

5. Onroad Mobile Sources

5.1 Introduction

Onroad mobile source emissions for carbon monoxide (CO) have been calculated for the CO maintenance area and Maricopa County for the 2008 Periodic Emissions Inventory (PEI).

Motor Vehicle Emission Simulator (MOVES2010b) is the latest model developed by the U.S. Environmental Protection Agency (EPA) for the purpose of estimating onroad and off-network motor vehicle emission factors.

The MOVES2010b modeling accounted for the oxygenated fuel and the Arizona Vehicle Inspection/Maintenance (I/M) programs applied in Maricopa County in 2008. The fuel use assumptions, including oxygen content and Reid Vapor Pressure (RVP), were derived from the 2008 fuel inspection results provided by the Arizona Department of Weights and Measures.

In order to develop the 2008 onroad mobile source emissions, the 2008 vehicle miles traveled (VMT) estimates by facility type and road type were derived from the 2008 Highway Performance Monitoring System (HPMS) data provided by the Arizona Department of Transportation (ADOT). The distribution of VMT by vehicle type is based on the July 2008 vehicle registration data for Maricopa County provided by ADOT. The VMT by vehicle type was provided as local input data for MOVES2010b to produce onroad exhaust emissions.

The main references for preparing the onroad mobile source portion of the 2008 emissions inventory were:

- Emission Inventory Requirements for Ozone State Implementation Plans (EPA, 1991);
- Procedures for Emission Inventory Preparation Volume IV: Mobile Sources (EPA, 1992a);
- Quality Review Guidelines for 1990 Base Year Emission Inventories (EPA, 1992b);
- User's Guide for the SMOKE-MOVES Integration Tool (EPA, 2010a);
- Motor Vehicle Emission Simulator (MOVES) - User Guide Version, MOVES2010b (EPA, 2012a);
- Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes (EPA, 2012b); and
- Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b (EPA, 2012c).

5.2 Exhaust emissions

Vehicle exhaust emission factors for CO were calculated using MOVES2010b. The MOVES2010b runs were executed by MAG. The contact person for the MOVES2010b emission estimates is Ieesuck Jung (602-254-6300).

5.2.1 MOVES2010b model

The emissions were calculated using MOVES2010b. MOVES2010b is EPA's state-of-the-art emissions modeling tool, which replaces EPA's previous mobile source emissions model, MOBILE6.2. MOVES2010b is intended for official use to estimate national, state, and county

level inventories of criteria air pollutants from highway vehicles. The user of MOVES2010b is allowed to specify vehicle types, time periods, geographical areas, pollutants, vehicle operating characteristics, and road types for a particular scenario to be modeled by creating a Run Specification (RunSpec).

In order to calculate vehicle emissions for the calendar year 2008, MOVES2010b was executed using local input data for each month of the year and each geographical area (the CO maintenance area and Maricopa County). Each scenario was created using the County Domain/Scale and the Inventory Calculation Type. The specific MOVES2010b model RunSpec and RunSpec summaries are described in Appendix 3.

5.2.2 MOVES2010b local input data

Compared with MOBILE6.2, MOVES2010b requires a more detailed level of local data, including fuel data, I/M program, meteorological data, vehicle population, source type age distribution, annual VMT, monthly/daily/hourly VMT fractions, road type distribution, average speed distribution, ramp fraction, and Alternative Vehicle and Fuel Technologies (AVFT) strategy.

5.2.2.1 Fuel data

Regarding the fuel local input data, MOVES2010b provides two MOVES tables, which are [fuelsupply] and [fuelformulation]. The fuel data for each month were derived from the 2008 fuel inspection results in Maricopa County provided by the Arizona Department of Weights and Measures. The fuel data for Maricopa County were also applied to the CO maintenance area. The specific MOVES tables for fuel data are presented in Appendix 3.

5.2.2.2 I/M programs

MOVES2010b has an [IMCoverage] table for I/M programs; this table was prepared using MOBILE6.2 input. This table reflects the actual proportions of vehicles subject to the specified levels of inspection. The term “I/M vehicles” denotes vehicles which are required to undergo an emission test and/or inspection under the Vehicle Inspection/Maintenance Program. It is important to note that participation in the I/M program is required for all vehicles registered in the CO maintenance area, with the exception of certain model years and vehicle classes. However, it is assumed that 91.6 percent of the vehicles operating within the CO maintenance area and Maricopa County participate in the I/M program and the remaining 8.4 percent do not participate in the program. These percentages reflect the control measures “Tougher Enforcement of Vehicle Registration and Emissions Test Compliance” and “Expansion of Area A Boundaries,” described in the MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area (MAG, 2009). This percentage is directly applied to the Compliance Factor in the [IMCoverage] table. The same I/M programs were applied for the CO maintenance area and Maricopa County. The specific MOVES table for I/M programs is presented in Appendix 3.

5.2.2.3 Meteorological data

MOVES2010b requires hourly temperature and relative humidity data by specific month of the year. Meteorological data for the Phoenix Sky Harbor International Airport in 2008 were obtained from the National Climatic Data Center (http://www7.ncdc.noaa.gov/IPS/lcd/lcd.html?page=1&state=AZ&wban=23183&_target2=Next+%3E). The same hourly average temperature

and relative humidity data for each month were applied for the CO maintenance area and Maricopa County. The specific MOVES table [ZoneMonthHour] for meteorological data is presented in Appendix 3.

5.2.2.4 Vehicle population

In order to capture start, evaporative, and extended idle emissions, MOVES2010b introduced a new mobile source emission category called off-network emissions. In MOVES2010b, these off-network emissions are directly determined by population of vehicles in an area. The vehicle population in Maricopa County was obtained from the July 2008 vehicle registration data provided by ADOT. The vehicle population data were allocated to the 28 MOBILE6.2 vehicle types based on MOBILE6.2 VMT fractions for 2008. Then, the vehicle population data allocated to the 28 MOBILE6.2 vehicle types were assigned to the 13 MOVES source types using the match-up table (Table A.1) in EPA's technical guidance (EPA, 2010a). The vehicle population in the CO maintenance area was estimated by applying the population ratio of the two geographical areas to the vehicle population in Maricopa County. The population ratio for 2008 was derived from the MAG socioeconomic data, which is 3,688,000 people for the CO maintenance area and 3,988,000 people for Maricopa County. The specific MOVES table [SourceTypeYear] for vehicle population is presented in Appendix 3.

5.2.2.5 Source type age distribution

MOVES2010b categorizes vehicles according to vehicle classes and model years. The source type age distribution was prepared using EPA's data converter that takes the registration distribution input file created for MOBILE6.2 and converts it to the appropriate MOVES age distribution input table [SourceTypeAgeDistribution]. The same source type age distribution was applied for the CO maintenance area and Maricopa County. The specific MOVES table for source type age distribution is presented in Appendix 3.

5.2.2.6 Annual VMT

The 2008 daily VMTs by facility type were used to estimate onroad exhaust emissions. The 2008 VMT distributions by facility type for the CO maintenance area and Maricopa County were obtained from the 2008 Maricopa County Estimates of Daily Vehicle Travel by Highway Functional Classification provided by ADOT. The 2008 VMT distributions were multiplied by the 2008 HPMS VMT for the CO maintenance area and Maricopa County. The resultant VMT estimates by facility type for the CO maintenance area and Maricopa County are shown in Table 5.2-1.

Since MOVES2010b requires annual VMTs by HPMS vehicle type as a local input, the daily VMTs by HPMS vehicle type were derived from the 2008 traffic assignment data provided by the MAG transportation modeling group in January 2012 and the daily VMTs by facility type and the estimated percentages of daily vehicle travel by vehicle type and highway functional classification provided by ADOT. Then, the daily VMTs by HPMS vehicle type were multiplied by 366 days to obtain the annual VMTs by HPMS vehicle type. The specific MOVES table [HPMSvTypeYear] for annual VMT is presented in Appendix 3.

Table 5.2–1. 2008 daily VMT by facility type (annual average daily traffic).

	Facility Type	CO Maintenance Area (thousand miles/day)	Maricopa County (thousand miles/day)
Rural	Interstate	2,040	3,223
	Other Principal Arterial	819	1,293
	Minor Arterial	418	661
	Major Collector	1,065	1,682
	Minor Collector	130	205
	Local	498	787
Urban	Interstate	10,467	10,939
	Other Freeway/Expressway	18,907	19,760
	Other Principal Arterial	21,673	22,651
	Minor Arterial	14,285	14,930
	Collector	4,655	4,865
	Local	9,818	10,261
Totals:		84,775	91,257

5.2.2.7 Road type distribution

MOVES2010b requires the distribution of VMTs by road type as a local input. The road type VMT distribution by HPMS vehicle type was derived from the 2008 traffic assignment data and the daily VMTs by HPMS vehicle type mentioned in the previous section. As suggested in EPA’s technical guidance (EPA, 2010a), the same road type distribution by HPMS vehicle type was used for all MOVES source types within an HPMS vehicle class. The specific MOVES table [RoadTypeDistribution] for road type distribution is presented in Appendix 3.

5.2.2.8 VMT fraction

Since VMT varies by month, day of week, and hour, MOVES2010b requires month/day/hour VMT fractions as a local input in order to derive hourly VMT for each weekday/weekend and month from the annual VMT. The month/day/hour VMT fractions were developed from data recorded by continuous traffic counters on freeways (ADOT Freeway Management System) and arterials (Phoenix Automatic Traffic Recorders) during the year 2007. The specific MOVES tables [MonthVMTFraction], [DayVMTFraction], and [HourVMTFraction] for VMT fractions are presented in Appendix 3.

5.2.2.9 Average speed distribution

In MOVES2010b, vehicle power, speed, and acceleration have a significant effect on vehicle emissions for all pollutants. MOVES2010b estimates those emission effects by assigning activity to operating mode distributions, which are determined by the distribution of vehicle hours traveled (VHT) by average speed. As recommended in EPA’s technical guidance (EPA, 2010a), estimates of local average speeds were developed by post-processing the output from the 2008 traffic assignment data provided by the MAG transportation modeling group in January 2012. To develop the average speed distribution, VHTs in sixteen speed bins were accumulated separately for each hour of the day, source type, and road type in Maricopa County. Then, the average speed distribution was calculated by normalizing VHTs in sixteen speed bins for each hour of the day, source type, and road type. The same methodology was applied to develop the

speed estimates for the CO maintenance area. The specific MOVES table [AvgSpeedDistribution] for the average speed distribution is presented in Appendix 3.

5.2.2.10 Ramp fraction

MOVES2010b requires the ramp fraction, which represents the percent of VHT on ramps, on both rural restricted roads (road type 2) and urban restricted roads (road type 4). The fraction of VHT on ramps was derived by dividing the total VHTs on ramps by the total VHTs for each restricted road type. Those VHTs were obtained from the 2008 traffic assignment data provided by the MAG transportation modeling group in January 2012. The specific MOVES table [RoadType] for ramp fractions is presented in Appendix 3.

5.2.2.11 AVFT strategy

MOVES2010b allows users to modify the fuel engine fraction using different fuels and technologies in each model year in order to reflect the local situation. The fleet information for transit buses for model years 1997 through 2010 was provided by Valley Metro and used to prepare the AVFT input file. Since the fleet data are available only for specific model years, MOVES2010b default values were obtained from the [fuelEngFraction] table in the MOVES default database and used for the rest of the model years. The specific MOVES table [AVFT] for AVFT strategy is presented in Appendix 3.

5.2.3 MOVES2010b outputs

MOVES2010b was executed with the RunSpec files described in Appendix 3 to obtain exhaust emissions for CO. These values were obtained for the following categories by month:

- Vehicle classes: light duty gasoline vehicles (LDGV), light duty gasoline trucks 1 & 2 (LDGT1), light duty gasoline trucks 3 and 4 (LDGT2), heavy duty gasoline vehicles 2B thru 8B and gasoline buses (HDGV), motorcycles (MC), light duty diesel vehicles (LDDV), light duty diesel trucks 1 thru 4 (LDDT), heavy duty diesel vehicles class 2B (2BHDDV), heavy duty diesel vehicles classes 3, 4, and 5 (LHDDV), heavy duty diesel vehicles classes 6 and 7 (MHDDV), heavy duty diesel vehicles classes 8A and 8B (HHDDV), and heavy duty diesel buses (BUSES)
- Facility types: rural interstate, rural principal arterial, rural minor arterial, rural major collector, rural minor collector, rural local, urban interstate, urban freeway/expressway, urban principal arterial, urban minor arterial, urban collector, urban local, and off-network, which was newly added in MOVES2010b
- Days: weekdays and weekend days

5.2.4 MOVES2010b emission estimates

MOVES2010b was used to generate onroad emissions by vehicle class, facility type, weekdays /weekend days, and month. By specifying the output time aggregate level as month, MOVES2010b produces monthly emissions including weekday and weekend emissions for a given month. The annual emissions were calculated by aggregating monthly onroad emissions derived by MOVES2010b. The CO season-day emissions were calculated by dividing the three-month peak CO season emissions from November through January by 92 days.

Table 5.2-2 shows the calculated annual and season-day CO emissions by facility type and vehicle class in the CO maintenance area and Maricopa County.

Table 5.2–2. Annual and CO season-day onroad mobile source emissions by facility type and vehicle class in the CO maintenance area and Maricopa County.

Facility Type	Vehicle Class	SCC	Annual CO emissions (tons/year)		Season-day CO emissions (lbs/day)	
			CO		CO	
			Maintenance Area	Maricopa County	Maintenance Area	Maricopa County
Rural Interstate	LDGV	2201001110	1,315.28	2,145.56	5,249.8	8,541.7
	LDGT1	2201020110	1,026.34	1,716.57	4,191.5	6,991.0
	LDGT2	2201040110	528.72	884.29	2,159.3	3,601.4
	HDGV	2201070110	410.53	540.14	1,970.5	2,543.7
	MC	2201080110	46.53	63.10	236.8	321.1
	LDDV	2230001110	0.35	0.52	1.5	2.3
	LDDT	2230060110	7.61	11.09	32.7	47.5
	2BHDDV	2230071110	3.33	4.85	14.3	20.7
	LHDDV	2230072110	18.21	26.48	78.5	113.7
	MHDDV	2230073110	64.39	84.06	351.2	458.6
	HHDDV	2230074110	162.43	260.03	886.0	1,418.6
BUSES	2230075110	3.67	6.41	20.0	34.9	
Rural Principal Arterial	LDGV	2201001130	682.58	1,062.08	2,788.2	4,329.5
	LDGT1	2201020130	562.67	876.46	2,345.7	3,643.6
	LDGT2	2201040130	289.86	451.51	1,208.4	1,877.0
	HDGV	2201070130	139.18	214.84	646.3	995.6
	MC	2201080130	32.65	46.22	166.2	235.2
	LDDV	2230001130	0.25	0.38	1.1	1.7
	LDDT	2230060130	5.68	8.45	24.9	36.8
	2BHDDV	2230071130	2.48	3.70	10.8	16.1
	LHDDV	2230072130	13.60	20.20	59.6	88.2
	MHDDV	2230073130	16.94	26.68	92.5	145.6
	HHDDV	2230074130	38.90	64.41	212.3	351.5
BUSES	2230075130	3.01	5.30	16.5	28.9	
Rural Minor Arterial	LDGV	2201001150	663.29	1,032.06	2,709.3	4,207.1
	LDGT1	2201020150	546.76	851.69	2,279.4	3,540.7
	LDGT2	2201040150	281.67	438.75	1,174.3	1,824.0
	HDGV	2201070150	135.25	208.77	628.1	967.4
	MC	2201080150	31.73	44.92	161.5	228.6
	LDDV	2230001150	0.24	0.37	1.1	1.6
	LDDT	2230060150	5.52	8.21	24.2	35.8
	2BHDDV	2230071150	2.41	3.59	10.5	15.6
	LHDDV	2230072150	13.21	19.63	57.9	85.7
	MHDDV	2230073150	16.46	25.93	89.8	141.5
	HHDDV	2230074150	37.80	62.59	206.3	341.5
BUSES	2230075150	2.93	5.15	16.0	28.1	
Rural Major Collector	LDGV	2201001170	123.63	192.36	505.0	784.1
	LDGT1	2201020170	101.91	158.74	424.9	659.9
	LDGT2	2201040170	52.50	81.78	218.9	340.0
	HDGV	2201070170	25.21	38.91	117.1	180.3
	MC	2201080170	5.91	8.37	30.1	42.6
	LDDV	2230001170	0.04	0.07	0.2	0.3
	LDDT	2230060170	1.03	1.53	4.5	6.7
	2BHDDV	2230071170	0.45	0.67	2.0	2.9
	LHDDV	2230072170	2.46	3.66	10.8	16.0
	MHDDV	2230073170	3.07	4.83	16.7	26.4
	HHDDV	2230074170	7.04	11.67	38.4	63.7
BUSES	2230075170	0.55	0.96	3.0	5.2	

Table 5.2–2. Annual and CO season-day onroad mobile source emissions by facility type and vehicle class in the CO maintenance area and Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual CO emissions (tons/year)		Season-day CO emissions (lbs/day)	
			CO		CO	
			Maintenance Area	Maricopa County	Maintenance Area	Maricopa County
Rural Minor Collector	LDGV	2201001190	28.62	44.53	116.9	181.5
	LDGT1	2201020190	23.59	36.75	98.4	152.8
	LDGT2	2201040190	12.15	18.93	50.7	78.7
	HDGV	2201070190	5.84	9.01	27.1	41.7
	MC	2201080190	1.37	1.94	7.0	9.9
	LDDV	2230001190	0.01	0.02	0.0	0.1
	LDDT	2230060190	0.24	0.35	1.0	1.5
	2BHDDV	2230071190	0.10	0.16	0.5	0.7
	LHDDV	2230072190	0.57	0.85	2.5	3.7
	MHDDV	2230073190	0.71	1.12	3.9	6.1
	HHDDV	2230074190	1.63	2.70	8.9	14.7
BUSES	2230075190	0.13	0.22	0.7	1.2	
Rural Local	LDGV	2201001210	299.00	465.24	1,221.4	1,896.5
	LDGT1	2201020210	246.48	383.93	1,027.6	1,596.1
	LDGT2	2201040210	126.97	197.78	529.3	822.2
	HDGV	2201070210	60.97	94.11	283.1	436.1
	MC	2201080210	14.30	20.25	72.8	103.0
	LDDV	2230001210	0.11	0.17	0.5	0.7
	LDDT	2230060210	2.49	3.70	10.9	16.1
	2BHDDV	2230071210	1.09	1.62	4.7	7.0
	LHDDV	2230072210	5.96	8.85	26.1	38.6
	MHDDV	2230073210	7.42	11.69	40.5	63.8
	HHDDV	2230074210	17.04	28.21	93.0	154.0
BUSES	2230075210	1.32	2.32	7.2	12.7	
Urban Interstate	LDGV	2201001230	10,581.17	11,055.84	42,347.7	44,246.7
	LDGT1	2201020230	7,657.75	8,003.28	31,375.3	32,790.3
	LDGT2	2201040230	3,944.90	4,122.90	16,163.0	16,892.0
	HDGV	2201070230	3,124.96	3,260.99	15,041.9	15,695.1
	MC	2201080230	339.16	354.16	1,726.2	1,802.6
	LDDV	2230001230	2.69	2.81	11.7	12.2
	LDDT	2230060230	58.55	61.12	253.0	264.0
	2BHDDV	2230071230	25.58	26.70	110.3	115.1
	LHDDV	2230072230	140.47	146.62	608.2	634.8
	MHDDV	2230073230	436.75	455.92	2,382.4	2,486.9
	HHDDV	2230074230	990.85	1,036.24	5,404.9	5,652.5
BUSES	2230075230	36.86	38.59	201.0	210.5	
Urban Freeway And Expressway	LDGV	2201001250	11,101.55	11,599.57	44,430.4	46,422.8
	LDGT1	2201020250	8,034.36	8,396.88	32,918.3	34,402.9
	LDGT2	2201040250	4,138.91	4,325.66	16,957.9	17,722.7
	HDGV	2201070250	3,278.65	3,421.37	15,781.8	16,467.0
	MC	2201080250	355.84	371.58	1,811.1	1,891.2
	LDDV	2230001250	2.82	2.95	12.2	12.8
	LDDT	2230060250	61.43	64.13	265.4	277.0
	2BHDDV	2230071250	26.83	28.01	115.7	120.8
	LHDDV	2230072250	147.38	153.83	638.1	666.0
	MHDDV	2230073250	458.23	478.34	2,499.5	2,609.2
	HHDDV	2230074250	1,039.58	1,087.20	5,670.8	5,930.5
BUSES	2230075250	38.67	40.49	210.9	220.9	

Table 5.2–2. Annual and CO season-day onroad mobile source emissions by facility type and vehicle class in the CO maintenance area and Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual CO emissions (tons/year)		Season-day CO emissions (lbs/day)	
			CO		CO	
			Maintenance Area	Maricopa County	Maintenance Area	Maricopa County
Urban Principal Arterial	LDGV	2201001270	17,742.84	18,539.93	73,323.3	76,615.7
	LDGT1	2201020270	12,966.07	13,548.16	54,751.7	57,207.8
	LDGT2	2201040270	6,679.49	6,979.35	28,205.4	29,470.7
	HDGV	2201070270	3,594.78	3,756.21	16,948.1	17,708.9
	MC	2201080270	546.45	571.05	2,781.0	2,906.2
	LDDV	2230001270	6.86	7.17	30.6	31.9
	LDDT	2230060270	150.86	157.58	669.7	699.5
	2BHDDV	2230071270	65.87	68.80	291.9	304.8
	LHDDV	2230072270	362.20	378.33	1,611.1	1,682.7
	MHDDV	2230073270	463.74	484.61	2,530.6	2,644.5
HHDDV	2230074270	965.51	1,008.84	5,268.8	5,505.2	
BUSES	2230075270	61.82	64.60	337.4	352.5	
Urban Minor Arterial	LDGV	2201001290	9,018.61	9,423.76	37,270.0	38,943.4
	LDGT1	2201020290	6,590.60	6,886.47	27,830.0	29,078.5
	LDGT2	2201040290	3,395.16	3,547.57	14,336.7	14,979.8
	HDGV	2201070290	1,827.21	1,909.26	8,614.6	9,001.4
	MC	2201080290	277.76	290.26	1,413.6	1,477.2
	LDDV	2230001290	3.49	3.64	15.5	16.2
	LDDT	2230060290	76.68	80.10	340.4	355.6
	2BHDDV	2230071290	33.48	34.97	148.3	154.9
	LHDDV	2230072290	184.11	192.30	818.9	855.3
	MHDDV	2230073290	235.72	246.32	1,286.3	1,344.2
HHDDV	2230074290	490.77	512.79	2,678.1	2,798.3	
BUSES	2230075290	31.43	32.83	171.5	179.2	
Urban Collector	LDGV	2201001310	1,761.28	1,840.40	7,278.6	7,605.4
	LDGT1	2201020310	1,287.10	1,344.88	5,435.0	5,678.8
	LDGT2	2201040310	663.05	692.82	2,799.9	2,925.5
	HDGV	2201070310	356.84	372.87	1,682.4	1,757.9
	MC	2201080310	54.24	56.69	276.1	288.5
	LDDV	2230001310	0.68	0.71	3.0	3.2
	LDDT	2230060310	14.98	15.64	66.5	69.4
	2BHDDV	2230071310	6.54	6.83	29.0	30.3
	LHDDV	2230072310	35.95	37.56	159.9	167.0
	MHDDV	2230073310	46.03	48.11	251.2	262.5
HHDDV	2230074310	95.84	100.14	523.0	546.5	
BUSES	2230075310	6.14	6.41	33.5	35.0	
Urban Local	LDGV	2201001330	8,501.75	8,883.68	35,134.1	36,711.5
	LDGT1	2201020330	6,212.89	6,491.80	26,235.1	27,412.0
	LDGT2	2201040330	3,200.58	3,344.26	13,515.0	14,121.3
	HDGV	2201070330	1,722.49	1,799.84	8,120.9	8,485.5
	MC	2201080330	261.84	273.63	1,332.5	1,392.5
	LDDV	2230001330	3.29	3.43	14.6	15.3
	LDDT	2230060330	72.29	75.51	320.9	335.2
	2BHDDV	2230071330	31.56	32.97	139.8	146.1
	LHDDV	2230072330	173.56	181.28	772.0	806.3
	MHDDV	2230073330	222.21	232.21	1,212.6	1,267.1
HHDDV	2230074330	462.64	483.40	2,524.6	2,637.9	
BUSES	2230075330	29.62	30.95	161.7	168.9	

Table 5.2–2. Annual and CO season-day onroad mobile source emissions by facility type and vehicle class in the CO maintenance area and Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual CO emissions (tons/year)		Season-day CO emissions (lbs/day)	
			CO		CO	
			Maintenance Area	Maricopa County	Maintenance Area	Maricopa County
	LDGV	2201001000	44,232.59	47,830.69	316,294.2	342,022.9
	LDGT1	2201020000	20,331.12	21,984.95	121,473.5	131,354.9
	LDGT2	2201040000	10,473.60	11,325.57	62,577.3	67,667.6
	HDGV	2201070000	5,302.43	5,733.76	29,934.9	32,370.0
	MC	2201080000	68.78	74.37	748.5	809.4
Off-Network	LDDV	2230001000	12.03	13.01	71.6	77.5
	LDDT	2230060000	16.20	17.52	95.7	103.5
	2BHDDV	2230071000	6.96	7.52	41.2	44.5
	LHDDV	2230072000	37.59	40.65	222.4	240.5
	MHDDV	2230073000	216.62	233.95	1,201.1	1,297.2
	HHDDV	2230074000	1,231.54	1,326.20	6,745.5	7,264.1
	BUSES	2230075000	81.74	88.39	453.2	490.0

5.3 Summary of CO emissions from onroad mobile sources

Table 5.3-1 summarizes the annual and season-day emissions for CO from all onroad mobile sources in the CO maintenance area and Maricopa County in 2008.

Table 5.3–1. Annual and CO season-day emissions from all onroad mobile sources in the CO maintenance area and Maricopa County.

Emission Category	Annual CO emissions (tons/year)	Season-day CO emissions (lbs/day)
Maricopa County	255,355.67	1,293,502.6
CO maintenance area	237,324.41	1,201,621.5

5.4 Quality assurance process

5.4.1 VMT estimates

Normal quality assurance procedures, including automated and manual consistency checks, were conducted by MAG in developing the 2008 TransCAD traffic assignment network used to generate the VMT data. The VMT estimates using the MAG travel demand model have been validated against approximately 2,200 traffic counts collected in 2006–2008.

5.4.2 Emission estimates

The quality assurance process performed on the MOVES2010b analyses included accuracy, completeness, and reasonableness checks. For accuracy and completeness, all calculations were checked by an independent reviewer. Any errors found were corrected and the corrections were then rechecked by the reviewer.

5.4.3 Draft CO emissions inventory

The draft onroad mobile source portion of the 2008 periodic CO emissions inventory was reviewed using published EPA quality review guidelines for base year emission inventories (EPA, 1992b). The procedure review (Levels I, II, and III) included checks for completeness, consistency, and the correct use of appropriate procedures.

5.5 References

- MAG, 2009. MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area, February 2009.
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- US EPA, 1992a. Procedures for Emission Inventory Preparation Volume IV: Mobile Sources, EPA-450/4-81-026d (Revised), 1992.
- US EPA, 1992b. Quality Review Guidelines for 1990 Base Year Emission Inventories, EPA-454/R-92-007, July 1992.
- US EPA, 2010a. User's Guide for the SMOKE-MOVES Integration Tool, EPA Contract EP-D-07-102 (WA 3-03), July 2010.
- US EPA, 2012a. Motor Vehicle Emission Simulator (MOVES) - User Guide Version, MOVES2010b, EPA-420-B-12-001, March 2012.
- US EPA, 2012b. Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes, EPA-420-B-12-010, April 2012.
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