15 | 3.84 | 3.81 |
| 2005 | 50.0 | 0.0 | 50.0 | 4.58 | 4.16 | 3.79 | 3.47 | 3.53 |
| 2005 | 0.0 | 50.0 | 0.0 | 4.78 | 4.20 | 3.71 | 3.30 | 3.36 |
| 2005 | 50.0 | 50.0 | 50.0 | 5.06 | 4.52 | 4.06 | 3.67 | 3.65 |
| 2005 | 20.6 | 27.3 | 20.6 | 4.67 | 4.16 | 3.73 | 3.36 | 3.42 |
| 2010 | 0.0 | 0.0 | 0.0 | 4.01 | 3.59 | 3.22 | 2.91 | 3.05 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.97 | 4.31 | 3.76 | 3.31 | 3.31 |
| 2010 | 100.0 | 0.0 | 100.0 | 4.63 | 4.27 | 3.94 | 3.65 | 3.63 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.34 | 3.94 | 3.60 | 3.30 | 3.35 |
| 2010 | 0.0 | 50.0 | 0.0 | 4.51 | 3.97 | 3.51 | 3.12 | 3.19 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.80 | 4.29 | 3.85 | 3.48 | 3.47 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.42 | 3.94 | 3.53 | 3.19 | 3.25 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.92 | 3.51 | 3.16 | 2.87 | 3.00 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.84 | 4.21 | 3.68 | 3.24 | 3.25 |
| 2020 | 100.0 | 0.0 | 100.0 | 4.51 | 4.16 | 3.84 | 3.56 | 3.53 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.23 | 3.85 | 3.52 | 3.22 | 3.28 |
| 2020 | 0.0 | 50.0 | 0.0 | 4.40 | 3.88 | 3.44 | 3.07 | 3.13 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.68 | 4.18 | 3.76 | 3.40 | 3.39 |
| 2020 | 20.6 | 27.3 | 20.6 | 4.31 | 3.85 | 3.46 | 3.12 | 3.19 |

TABLE 1.21: EXHAUST NO_x AT 65.0 MPH

TABLE 1.22

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|-------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 22.18 | 18.57 | 15.64 | 13.25 | 18.77 |
| 1990 | 0.0 | 100.0 | 0.0 | 22.91 | 20.85 | 19.11 | 17.64 | 24.78 |
| 1990 | 100.0 | 0.0 | 100.0 | 207.67 | 105.32 | 54.54 | 28.96 | 24.79 |
| 1990 | 50.0 | 0.0 | 50.0 | 96.19 | 53.07 | 31.03 | 19.39 | 21.10 |
| 1990 | 0.0 | 50.0 | 0.0 | 22.35 | 19.37 | 16.92 | 14.90 | 21.03 |
| 1990 | 50.0 | 50.0 | 50.0 | 115.29 | 63.09 | 36.83 | 23.30 | 24.79 |
| 1990 | 20.6 | 27.3 | 20.6 | 52.57 | 33.13 | 22.64 | 16.67 | 20.96 |
| 1995 | 0.0 | 0.0 | 0.0 | 15.75 | 13.05 | 10.86 | 9.09 | 11.23 |
| 1995 | 0.0 | 100.0 | 0.0 | 18.32 | 15.92 | 13.92 | 12.24 | 14.55 |
| 1995 | 100.0 | 0.0 | 100.0 | 153.13 | 75.52 | 38.03 | 19.66 | 18.55 |
| 1995 | 50.0 | 0.0 | 50.0 | 70.87 | 37.99 | 21.62 | 13.20 | 14.03 |
| 1995 | 0.0 | 50.0 | 0.0 | 16.59 | 14.05 | 11.96 | 10.24 | 12.43 |
| 1995 | 50.0 | 50.0 | 50.0 | 85.72 | 45.72 | 25.97 | 15.95 | 16.55 |
| 1995 | 20.6 | 27.3 | 20.6 | 38.75 | 23.79 | 15.86 | 11.40 | 13.04 |
| 2000 | 0.0 | 0.0 | 0.0 | 12.80 | 10.49 | 8.64 | 7.14 | 8.20 |
| 2000 | 0.0 | 100.0 | 0.0 | 15.66 | 13.34 | 11.40 | 9.77 | 10.58 |
| 2000 | 100.0 | 0.0 | 100.0 | 108.44 | 55.17 | 28.56 | 15.14 | 14.83 |
| 2000 | 50.0 | 0.0 | 50.0 | 50.59 | 27.99 | 16.33 | 10.13 | 10.63 |
| 2000 | 0.0 | 50.0 | 0.0 | 13.61 | 11.36 | 9.52 | 8.01 | 8.96 |
| 2000 | 50.0 | 50.0 | 50.0 | 62.05 | 34.25 | 19.98 | 12.45 | 12.71 |
| 2000 | 20.6 | 27.3 | 20.6 | 28.62 | 18.07 | 12.23 | 8.81 | 9.58 |
| 2005 | 0.0 | 0.0 | 0.0 | 11.46 | 9.37 | 7.69 | 6.34 | 6.88 |
| 2005 | 0.0 | 100.0 | 0.0 | 14.43 | 12.17 | 10.29 | 8.72 | 8.86 |
| 2005 | 100.0 | 0.0 | 100.0 | 85.64 | 45.26 | 24.25 | 13.25 | 13.28 |
| 2005 | 50.0 | 0.0 | 50.0 | 40.32 | 23.19 | 13.95 | 8.85 | 9.17 |
| 2005 | 0.0 | 50.0 | 0.0 | 12.24 | 10.16 | 8.46 | 7.07 | 7.44 |
| 2005 | 50.0 | 50.0 | 50.0 | 50.04 | 28.72 | 17.27 | 10.99 | 11.07 |
| 2005 | 20.6 | 27.3 | 20.6 | 23.56 | 15.36 | 10.60 | 7.72 | 8.07 |
| 2010 | 0.0 | 0.0 | 0.0 | 11.09 | 9.06 | 7.43 | 6.12 | 6.62 |
| 2010 | 0.0 | 100.0 | 0.0 | 13.98 | 11.79 | 9.96 | 8.44 | 8.55 |
| 2010 | 100.0 | 0.0 | 100.0 | 79.00 | 42.47 | 23.10 | 12.79 | 12.80 |
| 2010 | 50.0 | 0.0 | 50.0 | 37.31 | 21.82 | 13.30 | 8.52 | 8.81 |
| 2010 | 0.0 | 50.0 | 0.0 | 11.83 | 9.81 | 8.16 | 6.82 | 7.15 |
| 2010 | 50.0 | 50.0 | 50.0 | 46.49 | 27.13 | 16.53 | 10.62 | 10.68 |
| 2010 | 20.6 | 27.3 | 20.6 | 22.05 | 14.57 | 10.15 | 7.43 | 7.74 |
| 2020 | 0.0 | 0.0 | 0.0 | 10.98 | 8.96 | 7.35 | 6.06 | 6.55 |
| 2020 | 0.0 | 100.0 | 0.0 | 13.81 | 11.64 | 9.83 | 8.33 | 8.44 |
| 2020 | 100.0 | 0.0 | 100.0 | 75.19 | 40.88 | 22.47 | 12.56 | 12.57 |
| 2020 | 50.0 | 0.0 | 50.0 | 35.66 | 21.10 | 12.99 | 8.39 | 8.67 |
| 2020 | 0.0 | 50.0 | 0.0 | 11.68 | 9.69 | 8.06 | 6.74 | 7.06 |
| 2020 | 50.0 | 50.0 | 50.0 | 44.50 | 26.26 | 16.15 | 10.44 | 10.50 |
| 2020 | 20.6 | 27.3 | 20.6 | 21.29 | 14.21 | 9.97 | 7.32 | 7.63 |

TABLE 1.22: EXHAUST NMHC AT 2.5 MPH

TABLE 1.23

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|-------|-------|-------|-------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 12.69 | 10.72 | 9.11 | 7.79 | 10.75 |
| 1990 | 0.0 | 100.0 | 0.0 | 13.05 | 11.91 | 10.94 | 10.12 | 13.98 |
| 1990 | 100.0 | 0.0 | 100.0 | 112.13 | 57.34 | 30.06 | 16.24 | 14.00 |
| 1990 | 50.0 | 0.0 | 50.0 | 52.43 | 29.29 | 17.41 | 11.10 | 12.01 |
| 1990 | 0.0 | 50.0 | 0.0 | 12.77 | 11.13 | 9.78 | 8.67 | 11.96 |
| 1990 | 50.0 | 50.0 | 50.0 | 62.59 | 34.62 | 20.50 | 13.18 | 13.99 |
| 1990 | 20.6 | 27.3 | 20.6 | 29.00 | 18.55 | 12.87 | 9.63 | 11.93 |
| 1995 | 0.0 | 0.0 | 0.0 | 9.00 | 7.52 | 6.31 | 5.33 | 6.51 |
| 1995 | 0.0 | 100.0 | 0.0 | 10.38 | 9.05 | 7.95 | 7.02 | 8.30 |
| 1995 | 100.0 | 0.0 | 100.0 | 82.61 | 41.09 | 20.95 | 11.05 | 10.48 |
| 1995 | 50.0 | 0.0 | 50.0 | 38.54 | 20.92 | 12.11 | 7.55 | 8.03 |
| 1995 | 0.0 | 50.0 | 0.0 | 9.45 | 8.05 | 6.89 | 5.95 | 7.16 |
| 1995 | 50.0 | 50.0 | 50.0 | 46.49 | 25.07 | 14.45 | 9.04 | 9.39 |
| 1995 | 20.6 | 27.3 | 20.6 | 21.32 | 13.29 | 9.00 | 6.58 | 7.49 |
| 2000 | 0.0 | 0.0 | 0.0 | 7.40 | 6.11 | 5.08 | 4.24 | 4.84 |
| 2000 | 0.0 | 100.0 | 0.0 | 8.96 | 7.66 | 6.58 | 5.67 | 6.14 |
| 2000 | 100.0 | 0.0 | 100.0 | 59.27 | 30.40 | 15.94 | 8.61 | 8.46 |
| 2000 | 50.0 | 0.0 | 50.0 | 27.89 | 15.62 | 9.27 | 5.87 | 6.16 |
| 2000 | 0.0 | 50.0 | 0.0 | 7.84 | 6.59 | 5.56 | 4.72 | 5.25 |
| 2000 | 50.0 | 50.0 | 50.0 | 34.12 | 19.03 | 11.26 | 7.14 | 7.30 |
| 2000 | 20.6 | 27.3 | 20.6 | 15.98 | 10.23 | 7.03 | 5.15 | 5.59 |
| 2005 | 0.0 | 0.0 | 0.0 | 6.70 | 5.52 | 4.57 | 3.81 | 4.12 |
| 2005 | 0.0 | 100.0 | 0.0 | 8.34 | 7.07 | 6.01 | 5.13 | 5.22 |
| 2005 | 100.0 | 0.0 | 100.0 | 47.36 | 25.22 | 13.68 | 7.62 | 7.65 |
| 2005 | 50.0 | 0.0 | 50.0 | 22.51 | 13.10 | 8.01 | 5.19 | 5.38 |
| 2005 | 0.0 | 50.0 | 0.0 | 7.13 | 5.96 | 5.00 | 4.22 | 4.43 |
| 2005 | 50.0 | 50.0 | 50.0 | 27.85 | 16.14 | 9.84 | 6.37 | 6.43 |
| 2005 | 20.6 | 27.3 | 20.6 | 13.33 | 8.81 | 6.18 | 4.57 | 4.78 |
| 2010 | 0.0 | 0.0 | 0.0 | 6.53 | 5.38 | 4.45 | 3.71 | 3.99 |
| 2010 | 0.0 | 100.0 | 0.0 | 8.13 | 6.89 | 5.85 | 4.99 | 5.06 |
| 2010 | 100.0 | 0.0 | 100.0 | 43.94 | 23.80 | 13.10 | 7.39 | 7.41 |
| 2010 | 50.0 | 0.0 | 50.0 | 20.98 | 12.41 | 7.69 | 5.03 | 5.20 |
| 2010 | 0.0 | 50.0 | 0.0 | 6.94 | 5.79 | 4.86 | 4.10 | 4.28 |
| 2010 | 50.0 | 50.0 | 50.0 | 26.04 | 15.34 | 9.48 | 6.19 | 6.23 |
| 2010 | 20.6 | 27.3 | 20.6 | 12.57 | 8.42 | 5.95 | 4.43 | 4.61 |
| 2020 | 0.0 | 0.0 | 0.0 | 6.50 | 5.35 | 4.43 | 3.70 | 3.98 |
| 2020 | 0.0 | 100.0 | 0.0 | 8.07 | 6.83 | 5.81 | 4.96 | 5.02 |
| 2020 | 100.0 | 0.0 | 100.0 | 41.98 | 23.00 | 12.79 | 7.30 | 7.31 |
| 2020 | 50.0 | 0.0 | 50.0 | 20.14 | 12.06 | 7.55 | 4.99 | 5.15 |
| 2020 | 0.0 | 50.0 | 0.0 | 6.89 | 5.75 | 4.83 | 4.07 | 4.26 |
| 2020 | 50.0 | 50.0 | 50.0 | 25.02 | 14.91 | 9.30 | 6.13 | 6.17 |
| 2020 | 20.6 | 27.3 | 20.6 | 12.20 | 8.25 | 5.88 | 4.40 | 4.58 |

TABLE 1.23: EXHAUST NMHC AT 5.0 MPH

TABLE 1.24

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|-------|-------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 7.09 | 6.02 | 5.15 | 4.44 | 5.98 |
| 1990 | 0.0 | 100.0 | 0.0 | 7.32 | 6.68 | 6.14 | 5.68 | 7.69 |
| 1990 | 100.0 | 0.0 | 100.0 | 60.70 | 31.14 | 16.43 | 8.99 | 7.83 |
| 1990 | 50.0 | 0.0 | 50.0 | 28.53 | 16.03 | 9.62 | 6.22 | 6.70 |
| 1990 | 0.0 | 50.0 | 0.0 | 7.14 | 6.25 | 5.51 | 4.90 | 6.62 |
| 1990 | 50.0 | 50.0 | 50.0 | 34.01 | 18.91 | 11.28 | 7.33 | 7.76 |
| 1990 | 20.6 | 27.3 | 20.6 | 15.90 | 10.24 | 7.18 | 5.42 | 6.63 |
| 1995 | 0.0 | 0.0 | 0.0 | 5.20 | 4.37 | 3.69 | 3.14 | 3.78 |
| 1995 | 0.0 | 100.0 | 0.0 | 6.00 | 5.24 | 4.61 | 4.08 | 4.77 |
| 1995 | 100.0 | 0.0 | 100.0 | 46.06 | 23.04 | 11.86 | 6.35 | 6.06 |
| 1995 | 50.0 | 0.0 | 50.0 | 21.59 | 11.82 | 6.93 | 4.39 | 4.65 |
| 1995 | 0.0 | 50.0 | 0.0 | 5.46 | 4.67 | 4.02 | 3.49 | 4.14 |
| 1995 | 50.0 | 50.0 | 50.0 | 26.03 | 14.14 | 8.24 | 5.22 | 5.42 |
| 1995 | 20.6 | 27.3 | 20.6 | 12.04 | 7.58 | 5.19 | 3.84 | 4.33 |
| 2000 | 0.0 | 0.0 | 0.0 | 4.43 | 3.68 | 3.08 | 2.59 | 2.93 |
| 2000 | 0.0 | 100.0 | 0.0 | 5.35 | 4.59 | 3.95 | 3.42 | 3.67 |
| 2000 | 100.0 | 0.0 | 100.0 | 34.14 | 17.63 | 9.34 | 5.12 | 5.05 |
| 2000 | 50.0 | 0.0 | 50.0 | 16.15 | 9.14 | 5.49 | 3.54 | 3.71 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.69 | 3.96 | 3.36 | 2.87 | 3.16 |
| 2000 | 50.0 | 50.0 | 50.0 | 19.74 | 11.11 | 6.64 | 4.27 | 4.36 |
| 2000 | 20.6 | 27.3 | 20.6 | 9.34 | 6.05 | 4.20 | 3.12 | 3.36 |
| 2005 | 0.0 | 0.0 | 0.0 | 4.11 | 3.41 | 2.85 | 2.39 | 2.58 |
| 2005 | 0.0 | 100.0 | 0.0 | 5.08 | 4.32 | 3.69 | 3.17 | 3.22 |
| 2005 | 100.0 | 0.0 | 100.0 | 27.97 | 14.99 | 8.21 | 4.64 | 4.66 |
| 2005 | 50.0 | 0.0 | 50.0 | 13.38 | 7.86 | 4.87 | 3.21 | 3.32 |
| 2005 | 0.0 | 50.0 | 0.0 | 4.37 | 3.67 | 3.10 | 2.63 | 2.76 |
| 2005 | 50.0 | 50.0 | 50.0 | 16.53 | 9.66 | 5.95 | 3.91 | 3.94 |
| 2005 | 20.6 | 27.3 | 20.6 | 8.00 | 5.34 | 3.79 | 2.84 | 2.97 |
| 2010 | 0.0 | 0.0 | 0.0 | 4.04 | 3.35 | 2.79 | 2.35 | 2.52 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.99 | 4.24 | 3.62 | 3.11 | 3.15 |
| 2010 | 100.0 | 0.0 | 100.0 | 26.17 | 14.26 | 7.92 | 4.54 | 4.55 |
| 2010 | 50.0 | 0.0 | 50.0 | 12.58 | 7.51 | 4.71 | 3.13 | 3.23 |
| 2010 | 0.0 | 50.0 | 0.0 | 4.28 | 3.59 | 3.03 | 2.58 | 2.69 |
| 2010 | 50.0 | 50.0 | 50.0 | 15.58 | 9.25 | 5.77 | 3.82 | 3.85 |
| 2010 | 20.6 | 27.3 | 20.6 | 7.61 | 5.15 | 3.68 | 2.78 | 2.89 |
| 2020 | 0.0 | 0.0 | 0.0 | 4.04 | 3.35 | 2.80 | 2.36 | 2.52 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.97 | 4.23 | 3.61 | 3.10 | 3.14 |
| 2020 | 100.0 | 0.0 | 100.0 | 25.12 | 13.84 | 7.77 | 4.50 | 4.51 |
| 2020 | 50.0 | 0.0 | 50.0 | 12.14 | 7.34 | 4.65 | 3.12 | 3.22 |
| 2020 | 0.0 | 50.0 | 0.0 | 4.27 | 3.59 | 3.03 | 2.58 | 2.69 |
| 2020 | 50.0 | 50.0 | 50.0 | 15.04 | 9.03 | 5.69 | 3.80 | 3.83 |
| 2020 | 20.6 | 27.3 | 20.6 | 7.42 | 5.07 | 3.66 | 2.77 | 2.88 |

TABLE 1.24: EXHAUST NMHC AT 10.0 MPH

TABLE 1.25

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|-------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 4.03 | 3.44 | 2.96 | 2.56 | 3.40 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.20 | 3.84 | 3.53 | 3.27 | 4.36 |
| 1990 | 100.0 | 0.0 | 100.0 | 35.34 | 18.09 | 9.53 | 5.21 | 4.56 |
| 1990 | 50.0 | 0.0 | 50.0 | 16.58 | 9.29 | 5.57 | 3.60 | 3.85 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.07 | 3.58 | 3.17 | 2.83 | 3.76 |
| 1990 | 50.0 | 50.0 | 50.0 | 19.77 | 10.96 | 6.53 | 4.24 | 4.46 |
| 1990 | 20.6 | 27.3 | 20.6 | 9.19 | 5.91 | 4.14 | 3.13 | 3.78 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.11 | 2.62 | 2.22 | 1.89 | 2.25 |
| 1995 | 0.0 | 100.0 | 0.0 | 3.62 | 3.16 | 2.78 | 2.47 | 2.84 |
| 1995 | 100.0 | 0.0 | 100.0 | 27.97 | 14.01 | 7.22 | 3.87 | 3.70 |
| 1995 | 50.0 | 0.0 | 50.0 | 13.07 | 7.16 | 4.20 | 2.66 | 2.80 |
| 1995 | 0.0 | 50.0 | 0.0 | 3.27 | 2.80 | 2.42 | 2.10 | 2.46 |
| 1995 | 50.0 | 50.0 | 50.0 | 15.79 | 8.59 | 5.00 | 3.17 | 3.27 |
| 1995 | 20.6 | 27.3 | 20.6 | 7.27 | 4.58 | 3.13 | 2.32 | 2.59 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.78 | 2.32 | 1.94 | 1.64 | 1.83 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.38 | 2.90 | 2.50 | 2.17 | 2.31 |
| 2000 | 100.0 | 0.0 | 100.0 | 21.65 | 11.20 | 5.94 | 3.27 | 3.22 |
| 2000 | 50.0 | 0.0 | 50.0 | 10.22 | 5.79 | 3.48 | 2.24 | 2.34 |
| 2000 | 0.0 | 50.0 | 0.0 | 2.95 | 2.49 | 2.12 | 1.81 | 1.98 |
| 2000 | 50.0 | 50.0 | 50.0 | 12.52 | 7.05 | 4.22 | 2.72 | 2.77 |
| 2000 | 20.6 | 27.3 | 20.6 | 5.89 | 3.82 | 2.66 | 1.97 | 2.11 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.66 | 2.21 | 1.85 | 1.55 | 1.67 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.30 | 2.81 | 2.40 | 2.07 | 2.10 |
| 2005 | 100.0 | 0.0 | 100.0 | 18.30 | 9.82 | 5.38 | 3.04 | 3.05 |
| 2005 | 50.0 | 0.0 | 50.0 | 8.73 | 5.13 | 3.18 | 2.09 | 2.16 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.83 | 2.38 | 2.01 | 1.71 | 1.79 |
| 2005 | 50.0 | 50.0 | 50.0 | 10.80 | 6.32 | 3.89 | 2.56 | 2.58 |
| 2005 | 20.6 | 27.3 | 20.6 | 5.20 | 3.47 | 2.47 | 1.85 | 1.93 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.63 | 2.18 | 1.82 | 1.54 | 1.65 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.26 | 2.78 | 2.38 | 2.04 | 2.07 |
| 2010 | 100.0 | 0.0 | 100.0 | 17.28 | 9.41 | 5.23 | 2.99 | 3.00 |
| 2010 | 50.0 | 0.0 | 50.0 | 8.28 | 4.94 | 3.10 | 2.06 | 2.12 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.79 | 2.35 | 1.98 | 1.69 | 1.76 |
| 2010 | 50.0 | 50.0 | 50.0 | 10.27 | 6.10 | 3.80 | 2.52 | 2.53 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.99 | 3.38 | 2.42 | 1.82 | 1.89 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.63 | 2.19 | 1.83 | 1.54 | 1.65 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.25 | 2.77 | 2.38 | 2.04 | 2.07 |
| 2020 | 100.0 | 0.0 | 100.0 | 16.66 | 9.17 | 5.14 | 2.97 | 2.98 |
| 2020 | 50.0 | 0.0 | 50.0 | 8.02 | 4.84 | 3.07 | 2.06 | 2.12 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.79 | 2.35 | 1.99 | 1.69 | 1.76 |
| 2020 | 50.0 | 50.0 | 50.0 | 9.96 | 5.97 | 3.76 | 2.51 | 2.52 |
| 2020 | 20.6 | 27.3 | 20.6 | 4.89 | 3.34 | 2.40 | 1.82 | 1.89 |

TABLE 1.25: EXHAUST NMHC AT 19.6 MPH

TABLE 1.26

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start VMT Percentages | | | Combined for Eight Vehicle Types @ Ambient Temperature | | | | |
|--------------|-----------------------------------|-------|-------|---|-------|------|------|------|
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 2.42 | 2.07 | 1.79 | 1.56 | 2.03 |
| 1990 | 0.0 | 100.0 | 0.0 | 2.55 | 2.33 | 2.15 | 1.99 | 2.63 |
| 1990 | 100.0 | 0.0 | 100.0 | 22.13 | 11.26 | 5.89 | 3.19 | 2.79 |
| 1990 | 50.0 | 0.0 | 50.0 | 10.36 | 5.76 | 3.43 | 2.21 | 2.33 |
| 1990 | 0.0 | 50.0 | 0.0 | 2.46 | 2.16 | 1.92 | 1.73 | 2.26 |
| 1990 | 50.0 | 50.0 | 50.0 | 12.34 | 6.79 | 4.02 | 2.59 | 2.71 |
| 1990 | 20.6 | 27.3 | 20.6 | 5.69 | 3.63 | 2.53 | 1.91 | 2.28 |
| 1995 | 0.0 | 0.0 | 0.0 | 1.92 | 1.62 | 1.38 | 1.18 | 1.38 |
| 1995 | 0.0 | 100.0 | 0.0 | 2.25 | 1.96 | 1.73 | 1.53 | 1.75 |
| 1995 | 100.0 | 0.0 | 100.0 | 17.76 | 8.84 | 4.52 | 2.40 | 2.29 |
| 1995 | 50.0 | 0.0 | 50.0 | 8.29 | 4.51 | 2.62 | 1.65 | 1.73 |
| 1995 | 0.0 | 50.0 | 0.0 | 2.03 | 1.74 | 1.50 | 1.31 | 1.52 |
| 1995 | 50.0 | 50.0 | 50.0 | 10.00 | 5.40 | 3.13 | 1.97 | 2.02 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.58 | 2.87 | 1.95 | 1.44 | 1.60 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.68 | 1.40 | 1.18 | 0.99 | 1.11 |
| 2000 | 0.0 | 100.0 | 0.0 | 2.05 | 1.76 | 1.52 | 1.32 | 1.40 |
| 2000 | 100.0 | 0.0 | 100.0 | 13.37 | 6.88 | 3.63 | 1.98 | 1.95 |
| 2000 | 50.0 | 0.0 | 50.0 | 6.30 | 3.55 | 2.12 | 1.36 | 1.42 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.79 | 1.51 | 1.29 | 1.10 | 1.20 |
| 2000 | 50.0 | 50.0 | 50.0 | 7.71 | 4.32 | 2.57 | 1.65 | 1.67 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.62 | 2.33 | 1.62 | 1.20 | 1.28 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.58 | 1.32 | 1.10 | 0.93 | 1.00 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.96 | 1.67 | 1.43 | 1.24 | 1.25 |
| 2005 | 100.0 | 0.0 | 100.0 | 11.02 | 5.90 | 3.22 | 1.82 | 1.82 |
| 2005 | 50.0 | 0.0 | 50.0 | 5.25 | 3.08 | 1.90 | 1.25 | 1.29 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.68 | 1.42 | 1.20 | 1.02 | 1.07 |
| 2005 | 50.0 | 50.0 | 50.0 | 6.49 | 3.79 | 2.33 | 1.53 | 1.54 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.12 | 2.08 | 1.48 | 1.11 | 1.15 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.55 | 1.29 | 1.08 | 0.91 | 0.98 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.92 | 1.64 | 1.41 | 1.21 | 1.23 |
| 2010 | 100.0 | 0.0 | 100.0 | 10.28 | 5.59 | 3.10 | 1.77 | 1.77 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.92 | 2.93 | 1.84 | 1.22 | 1.26 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.64 | 1.39 | 1.17 | 1.00 | 1.05 |
| 2010 | 50.0 | 50.0 | 50.0 | 6.10 | 3.62 | 2.25 | 1.49 | 1.50 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.96 | 2.00 | 1.43 | 1.08 | 1.12 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.55 | 1.29 | 1.08 | 0.92 | 0.98 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.91 | 1.63 | 1.40 | 1.21 | 1.22 |
| 2020 | 100.0 | 0.0 | 100.0 | 9.85 | 5.42 | 3.04 | 1.76 | 1.76 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.74 | 2.86 | 1.81 | 1.22 | 1.25 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.64 | 1.38 | 1.17 | 1.00 | 1.04 |
| 2020 | 50.0 | 50.0 | 50.0 | 5.88 | 3.53 | 2.22 | 1.48 | 1.49 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.88 | 1.97 | 1.42 | 1.08 | 1.12 |

TABLE 1.26: EXHAUST NMHC AT 35.0 MPH

TABLE 1.27

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 1.89 | 1.63 | 1.41 | 1.23 | 1.59 |
| 1990 | 0.0 | 100.0 | 0.0 | 2.00 | 1.83 | 1.69 | 1.57 | 2.06 |
| 1990 | 100.0 | 0.0 | 100.0 | 17.77 | 9.01 | 4.69 | 2.53 | 2.20 |
| 1990 | 50.0 | 0.0 | 50.0 | 8.31 | 4.60 | 2.73 | 1.75 | 1.83 |
| 1990 | 0.0 | 50.0 | 0.0 | 1.92 | 1.70 | 1.51 | 1.36 | 1.77 |
| 1990 | 50.0 | 50.0 | 50.0 | 9.89 | 5.42 | 3.19 | 2.05 | 2.13 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.54 | 2.88 | 2.01 | 1.51 | 1.78 |
| 1995 | 0.0 | 0.0 | 0.0 | 1.52 | 1.28 | 1.08 | 0.93 | 1.09 |
| 1995 | 0.0 | 100.0 | 0.0 | 1.78 | 1.55 | 1.37 | 1.21 | 1.38 |
| 1995 | 100.0 | 0.0 | 100.0 | 14.30 | 7.09 | 3.61 | 1.90 | 1.81 |
| 1995 | 50.0 | 0.0 | 50.0 | 6.67 | 3.61 | 2.09 | 1.31 | 1.36 |
| 1995 | 0.0 | 50.0 | 0.0 | 1.60 | 1.37 | 1.19 | 1.03 | 1.19 |
| 1995 | 50.0 | 50.0 | 50.0 | 8.04 | 4.32 | 2.49 | 1.56 | 1.60 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.67 | 2.28 | 1.55 | 1.14 | 1.26 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.30 | 1.09 | 0.91 | 0.77 | 0.86 |
| 2000 | 0.0 | 100.0 | 0.0 | 1.59 | 1.37 | 1.18 | 1.02 | 1.08 |
| 2000 | 100.0 | 0.0 | 100.0 | 10.55 | 5.40 | 2.83 | 1.54 | 1.51 |
| 2000 | 50.0 | 0.0 | 50.0 | 4.96 | 2.78 | 1.65 | 1.05 | 1.10 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.39 | 1.17 | 1.00 | 0.85 | 0.93 |
| 2000 | 50.0 | 50.0 | 50.0 | 6.07 | 3.38 | 2.00 | 1.28 | 1.30 |
| 2000 | 20.6 | 27.3 | 20.6 | 2.84 | 1.82 | 1.26 | 0.93 | 0.99 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.21 | 1.00 | 0.84 | 0.71 | 0.76 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.50 | 1.28 | 1.10 | 0.94 | 0.96 |
| 2005 | 100.0 | 0.0 | 100.0 | 8.54 | 4.55 | 2.47 | 1.39 | 1.39 |
| 2005 | 50.0 | 0.0 | 50.0 | 4.06 | 2.37 | 1.46 | 0.95 | 0.99 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.28 | 1.08 | 0.92 | 0.78 | 0.81 |
| 2005 | 50.0 | 50.0 | 50.0 | 5.02 | 2.91 | 1.78 | 1.17 | 1.17 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.40 | 1.60 | 1.13 | 0.84 | 0.88 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.17 | 0.98 | 0.82 | 0.69 | 0.74 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.46 | 1.25 | 1.07 | 0.92 | 0.93 |
| 2010 | 100.0 | 0.0 | 100.0 | 7.89 | 4.28 | 2.37 | 1.35 | 1.35 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.77 | 2.24 | 1.40 | 0.93 | 0.95 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.25 | 1.05 | 0.89 | 0.76 | 0.79 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.68 | 2.76 | 1.72 | 1.13 | 1.14 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.26 | 1.52 | 1.09 | 0.82 | 0.85 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.17 | 0.97 | 0.81 | 0.69 | 0.74 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.45 | 1.24 | 1.06 | 0.91 | 0.92 |
| 2020 | 100.0 | 0.0 | 100.0 | 7.53 | 4.13 | 2.31 | 1.33 | 1.33 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.62 | 2.17 | 1.37 | 0.92 | 0.95 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.24 | 1.04 | 0.88 | 0.76 | 0.79 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.49 | 2.68 | 1.68 | 1.12 | 1.13 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.19 | 1.49 | 1.07 | 0.81 | 0.84 |

TABLE 1.27: EXHAUST NMHC AT 55.0 MPH

TABLE 1.28

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start VMT Percentages | | | Combined for Eight Vehicle Types @ Ambient Temperature | | | | |
|--------------|-----------------------------------|-------|-------|---|-------|------|------|------|
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.15 | 2.69 | 2.31 | 2.00 | 2.66 |
| 1990 | 0.0 | 100.0 | 0.0 | 2.97 | 2.72 | 2.52 | 2.35 | 3.16 |
| 1990 | 100.0 | 0.0 | 100.0 | 27.18 | 13.80 | 7.16 | 3.82 | 3.27 |
| 1990 | 50.0 | 0.0 | 50.0 | 13.62 | 7.52 | 4.41 | 2.78 | 2.93 |
| 1990 | 0.0 | 50.0 | 0.0 | 3.07 | 2.70 | 2.39 | 2.14 | 2.87 |
| 1990 | 50.0 | 50.0 | 50.0 | 15.07 | 8.26 | 4.84 | 3.08 | 3.22 |
| 1990 | 20.6 | 27.3 | 20.6 | 7.40 | 4.68 | 3.22 | 2.40 | 2.89 |
| 1995 | 0.0 | 0.0 | 0.0 | 2.33 | 1.95 | 1.64 | 1.39 | 1.67 |
| 1995 | 0.0 | 100.0 | 0.0 | 2.41 | 2.11 | 1.86 | 1.65 | 1.93 |
| 1995 | 100.0 | 0.0 | 100.0 | 20.18 | 9.96 | 5.03 | 2.61 | 2.45 |
| 1995 | 50.0 | 0.0 | 50.0 | 10.17 | 5.46 | 3.12 | 1.92 | 2.01 |
| 1995 | 0.0 | 50.0 | 0.0 | 2.35 | 2.01 | 1.73 | 1.50 | 1.77 |
| 1995 | 50.0 | 50.0 | 50.0 | 11.29 | 6.03 | 3.44 | 2.13 | 2.19 |
| 1995 | 20.6 | 27.3 | 20.6 | 5.56 | 3.42 | 2.29 | 1.67 | 1.87 |
| 2000 | 0.0 | 0.0 | 0.0 | 1.83 | 1.51 | 1.26 | 1.05 | 1.19 |
| 2000 | 0.0 | 100.0 | 0.0 | 1.98 | 1.70 | 1.46 | 1.26 | 1.36 |
| 2000 | 100.0 | 0.0 | 100.0 | 13.69 | 6.96 | 3.61 | 1.93 | 1.88 |
| 2000 | 50.0 | 0.0 | 50.0 | 7.01 | 3.88 | 2.27 | 1.42 | 1.48 |
| 2000 | 0.0 | 50.0 | 0.0 | 1.88 | 1.58 | 1.33 | 1.13 | 1.25 |
| 2000 | 50.0 | 50.0 | 50.0 | 7.84 | 4.33 | 2.54 | 1.60 | 1.62 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.97 | 2.51 | 1.71 | 1.25 | 1.34 |
| 2005 | 0.0 | 0.0 | 0.0 | 1.61 | 1.33 | 1.10 | 0.92 | 0.99 |
| 2005 | 0.0 | 100.0 | 0.0 | 1.78 | 1.51 | 1.29 | 1.11 | 1.13 |
| 2005 | 100.0 | 0.0 | 100.0 | 10.46 | 5.54 | 2.98 | 1.65 | 1.65 |
| 2005 | 50.0 | 0.0 | 50.0 | 5.44 | 3.14 | 1.90 | 1.22 | 1.26 |
| 2005 | 0.0 | 50.0 | 0.0 | 1.66 | 1.39 | 1.17 | 0.99 | 1.03 |
| 2005 | 50.0 | 50.0 | 50.0 | 6.12 | 3.53 | 2.14 | 1.38 | 1.39 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.19 | 2.09 | 1.46 | 1.08 | 1.12 |
| 2010 | 0.0 | 0.0 | 0.0 | 1.53 | 1.27 | 1.05 | 0.88 | 0.94 |
| 2010 | 0.0 | 100.0 | 0.0 | 1.70 | 1.45 | 1.24 | 1.06 | 1.07 |
| 2010 | 100.0 | 0.0 | 100.0 | 9.43 | 5.09 | 2.80 | 1.58 | 1.58 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.93 | 2.90 | 1.79 | 1.16 | 1.20 |
| 2010 | 0.0 | 50.0 | 0.0 | 1.58 | 1.32 | 1.11 | 0.94 | 0.98 |
| 2010 | 50.0 | 50.0 | 50.0 | 5.56 | 3.27 | 2.02 | 1.32 | 1.32 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.94 | 1.96 | 1.38 | 1.03 | 1.07 |
| 2020 | 0.0 | 0.0 | 0.0 | 1.51 | 1.25 | 1.04 | 0.87 | 0.93 |
| 2020 | 0.0 | 100.0 | 0.0 | 1.67 | 1.43 | 1.22 | 1.05 | 1.06 |
| 2020 | 100.0 | 0.0 | 100.0 | 8.91 | 4.87 | 2.71 | 1.55 | 1.54 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.69 | 2.80 | 1.74 | 1.15 | 1.18 |
| 2020 | 0.0 | 50.0 | 0.0 | 1.55 | 1.30 | 1.10 | 0.93 | 0.97 |
| 2020 | 50.0 | 50.0 | 50.0 | 5.29 | 3.15 | 1.97 | 1.30 | 1.30 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.82 | 1.90 | 1.35 | 1.01 | 1.05 |

TABLE 1.28: EXHAUST NMHC AT 65.0 MPH

TABLE 1.29

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|-----------------------------------|---------|--------|--------|--------|
| | VMT PCCN | Percentages | | ----- @ Ambient Temperature ----- | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 376.56 | 294.66 | 233.49 | 187.49 | 404.96 |
| 1990 | 0.0 | 100.0 | 0.0 | 332.93 | 288.80 | 253.87 | 226.22 | 379.05 |
| 1990 | 100.0 | 0.0 | 100.0 | 1942.97 | 1215.43 | 751.76 | 432.36 | 374.89 |
| 1990 | 50.0 | 0.0 | 50.0 | 1007.27 | 667.64 | 444.64 | 287.83 | 396.78 |
| 1990 | 0.0 | 50.0 | 0.0 | 362.64 | 294.96 | 243.59 | 204.39 | 397.56 |
| 1990 | 50.0 | 50.0 | 50.0 | 1137.95 | 752.12 | 502.82 | 329.29 | 376.97 |
| 1990 | 20.6 | 27.3 | 20.6 | 628.52 | 448.52 | 326.21 | 238.37 | 398.75 |
| 1995 | 0.0 | 0.0 | 0.0 | 305.21 | 223.69 | 165.95 | 124.82 | 203.31 |
| 1995 | 0.0 | 100.0 | 0.0 | 294.96 | 243.07 | 201.88 | 169.14 | 241.62 |
| 1995 | 100.0 | 0.0 | 100.0 | 990.31 | 686.71 | 461.88 | 280.23 | 277.88 |
| 1995 | 50.0 | 0.0 | 50.0 | 575.70 | 407.06 | 284.08 | 188.24 | 234.55 |
| 1995 | 0.0 | 50.0 | 0.0 | 300.62 | 231.40 | 180.52 | 142.87 | 219.61 |
| 1995 | 50.0 | 50.0 | 50.0 | 642.64 | 464.89 | 331.88 | 224.69 | 259.75 |
| 1995 | 20.6 | 27.3 | 20.6 | 414.51 | 303.75 | 222.87 | 161.14 | 225.88 |
| 2000 | 0.0 | 0.0 | 0.0 | 256.50 | 180.48 | 128.25 | 92.23 | 122.66 |
| 2000 | 0.0 | 100.0 | 0.0 | 245.13 | 198.77 | 161.82 | 132.34 | 172.41 |
| 2000 | 100.0 | 0.0 | 100.0 | 559.03 | 417.47 | 299.69 | 194.91 | 202.94 |
| 2000 | 50.0 | 0.0 | 50.0 | 362.67 | 264.62 | 189.67 | 129.20 | 150.39 |
| 2000 | 0.0 | 50.0 | 0.0 | 242.12 | 180.78 | 136.63 | 104.61 | 138.45 |
| 2000 | 50.0 | 50.0 | 50.0 | 402.08 | 308.12 | 230.76 | 163.63 | 187.67 |
| 2000 | 20.6 | 27.3 | 20.6 | 291.35 | 214.52 | 157.56 | 113.86 | 142.42 |
| 2005 | 0.0 | 0.0 | 0.0 | 237.63 | 163.75 | 113.75 | 79.84 | 88.62 |
| 2005 | 0.0 | 100.0 | 0.0 | 226.29 | 182.01 | 146.70 | 118.53 | 144.88 |
| 2005 | 100.0 | 0.0 | 100.0 | 374.24 | 302.41 | 231.75 | 161.82 | 172.55 |
| 2005 | 50.0 | 0.0 | 50.0 | 273.49 | 205.24 | 150.94 | 106.03 | 115.17 |
| 2005 | 0.0 | 50.0 | 0.0 | 218.89 | 160.73 | 119.37 | 89.74 | 104.73 |
| 2005 | 50.0 | 50.0 | 50.0 | 300.27 | 242.21 | 189.22 | 140.18 | 158.72 |
| 2005 | 20.6 | 27.3 | 20.6 | 240.54 | 177.96 | 131.23 | 95.39 | 107.65 |
| 2010 | 0.0 | 0.0 | 0.0 | 231.07 | 158.47 | 109.50 | 76.40 | 82.91 |
| 2010 | 0.0 | 100.0 | 0.0 | 217.09 | 174.60 | 140.68 | 113.59 | 137.54 |
| 2010 | 100.0 | 0.0 | 100.0 | 335.98 | 273.81 | 212.71 | 152.30 | 161.16 |
| 2010 | 50.0 | 0.0 | 50.0 | 253.40 | 189.79 | 139.89 | 99.21 | 106.16 |
| 2010 | 0.0 | 50.0 | 0.0 | 209.75 | 153.43 | 113.52 | 85.01 | 97.53 |
| 2010 | 50.0 | 50.0 | 50.0 | 276.53 | 224.20 | 176.70 | 132.94 | 149.35 |
| 2010 | 20.6 | 27.3 | 20.6 | 226.65 | 167.12 | 123.09 | 89.68 | 99.56 |
| 2020 | 0.0 | 0.0 | 0.0 | 228.78 | 156.77 | 108.27 | 75.55 | 81.92 |
| 2020 | 0.0 | 100.0 | 0.0 | 213.51 | 171.79 | 138.48 | 111.88 | 135.33 |
| 2020 | 100.0 | 0.0 | 100.0 | 320.60 | 262.29 | 204.93 | 148.16 | 156.89 |
| 2020 | 50.0 | 0.0 | 50.0 | 245.58 | 183.88 | 135.76 | 96.74 | 103.56 |
| 2020 | 0.0 | 50.0 | 0.0 | 206.47 | 150.94 | 111.64 | 83.61 | 95.81 |
| 2020 | 50.0 | 50.0 | 50.0 | 267.05 | 217.04 | 171.70 | 130.02 | 146.11 |
| 2020 | 20.6 | 27.3 | 20.6 | 221.49 | 163.22 | 120.29 | 87.85 | 97.49 |

TABLE 1.29: EXHAUST CO AT 2.5 MPH

TABLE 1.30

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|--------|--------|--------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 207.18 | 164.01 | 131.64 | 107.17 | 224.71 |
| 1990 | 0.0 | 100.0 | 0.0 | 182.64 | 159.38 | 140.93 | 126.31 | 210.73 |
| 1990 | 100.0 | 0.0 | 100.0 | 1032.04 | 648.64 | 403.56 | 234.35 | 206.77 |
| 1990 | 50.0 | 0.0 | 50.0 | 539.71 | 360.40 | 242.36 | 159.19 | 219.09 |
| 1990 | 0.0 | 50.0 | 0.0 | 198.85 | 163.25 | 136.15 | 115.40 | 220.34 |
| 1990 | 50.0 | 50.0 | 50.0 | 607.34 | 404.01 | 272.24 | 180.33 | 208.75 |
| 1990 | 20.6 | 27.3 | 20.6 | 339.43 | 244.49 | 179.80 | 133.25 | 220.60 |
| 1995 | 0.0 | 0.0 | 0.0 | 168.17 | 124.48 | 93.46 | 71.30 | 115.17 |
| 1995 | 0.0 | 100.0 | 0.0 | 161.99 | 134.18 | 112.07 | 94.46 | 135.50 |
| 1995 | 100.0 | 0.0 | 100.0 | 535.47 | 372.61 | 251.30 | 152.85 | 153.95 |
| 1995 | 50.0 | 0.0 | 50.0 | 312.65 | 222.29 | 156.11 | 104.35 | 131.08 |
| 1995 | 0.0 | 50.0 | 0.0 | 165.00 | 128.01 | 100.76 | 80.55 | 123.55 |
| 1995 | 50.0 | 50.0 | 50.0 | 348.73 | 253.40 | 181.68 | 123.66 | 144.73 |
| 1995 | 20.6 | 27.3 | 20.6 | 226.07 | 166.80 | 123.37 | 90.11 | 126.68 |
| 2000 | 0.0 | 0.0 | 0.0 | 144.90 | 102.79 | 73.83 | 53.81 | 71.46 |
| 2000 | 0.0 | 100.0 | 0.0 | 138.29 | 112.60 | 92.09 | 75.71 | 98.85 |
| 2000 | 100.0 | 0.0 | 100.0 | 309.83 | 232.27 | 167.35 | 109.38 | 115.14 |
| 2000 | 50.0 | 0.0 | 50.0 | 202.35 | 148.44 | 107.08 | 73.61 | 86.33 |
| 2000 | 0.0 | 50.0 | 0.0 | 136.58 | 102.65 | 78.20 | 60.44 | 80.00 |
| 2000 | 50.0 | 50.0 | 50.0 | 224.06 | 172.44 | 129.72 | 92.54 | 107.00 |
| 2000 | 20.6 | 27.3 | 20.6 | 163.42 | 121.06 | 89.58 | 65.37 | 82.07 |
| 2005 | 0.0 | 0.0 | 0.0 | 135.85 | 94.33 | 66.19 | 47.08 | 52.57 |
| 2005 | 0.0 | 100.0 | 0.0 | 129.26 | 104.36 | 84.49 | 68.63 | 83.94 |
| 2005 | 100.0 | 0.0 | 100.0 | 212.56 | 171.90 | 131.98 | 92.55 | 99.07 |
| 2005 | 50.0 | 0.0 | 50.0 | 155.90 | 117.43 | 86.82 | 61.51 | 67.17 |
| 2005 | 0.0 | 50.0 | 0.0 | 125.16 | 92.49 | 69.22 | 52.54 | 61.49 |
| 2005 | 50.0 | 50.0 | 50.0 | 170.91 | 138.13 | 108.24 | 80.59 | 91.51 |
| 2005 | 20.6 | 27.3 | 20.6 | 137.34 | 102.13 | 75.82 | 55.64 | 63.05 |
| 2010 | 0.0 | 0.0 | 0.0 | 132.94 | 91.85 | 64.09 | 45.30 | 49.33 |
| 2010 | 0.0 | 100.0 | 0.0 | 124.93 | 100.83 | 81.57 | 66.17 | 80.00 |
| 2010 | 100.0 | 0.0 | 100.0 | 192.17 | 156.78 | 122.10 | 87.87 | 93.14 |
| 2010 | 50.0 | 0.0 | 50.0 | 145.56 | 109.46 | 81.15 | 58.06 | 62.31 |
| 2010 | 0.0 | 50.0 | 0.0 | 120.86 | 88.96 | 66.31 | 50.12 | 57.52 |
| 2010 | 50.0 | 50.0 | 50.0 | 158.55 | 128.80 | 101.83 | 77.02 | 86.57 |
| 2010 | 20.6 | 27.3 | 20.6 | 130.43 | 96.68 | 71.70 | 52.73 | 58.63 |
| 2020 | 0.0 | 0.0 | 0.0 | 132.10 | 91.23 | 63.66 | 45.02 | 48.99 |
| 2020 | 0.0 | 100.0 | 0.0 | 123.39 | 99.64 | 80.66 | 65.49 | 79.08 |
| 2020 | 100.0 | 0.0 | 100.0 | 184.14 | 150.87 | 118.21 | 85.95 | 91.18 |
| 2020 | 50.0 | 0.0 | 50.0 | 141.69 | 106.58 | 79.19 | 56.97 | 61.16 |
| 2020 | 0.0 | 50.0 | 0.0 | 119.49 | 87.93 | 65.55 | 49.56 | 56.81 |
| 2020 | 50.0 | 50.0 | 50.0 | 153.76 | 125.25 | 99.43 | 75.72 | 85.13 |
| 2020 | 20.6 | 27.3 | 20.6 | 128.02 | 94.89 | 70.44 | 51.96 | 57.75 |

TABLE 1.30: EXHAUST CO AT 5.0 MPH

TABLE 1.31

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|--------|--------|--------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 112.06 | 89.29 | 72.19 | 59.25 | 120.77 |
| 1990 | 0.0 | 100.0 | 0.0 | 99.31 | 86.85 | 76.96 | 69.10 | 114.27 |
| 1990 | 100.0 | 0.0 | 100.0 | 542.39 | 343.49 | 215.02 | 125.27 | 112.61 |
| 1990 | 50.0 | 0.0 | 50.0 | 285.58 | 192.24 | 130.26 | 86.19 | 118.12 |
| 1990 | 0.0 | 50.0 | 0.0 | 107.56 | 88.75 | 74.41 | 63.42 | 118.68 |
| 1990 | 50.0 | 50.0 | 50.0 | 320.85 | 215.17 | 145.99 | 97.18 | 113.44 |
| 1990 | 20.6 | 27.3 | 20.6 | 180.96 | 131.38 | 97.36 | 72.69 | 118.82 |
| 1995 | 0.0 | 0.0 | 0.0 | 94.12 | 69.89 | 52.72 | 40.46 | 64.15 |
| 1995 | 0.0 | 100.0 | 0.0 | 90.75 | 75.31 | 63.01 | 53.21 | 76.00 |
| 1995 | 100.0 | 0.0 | 100.0 | 294.97 | 206.70 | 139.67 | 84.36 | 86.24 |
| 1995 | 50.0 | 0.0 | 50.0 | 172.46 | 123.31 | 86.87 | 58.03 | 72.94 |
| 1995 | 0.0 | 50.0 | 0.0 | 92.03 | 71.60 | 56.55 | 45.40 | 68.82 |
| 1995 | 50.0 | 50.0 | 50.0 | 192.86 | 141.01 | 101.34 | 68.78 | 81.11 |
| 1995 | 20.6 | 27.3 | 20.6 | 125.24 | 92.83 | 68.90 | 50.45 | 70.48 |
| 2000 | 0.0 | 0.0 | 0.0 | 85.74 | 60.93 | 43.88 | 32.11 | 42.00 |
| 2000 | 0.0 | 100.0 | 0.0 | 81.79 | 66.68 | 54.60 | 44.95 | 58.42 |
| 2000 | 100.0 | 0.0 | 100.0 | 179.57 | 135.50 | 97.92 | 63.92 | 67.86 |
| 2000 | 50.0 | 0.0 | 50.0 | 117.90 | 86.86 | 62.84 | 43.26 | 50.65 |
| 2000 | 0.0 | 50.0 | 0.0 | 80.58 | 60.65 | 46.30 | 35.89 | 47.03 |
| 2000 | 50.0 | 50.0 | 50.0 | 130.68 | 101.09 | 76.26 | 54.43 | 63.14 |
| 2000 | 20.6 | 27.3 | 20.6 | 95.78 | 71.16 | 52.80 | 38.63 | 48.18 |
| 2005 | 0.0 | 0.0 | 0.0 | 82.71 | 57.56 | 40.52 | 28.94 | 32.32 |
| 2005 | 0.0 | 100.0 | 0.0 | 78.54 | 63.50 | 51.50 | 41.91 | 51.23 |
| 2005 | 100.0 | 0.0 | 100.0 | 129.10 | 104.37 | 80.10 | 56.11 | 60.14 |
| 2005 | 50.0 | 0.0 | 50.0 | 94.69 | 71.38 | 52.82 | 37.47 | 40.96 |
| 2005 | 0.0 | 50.0 | 0.0 | 76.06 | 56.32 | 42.26 | 32.17 | 37.63 |
| 2005 | 50.0 | 50.0 | 50.0 | 103.82 | 83.94 | 65.80 | 49.01 | 55.69 |
| 2005 | 20.6 | 27.3 | 20.6 | 83.43 | 62.13 | 46.21 | 33.99 | 38.53 |
| 2010 | 0.0 | 0.0 | 0.0 | 81.78 | 56.63 | 39.64 | 28.13 | 30.64 |
| 2010 | 0.0 | 100.0 | 0.0 | 76.79 | 62.04 | 50.26 | 40.85 | 49.33 |
| 2010 | 100.0 | 0.0 | 100.0 | 117.81 | 96.17 | 74.94 | 53.99 | 57.28 |
| 2010 | 50.0 | 0.0 | 50.0 | 89.39 | 67.31 | 49.99 | 35.86 | 38.51 |
| 2010 | 0.0 | 50.0 | 0.0 | 74.34 | 54.82 | 40.96 | 31.05 | 35.61 |
| 2010 | 50.0 | 50.0 | 50.0 | 97.30 | 79.11 | 62.60 | 47.42 | 53.30 |
| 2010 | 20.6 | 27.3 | 20.6 | 80.17 | 59.53 | 44.24 | 32.63 | 36.28 |
| 2020 | 0.0 | 0.0 | 0.0 | 81.60 | 56.49 | 39.55 | 28.09 | 30.57 |
| 2020 | 0.0 | 100.0 | 0.0 | 76.19 | 61.60 | 49.94 | 40.62 | 48.99 |
| 2020 | 100.0 | 0.0 | 100.0 | 113.45 | 93.02 | 72.96 | 53.14 | 56.41 |
| 2020 | 50.0 | 0.0 | 50.0 | 87.46 | 65.89 | 49.06 | 35.40 | 38.03 |
| 2020 | 0.0 | 50.0 | 0.0 | 73.85 | 54.45 | 40.70 | 30.87 | 35.36 |
| 2020 | 50.0 | 50.0 | 50.0 | 94.82 | 77.31 | 61.45 | 46.88 | 52.70 |
| 2020 | 20.6 | 27.3 | 20.6 | 79.08 | 58.72 | 43.70 | 32.33 | 35.94 |

TABLE 1.31: EXHAUST CO AT 10.0 MPH

TABLE 1.32

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|--------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 63.05 | 50.37 | 40.86 | 33.68 | 67.51 |
| 1990 | 0.0 | 100.0 | 0.0 | 55.33 | 48.49 | 43.08 | 38.81 | 64.04 |
| 1990 | 100.0 | 0.0 | 100.0 | 307.57 | 195.48 | 122.22 | 70.40 | 62.81 |
| 1990 | 50.0 | 0.0 | 50.0 | 161.75 | 109.10 | 73.86 | 48.59 | 65.72 |
| 1990 | 0.0 | 50.0 | 0.0 | 60.08 | 49.69 | 41.80 | 35.76 | 66.23 |
| 1990 | 50.0 | 50.0 | 50.0 | 181.45 | 121.98 | 82.65 | 54.61 | 63.43 |
| 1990 | 20.6 | 27.3 | 20.6 | 101.99 | 74.16 | 54.97 | 40.99 | 66.21 |
| 1995 | 0.0 | 0.0 | 0.0 | 55.50 | 40.98 | 30.75 | 23.48 | 36.55 |
| 1995 | 0.0 | 100.0 | 0.0 | 53.27 | 44.13 | 36.86 | 31.07 | 44.04 |
| 1995 | 100.0 | 0.0 | 100.0 | 177.21 | 124.47 | 83.54 | 49.14 | 50.03 |
| 1995 | 50.0 | 0.0 | 50.0 | 102.43 | 73.16 | 51.17 | 33.55 | 41.65 |
| 1995 | 0.0 | 50.0 | 0.0 | 53.82 | 41.71 | 32.83 | 26.27 | 39.30 |
| 1995 | 50.0 | 50.0 | 50.0 | 115.24 | 84.30 | 60.20 | 40.10 | 47.03 |
| 1995 | 20.6 | 27.3 | 20.6 | 73.84 | 54.58 | 40.27 | 29.16 | 40.21 |
| 2000 | 0.0 | 0.0 | 0.0 | 54.91 | 38.71 | 27.62 | 20.00 | 25.63 |
| 2000 | 0.0 | 100.0 | 0.0 | 52.17 | 42.41 | 34.61 | 28.39 | 36.59 |
| 2000 | 100.0 | 0.0 | 100.0 | 114.70 | 86.77 | 62.50 | 40.24 | 42.58 |
| 2000 | 50.0 | 0.0 | 50.0 | 75.00 | 55.14 | 39.65 | 26.94 | 31.15 |
| 2000 | 0.0 | 50.0 | 0.0 | 51.25 | 38.34 | 29.08 | 22.38 | 28.89 |
| 2000 | 50.0 | 50.0 | 50.0 | 83.44 | 64.59 | 48.56 | 34.31 | 39.59 |
| 2000 | 20.6 | 27.3 | 20.6 | 60.90 | 45.05 | 33.21 | 24.05 | 29.58 |
| 2005 | 0.0 | 0.0 | 0.0 | 55.12 | 38.10 | 26.60 | 18.82 | 20.87 |
| 2005 | 0.0 | 100.0 | 0.0 | 52.12 | 42.04 | 34.00 | 27.58 | 33.67 |
| 2005 | 100.0 | 0.0 | 100.0 | 86.70 | 69.88 | 53.36 | 37.02 | 39.53 |
| 2005 | 50.0 | 0.0 | 50.0 | 63.17 | 47.39 | 34.84 | 24.46 | 26.59 |
| 2005 | 0.0 | 50.0 | 0.0 | 50.46 | 37.16 | 27.71 | 20.95 | 24.42 |
| 2005 | 50.0 | 50.0 | 50.0 | 69.41 | 55.96 | 43.68 | 32.30 | 36.60 |
| 2005 | 20.6 | 27.3 | 20.6 | 55.47 | 41.10 | 30.37 | 22.14 | 24.98 |
| 2010 | 0.0 | 0.0 | 0.0 | 55.25 | 38.03 | 26.42 | 18.57 | 20.18 |
| 2010 | 0.0 | 100.0 | 0.0 | 51.73 | 41.70 | 33.69 | 27.29 | 32.99 |
| 2010 | 100.0 | 0.0 | 100.0 | 79.96 | 65.15 | 50.62 | 36.25 | 38.39 |
| 2010 | 50.0 | 0.0 | 50.0 | 60.43 | 45.33 | 33.49 | 23.83 | 25.54 |
| 2010 | 0.0 | 50.0 | 0.0 | 50.08 | 36.75 | 27.31 | 20.56 | 23.58 |
| 2010 | 50.0 | 50.0 | 50.0 | 65.85 | 53.43 | 42.15 | 31.77 | 35.69 |
| 2010 | 20.6 | 27.3 | 20.6 | 54.09 | 39.98 | 29.55 | 21.63 | 24.02 |
| 2020 | 0.0 | 0.0 | 0.0 | 55.35 | 38.08 | 26.45 | 18.60 | 20.19 |
| 2020 | 0.0 | 100.0 | 0.0 | 51.55 | 41.57 | 33.60 | 27.24 | 32.89 |
| 2020 | 100.0 | 0.0 | 100.0 | 77.34 | 63.30 | 49.51 | 35.87 | 38.01 |
| 2020 | 50.0 | 0.0 | 50.0 | 59.39 | 44.57 | 33.02 | 23.64 | 25.33 |
| 2020 | 0.0 | 50.0 | 0.0 | 49.97 | 36.66 | 27.24 | 20.52 | 23.50 |
| 2020 | 50.0 | 50.0 | 50.0 | 64.44 | 52.44 | 41.56 | 31.55 | 35.45 |
| 2020 | 20.6 | 27.3 | 20.6 | 53.60 | 39.62 | 29.31 | 21.53 | 23.89 |

TABLE 1.32: EXHAUST CO AT 19.6 MPH

TABLE 1.33

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|-------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 40.40 | 32.17 | 26.03 | 21.42 | 41.65 |
| 1990 | 0.0 | 100.0 | 0.0 | 35.97 | 31.33 | 27.70 | 24.85 | 40.48 |
| 1990 | 100.0 | 0.0 | 100.0 | 193.14 | 123.78 | 77.89 | 45.03 | 40.08 |
| 1990 | 50.0 | 0.0 | 50.0 | 102.82 | 69.75 | 47.38 | 31.18 | 41.20 |
| 1990 | 0.0 | 50.0 | 0.0 | 38.84 | 31.99 | 26.82 | 22.88 | 41.34 |
| 1990 | 50.0 | 50.0 | 50.0 | 114.56 | 77.56 | 52.79 | 34.94 | 40.28 |
| 1990 | 20.6 | 27.3 | 20.6 | 65.24 | 47.56 | 35.28 | 26.27 | 41.40 |
| 1995 | 0.0 | 0.0 | 0.0 | 34.68 | 25.62 | 19.21 | 14.65 | 22.68 |
| 1995 | 0.0 | 100.0 | 0.0 | 33.38 | 27.59 | 23.00 | 19.36 | 27.41 |
| 1995 | 100.0 | 0.0 | 100.0 | 106.49 | 74.98 | 50.85 | 30.84 | 31.19 |
| 1995 | 50.0 | 0.0 | 50.0 | 63.05 | 45.13 | 31.79 | 21.22 | 26.11 |
| 1995 | 0.0 | 50.0 | 0.0 | 33.95 | 26.29 | 20.67 | 16.51 | 24.58 |
| 1995 | 50.0 | 50.0 | 50.0 | 69.93 | 51.29 | 36.93 | 25.10 | 29.30 |
| 1995 | 20.6 | 27.3 | 20.6 | 45.99 | 34.04 | 25.21 | 18.40 | 25.20 |
| 2000 | 0.0 | 0.0 | 0.0 | 30.44 | 21.53 | 15.42 | 11.21 | 14.53 |
| 2000 | 0.0 | 100.0 | 0.0 | 28.91 | 23.51 | 19.21 | 15.77 | 20.44 |
| 2000 | 100.0 | 0.0 | 100.0 | 63.18 | 47.74 | 34.53 | 22.56 | 23.80 |
| 2000 | 50.0 | 0.0 | 50.0 | 41.79 | 30.75 | 22.20 | 15.24 | 17.68 |
| 2000 | 0.0 | 50.0 | 0.0 | 28.62 | 21.46 | 16.31 | 12.58 | 16.38 |
| 2000 | 50.0 | 50.0 | 50.0 | 46.05 | 35.63 | 26.87 | 19.17 | 22.12 |
| 2000 | 20.6 | 27.3 | 20.6 | 33.99 | 25.19 | 18.63 | 13.57 | 16.80 |
| 2005 | 0.0 | 0.0 | 0.0 | 28.33 | 19.65 | 13.77 | 9.78 | 10.92 |
| 2005 | 0.0 | 100.0 | 0.0 | 26.80 | 21.64 | 17.52 | 14.23 | 17.42 |
| 2005 | 100.0 | 0.0 | 100.0 | 44.39 | 35.81 | 27.43 | 19.17 | 20.48 |
| 2005 | 50.0 | 0.0 | 50.0 | 32.55 | 24.47 | 18.06 | 12.76 | 13.92 |
| 2005 | 0.0 | 50.0 | 0.0 | 26.04 | 19.23 | 14.38 | 10.91 | 12.77 |
| 2005 | 50.0 | 50.0 | 50.0 | 35.59 | 28.73 | 22.48 | 16.70 | 18.95 |
| 2005 | 20.6 | 27.3 | 20.6 | 28.62 | 21.26 | 15.76 | 11.55 | 13.08 |
| 2010 | 0.0 | 0.0 | 0.0 | 27.62 | 19.06 | 13.29 | 9.39 | 10.23 |
| 2010 | 0.0 | 100.0 | 0.0 | 25.80 | 20.83 | 16.86 | 13.68 | 16.55 |
| 2010 | 100.0 | 0.0 | 100.0 | 40.05 | 32.60 | 25.33 | 18.17 | 19.23 |
| 2010 | 50.0 | 0.0 | 50.0 | 30.30 | 22.75 | 16.84 | 12.02 | 12.90 |
| 2010 | 0.0 | 50.0 | 0.0 | 25.06 | 18.43 | 13.73 | 10.38 | 11.92 |
| 2010 | 50.0 | 50.0 | 50.0 | 32.93 | 26.72 | 21.09 | 15.93 | 17.89 |
| 2010 | 20.6 | 27.3 | 20.6 | 27.10 | 20.06 | 14.86 | 10.92 | 12.14 |
| 2020 | 0.0 | 0.0 | 0.0 | 27.40 | 18.90 | 13.18 | 9.31 | 10.14 |
| 2020 | 0.0 | 100.0 | 0.0 | 25.44 | 20.55 | 16.64 | 13.52 | 16.33 |
| 2020 | 100.0 | 0.0 | 100.0 | 38.33 | 31.34 | 24.50 | 17.75 | 18.80 |
| 2020 | 50.0 | 0.0 | 50.0 | 29.45 | 22.12 | 16.41 | 11.78 | 12.64 |
| 2020 | 0.0 | 50.0 | 0.0 | 24.73 | 18.18 | 13.55 | 10.24 | 11.75 |
| 2020 | 50.0 | 50.0 | 50.0 | 31.89 | 25.94 | 20.57 | 15.63 | 17.57 |
| 2020 | 20.6 | 27.3 | 20.6 | 26.55 | 19.66 | 14.58 | 10.74 | 11.94 |

TABLE 1.33: EXHAUST CO AT 35.0 MPH

TABLE 1.34

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|-----------------------------------|--------|-------|-------|-------|
| | VMT Percentages | | | ----- @ Ambient Temperature ----- | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 34.82 | 27.89 | 22.70 | 18.80 | 35.73 |
| 1990 | 0.0 | 100.0 | 0.0 | 31.15 | 27.16 | 24.03 | 21.59 | 34.98 |
| 1990 | 100.0 | 0.0 | 100.0 | 159.91 | 103.05 | 65.32 | 38.24 | 34.50 |
| 1990 | 50.0 | 0.0 | 50.0 | 86.35 | 58.98 | 40.40 | 26.92 | 35.41 |
| 1990 | 0.0 | 50.0 | 0.0 | 33.57 | 27.76 | 23.36 | 20.01 | 35.57 |
| 1990 | 50.0 | 50.0 | 50.0 | 95.53 | 65.11 | 44.68 | 29.92 | 34.74 |
| 1990 | 20.6 | 27.3 | 20.6 | 55.37 | 40.64 | 30.38 | 22.84 | 35.60 |
| 1995 | 0.0 | 0.0 | 0.0 | 28.76 | 21.45 | 16.25 | 12.53 | 19.50 |
| 1995 | 0.0 | 100.0 | 0.0 | 27.66 | 22.94 | 19.19 | 16.22 | 23.17 |
| 1995 | 100.0 | 0.0 | 100.0 | 84.60 | 59.66 | 40.88 | 25.54 | 26.06 |
| 1995 | 50.0 | 0.0 | 50.0 | 51.22 | 36.84 | 26.24 | 17.92 | 22.25 |
| 1995 | 0.0 | 50.0 | 0.0 | 28.30 | 22.06 | 17.47 | 14.05 | 21.05 |
| 1995 | 50.0 | 50.0 | 50.0 | 56.13 | 41.30 | 30.04 | 20.88 | 24.61 |
| 1995 | 20.6 | 27.3 | 20.6 | 37.81 | 28.16 | 21.06 | 15.61 | 21.55 |
| 2000 | 0.0 | 0.0 | 0.0 | 22.83 | 16.35 | 11.88 | 8.77 | 11.65 |
| 2000 | 0.0 | 100.0 | 0.0 | 21.67 | 17.71 | 14.54 | 12.01 | 15.77 |
| 2000 | 100.0 | 0.0 | 100.0 | 46.74 | 35.27 | 25.67 | 17.11 | 18.18 |
| 2000 | 50.0 | 0.0 | 50.0 | 31.36 | 23.17 | 16.89 | 11.82 | 13.94 |
| 2000 | 0.0 | 50.0 | 0.0 | 21.61 | 16.36 | 12.56 | 9.79 | 12.99 |
| 2000 | 50.0 | 50.0 | 50.0 | 34.21 | 26.49 | 20.11 | 14.56 | 16.97 |
| 2000 | 20.6 | 27.3 | 20.6 | 25.61 | 19.11 | 14.28 | 10.56 | 13.30 |
| 2005 | 0.0 | 0.0 | 0.0 | 19.67 | 13.80 | 9.81 | 7.09 | 8.03 |
| 2005 | 0.0 | 100.0 | 0.0 | 18.63 | 15.11 | 12.30 | 10.06 | 12.36 |
| 2005 | 100.0 | 0.0 | 100.0 | 30.45 | 24.64 | 18.99 | 13.45 | 14.46 |
| 2005 | 50.0 | 0.0 | 50.0 | 22.59 | 17.10 | 12.74 | 9.15 | 10.09 |
| 2005 | 0.0 | 50.0 | 0.0 | 18.19 | 13.55 | 10.24 | 7.86 | 9.29 |
| 2005 | 50.0 | 50.0 | 50.0 | 24.54 | 19.87 | 15.65 | 11.75 | 13.41 |
| 2005 | 20.6 | 27.3 | 20.6 | 19.95 | 14.94 | 11.19 | 8.31 | 9.52 |
| 2010 | 0.0 | 0.0 | 0.0 | 18.64 | 13.00 | 9.19 | 6.60 | 7.25 |
| 2010 | 0.0 | 100.0 | 0.0 | 17.40 | 14.12 | 11.49 | 9.38 | 11.35 |
| 2010 | 100.0 | 0.0 | 100.0 | 26.91 | 21.91 | 17.08 | 12.34 | 13.09 |
| 2010 | 50.0 | 0.0 | 50.0 | 20.49 | 15.47 | 11.54 | 8.34 | 8.99 |
| 2010 | 0.0 | 50.0 | 0.0 | 16.97 | 12.59 | 9.48 | 7.25 | 8.35 |
| 2010 | 50.0 | 50.0 | 50.0 | 22.15 | 18.01 | 14.28 | 10.86 | 12.22 |
| 2010 | 20.6 | 27.3 | 20.6 | 18.34 | 13.68 | 10.23 | 7.61 | 8.50 |
| 2020 | 0.0 | 0.0 | 0.0 | 18.33 | 12.78 | 9.04 | 6.50 | 7.14 |
| 2020 | 0.0 | 100.0 | 0.0 | 17.00 | 13.80 | 11.24 | 9.19 | 11.10 |
| 2020 | 100.0 | 0.0 | 100.0 | 25.51 | 20.86 | 16.35 | 11.92 | 12.66 |
| 2020 | 50.0 | 0.0 | 50.0 | 19.71 | 14.89 | 11.13 | 8.09 | 8.73 |
| 2020 | 0.0 | 50.0 | 0.0 | 16.58 | 12.31 | 9.27 | 7.10 | 8.17 |
| 2020 | 50.0 | 50.0 | 50.0 | 21.26 | 17.33 | 13.79 | 10.56 | 11.89 |
| 2020 | 20.6 | 27.3 | 20.6 | 17.80 | 13.28 | 9.94 | 7.42 | 8.28 |

TABLE 1.34: EXHAUST CO AT 55.0 MPH

TABLE 1.35

HIGH ALTITUDE

EXHAUST CO EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|--------|--------|--------|--------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 99.78 | 79.43 | 64.21 | 52.73 | 106.04 |
| 1990 | 0.0 | 100.0 | 0.0 | 80.57 | 70.54 | 62.76 | 56.77 | 94.83 |
| 1990 | 100.0 | 0.0 | 100.0 | 462.22 | 291.19 | 181.96 | 107.13 | 90.65 |
| 1990 | 50.0 | 0.0 | 50.0 | 254.44 | 170.26 | 114.93 | 76.21 | 100.13 |
| 1990 | 0.0 | 50.0 | 0.0 | 92.26 | 76.08 | 63.87 | 54.61 | 101.76 |
| 1990 | 50.0 | 50.0 | 50.0 | 271.40 | 180.87 | 122.36 | 81.95 | 92.74 |
| 1990 | 20.6 | 27.3 | 20.6 | 159.41 | 115.09 | 85.00 | 63.52 | 101.53 |
| 1995 | 0.0 | 0.0 | 0.0 | 73.00 | 54.27 | 40.88 | 31.25 | 51.47 |
| 1995 | 0.0 | 100.0 | 0.0 | 64.28 | 53.31 | 44.66 | 37.83 | 55.40 |
| 1995 | 100.0 | 0.0 | 100.0 | 215.81 | 148.23 | 100.48 | 63.75 | 61.77 |
| 1995 | 50.0 | 0.0 | 50.0 | 133.82 | 94.45 | 66.55 | 45.49 | 56.32 |
| 1995 | 0.0 | 50.0 | 0.0 | 69.64 | 54.16 | 42.73 | 34.25 | 53.49 |
| 1995 | 50.0 | 50.0 | 50.0 | 140.04 | 100.77 | 72.57 | 50.79 | 58.58 |
| 1995 | 20.6 | 27.3 | 20.6 | 96.41 | 70.91 | 52.58 | 38.86 | 54.78 |
| 2000 | 0.0 | 0.0 | 0.0 | 49.62 | 35.42 | 25.56 | 18.69 | 26.30 |
| 2000 | 0.0 | 100.0 | 0.0 | 43.40 | 35.41 | 29.05 | 23.98 | 32.22 |
| 2000 | 100.0 | 0.0 | 100.0 | 102.69 | 75.39 | 54.10 | 36.13 | 37.15 |
| 2000 | 50.0 | 0.0 | 50.0 | 70.54 | 51.26 | 36.95 | 25.71 | 30.50 |
| 2000 | 0.0 | 50.0 | 0.0 | 46.00 | 34.71 | 26.53 | 20.57 | 28.41 |
| 2000 | 50.0 | 50.0 | 50.0 | 73.05 | 55.40 | 41.58 | 30.06 | 34.68 |
| 2000 | 20.6 | 27.3 | 20.6 | 56.19 | 41.50 | 30.74 | 22.58 | 29.18 |
| 2005 | 0.0 | 0.0 | 0.0 | 38.64 | 26.90 | 18.91 | 13.47 | 15.34 |
| 2005 | 0.0 | 100.0 | 0.0 | 34.06 | 27.51 | 22.30 | 18.14 | 22.45 |
| 2005 | 100.0 | 0.0 | 100.0 | 56.44 | 45.53 | 35.10 | 24.98 | 26.65 |
| 2005 | 50.0 | 0.0 | 50.0 | 44.16 | 33.28 | 24.69 | 17.64 | 19.39 |
| 2005 | 0.0 | 50.0 | 0.0 | 35.21 | 26.07 | 19.54 | 14.85 | 17.67 |
| 2005 | 50.0 | 50.0 | 50.0 | 45.25 | 36.52 | 28.70 | 21.56 | 24.55 |
| 2005 | 20.6 | 27.3 | 20.6 | 38.88 | 28.95 | 21.55 | 15.88 | 18.21 |
| 2010 | 0.0 | 0.0 | 0.0 | 34.87 | 24.12 | 16.86 | 11.93 | 13.17 |
| 2010 | 0.0 | 100.0 | 0.0 | 30.08 | 24.33 | 19.73 | 16.06 | 19.60 |
| 2010 | 100.0 | 0.0 | 100.0 | 47.73 | 38.59 | 29.90 | 21.48 | 22.65 |
| 2010 | 50.0 | 0.0 | 50.0 | 38.15 | 28.60 | 21.16 | 15.13 | 16.27 |
| 2010 | 0.0 | 50.0 | 0.0 | 31.13 | 22.95 | 17.14 | 12.98 | 15.08 |
| 2010 | 50.0 | 50.0 | 50.0 | 38.90 | 31.46 | 24.82 | 18.77 | 21.12 |
| 2010 | 20.6 | 27.3 | 20.6 | 33.95 | 25.16 | 18.66 | 13.73 | 15.39 |
| 2020 | 0.0 | 0.0 | 0.0 | 33.79 | 23.36 | 16.32 | 11.56 | 12.73 |
| 2020 | 0.0 | 100.0 | 0.0 | 28.93 | 23.41 | 19.01 | 15.48 | 18.85 |
| 2020 | 100.0 | 0.0 | 100.0 | 44.48 | 36.09 | 28.09 | 20.32 | 21.46 |
| 2020 | 50.0 | 0.0 | 50.0 | 36.10 | 27.05 | 20.03 | 14.37 | 15.48 |
| 2020 | 0.0 | 50.0 | 0.0 | 29.97 | 22.08 | 16.49 | 12.49 | 14.48 |
| 2020 | 50.0 | 50.0 | 50.0 | 36.70 | 29.75 | 23.55 | 17.90 | 20.16 |
| 2020 | 20.6 | 27.3 | 20.6 | 32.42 | 24.01 | 17.81 | 13.13 | 14.71 |

TABLE 1.35: EXHAUST CO AT 65.0 MPH

TABLE 1.36

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 5.15 | 4.65 | 4.23 | 3.88 | 3.75 |
| 1990 | 0.0 | 100.0 | 0.0 | 6.39 | 5.66 | 5.07 | 4.59 | 4.26 |
| 1990 | 100.0 | 0.0 | 100.0 | 5.99 | 5.58 | 5.23 | 4.93 | 4.59 |
| 1990 | 50.0 | 0.0 | 50.0 | 5.64 | 5.18 | 4.80 | 4.47 | 4.23 |
| 1990 | 0.0 | 50.0 | 0.0 | 5.87 | 5.24 | 4.72 | 4.29 | 4.06 |
| 1990 | 50.0 | 50.0 | 50.0 | 6.19 | 5.62 | 5.15 | 4.76 | 4.42 |
| 1990 | 20.6 | 27.3 | 20.6 | 5.75 | 5.19 | 4.73 | 4.35 | 4.12 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.80 | 4.28 | 3.85 | 3.49 | 3.54 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.98 | 5.20 | 4.57 | 4.05 | 3.95 |
| 1995 | 100.0 | 0.0 | 100.0 | 5.55 | 5.16 | 4.80 | 4.48 | 4.36 |
| 1995 | 50.0 | 0.0 | 50.0 | 5.26 | 4.80 | 4.39 | 4.05 | 4.01 |
| 1995 | 0.0 | 50.0 | 0.0 | 5.49 | 4.82 | 4.28 | 3.83 | 3.80 |
| 1995 | 50.0 | 50.0 | 50.0 | 5.77 | 5.18 | 4.68 | 4.27 | 4.16 |
| 1995 | 20.6 | 27.3 | 20.6 | 5.38 | 4.80 | 4.31 | 3.91 | 3.88 |
| 2000 | 0.0 | 0.0 | 0.0 | 4.26 | 3.81 | 3.42 | 3.10 | 3.20 |
| 2000 | 0.0 | 100.0 | 0.0 | 5.26 | 4.57 | 3.99 | 3.53 | 3.50 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.86 | 4.50 | 4.18 | 3.89 | 3.83 |
| 2000 | 50.0 | 0.0 | 50.0 | 4.63 | 4.22 | 3.86 | 3.54 | 3.57 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.84 | 4.25 | 3.76 | 3.36 | 3.40 |
| 2000 | 50.0 | 50.0 | 50.0 | 5.06 | 4.53 | 4.09 | 3.71 | 3.67 |
| 2000 | 20.6 | 27.3 | 20.6 | 4.73 | 4.22 | 3.79 | 3.42 | 3.46 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.83 | 3.43 | 3.08 | 2.79 | 2.91 |
| 2005 | 0.0 | 100.0 | 0.0 | 4.72 | 4.09 | 3.58 | 3.15 | 3.15 |
| 2005 | 100.0 | 0.0 | 100.0 | 4.38 | 4.04 | 3.74 | 3.47 | 3.44 |
| 2005 | 50.0 | 0.0 | 50.0 | 4.16 | 3.79 | 3.46 | 3.17 | 3.22 |
| 2005 | 0.0 | 50.0 | 0.0 | 4.34 | 3.81 | 3.38 | 3.01 | 3.07 |
| 2005 | 50.0 | 50.0 | 50.0 | 4.55 | 4.07 | 3.66 | 3.31 | 3.30 |
| 2005 | 20.6 | 27.3 | 20.6 | 4.25 | 3.79 | 3.40 | 3.07 | 3.13 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.66 | 3.28 | 2.95 | 2.67 | 2.80 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.51 | 3.92 | 3.43 | 3.02 | 3.02 |
| 2010 | 100.0 | 0.0 | 100.0 | 4.21 | 3.88 | 3.59 | 3.33 | 3.30 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.99 | 3.63 | 3.32 | 3.04 | 3.09 |
| 2010 | 0.0 | 50.0 | 0.0 | 4.14 | 3.65 | 3.23 | 2.88 | 2.94 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.36 | 3.90 | 3.51 | 3.17 | 3.16 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.06 | 3.63 | 3.26 | 2.94 | 3.00 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.59 | 3.22 | 2.91 | 2.64 | 2.76 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.43 | 3.85 | 3.37 | 2.97 | 2.98 |
| 2020 | 100.0 | 0.0 | 100.0 | 4.12 | 3.80 | 3.52 | 3.26 | 3.24 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.91 | 3.56 | 3.26 | 2.99 | 3.04 |
| 2020 | 0.0 | 50.0 | 0.0 | 4.06 | 3.58 | 3.18 | 2.84 | 2.90 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.27 | 3.83 | 3.45 | 3.12 | 3.11 |
| 2020 | 20.6 | 27.3 | 20.6 | 3.98 | 3.56 | 3.20 | 2.89 | 2.95 |

TABLE 1.36: EXHAUST NO_x AT 2.5 MPH

TABLE 1.37

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|------|------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 4.46 | 4.04 | 3.69 | 3.40 | 3.27 |
| 1990 | 0.0 | 100.0 | 0.0 | 5.50 | 4.90 | 4.41 | 4.00 | 3.70 |
| 1990 | 100.0 | 0.0 | 100.0 | 5.18 | 4.83 | 4.53 | 4.27 | 3.96 |
| 1990 | 50.0 | 0.0 | 50.0 | 4.88 | 4.49 | 4.16 | 3.89 | 3.67 |
| 1990 | 0.0 | 50.0 | 0.0 | 5.06 | 4.54 | 4.11 | 3.75 | 3.53 |
| 1990 | 50.0 | 50.0 | 50.0 | 5.34 | 4.86 | 4.47 | 4.14 | 3.83 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.97 | 4.50 | 4.11 | 3.79 | 3.58 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.07 | 3.64 | 3.29 | 3.00 | 3.03 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.03 | 4.40 | 3.88 | 3.46 | 3.37 |
| 1995 | 100.0 | 0.0 | 100.0 | 4.69 | 4.36 | 4.07 | 3.81 | 3.70 |
| 1995 | 50.0 | 0.0 | 50.0 | 4.45 | 4.06 | 3.74 | 3.45 | 3.41 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.63 | 4.09 | 3.64 | 3.28 | 3.24 |
| 1995 | 50.0 | 50.0 | 50.0 | 4.86 | 4.38 | 3.97 | 3.63 | 3.53 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.54 | 4.06 | 3.67 | 3.34 | 3.31 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.59 | 3.22 | 2.90 | 2.64 | 2.72 |
| 2000 | 0.0 | 100.0 | 0.0 | 4.40 | 3.83 | 3.37 | 2.99 | 2.96 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.07 | 3.78 | 3.52 | 3.28 | 3.23 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.89 | 3.55 | 3.26 | 3.00 | 3.02 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.05 | 3.58 | 3.18 | 2.85 | 2.88 |
| 2000 | 50.0 | 50.0 | 50.0 | 4.24 | 3.81 | 3.44 | 3.14 | 3.10 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.97 | 3.55 | 3.20 | 2.91 | 2.93 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.21 | 2.88 | 2.61 | 2.37 | 2.47 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.92 | 3.42 | 3.01 | 2.66 | 2.66 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.65 | 3.38 | 3.13 | 2.91 | 2.89 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.48 | 3.17 | 2.91 | 2.68 | 2.72 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.62 | 3.20 | 2.84 | 2.55 | 2.60 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.79 | 3.40 | 3.07 | 2.79 | 2.78 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.55 | 3.17 | 2.86 | 2.59 | 2.64 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.06 | 2.75 | 2.49 | 2.27 | 2.37 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.76 | 3.27 | 2.88 | 2.55 | 2.55 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.51 | 3.24 | 3.01 | 2.79 | 2.78 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.33 | 3.04 | 2.78 | 2.56 | 2.60 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.46 | 3.06 | 2.72 | 2.43 | 2.49 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.63 | 3.26 | 2.94 | 2.67 | 2.66 |
| 2010 | 20.6 | 27.3 | 20.6 | 3.39 | 3.04 | 2.74 | 2.48 | 2.53 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.01 | 2.71 | 2.46 | 2.24 | 2.34 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.68 | 3.22 | 2.83 | 2.51 | 2.51 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.44 | 3.18 | 2.95 | 2.74 | 2.72 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.27 | 2.98 | 2.74 | 2.52 | 2.56 |
| 2020 | 0.0 | 50.0 | 0.0 | 3.39 | 3.00 | 2.68 | 2.40 | 2.45 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.56 | 3.20 | 2.89 | 2.63 | 2.62 |
| 2020 | 20.6 | 27.3 | 20.6 | 3.33 | 2.98 | 2.69 | 2.44 | 2.49 |

TABLE 1.37: EXHAUST NO_x AT 5.0 MPH

TABLE 1.38

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.87 | 3.50 | 3.19 | 2.93 | 2.81 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.79 | 4.26 | 3.82 | 3.47 | 3.19 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.51 | 4.20 | 3.93 | 3.70 | 3.42 |
| 1990 | 50.0 | 0.0 | 50.0 | 4.24 | 3.90 | 3.61 | 3.36 | 3.16 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.40 | 3.93 | 3.55 | 3.24 | 3.04 |
| 1990 | 50.0 | 50.0 | 50.0 | 4.65 | 4.23 | 3.88 | 3.58 | 3.31 |
| 1990 | 20.6 | 27.3 | 20.6 | 4.32 | 3.90 | 3.56 | 3.28 | 3.08 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.54 | 3.16 | 2.85 | 2.59 | 2.62 |
| 1995 | 0.0 | 100.0 | 0.0 | 4.39 | 3.83 | 3.37 | 3.00 | 2.91 |
| 1995 | 100.0 | 0.0 | 100.0 | 4.08 | 3.79 | 3.53 | 3.30 | 3.20 |
| 1995 | 50.0 | 0.0 | 50.0 | 3.87 | 3.53 | 3.24 | 2.99 | 2.95 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.03 | 3.55 | 3.16 | 2.84 | 2.80 |
| 1995 | 50.0 | 50.0 | 50.0 | 4.24 | 3.81 | 3.45 | 3.15 | 3.06 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.95 | 3.53 | 3.18 | 2.89 | 2.86 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.12 | 2.79 | 2.52 | 2.29 | 2.36 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.84 | 3.34 | 2.93 | 2.59 | 2.57 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.55 | 3.29 | 3.06 | 2.85 | 2.81 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.39 | 3.09 | 2.83 | 2.60 | 2.62 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.53 | 3.11 | 2.76 | 2.47 | 2.50 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.69 | 3.31 | 2.99 | 2.72 | 2.69 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.46 | 3.09 | 2.78 | 2.52 | 2.54 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.79 | 2.51 | 2.26 | 2.05 | 2.14 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.43 | 2.98 | 2.62 | 2.31 | 2.31 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.18 | 2.94 | 2.73 | 2.54 | 2.52 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.03 | 2.76 | 2.53 | 2.32 | 2.36 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.16 | 2.78 | 2.47 | 2.21 | 2.25 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.30 | 2.96 | 2.67 | 2.42 | 2.41 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.09 | 2.77 | 2.49 | 2.25 | 2.29 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.67 | 2.40 | 2.16 | 1.97 | 2.05 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.28 | 2.86 | 2.50 | 2.21 | 2.21 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.06 | 2.83 | 2.62 | 2.43 | 2.41 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.91 | 2.65 | 2.42 | 2.23 | 2.26 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.02 | 2.66 | 2.36 | 2.11 | 2.16 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.17 | 2.84 | 2.56 | 2.32 | 2.32 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.96 | 2.65 | 2.38 | 2.15 | 2.20 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.62 | 2.36 | 2.13 | 1.94 | 2.03 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.21 | 2.81 | 2.46 | 2.18 | 2.18 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.00 | 2.77 | 2.57 | 2.38 | 2.37 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.85 | 2.60 | 2.38 | 2.19 | 2.22 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.96 | 2.62 | 2.33 | 2.09 | 2.13 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.11 | 2.79 | 2.52 | 2.28 | 2.28 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.90 | 2.60 | 2.34 | 2.12 | 2.17 |

TABLE 1.38: EXHAUST NO_x AT 10.0 MPH

TABLE 1.39

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.43 | 3.08 | 2.79 | 2.55 | 2.43 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.30 | 3.80 | 3.39 | 3.06 | 2.79 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.02 | 3.73 | 3.49 | 3.27 | 3.00 |
| 1990 | 50.0 | 0.0 | 50.0 | 3.78 | 3.46 | 3.18 | 2.96 | 2.76 |
| 1990 | 0.0 | 50.0 | 0.0 | 3.93 | 3.50 | 3.14 | 2.84 | 2.65 |
| 1990 | 50.0 | 50.0 | 50.0 | 4.16 | 3.77 | 3.44 | 3.17 | 2.90 |
| 1990 | 20.6 | 27.3 | 20.6 | 3.85 | 3.46 | 3.14 | 2.88 | 2.69 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.15 | 2.80 | 2.50 | 2.26 | 2.28 |
| 1995 | 0.0 | 100.0 | 0.0 | 3.94 | 3.42 | 2.99 | 2.64 | 2.56 |
| 1995 | 100.0 | 0.0 | 100.0 | 3.65 | 3.38 | 3.14 | 2.93 | 2.83 |
| 1995 | 50.0 | 0.0 | 50.0 | 3.46 | 3.14 | 2.87 | 2.64 | 2.60 |
| 1995 | 0.0 | 50.0 | 0.0 | 3.61 | 3.16 | 2.80 | 2.49 | 2.46 |
| 1995 | 50.0 | 50.0 | 50.0 | 3.80 | 3.40 | 3.07 | 2.79 | 2.70 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.54 | 3.14 | 2.82 | 2.54 | 2.51 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.78 | 2.48 | 2.22 | 2.00 | 2.07 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.45 | 2.99 | 2.60 | 2.29 | 2.27 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.19 | 2.94 | 2.72 | 2.53 | 2.49 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.03 | 2.75 | 2.51 | 2.30 | 2.31 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.17 | 2.78 | 2.45 | 2.18 | 2.20 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.32 | 2.96 | 2.66 | 2.41 | 2.38 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.10 | 2.76 | 2.47 | 2.22 | 2.24 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.50 | 2.23 | 2.00 | 1.81 | 1.89 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.09 | 2.68 | 2.33 | 2.05 | 2.05 |
| 2005 | 100.0 | 0.0 | 100.0 | 2.86 | 2.64 | 2.44 | 2.26 | 2.24 |
| 2005 | 50.0 | 0.0 | 50.0 | 2.72 | 2.47 | 2.25 | 2.06 | 2.09 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.84 | 2.49 | 2.20 | 1.95 | 1.99 |
| 2005 | 50.0 | 50.0 | 50.0 | 2.98 | 2.66 | 2.38 | 2.15 | 2.14 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.78 | 2.47 | 2.21 | 1.99 | 2.03 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.39 | 2.14 | 1.92 | 1.73 | 1.82 |
| 2010 | 0.0 | 100.0 | 0.0 | 2.96 | 2.57 | 2.24 | 1.96 | 1.97 |
| 2010 | 100.0 | 0.0 | 100.0 | 2.76 | 2.54 | 2.34 | 2.17 | 2.15 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.61 | 2.37 | 2.16 | 1.98 | 2.01 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.72 | 2.38 | 2.11 | 1.87 | 1.91 |
| 2010 | 50.0 | 50.0 | 50.0 | 2.86 | 2.55 | 2.29 | 2.07 | 2.06 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.66 | 2.37 | 2.12 | 1.91 | 1.95 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.35 | 2.10 | 1.89 | 1.71 | 1.79 |
| 2020 | 0.0 | 100.0 | 0.0 | 2.90 | 2.52 | 2.20 | 1.93 | 1.94 |
| 2020 | 100.0 | 0.0 | 100.0 | 2.70 | 2.49 | 2.30 | 2.12 | 2.11 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.56 | 2.33 | 2.12 | 1.94 | 1.98 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.66 | 2.34 | 2.07 | 1.84 | 1.89 |
| 2020 | 50.0 | 50.0 | 50.0 | 2.80 | 2.50 | 2.25 | 2.03 | 2.02 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.61 | 2.33 | 2.09 | 1.88 | 1.92 |

TABLE 1.39: EXHAUST NO_x AT 19.6 MPH

TABLE 1.40

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|-----------------|-------|-------|----------------------------------|------|------|------|------|
| | VMT Percentages | | | @ Ambient Temperature | | | | |
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 3.51 | 3.13 | 2.82 | 2.55 | 2.42 |
| 1990 | 0.0 | 100.0 | 0.0 | 4.44 | 3.91 | 3.47 | 3.11 | 2.81 |
| 1990 | 100.0 | 0.0 | 100.0 | 4.10 | 3.81 | 3.55 | 3.33 | 3.04 |
| 1990 | 50.0 | 0.0 | 50.0 | 3.87 | 3.53 | 3.24 | 3.00 | 2.78 |
| 1990 | 0.0 | 50.0 | 0.0 | 4.06 | 3.59 | 3.20 | 2.88 | 2.66 |
| 1990 | 50.0 | 50.0 | 50.0 | 4.27 | 3.86 | 3.51 | 3.22 | 2.93 |
| 1990 | 20.6 | 27.3 | 20.6 | 3.96 | 3.55 | 3.20 | 2.92 | 2.70 |
| 1995 | 0.0 | 0.0 | 0.0 | 3.21 | 2.83 | 2.52 | 2.26 | 2.27 |
| 1995 | 0.0 | 100.0 | 0.0 | 4.06 | 3.50 | 3.05 | 2.67 | 2.58 |
| 1995 | 100.0 | 0.0 | 100.0 | 3.74 | 3.45 | 3.19 | 2.97 | 2.86 |
| 1995 | 50.0 | 0.0 | 50.0 | 3.54 | 3.20 | 2.91 | 2.66 | 2.61 |
| 1995 | 0.0 | 50.0 | 0.0 | 3.71 | 3.23 | 2.83 | 2.51 | 2.47 |
| 1995 | 50.0 | 50.0 | 50.0 | 3.90 | 3.48 | 3.12 | 2.82 | 2.72 |
| 1995 | 20.6 | 27.3 | 20.6 | 3.63 | 3.20 | 2.86 | 2.56 | 2.52 |
| 2000 | 0.0 | 0.0 | 0.0 | 2.81 | 2.49 | 2.22 | 1.99 | 2.05 |
| 2000 | 0.0 | 100.0 | 0.0 | 3.51 | 3.02 | 2.62 | 2.29 | 2.26 |
| 2000 | 100.0 | 0.0 | 100.0 | 3.23 | 2.98 | 2.75 | 2.54 | 2.50 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.07 | 2.78 | 2.52 | 2.30 | 2.31 |
| 2000 | 0.0 | 50.0 | 0.0 | 3.22 | 2.80 | 2.46 | 2.17 | 2.19 |
| 2000 | 50.0 | 50.0 | 50.0 | 3.37 | 3.00 | 2.68 | 2.42 | 2.38 |
| 2000 | 20.6 | 27.3 | 20.6 | 3.14 | 2.78 | 2.48 | 2.22 | 2.24 |
| 2005 | 0.0 | 0.0 | 0.0 | 2.52 | 2.24 | 2.00 | 1.79 | 1.88 |
| 2005 | 0.0 | 100.0 | 0.0 | 3.13 | 2.70 | 2.34 | 2.04 | 2.04 |
| 2005 | 100.0 | 0.0 | 100.0 | 2.90 | 2.66 | 2.45 | 2.26 | 2.24 |
| 2005 | 50.0 | 0.0 | 50.0 | 2.75 | 2.49 | 2.26 | 2.06 | 2.09 |
| 2005 | 0.0 | 50.0 | 0.0 | 2.87 | 2.51 | 2.20 | 1.95 | 1.99 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.02 | 2.68 | 2.40 | 2.15 | 2.14 |
| 2005 | 20.6 | 27.3 | 20.6 | 2.81 | 2.49 | 2.22 | 1.99 | 2.03 |
| 2010 | 0.0 | 0.0 | 0.0 | 2.41 | 2.14 | 1.91 | 1.72 | 1.80 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.00 | 2.59 | 2.24 | 1.96 | 1.96 |
| 2010 | 100.0 | 0.0 | 100.0 | 2.79 | 2.56 | 2.36 | 2.17 | 2.16 |
| 2010 | 50.0 | 0.0 | 50.0 | 2.64 | 2.39 | 2.16 | 1.97 | 2.01 |
| 2010 | 0.0 | 50.0 | 0.0 | 2.74 | 2.40 | 2.11 | 1.86 | 1.91 |
| 2010 | 50.0 | 50.0 | 50.0 | 2.89 | 2.57 | 2.30 | 2.06 | 2.06 |
| 2010 | 20.6 | 27.3 | 20.6 | 2.69 | 2.38 | 2.12 | 1.90 | 1.95 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.36 | 2.10 | 1.88 | 1.69 | 1.78 |
| 2020 | 0.0 | 100.0 | 0.0 | 2.93 | 2.53 | 2.20 | 1.92 | 1.93 |
| 2020 | 100.0 | 0.0 | 100.0 | 2.72 | 2.50 | 2.30 | 2.12 | 2.11 |
| 2020 | 50.0 | 0.0 | 50.0 | 2.58 | 2.34 | 2.12 | 1.93 | 1.97 |
| 2020 | 0.0 | 50.0 | 0.0 | 2.68 | 2.35 | 2.07 | 1.83 | 1.88 |
| 2020 | 50.0 | 50.0 | 50.0 | 2.83 | 2.52 | 2.25 | 2.02 | 2.02 |
| 2020 | 20.6 | 27.3 | 20.6 | 2.63 | 2.34 | 2.08 | 1.87 | 1.91 |

TABLE 1.40: EXHAUST NO_x AT 35.0 MPH

TABLE 1.41

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

| Cal. Year | Cold/Hot Start | | | Combined for Eight Vehicle Types | | | | |
|--------------|----------------|-------------|-------|----------------------------------|------|------|------|------|
| | VMT PCCN | Percentages | | @ Ambient Temperature | | | | |
| | | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 4.75 | 4.23 | 3.81 | 3.45 | 3.26 |
| 1990 | 0.0 | 100.0 | 0.0 | 6.12 | 5.38 | 4.78 | 4.28 | 3.85 |
| 1990 | 100.0 | 0.0 | 100.0 | 5.64 | 5.23 | 4.88 | 4.58 | 4.16 |
| 1990 | 50.0 | 0.0 | 50.0 | 5.25 | 4.78 | 4.39 | 4.06 | 3.75 |
| 1990 | 0.0 | 50.0 | 0.0 | 5.50 | 4.87 | 4.34 | 3.91 | 3.60 |
| 1990 | 50.0 | 50.0 | 50.0 | 5.88 | 5.31 | 4.83 | 4.43 | 4.01 |
| 1990 | 20.6 | 27.3 | 20.6 | 5.37 | 4.81 | 4.34 | 3.95 | 3.65 |
| 1995 | 0.0 | 0.0 | 0.0 | 4.24 | 3.75 | 3.33 | 2.99 | 3.01 |
| 1995 | 0.0 | 100.0 | 0.0 | 5.41 | 4.67 | 4.06 | 3.57 | 3.43 |
| 1995 | 100.0 | 0.0 | 100.0 | 4.96 | 4.58 | 4.25 | 3.95 | 3.80 |
| 1995 | 50.0 | 0.0 | 50.0 | 4.66 | 4.22 | 3.84 | 3.51 | 3.44 |
| 1995 | 0.0 | 50.0 | 0.0 | 4.89 | 4.26 | 3.74 | 3.32 | 3.26 |
| 1995 | 50.0 | 50.0 | 50.0 | 5.19 | 4.63 | 4.15 | 3.76 | 3.62 |
| 1995 | 20.6 | 27.3 | 20.6 | 4.77 | 4.22 | 3.77 | 3.38 | 3.33 |
| 2000 | 0.0 | 0.0 | 0.0 | 3.64 | 3.23 | 2.88 | 2.58 | 2.67 |
| 2000 | 0.0 | 100.0 | 0.0 | 4.56 | 3.93 | 3.41 | 2.99 | 2.95 |
| 2000 | 100.0 | 0.0 | 100.0 | 4.19 | 3.86 | 3.57 | 3.31 | 3.25 |
| 2000 | 50.0 | 0.0 | 50.0 | 3.96 | 3.58 | 3.26 | 2.97 | 2.99 |
| 2000 | 0.0 | 50.0 | 0.0 | 4.15 | 3.62 | 3.18 | 2.81 | 2.84 |
| 2000 | 50.0 | 50.0 | 50.0 | 4.38 | 3.90 | 3.49 | 3.15 | 3.10 |
| 2000 | 20.6 | 27.3 | 20.6 | 4.05 | 3.59 | 3.20 | 2.87 | 2.89 |
| 2005 | 0.0 | 0.0 | 0.0 | 3.21 | 2.86 | 2.56 | 2.30 | 2.41 |
| 2005 | 0.0 | 100.0 | 0.0 | 4.00 | 3.45 | 3.00 | 2.62 | 2.62 |
| 2005 | 100.0 | 0.0 | 100.0 | 3.70 | 3.40 | 3.14 | 2.90 | 2.88 |
| 2005 | 50.0 | 0.0 | 50.0 | 3.49 | 3.16 | 2.87 | 2.62 | 2.67 |
| 2005 | 0.0 | 50.0 | 0.0 | 3.64 | 3.19 | 2.80 | 2.48 | 2.54 |
| 2005 | 50.0 | 50.0 | 50.0 | 3.85 | 3.43 | 3.07 | 2.76 | 2.75 |
| 2005 | 20.6 | 27.3 | 20.6 | 3.56 | 3.16 | 2.82 | 2.54 | 2.59 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.06 | 2.72 | 2.44 | 2.20 | 2.30 |
| 2010 | 0.0 | 100.0 | 0.0 | 3.80 | 3.29 | 2.86 | 2.50 | 2.50 |
| 2010 | 100.0 | 0.0 | 100.0 | 3.54 | 3.26 | 3.00 | 2.77 | 2.75 |
| 2010 | 50.0 | 0.0 | 50.0 | 3.33 | 3.02 | 2.74 | 2.50 | 2.55 |
| 2010 | 0.0 | 50.0 | 0.0 | 3.46 | 3.03 | 2.67 | 2.37 | 2.42 |
| 2010 | 50.0 | 50.0 | 50.0 | 3.67 | 3.27 | 2.93 | 2.63 | 2.63 |
| 2010 | 20.6 | 27.3 | 20.6 | 3.39 | 3.02 | 2.69 | 2.42 | 2.47 |
| 2020 | 0.0 | 0.0 | 0.0 | 2.99 | 2.67 | 2.40 | 2.16 | 2.27 |
| 2020 | 0.0 | 100.0 | 0.0 | 3.71 | 3.21 | 2.80 | 2.45 | 2.46 |
| 2020 | 100.0 | 0.0 | 100.0 | 3.45 | 3.17 | 2.93 | 2.70 | 2.68 |
| 2020 | 50.0 | 0.0 | 50.0 | 3.25 | 2.95 | 2.68 | 2.45 | 2.50 |
| 2020 | 0.0 | 50.0 | 0.0 | 3.38 | 2.97 | 2.62 | 2.33 | 2.38 |
| 2020 | 50.0 | 50.0 | 50.0 | 3.58 | 3.19 | 2.86 | 2.58 | 2.57 |
| 2020 | 20.6 | 27.3 | 20.6 | 3.31 | 2.95 | 2.64 | 2.37 | 2.42 |

TABLE 1.41: EXHAUST NO_x AT 55.0 MPH

TABLE 1.42

HIGH ALTITUDE

EXHAUST NO_x EMISSION FACTORS (GRAMS/MILE) AT 65.0 MPH

| Cal. Year | Cold/Hot Start VMT Percentages | | | Combined for Eight Vehicle Types @ Ambient Temperature | | | | |
|--------------|-----------------------------------|-------|-------|---|------|------|------|------|
| | PCCN | PCHC | PCCC | 0F | 25F | 50F | 75F | 100F |
| 1990 | 0.0 | 0.0 | 0.0 | 6.39 | 5.71 | 5.14 | 4.67 | 4.44 |
| 1990 | 0.0 | 100.0 | 0.0 | 8.31 | 7.32 | 6.51 | 5.84 | 5.28 |
| 1990 | 100.0 | 0.0 | 100.0 | 7.67 | 7.12 | 6.65 | 6.24 | 5.69 |
| 1990 | 50.0 | 0.0 | 50.0 | 7.07 | 6.45 | 5.93 | 5.49 | 5.09 |
| 1990 | 0.0 | 50.0 | 0.0 | 7.39 | 6.55 | 5.86 | 5.28 | 4.89 |
| 1990 | 50.0 | 50.0 | 50.0 | 7.99 | 7.22 | 6.58 | 6.04 | 5.48 |
| 1990 | 20.6 | 27.3 | 20.6 | 7.22 | 6.47 | 5.86 | 5.34 | 4.95 |
| 1995 | 0.0 | 0.0 | 0.0 | 5.66 | 5.01 | 4.47 | 4.02 | 4.05 |
| 1995 | 0.0 | 100.0 | 0.0 | 7.24 | 6.26 | 5.46 | 4.81 | 4.64 |
| 1995 | 100.0 | 0.0 | 100.0 | 6.63 | 6.13 | 5.69 | 5.30 | 5.11 |
| 1995 | 50.0 | 0.0 | 50.0 | 6.19 | 5.61 | 5.11 | 4.69 | 4.61 |
| 1995 | 0.0 | 50.0 | 0.0 | 6.50 | 5.67 | 5.00 | 4.44 | 4.37 |
| 1995 | 50.0 | 50.0 | 50.0 | 6.94 | 6.20 | 5.58 | 5.06 | 4.87 |
| 1995 | 20.6 | 27.3 | 20.6 | 6.34 | 5.62 | 5.02 | 4.53 | 4.45 |
| 2000 | 0.0 | 0.0 | 0.0 | 4.80 | 4.26 | 3.82 | 3.44 | 3.55 |
| 2000 | 0.0 | 100.0 | 0.0 | 6.01 | 5.19 | 4.52 | 3.97 | 3.92 |
| 2000 | 100.0 | 0.0 | 100.0 | 5.52 | 5.10 | 4.72 | 4.38 | 4.30 |
| 2000 | 50.0 | 0.0 | 50.0 | 5.19 | 4.71 | 4.29 | 3.93 | 3.94 |
| 2000 | 0.0 | 50.0 | 0.0 | 5.44 | 4.75 | 4.19 | 3.72 | 3.75 |
| 2000 | 50.0 | 50.0 | 50.0 | 5.77 | 5.15 | 4.62 | 4.18 | 4.11 |
| 2000 | 20.6 | 27.3 | 20.6 | 5.31 | 4.72 | 4.22 | 3.80 | 3.82 |
| 2005 | 0.0 | 0.0 | 0.0 | 4.19 | 3.74 | 3.36 | 3.03 | 3.16 |
| 2005 | 0.0 | 100.0 | 0.0 | 5.20 | 4.50 | 3.92 | 3.45 | 3.44 |
| 2005 | 100.0 | 0.0 | 100.0 | 4.81 | 4.44 | 4.10 | 3.80 | 3.77 |
| 2005 | 50.0 | 0.0 | 50.0 | 4.52 | 4.11 | 3.74 | 3.43 | 3.48 |
| 2005 | 0.0 | 50.0 | 0.0 | 4.72 | 4.14 | 3.66 | 3.25 | 3.32 |
| 2005 | 50.0 | 50.0 | 50.0 | 5.01 | 4.47 | 4.01 | 3.62 | 3.61 |
| 2005 | 20.6 | 27.3 | 20.6 | 4.62 | 4.11 | 3.68 | 3.32 | 3.38 |
| 2010 | 0.0 | 0.0 | 0.0 | 3.97 | 3.55 | 3.19 | 2.88 | 3.02 |
| 2010 | 0.0 | 100.0 | 0.0 | 4.93 | 4.27 | 3.73 | 3.27 | 3.28 |
| 2010 | 100.0 | 0.0 | 100.0 | 4.59 | 4.23 | 3.90 | 3.61 | 3.59 |
| 2010 | 50.0 | 0.0 | 50.0 | 4.30 | 3.91 | 3.56 | 3.26 | 3.32 |
| 2010 | 0.0 | 50.0 | 0.0 | 4.47 | 3.93 | 3.47 | 3.09 | 3.16 |
| 2010 | 50.0 | 50.0 | 50.0 | 4.76 | 4.25 | 3.82 | 3.44 | 3.43 |
| 2010 | 20.6 | 27.3 | 20.6 | 4.38 | 3.90 | 3.50 | 3.15 | 3.22 |
| 2020 | 0.0 | 0.0 | 0.0 | 3.88 | 3.48 | 3.13 | 2.84 | 2.97 |
| 2020 | 0.0 | 100.0 | 0.0 | 4.81 | 4.17 | 3.65 | 3.21 | 3.21 |
| 2020 | 100.0 | 0.0 | 100.0 | 4.47 | 4.12 | 3.81 | 3.53 | 3.50 |
| 2020 | 50.0 | 0.0 | 50.0 | 4.19 | 3.82 | 3.48 | 3.19 | 3.25 |
| 2020 | 0.0 | 50.0 | 0.0 | 4.36 | 3.84 | 3.40 | 3.03 | 3.10 |
| 2020 | 50.0 | 50.0 | 50.0 | 4.64 | 4.15 | 3.73 | 3.37 | 3.36 |
| 2020 | 20.6 | 27.3 | 20.6 | 4.27 | 3.82 | 3.42 | 3.09 | 3.16 |

TABLE 1.42: EXHAUST NO_x AT 65.0 MPH

TABLE 2.01

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
60-84F DIURNAL, 80F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 3.59 | 3.87 | 4.21 | 4.78 | 4.87 | 5.74 |
| 1990 | Exhaust NMHC | 2.69 | 2.69 | 2.69 | 2.79 | 2.83 | 2.95 |
| 1990 | Evaporative HC | 0.51 | 0.61 | 0.77 | 0.98 | 0.91 | 1.19 |
| 1990 | Refueling Loss | 0.15 | 0.17 | 0.20 | 0.22 | 0.23 | 0.26 |
| 1990 | Running Loss HC | 0.18 | 0.33 | 0.48 | 0.73 | 0.83 | 1.27 |
| 1990 | Resting Loss HC | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1990 | Exhaust CO | 31.99 | 31.99 | 32.12 | 34.40 | 35.45 | 38.77 |
| 1990 | Exhaust NOx | 3.10 | 3.10 | 3.10 | 3.11 | 3.11 | 3.11 |
| 1995 | Combined NMHC | 2.66 | 2.86 | 3.11 | 3.62 | 3.85 | 4.70 |
| 1995 | Exhaust NMHC | 2.02 | 2.02 | 2.02 | 2.16 | 2.22 | 2.39 |
| 1995 | Evaporative HC | 0.27 | 0.33 | 0.41 | 0.55 | 0.62 | 0.88 |
| 1995 | Refueling Loss | 0.14 | 0.16 | 0.18 | 0.21 | 0.22 | 0.24 |
| 1995 | Running Loss HC | 0.17 | 0.30 | 0.43 | 0.64 | 0.74 | 1.13 |
| 1995 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1995 | Exhaust CO | 24.72 | 24.72 | 24.88 | 28.25 | 29.83 | 34.97 |
| 1995 | Exhaust NOx | 2.62 | 2.63 | 2.64 | 2.65 | 2.65 | 2.66 |
| 2000 | Combined NMHC | 2.23 | 2.42 | 2.64 | 3.12 | 3.34 | 4.14 |
| 2000 | Exhaust NMHC | 1.73 | 1.73 | 1.73 | 1.88 | 1.95 | 2.15 |
| 2000 | Evaporative HC | 0.19 | 0.23 | 0.31 | 0.42 | 0.49 | 0.72 |
| 2000 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.24 |
| 2000 | Running Loss HC | 0.14 | 0.26 | 0.38 | 0.56 | 0.65 | 0.98 |
| 2000 | Resting Loss HC | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 2000 | Exhaust CO | 21.79 | 21.79 | 21.94 | 25.92 | 27.80 | 33.99 |
| 2000 | Exhaust NOx | 2.25 | 2.26 | 2.27 | 2.29 | 2.29 | 2.31 |
| 2005 | Combined NMHC | 2.02 | 2.19 | 2.38 | 2.82 | 3.03 | 3.74 |
| 2005 | Exhaust NMHC | 1.61 | 1.61 | 1.61 | 1.77 | 1.84 | 2.05 |
| 2005 | Evaporative HC | 0.15 | 0.18 | 0.25 | 0.34 | 0.40 | 0.60 |
| 2005 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2005 | Running Loss HC | 0.10 | 0.21 | 0.32 | 0.48 | 0.55 | 0.82 |
| 2005 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2005 | Exhaust CO | 20.55 | 20.55 | 20.70 | 24.93 | 26.93 | 33.54 |
| 2005 | Exhaust NOx | 2.00 | 2.01 | 2.03 | 2.04 | 2.05 | 2.06 |
| 2010 | Combined NMHC | 1.95 | 2.10 | 2.28 | 2.69 | 2.88 | 3.54 |
| 2010 | Exhaust NMHC | 1.58 | 1.58 | 1.58 | 1.74 | 1.81 | 2.02 |
| 2010 | Evaporative HC | 0.13 | 0.16 | 0.22 | 0.31 | 0.36 | 0.54 |
| 2010 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2010 | Running Loss HC | 0.09 | 0.18 | 0.28 | 0.43 | 0.49 | 0.73 |
| 2010 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2010 | Exhaust CO | 20.28 | 20.28 | 20.43 | 24.73 | 26.77 | 33.52 |
| 2010 | Exhaust NOx | 1.91 | 1.92 | 1.94 | 1.95 | 1.96 | 1.98 |
| 2020 | Combined NMHC | 1.92 | 2.06 | 2.23 | 2.63 | 2.81 | 3.43 |
| 2020 | Exhaust NMHC | 1.57 | 1.57 | 1.57 | 1.73 | 1.80 | 2.00 |
| 2020 | Evaporative HC | 0.12 | 0.15 | 0.20 | 0.29 | 0.33 | 0.50 |
| 2020 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2020 | Running Loss HC | 0.08 | 0.17 | 0.26 | 0.40 | 0.45 | 0.68 |
| 2020 | Resting Loss HC | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2020 | Exhaust CO | 20.15 | 20.15 | 20.29 | 24.57 | 26.60 | 33.31 |
| 2020 | Exhaust NOx | 1.88 | 1.89 | 1.90 | 1.92 | 1.92 | 1.94 |

TABLE 2.01: LOW ALTITUDE, 60-84F

TABLE 2.02

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
67-95F DIURNAL, 90F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.17 | 4.65 | 5.08 | 5.98 | 6.44 | 7.94 |
| 1990 | Exhaust NMHC | 2.88 | 2.88 | 2.90 | 3.01 | 3.06 | 3.22 |
| 1990 | Evaporative HC | 0.73 | 0.91 | 1.01 | 1.32 | 1.46 | 1.95 |
| 1990 | Refueling Loss | 0.17 | 0.19 | 0.22 | 0.24 | 0.25 | 0.28 |
| 1990 | Running Loss HC | 0.30 | 0.58 | 0.86 | 1.31 | 1.58 | 2.40 |
| 1990 | Resting Loss HC | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1990 | Exhaust CO | 37.37 | 37.37 | 38.22 | 40.96 | 42.39 | 47.01 |
| 1990 | Exhaust NOx | 2.99 | 2.99 | 2.99 | 2.99 | 2.99 | 2.99 |
| 1995 | Combined NMHC | 2.97 | 3.34 | 3.80 | 4.62 | 5.06 | 6.50 |
| 1995 | Exhaust NMHC | 2.09 | 2.09 | 2.11 | 2.27 | 2.34 | 2.56 |
| 1995 | Evaporative HC | 0.38 | 0.47 | 0.64 | 0.88 | 1.00 | 1.44 |
| 1995 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.26 |
| 1995 | Running Loss HC | 0.27 | 0.52 | 0.76 | 1.17 | 1.40 | 2.15 |
| 1995 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1995 | Exhaust CO | 26.78 | 26.78 | 27.86 | 32.17 | 34.30 | 41.52 |
| 1995 | Exhaust NOx | 2.60 | 2.60 | 2.61 | 2.62 | 2.63 | 2.64 |
| 2000 | Combined NMHC | 2.46 | 2.78 | 3.18 | 3.91 | 4.31 | 5.59 |
| 2000 | Exhaust NMHC | 1.75 | 1.75 | 1.78 | 1.95 | 2.03 | 2.28 |
| 2000 | Evaporative HC | 0.26 | 0.34 | 0.47 | 0.67 | 0.77 | 1.16 |
| 2000 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2000 | Running Loss HC | 0.23 | 0.45 | 0.66 | 1.01 | 1.21 | 1.84 |
| 2000 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 2000 | Exhaust CO | 22.56 | 22.56 | 23.62 | 28.83 | 31.40 | 40.25 |
| 2000 | Exhaust NOx | 2.26 | 2.27 | 2.28 | 2.29 | 2.30 | 2.31 |
| 2005 | Combined NMHC | 2.19 | 2.46 | 2.80 | 3.44 | 3.77 | 4.86 |
| 2005 | Exhaust NMHC | 1.61 | 1.61 | 1.64 | 1.82 | 1.90 | 2.15 |
| 2005 | Evaporative HC | 0.20 | 0.27 | 0.37 | 0.53 | 0.62 | 0.95 |
| 2005 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2005 | Running Loss HC | 0.18 | 0.36 | 0.55 | 0.82 | 0.98 | 1.46 |
| 2005 | Resting Loss HC | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 2005 | Exhaust CO | 20.68 | 20.68 | 21.74 | 27.31 | 30.05 | 39.55 |
| 2005 | Exhaust NOx | 2.02 | 2.03 | 2.04 | 2.06 | 2.06 | 2.08 |
| 2010 | Combined NMHC | 2.09 | 2.33 | 2.63 | 3.19 | 3.49 | 4.45 |
| 2010 | Exhaust NMHC | 1.58 | 1.58 | 1.61 | 1.79 | 1.87 | 2.12 |
| 2010 | Evaporative HC | 0.17 | 0.23 | 0.32 | 0.46 | 0.54 | 0.82 |
| 2010 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2010 | Running Loss HC | 0.15 | 0.31 | 0.47 | 0.70 | 0.83 | 1.23 |
| 2010 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2010 | Exhaust CO | 20.30 | 20.30 | 21.35 | 27.03 | 29.83 | 39.56 |
| 2010 | Exhaust NOx | 1.93 | 1.94 | 1.96 | 1.97 | 1.98 | 1.99 |
| 2020 | Combined NMHC | 2.04 | 2.26 | 2.53 | 3.06 | 3.33 | 4.21 |
| 2020 | Exhaust NMHC | 1.57 | 1.57 | 1.60 | 1.78 | 1.86 | 2.10 |
| 2020 | Evaporative HC | 0.16 | 0.21 | 0.29 | 0.42 | 0.49 | 0.74 |
| 2020 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2020 | Running Loss HC | 0.14 | 0.28 | 0.42 | 0.63 | 0.74 | 1.10 |
| 2020 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2020 | Exhaust CO | 20.17 | 20.17 | 21.20 | 26.85 | 29.64 | 39.31 |
| 2020 | Exhaust NOx | 1.90 | 1.91 | 1.92 | 1.94 | 1.94 | 1.96 |

TABLE 2.02: LOW ALTITUDE, 67-95F

TABLE 2.03

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
71-92F DIURNAL, 88F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.01 | 4.43 | 4.96 | 5.61 | 6.00 | 7.35 |
| 1990 | Exhaust NMHC | 2.86 | 2.86 | 2.88 | 2.98 | 3.04 | 3.20 |
| 1990 | Evaporative HC | 0.64 | 0.78 | 1.02 | 1.14 | 1.25 | 1.67 |
| 1990 | Refueling Loss | 0.17 | 0.19 | 0.22 | 0.24 | 0.25 | 0.28 |
| 1990 | Running Loss HC | 0.25 | 0.50 | 0.76 | 1.15 | 1.37 | 2.12 |
| 1990 | Resting Loss HC | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1990 | Exhaust CO | 36.73 | 36.73 | 37.57 | 40.31 | 41.71 | 46.22 |
| 1990 | Exhaust NOx | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.01 |
| 1995 | Combined NMHC | 2.89 | 3.21 | 3.61 | 4.34 | 4.71 | 5.99 |
| 1995 | Exhaust NMHC | 2.08 | 2.08 | 2.11 | 2.26 | 2.33 | 2.55 |
| 1995 | Evaporative HC | 0.34 | 0.41 | 0.55 | 0.74 | 0.84 | 1.20 |
| 1995 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.26 |
| 1995 | Running Loss HC | 0.23 | 0.45 | 0.67 | 1.02 | 1.21 | 1.90 |
| 1995 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1995 | Exhaust CO | 26.54 | 26.54 | 27.65 | 31.91 | 34.00 | 41.06 |
| 1995 | Exhaust NOx | 2.60 | 2.61 | 2.62 | 2.63 | 2.63 | 2.64 |
| 2000 | Combined NMHC | 2.39 | 2.67 | 3.03 | 3.69 | 4.02 | 5.18 |
| 2000 | Exhaust NMHC | 1.75 | 1.75 | 1.78 | 1.95 | 2.03 | 2.27 |
| 2000 | Evaporative HC | 0.23 | 0.30 | 0.40 | 0.56 | 0.65 | 0.96 |
| 2000 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2000 | Running Loss HC | 0.19 | 0.39 | 0.58 | 0.89 | 1.05 | 1.63 |
| 2000 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 2000 | Exhaust CO | 22.47 | 22.47 | 23.59 | 28.73 | 31.25 | 39.91 |
| 2000 | Exhaust NOx | 2.26 | 2.27 | 2.28 | 2.29 | 2.30 | 2.31 |
| 2005 | Combined NMHC | 2.13 | 2.38 | 2.68 | 3.27 | 3.55 | 4.54 |
| 2005 | Exhaust NMHC | 1.61 | 1.61 | 1.64 | 1.82 | 1.90 | 2.15 |
| 2005 | Evaporative HC | 0.17 | 0.23 | 0.31 | 0.45 | 0.52 | 0.79 |
| 2005 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2005 | Running Loss HC | 0.15 | 0.32 | 0.49 | 0.73 | 0.86 | 1.30 |
| 2005 | Resting Loss HC | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 2005 | Exhaust CO | 20.66 | 20.66 | 21.80 | 27.29 | 29.98 | 39.27 |
| 2005 | Exhaust NOx | 2.02 | 2.03 | 2.04 | 2.06 | 2.06 | 2.08 |
| 2010 | Combined NMHC | 2.04 | 2.26 | 2.53 | 3.06 | 3.32 | 4.20 |
| 2010 | Exhaust NMHC | 1.58 | 1.58 | 1.61 | 1.79 | 1.87 | 2.12 |
| 2010 | Evaporative HC | 0.15 | 0.20 | 0.27 | 0.39 | 0.45 | 0.69 |
| 2010 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2010 | Running Loss HC | 0.13 | 0.27 | 0.42 | 0.63 | 0.74 | 1.11 |
| 2010 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2010 | Exhaust CO | 20.30 | 20.30 | 21.42 | 27.03 | 29.78 | 39.29 |
| 2010 | Exhaust NOx | 1.93 | 1.94 | 1.95 | 1.97 | 1.98 | 1.99 |
| 2020 | Combined NMHC | 2.00 | 2.20 | 2.45 | 2.94 | 3.18 | 4.00 |
| 2020 | Exhaust NMHC | 1.57 | 1.57 | 1.60 | 1.78 | 1.86 | 2.10 |
| 2020 | Evaporative HC | 0.14 | 0.19 | 0.25 | 0.35 | 0.41 | 0.63 |
| 2020 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2020 | Running Loss HC | 0.11 | 0.25 | 0.38 | 0.57 | 0.67 | 1.00 |
| 2020 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2020 | Exhaust CO | 20.17 | 20.17 | 21.28 | 26.85 | 29.58 | 39.04 |
| 2020 | Exhaust NOx | 1.90 | 1.91 | 1.92 | 1.93 | 1.94 | 1.96 |

TABLE 2.03: LOW ALTITUDE, 71-92F

TABLE 2.04

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
66-85F DIURNAL, 82F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 3.67 | 3.96 | 4.32 | 4.91 | 5.18 | 6.00 |
| 1990 | Exhaust NMHC | 2.73 | 2.73 | 2.74 | 2.84 | 2.88 | 3.02 |
| 1990 | Evaporative HC | 0.52 | 0.62 | 0.77 | 0.98 | 1.07 | 1.22 |
| 1990 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.27 |
| 1990 | Running Loss HC | 0.19 | 0.36 | 0.53 | 0.79 | 0.91 | 1.42 |
| 1990 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1990 | Exhaust CO | 33.09 | 33.09 | 33.45 | 35.88 | 37.02 | 40.65 |
| 1990 | Exhaust NOx | 3.08 | 3.07 | 3.08 | 3.08 | 3.08 | 3.08 |
| 1995 | Combined NMHC | 2.70 | 2.92 | 3.19 | 3.73 | 3.97 | 4.91 |
| 1995 | Exhaust NMHC | 2.03 | 2.03 | 2.05 | 2.19 | 2.25 | 2.44 |
| 1995 | Evaporative HC | 0.28 | 0.33 | 0.42 | 0.56 | 0.62 | 0.88 |
| 1995 | Refueling Loss | 0.14 | 0.17 | 0.19 | 0.21 | 0.22 | 0.25 |
| 1995 | Running Loss HC | 0.17 | 0.32 | 0.47 | 0.70 | 0.81 | 1.27 |
| 1995 | Resting Loss HC | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1995 | Exhaust CO | 25.15 | 25.15 | 25.65 | 29.28 | 31.00 | 36.65 |
| 1995 | Exhaust NOx | 2.62 | 2.62 | 2.63 | 2.64 | 2.64 | 2.66 |
| 2000 | Combined NMHC | 2.26 | 2.46 | 2.70 | 3.20 | 3.43 | 4.30 |
| 2000 | Exhaust NMHC | 1.73 | 1.73 | 1.74 | 1.90 | 1.97 | 2.19 |
| 2000 | Evaporative HC | 0.19 | 0.23 | 0.31 | 0.42 | 0.48 | 0.72 |
| 2000 | Refueling Loss | 0.14 | 0.17 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2000 | Running Loss HC | 0.14 | 0.28 | 0.41 | 0.62 | 0.71 | 1.10 |
| 2000 | Resting Loss HC | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 2000 | Exhaust CO | 21.95 | 21.95 | 22.47 | 26.78 | 28.84 | 35.70 |
| 2000 | Exhaust NOx | 2.25 | 2.26 | 2.28 | 2.29 | 2.29 | 2.31 |
| 2005 | Combined NMHC | 2.04 | 2.21 | 2.43 | 2.89 | 3.10 | 3.87 |
| 2005 | Exhaust NMHC | 1.61 | 1.61 | 1.62 | 1.79 | 1.86 | 2.08 |
| 2005 | Evaporative HC | 0.15 | 0.18 | 0.24 | 0.34 | 0.39 | 0.60 |
| 2005 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2005 | Running Loss HC | 0.11 | 0.23 | 0.34 | 0.52 | 0.60 | 0.91 |
| 2005 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2005 | Exhaust CO | 20.58 | 20.58 | 21.11 | 25.70 | 27.89 | 35.23 |
| 2005 | Exhaust NOx | 2.01 | 2.02 | 2.03 | 2.05 | 2.05 | 2.07 |
| 2010 | Combined NMHC | 1.97 | 2.13 | 2.32 | 2.75 | 2.95 | 3.65 |
| 2010 | Exhaust NMHC | 1.58 | 1.58 | 1.59 | 1.76 | 1.83 | 2.05 |
| 2010 | Evaporative HC | 0.13 | 0.16 | 0.21 | 0.30 | 0.35 | 0.53 |
| 2010 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2010 | Running Loss HC | 0.09 | 0.20 | 0.31 | 0.46 | 0.53 | 0.80 |
| 2010 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2010 | Exhaust CO | 20.29 | 20.29 | 20.81 | 25.49 | 27.73 | 35.23 |
| 2010 | Exhaust NOx | 1.92 | 1.93 | 1.94 | 1.96 | 1.96 | 1.98 |
| 2020 | Combined NMHC | 1.93 | 2.08 | 2.27 | 2.68 | 2.87 | 3.53 |
| 2020 | Exhaust NMHC | 1.57 | 1.57 | 1.59 | 1.75 | 1.82 | 2.04 |
| 2020 | Evaporative HC | 0.12 | 0.15 | 0.20 | 0.28 | 0.33 | 0.50 |
| 2020 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2020 | Running Loss HC | 0.08 | 0.18 | 0.28 | 0.43 | 0.49 | 0.74 |
| 2020 | Resting Loss HC | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2020 | Exhaust CO | 20.16 | 20.16 | 20.68 | 25.33 | 27.55 | 35.01 |
| 2020 | Exhaust NOx | 1.88 | 1.90 | 1.91 | 1.92 | 1.93 | 1.95 |

TABLE 2.04: LOW ALTITUDE, 66-85F

TABLE 2.05

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
60-84F DIURNAL, 80F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.16 | 4.47 | 4.84 | 5.34 | 5.61 | 6.58 |
| 1990 | Exhaust NMHC | 3.19 | 3.19 | 3.19 | 3.29 | 3.34 | 3.47 |
| 1990 | Evaporative HC | 0.58 | 0.71 | 0.91 | 1.03 | 1.14 | 1.52 |
| 1990 | Refueling Loss | 0.15 | 0.17 | 0.20 | 0.22 | 0.23 | 0.26 |
| 1990 | Running Loss HC | 0.18 | 0.33 | 0.48 | 0.73 | 0.83 | 1.27 |
| 1990 | Resting Loss HC | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1990 | Exhaust CO | 42.63 | 42.63 | 42.79 | 45.50 | 46.75 | 50.65 |
| 1990 | Exhaust NOx | 2.85 | 2.85 | 2.85 | 2.85 | 2.85 | 2.86 |
| 1995 | Combined NMHC | 3.02 | 3.24 | 3.51 | 4.05 | 4.31 | 5.24 |
| 1995 | Exhaust NMHC | 2.34 | 2.34 | 2.34 | 2.48 | 2.54 | 2.73 |
| 1995 | Evaporative HC | 0.31 | 0.38 | 0.49 | 0.66 | 0.75 | 1.08 |
| 1995 | Refueling Loss | 0.14 | 0.16 | 0.18 | 0.21 | 0.22 | 0.24 |
| 1995 | Running Loss HC | 0.17 | 0.30 | 0.43 | 0.64 | 0.74 | 1.13 |
| 1995 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1995 | Exhaust CO | 29.80 | 29.80 | 29.99 | 33.66 | 35.37 | 40.92 |
| 1995 | Exhaust NOx | 2.52 | 2.53 | 2.54 | 2.55 | 2.55 | 2.56 |
| 2000 | Combined NMHC | 2.51 | 2.71 | 2.94 | 3.45 | 3.69 | 4.55 |
| 2000 | Exhaust NMHC | 1.98 | 1.98 | 1.98 | 2.14 | 2.21 | 2.41 |
| 2000 | Evaporative HC | 0.22 | 0.27 | 0.35 | 0.50 | 0.58 | 0.86 |
| 2000 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.24 |
| 2000 | Running Loss HC | 0.14 | 0.26 | 0.38 | 0.56 | 0.65 | 0.98 |
| 2000 | Resting Loss HC | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 2000 | Exhaust CO | 24.30 | 24.30 | 24.46 | 28.60 | 30.55 | 36.97 |
| 2000 | Exhaust NOx | 2.20 | 2.21 | 2.22 | 2.24 | 2.24 | 2.26 |
| 2005 | Combined NMHC | 2.28 | 2.45 | 2.66 | 3.12 | 3.34 | 4.10 |
| 2005 | Exhaust NMHC | 1.85 | 1.85 | 1.85 | 2.01 | 2.08 | 2.30 |
| 2005 | Evaporative HC | 0.17 | 0.21 | 0.28 | 0.40 | 0.47 | 0.71 |
| 2005 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2005 | Running Loss HC | 0.10 | 0.21 | 0.32 | 0.48 | 0.55 | 0.82 |
| 2005 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2005 | Exhaust CO | 22.19 | 22.19 | 22.35 | 26.71 | 28.77 | 35.56 |
| 2005 | Exhaust NOx | 1.97 | 1.98 | 2.00 | 2.01 | 2.02 | 2.04 |
| 2010 | Combined NMHC | 2.21 | 2.36 | 2.55 | 2.98 | 3.18 | 3.88 |
| 2010 | Exhaust NMHC | 1.82 | 1.82 | 1.82 | 1.98 | 2.05 | 2.27 |
| 2010 | Evaporative HC | 0.14 | 0.18 | 0.25 | 0.35 | 0.41 | 0.63 |
| 2010 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2010 | Running Loss HC | 0.09 | 0.18 | 0.28 | 0.43 | 0.49 | 0.73 |
| 2010 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2010 | Exhaust CO | 21.64 | 21.64 | 21.80 | 26.21 | 28.29 | 35.18 |
| 2010 | Exhaust NOx | 1.89 | 1.90 | 1.91 | 1.93 | 1.93 | 1.95 |
| 2020 | Combined NMHC | 2.18 | 2.33 | 2.51 | 2.92 | 3.11 | 3.78 |
| 2020 | Exhaust NMHC | 1.82 | 1.82 | 1.82 | 1.98 | 2.05 | 2.26 |
| 2020 | Evaporative HC | 0.14 | 0.17 | 0.23 | 0.33 | 0.39 | 0.59 |
| 2020 | Refueling Loss | 0.13 | 0.16 | 0.18 | 0.20 | 0.21 | 0.23 |
| 2020 | Running Loss HC | 0.08 | 0.17 | 0.26 | 0.40 | 0.45 | 0.68 |
| 2020 | Resting Loss HC | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2020 | Exhaust CO | 21.53 | 21.53 | 21.69 | 26.07 | 28.14 | 34.98 |
| 2020 | Exhaust NOx | 1.86 | 1.87 | 1.88 | 1.90 | 1.90 | 1.92 |

TABLE 2.05: HIGH ALTITUDE, 60-84F

TABLE 2.06

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
67-95F DIURNAL, 90F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.76 | 5.30 | 5.84 | 6.86 | 7.37 | 9.19 |
| 1990 | Exhaust NMHC | 3.40 | 3.40 | 3.42 | 3.53 | 3.59 | 3.77 |
| 1990 | Evaporative HC | 0.80 | 1.04 | 1.25 | 1.67 | 1.86 | 2.65 |
| 1990 | Refueling Loss | 0.17 | 0.19 | 0.22 | 0.24 | 0.25 | 0.28 |
| 1990 | Running Loss HC | 0.30 | 0.58 | 0.86 | 1.31 | 1.58 | 2.40 |
| 1990 | Resting Loss HC | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1990 | Exhaust CO | 50.07 | 50.07 | 51.14 | 54.35 | 56.04 | 61.42 |
| 1990 | Exhaust NOx | 2.76 | 2.76 | 2.77 | 2.77 | 2.77 | 2.77 |
| 1995 | Combined NMHC | 3.36 | 3.75 | 4.26 | 5.17 | 5.66 | 7.35 |
| 1995 | Exhaust NMHC | 2.41 | 2.41 | 2.44 | 2.60 | 2.68 | 2.91 |
| 1995 | Evaporative HC | 0.43 | 0.56 | 0.77 | 1.09 | 1.26 | 1.95 |
| 1995 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.26 |
| 1995 | Running Loss HC | 0.27 | 0.52 | 0.76 | 1.17 | 1.40 | 2.15 |
| 1995 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1995 | Exhaust CO | 32.60 | 32.60 | 33.86 | 38.50 | 40.80 | 48.53 |
| 1995 | Exhaust NOx | 2.51 | 2.51 | 2.52 | 2.53 | 2.54 | 2.55 |
| 2000 | Combined NMHC | 2.75 | 3.09 | 3.52 | 4.32 | 4.76 | 6.25 |
| 2000 | Exhaust NMHC | 2.01 | 2.01 | 2.04 | 2.21 | 2.30 | 2.55 |
| 2000 | Evaporative HC | 0.30 | 0.40 | 0.56 | 0.82 | 0.96 | 1.54 |
| 2000 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2000 | Running Loss HC | 0.23 | 0.45 | 0.66 | 1.01 | 1.21 | 1.84 |
| 2000 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 2000 | Exhaust CO | 25.35 | 25.35 | 26.52 | 31.91 | 34.57 | 43.70 |
| 2000 | Exhaust NOx | 2.21 | 2.21 | 2.23 | 2.24 | 2.25 | 2.27 |
| 2005 | Combined NMHC | 2.46 | 2.74 | 3.11 | 3.80 | 4.16 | 5.41 |
| 2005 | Exhaust NMHC | 1.85 | 1.85 | 1.89 | 2.07 | 2.15 | 2.41 |
| 2005 | Evaporative HC | 0.23 | 0.31 | 0.44 | 0.64 | 0.76 | 1.25 |
| 2005 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2005 | Running Loss HC | 0.18 | 0.36 | 0.55 | 0.82 | 0.98 | 1.46 |
| 2005 | Resting Loss HC | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 2005 | Exhaust CO | 22.36 | 22.36 | 23.52 | 29.24 | 32.05 | 41.76 |
| 2005 | Exhaust NOx | 1.99 | 2.00 | 2.01 | 2.03 | 2.03 | 2.05 |
| 2010 | Combined NMHC | 2.35 | 2.60 | 2.92 | 3.53 | 3.85 | 4.96 |
| 2010 | Exhaust NMHC | 1.82 | 1.82 | 1.85 | 2.03 | 2.12 | 2.37 |
| 2010 | Evaporative HC | 0.19 | 0.26 | 0.37 | 0.55 | 0.65 | 1.08 |
| 2010 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2010 | Running Loss HC | 0.15 | 0.31 | 0.47 | 0.70 | 0.83 | 1.23 |
| 2010 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2010 | Exhaust CO | 21.67 | 21.67 | 22.81 | 28.61 | 31.46 | 41.35 |
| 2010 | Exhaust NOx | 1.91 | 1.92 | 1.93 | 1.95 | 1.95 | 1.97 |
| 2020 | Combined NMHC | 2.31 | 2.54 | 2.83 | 3.40 | 3.69 | 4.71 |
| 2020 | Exhaust NMHC | 1.82 | 1.82 | 1.85 | 2.03 | 2.11 | 2.36 |
| 2020 | Evaporative HC | 0.18 | 0.24 | 0.34 | 0.50 | 0.59 | 0.98 |
| 2020 | Refueling Loss | 0.15 | 0.18 | 0.20 | 0.22 | 0.23 | 0.25 |
| 2020 | Running Loss HC | 0.14 | 0.28 | 0.42 | 0.63 | 0.74 | 1.10 |
| 2020 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2020 | Exhaust CO | 21.56 | 21.56 | 22.69 | 28.45 | 31.28 | 41.10 |
| 2020 | Exhaust NOx | 1.88 | 1.89 | 1.90 | 1.91 | 1.92 | 1.94 |

TABLE 2.06: HIGH ALTITUDE, 67-95F

TABLE 2.07

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
71-92F DIURNAL, 88F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.61 | 5.07 | 5.67 | 6.44 | 6.88 | 8.41 |
| 1990 | Exhaust NMHC | 3.38 | 3.38 | 3.40 | 3.51 | 3.57 | 3.74 |
| 1990 | Evaporative HC | 0.72 | 0.90 | 1.21 | 1.44 | 1.60 | 2.19 |
| 1990 | Refueling Loss | 0.17 | 0.19 | 0.22 | 0.24 | 0.25 | 0.28 |
| 1990 | Running Loss HC | 0.25 | 0.50 | 0.76 | 1.15 | 1.37 | 2.12 |
| 1990 | Resting Loss HC | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1990 | Exhaust CO | 49.18 | 49.18 | 50.23 | 53.45 | 55.10 | 60.35 |
| 1990 | Exhaust NOx | 2.77 | 2.77 | 2.77 | 2.77 | 2.78 | 2.78 |
| 1995 | Combined NMHC | 3.27 | 3.61 | 4.05 | 4.85 | 5.25 | 6.69 |
| 1995 | Exhaust NMHC | 2.40 | 2.40 | 2.44 | 2.60 | 2.67 | 2.90 |
| 1995 | Evaporative HC | 0.39 | 0.49 | 0.66 | 0.92 | 1.05 | 1.56 |
| 1995 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.26 |
| 1995 | Running Loss HC | 0.23 | 0.45 | 0.67 | 1.02 | 1.21 | 1.90 |
| 1995 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1995 | Exhaust CO | 32.27 | 32.27 | 33.55 | 38.15 | 40.40 | 47.97 |
| 1995 | Exhaust NOx | 2.51 | 2.51 | 2.52 | 2.53 | 2.54 | 2.55 |
| 2000 | Combined NMHC | 2.67 | 2.97 | 3.35 | 4.06 | 4.43 | 5.71 |
| 2000 | Exhaust NMHC | 2.00 | 2.00 | 2.04 | 2.21 | 2.29 | 2.54 |
| 2000 | Evaporative HC | 0.26 | 0.34 | 0.47 | 0.68 | 0.79 | 1.22 |
| 2000 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2000 | Running Loss HC | 0.19 | 0.39 | 0.58 | 0.89 | 1.05 | 1.63 |
| 2000 | Resting Loss HC | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 2000 | Exhaust CO | 25.22 | 25.22 | 26.45 | 31.78 | 34.38 | 43.31 |
| 2000 | Exhaust NOx | 2.21 | 2.21 | 2.23 | 2.24 | 2.25 | 2.27 |
| 2005 | Combined NMHC | 2.40 | 2.65 | 2.98 | 3.60 | 3.91 | 5.00 |
| 2005 | Exhaust NMHC | 1.85 | 1.85 | 1.89 | 2.07 | 2.15 | 2.40 |
| 2005 | Evaporative HC | 0.20 | 0.26 | 0.36 | 0.54 | 0.63 | 0.99 |
| 2005 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2005 | Running Loss HC | 0.15 | 0.32 | 0.49 | 0.73 | 0.86 | 1.30 |
| 2005 | Resting Loss HC | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 2005 | Exhaust CO | 22.34 | 22.34 | 23.57 | 29.21 | 31.97 | 41.46 |
| 2005 | Exhaust NOx | 1.99 | 2.00 | 2.01 | 2.03 | 2.03 | 2.05 |
| 2010 | Combined NMHC | 2.30 | 2.53 | 2.81 | 3.37 | 3.65 | 4.62 |
| 2010 | Exhaust NMHC | 1.82 | 1.82 | 1.86 | 2.04 | 2.12 | 2.37 |
| 2010 | Evaporative HC | 0.17 | 0.23 | 0.31 | 0.46 | 0.54 | 0.86 |
| 2010 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2010 | Running Loss HC | 0.13 | 0.27 | 0.42 | 0.63 | 0.74 | 1.11 |
| 2010 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2010 | Exhaust CO | 21.67 | 21.67 | 22.88 | 28.60 | 31.40 | 41.06 |
| 2010 | Exhaust NOx | 1.90 | 1.91 | 1.93 | 1.95 | 1.95 | 1.97 |
| 2020 | Combined NMHC | 2.27 | 2.47 | 2.74 | 3.26 | 3.52 | 4.42 |
| 2020 | Exhaust NMHC | 1.82 | 1.82 | 1.86 | 2.03 | 2.11 | 2.36 |
| 2020 | Evaporative HC | 0.16 | 0.21 | 0.29 | 0.42 | 0.50 | 0.79 |
| 2020 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.22 | 0.23 | 0.26 |
| 2020 | Running Loss HC | 0.11 | 0.25 | 0.38 | 0.57 | 0.67 | 1.00 |
| 2020 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2020 | Exhaust CO | 21.56 | 21.56 | 22.76 | 28.44 | 31.22 | 40.82 |
| 2020 | Exhaust NOx | 1.88 | 1.88 | 1.90 | 1.91 | 1.92 | 1.94 |

TABLE 2.07: HIGH ALTITUDE, 71-92F

TABLE 2.08

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE)
66-85F DIURNAL, 82F HOT SOAK

| Cal. Year | Pollutant By Component | Combined for eight vehicle types @Reid Vapor Pressure (psi) | | | | | |
|--------------|---------------------------|--|-------|-------|-------|-------|-------|
| | | 7.0 | 8.0 | 9.0 | 10.0 | 10.4 | 11.5 |
| 1990 | Combined NMHC | 4.24 | 4.56 | 4.97 | 5.62 | 5.80 | 6.86 |
| 1990 | Exhaust NMHC | 3.23 | 3.23 | 3.24 | 3.35 | 3.40 | 3.54 |
| 1990 | Evaporative HC | 0.59 | 0.72 | 0.92 | 1.18 | 1.17 | 1.56 |
| 1990 | Refueling Loss | 0.16 | 0.18 | 0.20 | 0.23 | 0.24 | 0.27 |
| 1990 | Running Loss HC | 0.19 | 0.36 | 0.53 | 0.79 | 0.91 | 1.42 |
| 1990 | Resting Loss HC | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1990 | Exhaust CO | 44.14 | 44.14 | 44.60 | 47.47 | 48.83 | 53.08 |
| 1990 | Exhaust NOx | 2.82 | 2.83 | 2.83 | 2.83 | 2.83 | 2.83 |
| 1995 | Combined NMHC | 3.07 | 3.30 | 3.60 | 4.17 | 4.44 | 5.46 |
| 1995 | Exhaust NMHC | 2.36 | 2.36 | 2.37 | 2.52 | 2.58 | 2.78 |
| 1995 | Evaporative HC | 0.33 | 0.39 | 0.50 | 0.67 | 0.76 | 1.09 |
| 1995 | Refueling Loss | 0.14 | 0.17 | 0.19 | 0.21 | 0.22 | 0.25 |
| 1995 | Running Loss HC | 0.17 | 0.32 | 0.47 | 0.70 | 0.81 | 1.27 |
| 1995 | Resting Loss HC | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1995 | Exhaust CO | 30.38 | 30.38 | 30.95 | 34.90 | 36.76 | 42.85 |
| 1995 | Exhaust NOx | 2.52 | 2.52 | 2.53 | 2.54 | 2.55 | 2.56 |
| 2000 | Combined NMHC | 2.54 | 2.74 | 3.00 | 3.53 | 3.79 | 4.72 |
| 2000 | Exhaust NMHC | 1.98 | 1.98 | 2.00 | 2.16 | 2.23 | 2.45 |
| 2000 | Evaporative HC | 0.22 | 0.27 | 0.35 | 0.49 | 0.57 | 0.87 |
| 2000 | Refueling Loss | 0.14 | 0.17 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2000 | Running Loss HC | 0.14 | 0.28 | 0.41 | 0.62 | 0.71 | 1.10 |
| 2000 | Resting Loss HC | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 2000 | Exhaust CO | 24.51 | 24.51 | 25.08 | 29.56 | 31.69 | 38.78 |
| 2000 | Exhaust NOx | 2.20 | 2.21 | 2.22 | 2.24 | 2.24 | 2.26 |
| 2005 | Combined NMHC | 2.30 | 2.48 | 2.71 | 3.19 | 3.41 | 4.23 |
| 2005 | Exhaust NMHC | 1.85 | 1.85 | 1.87 | 2.03 | 2.11 | 2.33 |
| 2005 | Evaporative HC | 0.17 | 0.20 | 0.28 | 0.39 | 0.46 | 0.71 |
| 2005 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2005 | Running Loss HC | 0.11 | 0.23 | 0.34 | 0.52 | 0.60 | 0.91 |
| 2005 | Resting Loss HC | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 2005 | Exhaust CO | 22.22 | 22.22 | 22.79 | 27.52 | 29.77 | 37.30 |
| 2005 | Exhaust NOx | 1.97 | 1.99 | 2.00 | 2.02 | 2.02 | 2.04 |
| 2010 | Combined NMHC | 2.22 | 2.39 | 2.59 | 3.04 | 3.25 | 4.00 |
| 2010 | Exhaust NMHC | 1.82 | 1.82 | 1.84 | 2.00 | 2.08 | 2.30 |
| 2010 | Evaporative HC | 0.15 | 0.18 | 0.24 | 0.35 | 0.41 | 0.63 |
| 2010 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2010 | Running Loss HC | 0.09 | 0.20 | 0.31 | 0.46 | 0.53 | 0.80 |
| 2010 | Resting Loss HC | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 2010 | Exhaust CO | 21.65 | 21.65 | 22.21 | 26.99 | 29.28 | 36.92 |
| 2010 | Exhaust NOx | 1.89 | 1.90 | 1.92 | 1.93 | 1.94 | 1.96 |
| 2020 | Combined NMHC | 2.20 | 2.35 | 2.55 | 2.97 | 3.17 | 3.88 |
| 2020 | Exhaust NMHC | 1.82 | 1.82 | 1.84 | 2.00 | 2.07 | 2.29 |
| 2020 | Evaporative HC | 0.14 | 0.17 | 0.23 | 0.33 | 0.38 | 0.59 |
| 2020 | Refueling Loss | 0.14 | 0.16 | 0.19 | 0.21 | 0.22 | 0.24 |
| 2020 | Running Loss HC | 0.08 | 0.18 | 0.28 | 0.43 | 0.49 | 0.74 |
| 2020 | Resting Loss HC | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2020 | Exhaust CO | 21.54 | 21.54 | 22.10 | 26.85 | 29.12 | 36.71 |
| 2020 | Exhaust NOx | 1.86 | 1.87 | 1.89 | 1.90 | 1.91 | 1.93 |

TABLE 2.08: HIGH ALTITUDE, 66-85F