

# Appendix E

## Air Quality Analysis





## **APPENDIX E**

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### Air Quality Analysis

**Table AQ-1: Air Quality Analysis for Mobile Emissions  
City of Tulare On-Road Emissions - Year 2005**

EMFAC2007 Emission Factors (g/mi)

35 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.219	0.308	0.246	0.914	0.722	2.421
NOx	0.318	0.555	0.935	13.711	7.139	0.826
CO	4.78	6.782	5.255	7.273	7.606	30.926
CO2	392.17	463.925	620.64	1672.255	1511.778	111.017
PM10	0.031	0.039	0.039	0.669	0.128	0.042

55 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.199	0.282	0.202	0.8	0.487	3.719
NOx	0.333	0.6	1.118	14.531	10.13	0.956
CO	4.54	6.722	5.191	5.725	7.704	65.692
CO2	398.813	471.086	630.572	1549.092	1516.893	97.643
PM10	0.029	0.036	0.036	0.657	0.105	0.058

65 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.257	0.362	0.246	1.108	0.513	6.08
NOx	0.375	0.703	1.436	16.177	15.419	1.024
CO	5.502	8.491	6.657	7.141	10.817	130.75
CO2	487.595	574.068	770.055	1601.293	1621.511	102.551
PM10	0.031	0.039	0.038	0.848	0.113	0.088

Paved Road  
lbs/VMT  
Entrained  
PM10  
0.00147977

Year 2005  
Total Daily VMT = 1,740,544

Trip Percentages by Category (from URBEMIS)		
Type	Percent	# VMT
LDA	49.90%	868531.5
LDT	33.60%	584822.8
MDT	7.80%	135762.4
HDT	2.70%	46994.69
BUS	4.00%	69621.76
MCY	2.00%	34810.88
<b>Total</b>	<b>100.00%</b>	<b>1740544</b>

Emissions = Emission Factor x Miles/Day

**Mobile Emissions for the Year 2005 - Assuming 20% @ 35mph, 60% @ 55mph, 20% @ 65mph**

	ROG	NOx	CO	CO2	PM10	
LDA	2005 emissions (grams/mile)	0.2146	0.3384	4.7804	415.2408	0.0298
	2005 emissions (pounds/mile)	4.73E-04	7.46E-04	1.05E-02	9.15E-01	1.55E-03
	VMT/Day	868531.5	410.91	647.96	9153.34	795088.32
Mobile Emissions (lbs/day)						
LDT	2005 emissions (grams/mile)	0.3032	0.6116	7.0878	490.2502	0.0372
	2005 emissions (pounds/mile)	6.68E-04	1.35E-03	1.56E-02	1.08E+00	1.56E-03
	VMT/Day	584822.8	390.92	788.54	9138.30	632079.73
Mobile Emissions (lbs/day)						
MDT	2005 emissions (grams/mile)	0.22	1.15	5.50	656.48	0.04
	2005 emissions (pounds/mile)	4.84E-04	2.52E-03	1.21E-02	1.45E+00	1.56E-03
	VMT/Day	135762.4	65.73	342.70	1645.26	196486.34
Mobile Emissions (lbs/day)						
HDT	2005 emissions (grams/mile)	0.88	14.70	6.32	1584.16	0.70
	2005 emissions (pounds/mile)	1.95E-03	3.24E-02	1.39E-02	3.49E+00	3.02E-03
	VMT/Day	46994.69	91.63	1522.59	654.55	164126.58
Mobile Emissions (lbs/day)						
BUS	2005 emissions (grams/mile)	0.54	10.59	8.31	1536.79	0.11
	2005 emissions (pounds/mile)	1.19E-03	2.33E-02	1.83E-02	3.39E+00	1.72E-03
	VMT/Day	69621.76	82.76	1625.38	1275.03	235879.58
Mobile Emissions (lbs/day)						
MCY	2005 emissions (grams/mile)	3.93	0.94	71.75	101.30	0.06
	2005 emissions (pounds/mile)	8.67E-03	2.08E-03	1.58E-01	2.23E-01	1.61E-03
	VMT/Day	34810.88	301.73	72.42	5506.42	7774.13
Mobile Emissions (lbs/day)						

2005 - Operational Traffic Total Emissions (lbs/day)					
ROG	NOx	CO	CO2	PM10	
1344	5000	27373	2031435	2786	
2005 - Operational Traffic Total Emissions (tons/year)					
ROG	NOx	CO	CO2	PM10	
245	913	4996	336327	508	

\* Note: CO2 in metric tons

**Table AQ-2: Air Quality Analysis for Mobile Emissions  
City of Tulare On-Road Emissions - Year 2030**

EMFAC2007 Emission Factors (g/mi)

35 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.009	0.016	0.024	0.195	0.636	1.828
NOx	0.03	0.057	0.124	1.601	5.771	0.7
CO	0.563	0.901	1.034	1.158	8.029	16.247
CO2	385.552	482.063	621.818	1659.481	1527.216	139.91
PM10	0.03	0.038	0.041	0.128	0.099	0.024

55 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.008	0.014	0.019	0.13	0.427	2.725
NOx	0.028	0.056	0.144	1.493	7.964	0.79
CO	0.424	0.682	0.791	1.22	8.147	28.462
CO2	392.544	490.472	632.365	1540.962	1531.837	171.389
PM10	0.029	0.036	0.038	0.15	0.082	0.031

65 mph	LDA	LDT	MDT	HDT	BUS	MCY
ROG	0.01	0.017	0.024	0.126	0.448	4.496
NOx	0.031	0.063	0.184	1.707	11.676	0.879
CO	0.375	0.609	0.727	1.486	11.441	52.879
CO2	479.469	599.307	781.252	1592.56	1626.345	235.755
PM10	0.031	0.04	0.042	0.177	0.088	0.044

Paved Road  
lbs/VMT  
Entrained  
PM10  
0.00147977

Year 2030  
Total Daily VMT = 3,886,728

Trip Percentages by Category (from URBEMIS)

Type	Percent	# VMT
LDA	49.90%	1939477
LDT	33.60%	1305941
MDT	7.80%	303164.8
HDT	2.70%	104941.7
BUS	4.00%	155469.1
MCY	2.00%	77734.56
<b>Total</b>	<b>100.00%</b>	<b>3886728</b>

Emissions = Emission Factor x Miles/Day

**Mobile Emissions for the Year 2030 - Assuming 20% @ 35mph, 60% @ 55mph, 20% @ 65mph**

	ROG	NOx	CO	CO2	PM10
<b>LDA</b>					
2030 emissions (grams/mile)	0.0086	0.029	0.442	408.5306	0.0296
2030 emissions (pounds/mile)	1.90E-05	6.39E-05	9.74E-04	9.01E-01	1.55E-03
VMT/Day	1939477	36.77	124.00	1889.89	1746783.53
					2996.54
<b>LDT</b>					
2030 emissions (grams/mile)	0.015	0.0576	0.7112	510.5572	0.0372
2030 emissions (pounds/mile)	3.31E-05	1.27E-04	1.57E-03	1.13E+00	1.56E-03
VMT/Day	1305941	43.19	165.83	2047.60	1469933.32
					2039.59
<b>MDT</b>					
2030 emissions (grams/mile)	0.021	0.148	0.8268	660.033	0.0394
2030 emissions (pounds/mile)	4.63E-05	3.26E-04	1.82E-03	1.46E+00	1.57E-03
VMT/Day	303164.8	14.04	98.92	552.60	441137.73
					474.95
<b>HDT</b>					
2030 emissions (grams/mile)	0.1422	1.5574	1.2608	1574.9854	0.151
2030 emissions (pounds/mile)	3.13E-04	3.43E-03	2.78E-03	3.47E+00	1.81E-03
VMT/Day	104941.7	32.90	360.31	291.69	364379.76
					190.22
<b>BUS</b>					
2030 emissions (grams/mile)	0.473	8.2678	8.7822	1549.8144	0.0866
2030 emissions (pounds/mile)	1.04E-03	1.82E-02	1.94E-02	3.42E+00	1.67E-03
VMT/Day	155469.1	162.12	2833.77	3010.07	531194.58
					259.74
<b>MCY</b>					
2030 emissions (grams/mile)	2.8998	0.7898	30.9024	177.9664	0.0322
2030 emissions (pounds/mile)	6.39E-03	1.74E-03	6.81E-02	3.92E-01	1.55E-03
VMT/Day	77734.56	496.95	135.35	5295.86	30498.74
					120.55

2030 - Operational Traffic Total Emissions (lbs/day)				
ROG	NOx	CO	CO2	PM10
786	3,718	13,088	4,583,928	6,082
2030 - Operational Traffic Total Emissions (tons/year)				
ROG	NOx	CO	CO2	PM10
143	679	2,389	758,921	1,110

\* Note: CO2 in metric tons