Appendix C

Greenhouse Gas Emissions Inventory and Projections

From *Envision San José 2040 PEIR*

Sierra Research
2011

Updated Greenhouse Gas Inventories Summary Table

Updated Table 4-2 – Summary of Estimated GHG Emissions

The following table includes a summary of GHG emission estimates for the preferred scenario (referred to as Scenario 7) and a residential option (Scenario 7A) evaluated in the EIR. Scenario 7A includes residential uses on both the Rancho del Pueblo (Alum Rock Planning Area) and iStar (Edenvale Planning Area) properties. Appendices with the assumptions used to update Table 4-2 also are included in this appendix.

The November 2010 GHG emission estimates included in Appendix K-2 are for "Scenario 6", a General Plan Update scenario similar to the preferred scenario evaluated in this EIR, with the same number of new jobs and housing citywide. Some of the projected jobs subsequently were shifted out of the Alviso Master Plan area under the preferred scenario (Scenario 7).

Table 4-2
Envision San Jose 2040 General Plan GHG Emissions by Calendar Year (2020 and 2035) and Plan Alternative
City-Generated VMT Emissions Only

Category	Units	GHG Emissions ($MMTCO_2e$)							
		Calendar Year 2020				Calendar Year 2035			
		Preferred	Scenario7	Scenario7A	No Project	Preferred	Scenario7	Scenario7A	No Project
Electric Energy									
- Commercial/Industrial use	$MMTCO_2e$	1.45	1.45	1.45	1.17	2.27	2.27	2.27	1.56
- Municipal/public use[a]		0.41	0.41	0.41	0.16	0.92	0.92	0.92	0.29
- Residential use		0.65	0.65	0.65	0.62	0.78	0.78	0.78	0.71
Electric Energy Subtotal		2.52	2.52	2.52	1.95	3.97	3.97	3.97	2.57
Non-Electric Energy Industrial/Commercial/Institutional/Residential\									
- Natural gas building heating	$MMTCO_2e$								
- Commercial/Industrial/Office/R&D area		0.29	0.28	0.28	0.23	0.45	0.44	0.44	0.31
- Public/Quasi-public		0.0058	0.0062	0.0063	0.0023	0.013	0.014	0.014	0.0041
- Residential use[b,c,d,e,f]		0.80	0.80	0.80	0.76	0.96	0.96	0.96	0.87
Natural Gas Building Heating Subtotal		1.09	1.09	1.09	1.00	1.42	1.41	1.41	1.19
- Industrial/commercial combustion and other process uses of natural gas[g]		0.71	0.72	0.73	0.42	1.34	1.39	1.39	0.63
Leakage of natural gas, PFCs, and HFCs	$MMTCO_2e$	0.73	0.73	0.73	0.67	0.95	0.95	0.95	0.80
Mobile Sources									
- Off-Road Equipment (lawn & garden, construction, industrial, light commercial)[h]	$MMTCO_2e$	0.48	0.48	0.48	0.41	0.71	0.71	0.71	0.53
- Transportation									
- On-Road [i]		4.20	4.15	4.15	3.86	5.32	5.22	5.22	4.65
- Off-Road (ships, aircraft, trains)[j]		0.049	0.049	0.049	0.048	0.060	0.060	0.060	0.057
Mobile Source Subtotal		4.73	4.68	4.68	4.32	6.09	5.99	5.99	5.24
Waste Management									
- Solid Waste Management[k]	$MMTCO_2e$	0.15	0.15	0.15	0.14	0.17	0.17	0.17	0.16
- Sewage treatment[l]		0.40	0.40	0.40	0.36	0.52	0.52	0.52	0.44
Waste Management Subtotal		0.54	0.54	0.54	0.50	0.69	0.69	0.69	0.59
Total GHG Emissions:		10.3	10.3	10.3	8.9	14.5	14.4	14.4	11.0
City of San Jose Service Population	-	1,650,942	1,650,942	1,650,942	1,518,785	2,153,261	2,153,261	2,153,261	1,822,868
GHG Emission Efficiency	**(metric tons CO_2e/SP)**	**6.2**	**6.2**	**6.2**	**5.8**	**6.7**	**6.7**	**6.7**	**6.0**

NOTE: This inventory accounts for on-road transportation GHG emissions generated by the city resident population and employment, whether emitted within city limits or outside. Some sums are rounded.

[a] GHG emissions associated with the transport of water to and throughout a community (e.g., City of San Jose) are included in the emissions reported for electric energy use by the electric utility company (e.g., PG&E for San Jose)..

[b] Natural gas CO_2 emission factor = 53.02 kg/MMBtu = 116.6 lbs/MMBtu = 0.1198 lbs/scf = 0.05445 kg/scf .
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[c] Natural gas CH_4 emission factor = 0.0009 kg/MMBtu = 0.00198 lbs/MMBtu = 2.033E-06 lb/scf = 9.243E-07 kg/scf . (Reference **Error! Bookmark not defined.**, page A-9) CH_4 global warming potential = 21 (Reference **Error! Bookmark not defined.**, page A-4)
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
CH_4 global warming potential = 21.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[d] Natural gas N_2O emission factor = 0.0001 kg/MMBtu = 0.00022 lbs/MMBtu = 2.259E-07 lbs/scf = 1.027E-07 kg/scf. (Reference **Error! Bookmark not defined.**, page A-9, N_2O global warming potential = 310 (Reference **Error! Bookmark not defined.**, page A-4).
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
N_2O global warming potential = 310.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[e] LPG use for residential building heating within the City of San Jose is considered de minimis because residential LPG GHG emissions in Santa Clara County are only 2.6% of the GHG emissions from residential natural gas use, and the overwhelming location for LPG use is in rural Santa Clara County, not the City of San Jose where natural gas is available in all residential areas.

[f] Wood use for residential space heating within the City is excluded as a biogenic emission of GHG, following BAAQMD guidance. (Reference **Error! Bookmark not defined.**, page 2)

[g] Equal to the difference in GHG emissions between those associated with the total natural gas supplied by PG&E to the City and the GHG emissions associated with the natural gas combusted for building heating in all four activity sectors (commercial, industrial, public/quasi-public, and residential).

[h] Scaled by service population from BAAQMD GHG Inventory for Santa Clara County, which was based on OFFROAD2007 model.

[i] Based on City-Generated VMT and speed distributions combined with EMFAC2007 model and Pavley/LCFS post-processor.

[j] See Locomotive, SanJosePC and SJCGSE sheets in San Jose_TranspEmis_082310 City Generated.xls.

[k] Accounts for direct methane emissions from landfilled MSW and alternative daily cover, future emissions from solid waste landfilled in specified year, and other methodological guidance provided by the BAAQMD in Section 1.4 (Waste Sector) on page 6 of "GHG Plan Level Quantification Guidance", April 15, 2010.

[l] GHG emissions to transport raw water and sewage are included in electric energy category to run the water pumps.

APPENDIX A

Input Data Used in Non-Mobile Source Inventory Calculations

Table A-1
Input Information Matrix
Greenhouse Gas Emission Inventories
City of San Jose

Category	Units	1990	2000	2003	2005	2006	2007	2008	2009	2010	Input Metric to Calculate GHG Emissions: 2020 Envision 2040 General Plan	2020 Scenario 7	2020 Scenario 7A	2020 No Project/ Existing General Plan Alternative	2035 Envision 2040 General Plan	2035 Scenario 7	2035 Scenario 7A	2035 No Project/ Existing General Plan Alternative	Notes
City of San Jose (citywide, not just government operations)																			
1) Population	Number				941,435 (be)	956,813 (be)	972,190 (az)	985,307 (bb)	1,006,846 (be)	1,023,083 (be)	1,093,492 (bk)	1,093,492 (bk)	1,093,492 (bk)	1,047,115 (bk)	1,313,811 (bk)	1,313,811 (bk)	1,313,811 (bk)	1,197,868 (bk)	
2) Employment[a]	Number				349,000 (bn)	373,500 (bp)	398,000 (bn)	369,450 (bq)		405,170 (bo)	557,450	557,450	557,450	471,670	839,450	839,450	839,450	625,000	
Service Population of the City of San Jose					1,290,435	1,330,313	1,370,190	1,354,757		1,428,253	1,650,942	1,650,942	1,650,942	1,518,785	2,153,261	2,153,261	2,153,261	1,822,868	
Population of Santa Clara County[ac]		1,498,307 (ao)	1,686,154 (ao)	1,671,012 (ao)	1,687,956 (ao)	1,707,810 (ao)	1,731,958 (ao)	1,764,499 (ao)	1,784,642 (n)	1,880,870 (ad)	2,063,100 (ae)				2,431,400 (ae)				
Employment in Santa Clara County[as]							912,972 (ao)				1,071,980 (ae)				1,412,620 (ae)				
Service Population of Santa Clara County							2,644,930 (ao)				3,135,080 (ae)				3,844,020 (ae)				
Population of California[ab]	Number		33,994,571	35,251,107	35,795,255	35,979,208		36,580,371 (n)		38,648,090 (ac)	44,135,923 (ae)				51,753,503 (ae)				
3) Electric Energy																			
3A) Industrial use, PG&E	megawatt hours																		Conservatively assumes the 2008 electric energy use per unit area remains constant for each of these three types of use through 2035.
3A) Commercial/Industrial use, PG&E	megawatt hours							3,100,574 (bg)			4,966,214	4,966,214	4,966,214	3,997,545	7,764,675	7,764,675	7,764,675	5,343,002	
3A) Municipal/public use, PG&E	megawatt hours							254,242 (bf)			1,411,916	1,411,916	1,411,916	550,522	3,148,426	3,148,426	3,148,426	994,941	
3A) Residential use, PG&E	megawatt hours							1,916,298 (bf)			2,213,639	2,213,639	2,213,639	2,119,754	2,659,650	2,659,650	2,659,650	2,424,943	
4.) Non-Electric Energy																			
4A) Natural gas "building" heating (air, water and food)																			
Industrial/Office/R&D area	sq. ft.							63,978,468 (bl)			125,799,416 (bk)	122,238,292 (bv)	122,174,362 (bv)	94,837,914 (bk)	218,530,839 (bk)	209,628,028 (bv)	209,468,204 (bv)	141,127,084 (bk)	
Commercial area	sq. ft.							48,989,772 (bl)			55,142,728 (bk)	55,298,172 (bv)	55,327,972 (bv)	50,811,132 (bk)	64,372,161 (bk)	64,760,772 (bv)	64,835,272 (bv)	53,543,171 (bk)	
Public/Quasi-public	sq. ft.							652,168 (bl)			3,621,768 (bk)	3,901,608 (bv)	3,932,648 (bv)	1,412,168 (bk)	8,076,168 (bk)	8,775,768 (bv)	8,853,368 (bv)	2,552,168 (bk)	Revised August 18, 2010
Total:	sq. ft.							113,620,408			184,563,912	181,438,072	181,434,982	147,061,214	290,979,168	283,164,568	283,156,844	197,222,423	
Natural gas use for space heating[f]	MMBtu										5,555,374	5,461,286	5,461,193	4,426,543	8,758,473	8,523,253	8,523,021	5,936,395	
Natural gas energy intensity for air, water and food heating in Pacific Region[v]	1000Btu/ sq.ft./yr			30.1															
											0.98038	0.97850	0.97832	0.99040					
Government (included in public/quasi-public category)	MMTCO2e				0.0021 (y)						0.01962	0.02150	0.02168	0.00960					
Commercial+Industrial/Office/R&D, PG&E	MMTCO2e							0.4371			0.700	0.687	0.687	0.564	1.095	1.062	1.061	0.753	
Public/Quasi-public, PG&E	MMTCO2e							0.0613			0.340	0.366	0.369	0.133	0.759	0.824	0.832	0.240	
Residential, PG&E	MMTCO2e							0.6552			0.757	0.757	0.757	0.725	0.909	0.909	0.909	0.829	
Subtotal, PG&E	MMTCO2e							1.154			1.797	1.810	1.813	1.421	2.763	2.795	2.802	1.822	
Total Natural Gas Building Heating (bldg area method)	MMTCO2e										1.092	1.087	1.087	0.998	1.423	1.410	1.410	1.188	
4B) Industrial/commercial combustion and other processes	MMTCO2e										0.705	0.723	0.726	0.423	1.340	1.385	1.392	0.634	
4C) Citywide natural gas and refrigerant leakage	MMTCO2e						0.605 (as)				0.729 (at)	0.729 (at)	0.729 (at)	0.670 (at)	0.950 (at)	0.950 (at)	0.950 (at)	0.805 (at)	
Countywide natural gas and refrigerant leakage	MMTCO2e						1.17 (ap)												
Process HFC/PFC loss, gov't	MMTCO2e				0.00016 (y)														Emission of HFCs/PFCs covered in the BAAQMD inventory for the Bay Area (BAAQMD, 2010)
Process HFC/PFC loss, non-gov't	MMTCO2e				0.0268 (au)														
Citywide total	MMTCO2e				0.0270						0.0439 (av)	0.0431 (av)	0.0431 (av)	0.0350 (av)	0.0692 (av)	0.0673 (av)	0.0673 (av)	0.0469 (av)	
5) Mobile Sources		See Appendix B																	
6) Waste Management																			
Solid Waste Management (by City)																			
Government operations alone	MMTCO2e				0.0011 (x)														Contribution at Newby Island Landfill?
Solid waste facilities operation	MMTCO2e				0.0119 (x)														Santa Clara All Purpose Landfill closed in 1993. Ref. b, p. 23.
6A) City Total:	MMTCO2e				0.013		0.140 (as)												
6A) Total City: To landfills	tons MSW					753,749 (ay)		649,844 (bh)											
6A) Total City: Residential diversion	tons MSW					568,713 (ay)													
6A) Total City: Other diversion	tons MSW					546,741 (ay)													
6A) Total City:	tons MSW/day					5,958								6,110 (bd)				6,823 (bd)	
6A) Total City: City Total:	tons MSW					1,869,203 (ay)	1,932,076 (br)			1,943,659 (bc)	2,001,599 (bk)	2,001,599 (bk)	2,001,599 (bk)	1,916,708 (bk)	2,341,264 (bk)	2,341,264 (bk)	2,341,264 (bk)	2,134,648 (bk)	
6A) Total County of Santa Clara	MMTCO2e						0.271 (bm)					0	0			0	0		
6B) Water Transport	acre-feet/year				26,363				24,148		27,948	27,948	27,948	26,208	32,266	32,266	32,266	27,761	
Sewage Treated	million gal/day				15.25				13.3		89 (a)	89 (a)	89 (a)	85 (a)	102 (a)	102 (a)	102 (a)	93 (a)	
Stationary CH_4 emissions from incomplete combustion of digester gas [ai]	metric tons CH_4/yr							60.3			73.4	73.4	73.4	67.6	95.8	95.8	95.8	81.1	DJW email from Akoni at 9:51 AM on 14 May. Assume electric energy to pump both raw water and sewage included in electric energy in Item 3 above.
Process CH_4 emissions from wastewater treatment lagoons [ak]	metric tons CH_4/yr							14,964			18,235	18,235	18,235	16,775	23,783	23,783	23,783	20,134	
Process N_2O emissions with nitrification/denitrification [aj]	metric tons N_2O/yr							0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Not used at San Jose Water Pollution Treatment Plant.[an]
Process N_2O emissions from effluent discharge [am]	metric tons N_2O/yr							29.8			36.3	36.3	36.3	33.4	47.4	47.4	47.4	40.1	
Water and Wastewater Transport	MMTCO2e				0.0029 (x)														
7) Residential Fuel Usage																			
Detached housing units	Number							210,730 (bi)			211,776 (a)	211,790 (bv)	212,199 (bv)	213,772 (a)	213,344 (a)	213,380 (bv)	214,402 (bv)	218,335 (a)	
Attached housing units	Number							98,620 (bi)			145,574 (a)	145,560 (bv)	145,151 (bv)	128,422 (a)	216,006 (a)	215,970 (bv)	214,948 (bv)	173,126 (a)	
Total housing units	Number						299,000 (bn)	309,350 (bi)			357,350	357,350	357,350	342,194	429,350	429,350	429,350	391,461	
Households	Number	36,545 (p)	38,526 (p)		41,510 (p)														
Household income, median	$/year	$44,707 (q)	$69,466 (q)			$80,048 (q)													
Natural gas to California residents [aa]	million scf	514,507	516,730	497,955	483,699	491,777		489,304				590,368				692,262			2008 use projected to 2020 and 2035 by population.
Natural gas to City of San Jose residents	million scf		0			13,078		13,180			14,627	14,627	14,627	14,006	17,574	17,574	17,574	16,023	CA n.g. use proportioned to City by population.
Wood[m]	dry short tons										Excluded as biogenic, following guidance in BAAQMD (2010)[b]								
PG&E GHG intensity[bf]	lbs CO_2/MWh			620	489	456	636	644.1	644.1		644.1	644.1	644.1	644.1	644.1	644.1	644.1	644.1	Assumes 2008 intensity is constant through 2035. Intensities before 2008 only account for CO_2 emissions.
8) Agriculture/ Farming	Assumed de minimis within the city limits of Santa Clara.																		

Table A-1
Input Information Matrix
Greenhouse Gas Emission Inventories
City of San Jose

a) Email from DJPW at 2:30 PM on July 16, 2010.
b) BAAQMD. *GHG Plan Level Quantification Guidance,* April 15, 2010.

j) Oak Ridge National Laboratory (ORNL). *Conversion Factors used by ORNL Bioenergy Feedstock Development Programs, http://bioenergy.ornl.gov/papers/misc/energy_conv.html.*

l) Total natural gas to County in 2005 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 199 BAAQMD
Total natural gas to County in 2020 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 259 (2008), p. 6.3.2-
Total natural gas to County in 2035 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 289 1

The multiplying factor of 1.45 for 2035 is based on the BAAQMD's factor for 2030 (i.e., 1.40) plus 0.05, the incremental increase in the factor for each additional 5 years used by the District after 2020.

m) Total wood to County in 2005 for residential fireplaces and woodstoves (tons/dy) = 244 BAAQMD
Total wood to County in 2020 for residential fireplaces and woodstoves (tons/dy) = 278 (2008), p. 7.3.2-
Total wood to County in 2035 for residential fireplaces and woodstoves (tons/dy) = 319 1

The multiplying factors of 1.31 and 1.30 fireplaces and woodstoves in 2035, respectively, are estimated to be the BAAQMD's factors for 2030 (i.e., 1.26 and 1.25, respectively) plus 0.05, the incremental increase in the factors for each additional 5 years used by the District after 2025 and 2010, respectively.

n) City of Santa Clara. *City of Santa Clara 2010-2035 Draft General Plan* , Table 5.2-1, p. 5-10, March 2010, http://santaclaraca.gov/Modules/ShowDocument.aspx?documentid=2339.
o) Ibid, Table 3-3, p. 8.12-11.
p) Ibid, Table B-2, p. 8.12-128.
q) Ibid, Table B-10, p. 8.12-134.
r)
s) Calculated as the remainder after subtracting commercial and industrial/office/R&D from total.
t) Calculated by maintaining the same proportions as for the General Plan in 2035.
u) Calculated by maintaining the same proportions as documented for 2008.
v) US Department of Energy, Energy Information Agency, Table E7A - Natural Gas Consumption (Btu) amd Energy Intensities by End Use for All Buildings, 2003, http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003excel/e07a.xls.
w) Excludes the GHG emissions associated with handling non-government solid waste, government employee commuting and government vehicle fleet travel (see Table 3.1 from reference in Footnote b).
z) Revised upwards by 2,000 based on email from DJP at 10:51 AM on May 24, 2010.
aa) US Energy Information Administration. *Natural Gas Consumption by End Use, California, Annual,* http://www.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm and http://www.eia.doe.gov/dnav/ng/hist/n3010ca2a.htm
ab) Table 1 - *Annual Estimates of the Population for the United States, Regions, States and Puerto Rico, April 1, 2000 to July 1, 2009* , http://www.census.gov/popest/states/tables/NST-EST2009-01.xls
ac) *Table E-1: State/County Population Estimates with Annual Percent Change January 1, 2009 and 2010* , http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2009-10/documents/E-1_2010.xls
ad) *Table E-1: City/County Population Estimates with Annual Percent Change January 1, 2009 and 2010* , http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2009-10/documents/E-1_2010.xls.
ae) Santa Clara County population projections from Association of Bay Area Governments (via Akoni Danielson at David J. Powers & Associates, Inc.).
af) CalRecycle. *Jurisdiction Profile for City of Santa Clara,* http://www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=C&JURID=465&JUR=Santa+Clara
ag) DJP email from Akoni Danielsen at 2 PM on May 27, 2010.
ah) Proportioned from 2006 solid waste disposal amount by change in service population.
ai) Default Eq. 10.2 from Ref. "a", Ch. 10, p. 102, which was taken from Ref "aj" Ch. 8, p.8-9.
aj) USEPA. *Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006.*
ak) Default Eq. 10.4 from Ref. "a", Ch. 10, p. 103, which was taken from Ref "aj" Ch.8, p.8-9, and Tchobanogloous et al (2003).
Tchobanoglous, G., F.L. Burton, and H.D. Stensel, *Wastewater Engineering: Treatment and Reuse, 4th Edition, p. 473, 2003.*
al) Eq. 10.7 from Ref. "a", Ch. 10, p. 105, which was taken from Ref "aj" Ch.8, p.8-14.
am) Default Eq. 10.10 from Ref. "a", Ch. 10, p. 107, which was taken from Ref "aj" Ch.8, p.8-14, and Grady et al (1999).
Grady, C.P., Jr., G.T. Daigger, and H.C. Lim, *Biological Wastewater Treatment, 2nd Edition, pp. 108-109 and 644, 1999.*
an) Email from Akoni Danielsen at David J. Powers & Associates, Inc. at 8:18 AM on June 1, 2010.
ao) Google. Population, Estimates of the resident population, http://www.google.com/publicdata?ds=uspopulation&met=population&idim=county:06085&dl=en&hl=en&q=population+of+santa+clara+county
Santa Clara County population in 2007 = 1,805,000 according to BAAQMD (2010). Reference in next footnote.
ap) BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions,* updated February 2010 for natural gas distribution leakage.
aq) Assumed to be the arithmetic mean of the surrounding year populations for 2006 and 2008.
ar) Assumed linear increase from 2005 to 2008.
as) Proportioned by the service populations of the City and County of San Jose.
at) Proportioned by the service populations of the City in 2007 and in each projected scenario.
au) Proportioned from the HFC/PFC emissions of City government by the ratio of building area for industry plus commerce to the area of public buildings.
av) Roughly proportioned from the estimated 2005 emission of HFCs/PFCs by the total industrial, commercial and public building area in each projected scenario to the total area in 2008.
aw) PG&E. Email from Carolyn Weiner to Carol Anne Painter, City of Santa Clara, June 16, 2010.
ax) Provided by City of Santa Clara in May 13, 2010 (4:02 PM) email from Akoni Danielson at Powers.
ay) Provided by City of San Jose via July 19, 2010 email from DJP&A, and checked for applicable year of 2006.
az) City of San Jose, attributed to California Dept of Financehttp://www.sanjoseca.gov/about.asp
ba) MSW generation/collection rates (tons/year) for four scenarios from DJP&A July 16, 2010 email at 3:08 PM.
bb) Assumptions for 2008 San Jose Community GHG Baseline, September 11, 2009, and data needs table updated by DJP&A on August 3, 2010 and emailed at 4:12 PM.
bc) R3 Consulting Group. *Needs Assessment for the Integrated Waste Management Zero Waste Strategic Plan Development, Appendix A, Table 2A, page 2-3,* November 3, 2008.
bd) Calculated.
be) City of San Jose website with 2006 calculated as the arithmetic mean of 2005 and 2007 populations, http://www.sanjoseca.gov/planning/data/population/Population_1900_to_2035.xls.
bf) PG&E. *GHG data REFERENCE KEY v7*
bg) PG&E data for commercial + industrial minus industrial component.
bh) California Department of Resources Recycling and Recovery, Disposal Reporting Systen (DRS). *Jurisdiction Disposal By Facility, Disposal during 2008 for San Jose.*
bi) Email from John Baty (City of San Jose) at 8:50 AM on July 27, 2010.
bj) Increase in City of San Jose scenario populations as requested by DJP&A email at 9:52 AM on July 20, 2010 (%) = 3.15
bk) Updated Data Needs Table emailed by DJP&A at 4:12 PM on August 3, 2010.
bl) City of San Jose land non-residential land use area workbook received from DJP&A in 4:12 PM email on August 3, 2010.
bm) BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions,* updated February 2010 for landfill fugitive sources and combustion sources.
bn) Center for the Continuing Study of the California Economy. *Projections of Jobs, Population and Households For the City of San Jose,* Appendix B - A Summary of Results and Methodology, August 2008.
bo) Email from Nora Monette of DJP&A at 5:55 PM on August 5, 2010, attributed to Table 3.14-2 in ADEIR for the Envision 2040 General Plan, and taken from Association of Bay Area Governments (ABAG), *Projections 2007 Forecasts for the SanFrancisco Bay Area to the Year 2035.*
bp) Calculated as the arithmetic mean of employment in 2005 and 2007.
bq) Envision 2040 General Plan, taken from State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties and the State, 2001-2010 with 2000 Benchmark,* Sacramento, California, May 2010.
br) Residential MSW in Footnote bc citation scaled from 2006 by population; commercial and C&D MSW scaled from 2006 by employment; and city facility, non-franchised haul and additional diversion MSW scaled from 2006 by service population.
bs) Methane emissions from PG&E-supplied electric energy (lbs CH_4/MWh) = 0.0302 (PG&E. Email from GHGDataRequests@pge.com at 8:48 AM, July 29, 2010.
Nitrous oxide emissions from PG&E-supplied electric energy (lbs N_2O/MWh) = 0.0081
bt) Correction of GHG emission rate in CO_2 to CO_2e = 1.00094
bu) From worksheet "SJOSE08_THM".
bv) From SanJoseGHG-relatedInfo Needs List - Scenario 6_Scenario7_iStarRancho.doc, rec'd from David J Powers 2/28/11
??) ARB. *Staff Report: Initial Statement of Reasons,* Appendix B - California Facilities and Greenhouse Gas Emissions Inventory - High-Global Warming Potential Stationary Source Refrigerant Management Program, October 23, 2009, http://www.arb.ca.gov/regact/2009/gwprmp09/refappb.pdf.
??) Local Governments for Sustainability (ICLEI). *Local Government Operations Protocol, Version 1.0,* September 2008.
b) ICLEI. *City of Santa Clara 2005 Government Operations Greenhouse Gas Emissions Inventory, April 2, 2009.*
c) ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions* , Appendix A Table 2, p. Appendix A-4, December 2007.
k) Santa Clara County has no petroleum refineries, coatings or ink manufacturing, large bakeries, metallurgical processing, wood products manufacturing, natural gas production fields,
BAAQMD. *Source Category Methodologies, Base Year 2005 Emission Inventory,* October 4, 2008.

RATE DATA ANALYSIS: GHG_PHASE1 GAS AND ELECTRIC GHG SUMMARY FOR SAN JOSE

			RESIDENTIAL ELECTRIC ENERGY					COMMMERCIAL					INDUSTRIAL ELECTRIC ENERGY						DA KWH
TOTCITY	**YEAR**	**CATEGORY**	**AVG MONTHLY USE PER ENTITY (KWH)**	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY (KWH)**	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (KWH)	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	1515 RULE	
SAN JOSE	2008	NONGOVENT	531	1,916,298,390	557,175	9,486,149	4,970,742	10,987	3,100,573,937	901,510	15,536,115	8,140,924						FAIL	855,836,339
SAN JOSE	2008	(3) COUNTY	2,683	1,336,104	388			16,918	38,789,741	11,278			777,695	37,897,092	11,019				
SAN JOSE	2008	(4) CITY	910	65,167	19			4,480	93,440,362	27,168	35,840	18,780	821,370	66,144,913	19,232				
SAN JOSE	2008	(5) DISTRICT	1,395	16,745	5			19,168	120,594,106	35,063			2,244,553	26,934,641	7,831				16,546,333

Sector Totals (kW-hr):	1,917,716,406	3,353,398,146	130,976,646	
Overall Total (kW-hr):	5,402,091,198			
Sector Totals (MTCO2):	557,587	975,019	38,082	
Overall Total (MTCO2):	1,570,688			

RATE DATA ANALYSIS: GHG_PHA

TOTCITY	YEAR	CATEGORY	RESIDENTIAL NATURAL GAS					COMMMERCIAL NATURAL GAS					INDUSTRIAL NATURAL GAS					
			AVG MONTHLY USE PER ENTITY (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	1515 RULE
SAN JOSE	2008	NONGOVENT	41	123,349,836	654,628	489,361	6,579,948	632	82,278,484	436,659	966,407	12,994,309						FAIL
SAN JOSE	2008	(3) COUNTY	371	137,957	732			1,685	1,509,526	8,011				516,737	2,742			
SAN JOSE	2008	(4) CITY	19	689	4			1,110	2,052,044	10,890	45,024	605,393		3,457,437	18,349			
SAN JOSE	2008	(5) DISTRICT	98	1,170	6			1,054	3,347,556	17,766				508,809	2,700			

Sector Totals (kW-hr):
Overall Total (kW-hr):

Sector Totals (MTCO2):
Overall Total (MTCO2):

APPENDIX B

Data Used in Mobile Source Inventory Calculations

Title : SJ 08 Base CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 13:40:38
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	352545	74017	123485	37320	4157	3489	4818	2178	399	397	229	4144	17160	624338
VMT/1000	10699	2324	4223	1433	185	121	253	322	22	17	28	46	134	19807
Trips	2208090	455710	781495	238259	115298	86049	154464	20579	14171	1589	914	415	34316	4111350
Total Organic Gas Emissions														
Run Exh	2.14	0.85	0.8	0.27	0.06	0.1	0.11	0.5	0.01	0.01	0.04	0.04	0.48	5.42
Idle Exh	0	0	0	0	0	0	0	0.06	0	0	0	0	0	0.07
Start Ex	1.71	0.45	0.59	0.21	0.06	0.08	0.18	0.08	0.02	0	0	0	0.11	3.48
Total Ex	3.85	1.3	1.39	0.48	0.13	0.18	0.3	0.63	0.03	0.02	0.04	0.04	0.59	8.97
Diurnal	0.34	0.1	0.09	0.02	0	0	0	0	0	0	0	0	0.04	0.59
Hot Soak	0.57	0.16	0.15	0.03	0.01	0.01	0.01	0	0	0	0	0	0.02	0.96
Running	1.93	0.8	0.76	0.15	0.06	0.11	0.07	0.02	0	0	0	0	0.12	4.03
Resting	0.18	0.05	0.05	0.01	0	0	0	0	0	0	0	0	0.02	0.32
Total	6.88	2.42	2.44	0.69	0.2	0.3	0.38	0.65	0.03	0.02	0.04	0.05	0.79	14.87
Carbon Monoxide Emissions														
Run Exh	40.16	16.13	17.33	5.39	0.64	0.96	1.31	2.55	0.13	0.19	0.22	1.11	4.73	90.85
Idle Exh	0	0	0	0	0.03	0.02	0.03	0.19	0	0.01	0	0	0	0.28
Start Ex	16.78	5.11	6.57	2.14	0.74	0.98	1.95	1.01	0.22	0.02	0.01	0.01	0.37	35.91
Total Ex	56.95	21.24	23.9	7.53	1.41	1.95	3.29	3.75	0.36	0.21	0.23	1.12	5.1	127.04
Oxides of Nitrogen Emissions														
Run Exh	3.66	1.51	2.29	0.83	0.32	0.43	2.59	5.99	0.21	0.19	0.59	0.15	0.18	18.96
Idle Exh	0	0	0	0	0	0	0.03	0.38	0	0.01	0	0	0	0.44
Start Ex	1.1	0.27	0.62	0.22	0.17	0.14	0.16	0.09	0.03	0	0	0	0.01	2.81
Total Ex	4.76	1.78	2.91	1.05	0.49	0.58	2.78	6.47	0.24	0.2	0.59	0.15	0.2	22.2
Carbon Dioxide Emissions (000)														
Run Exh	4.62	1.23	2.25	1.04	0.17	0.11	0.38	0.63	0.03	0.03	0.08	0.04	0.02	10.62
Idle Exh	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0.03
Start Ex	0.18	0.05	0.08	0.03	0	0	0	0	0	0	0	0	0	0.35
Total Ex	4.8	1.27	2.33	1.08	0.18	0.11	0.39	0.65	0.03	0.03	0.08	0.04	0.02	11
PM10 Emissions														
Run Exh	0.15	0.04	0.12	0.04	0	0.01	0.07	0.22	0	0.01	0.01	0	0.01	0.68
Idle Exh	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0.01
Start Ex	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0.03
Total Ex	0.16	0.05	0.13	0.04	0	0.01	0.07	0.23	0	0.01	0.01	0	0.01	0.72
TireWear	0.09	0.02	0.04	0.01	0	0	0	0.01	0	0	0	0	0	0.19
BrakeWr	0.15	0.03	0.06	0.02	0	0	0	0.01	0	0	0	0	0	0.28
Total	0.4	0.1	0.22	0.07	0.01	0.01	0.08	0.25	0.01	0.01	0.01	0	0.01	1.18
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.05	0.01	0.02	0.01	0	0	0	0.01	0	0	0	0	0	0.11
Fuel Consumption (000 gallons)														
Gasoline	501.11	131.32	242.2	111.2	15.63	8.32	3.94	1.68	0.71	0.27	0.33	3.36	3.15	1023.24
Diesel	0.97	2.22	0.36	0.19	2.57	2.8	32.09	57.29	2.07	2.15	6.53	0.7	0	109.94

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2008 (SJ 08 Base CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	352,545	10,698,867	4,804.82	0.00	4,804.82	0.00%	0.00	4,804.82	1.51
LDT1	74,017	2,324,306	1,270.29	0.00	1,270.29	0.00%	0.00	1,270.29	0.40
LDT2	123,485	4,222,698	2,328.11	0.00	2,328.11	0.00%	0.00	2,328.11	0.73
MDV	37,320	1,433,180	1,075.11	0.00	1,075.11	0.00%	0.00	1,075.11	0.34
Total	**587,367**	**18,679,051**	**9,478.33**	**0.00**	**9,478.33**	**0.00%**	**0.00**	**9,478.33**	**2.98**

Annual GHG Emissions	(Million Metric Tons / Year)	2008 Base Year Ann GHG CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**3.46273**	**0.00010**	**0.00003**	**3.47543**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	2.98371	0.00008	0.00003	2.99491	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.47902	0.00001	0.00000	0.48052	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : SJ 20 No Proj CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:13:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	447219	92474	156807	47536	5210	4356	6146	2410	489	495	284	5169	21719	790313
VMT/1000	13651	2978	5081	1633	195	160	324	406	21	21	35	60	179	24745
Trips	2785680	561700	970197	294726	148919	105432	194105	16998	16613	1978	1138	517	43434	5141440
Total Organic Gas Emissions														
Run Exh	0.76	0.32	0.48	0.2	0.02	0.03	0.05	0.22	0.01	0.01	0.04	0.01	0.56	2.72
Idle Exh	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.52	0.18	0.29	0.12	0.04	0.04	0.05	0.02	0.01	0	0	0	0.11	1.4
Total Ex	1.29	0.5	0.77	0.33	0.07	0.07	0.11	0.28	0.02	0.01	0.04	0.01	0.67	4.17
Diurnal	0.2	0.08	0.09	0.03	0	0	0	0	0	0	0	0	0.04	0.44
Hot Soak	0.44	0.14	0.19	0.05	0.01	0.01	0	0	0	0	0	0	0.02	0.85
Running	0.9	0.59	0.75	0.2	0.06	0.08	0.03	0	0	0	0	0	0.06	2.68
Resting	0.14	0.05	0.07	0.02	0	0	0	0	0	0	0	0	0.02	0.31
Total	2.97	1.37	1.88	0.62	0.13	0.15	0.14	0.29	0.02	0.01	0.04	0.01	0.8	8.46
Carbon Monoxide Emissions														
Run Exh	16.47	7.34	10.69	3.92	0.2	0.24	0.58	1.02	0.08	0.11	0.15	0.2	3.79	44.78
Idle Exh	0	0	0	0	0.03	0.02	0.03	0.19	0	0.01	0	0	0	0.29
Start Ex	6.59	2.41	3.84	1.47	0.47	0.4	0.85	0.33	0.19	0.01	0.01	0	0.51	17.1
Total Ex	23.06	9.75	14.53	5.39	0.7	0.66	1.46	1.54	0.27	0.13	0.16	0.21	4.3	62.17
Oxides of Nitrogen Emissions														
Run Exh	1.34	0.67	1.15	0.44	0.14	0.21	0.89	1.97	0.1	0.17	0.55	0.08	0.22	7.92
Idle Exh	0	0	0	0	0	0.01	0.04	0.51	0	0.02	0	0	0	0.58
Start Ex	0.38	0.13	0.32	0.13	0.21	0.13	0.1	0.04	0.03	0	0	0	0.01	1.49
Total Ex	1.72	0.8	1.47	0.57	0.35	0.34	1.03	2.53	0.12	0.19	0.55	0.08	0.23	9.99
Carbon Dioxide Emissions (000)														
Run Exh	6.93	1.89	3.28	1.44	0.19	0.14	0.49	0.81	0.03	0.03	0.08	0.05	0.03	15.39
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.03
Start Ex	0.22	0.05	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0.42
Total Ex	7.15	1.95	3.38	1.48	0.2	0.14	0.49	0.84	0.03	0.03	0.08	0.05	0.04	15.85
PM10 Emissions														
Run Exh	0.26	0.07	0.25	0.09	0	0	0.05	0.07	0	0.01	0.01	0	0	0.83
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0.04
Total Ex	0.28	0.08	0.27	0.09	0	0	0.05	0.07	0	0.01	0.01	0	0	0.88
TireWear	0.12	0.03	0.04	0.01	0	0	0	0.02	0	0	0	0	0	0.23
BrakeWr	0.19	0.04	0.07	0.02	0	0	0	0.01	0	0	0	0	0	0.35
Total	0.59	0.14	0.39	0.13	0.01	0.01	0.05	0.1	0	0.01	0.01	0	0.01	1.46
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.07	0.02	0.03	0.01	0	0	0	0.01	0	0	0	0	0	0.15
Fuel Consumption (000 gallons)														
Gasoline	735.5	199.88	348.43	152.1	17.68	10.54	4.77	0.59	0.5	0.25	0.74	4.18	4.52	1479.67
Diesel	0.21	0.91	0.11	0.08	2.16	3.6	40.31	74.95	2.39	2.79	6.81	0.95	0	135.27

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 No Proj CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	447,219	13,651,078	7,146.62	1,486.25	5,660.37	10.00%	566.04	5,094.33	1.60
LDT1	92,474	2,977,932	1,945.73	363.04	1,582.69	10.00%	158.27	1,424.42	0.45
LDT2	156,807	5,081,204	3,379.56	443.45	2,936.11	10.00%	293.61	2,642.50	0.83
MDV	47,536	1,633,460	1,477.15	189.23	1,287.92	10.00%	128.79	1,159.13	0.36
Total	**744,035**	**23,343,674**	**13,949.06**	**2,481.97**	**11,467.09**	**10.00%**	**1,146.71**	**10,320.38**	**3.25**

2020 No Project Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**3.84720**	**0.00011**	**0.00004**	**3.86126**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	3.24879	0.00009	0.00003	3.26098	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.59841	0.00001	0.00001	0.60028	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : SJ 20 Prop Plan CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:17:29
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	477036	98639	167262	50706	5558	4646	6555	2570	521	528	303	5514	23167	843005
VMT/1000	14561	3176	5420	1742	208	171	346	433	23	22	37	64	191	26394
Trips	2971410	599150	1034880	314376	158847	112461	207046	18131	17721	2110	1214	552	46330	5484230
Total Organic Gas Emissions														
Run Exh	0.84	0.36	0.54	0.22	0.03	0.03	0.06	0.23	0.01	0.01	0.04	0.01	0.61	2.98
Idle Exh	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.56	0.19	0.31	0.13	0.04	0.04	0.06	0.02	0.01	0	0	0	0.12	1.49
Total Ex	1.4	0.55	0.85	0.36	0.07	0.07	0.12	0.3	0.02	0.01	0.04	0.01	0.73	4.54
Diurnal	0.22	0.08	0.1	0.03	0	0	0	0	0	0	0	0	0.04	0.47
Hot Soak	0.47	0.15	0.2	0.06	0.01	0.01	0	0	0	0	0	0	0.02	0.91
Running	0.96	0.63	0.8	0.21	0.06	0.08	0.03	0.01	0.01	0	0	0	0.06	2.86
Resting	0.15	0.06	0.08	0.02	0	0	0	0	0	0	0	0	0.02	0.33
Total	3.21	1.47	2.02	0.67	0.14	0.16	0.15	0.3	0.03	0.02	0.04	0.01	0.87	9.1
Carbon Monoxide Emissions														
Run Exh	17.79	7.94	11.55	4.23	0.21	0.25	0.62	1.09	0.08	0.11	0.16	0.22	4.05	48.3
Idle Exh	0	0	0	0	0.04	0.02	0.03	0.21	0	0.01	0	0	0	0.31
Start Ex	7.03	2.57	4.09	1.57	0.5	0.43	0.91	0.35	0.21	0.01	0.01	0.01	0.55	18.24
Total Ex	24.82	10.51	15.64	5.8	0.75	0.7	1.56	1.64	0.29	0.14	0.17	0.22	4.6	66.85
Oxides of Nitrogen Emissions														
Run Exh	1.44	0.72	1.24	0.47	0.15	0.22	0.95	2.11	0.1	0.18	0.59	0.09	0.23	8.49
Idle Exh	0	0	0	0	0	0.01	0.04	0.55	0	0.02	0	0	0	0.62
Start Ex	0.41	0.14	0.34	0.14	0.22	0.14	0.1	0.04	0.03	0	0	0	0.02	1.58
Total Ex	1.85	0.86	1.58	0.61	0.38	0.37	1.1	2.7	0.13	0.21	0.59	0.09	0.25	10.7
Carbon Dioxide Emissions (000)														
Run Exh	7.57	2.07	3.59	1.57	0.2	0.15	0.52	0.86	0.03	0.03	0.09	0.05	0.04	16.77
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.23	0.06	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0.45
Total Ex	7.8	2.12	3.69	1.61	0.21	0.15	0.53	0.89	0.03	0.04	0.09	0.05	0.04	17.25
PM10 Emissions														
Run Exh	0.29	0.08	0.28	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.92
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.31	0.08	0.3	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.97
TireWear	0.13	0.03	0.05	0.02	0	0	0	0.02	0	0	0	0	0	0.25
BrakeWr	0.2	0.04	0.07	0.02	0	0	0	0.01	0	0	0	0	0	0.37
Total	0.64	0.16	0.42	0.14	0.01	0.01	0.06	0.11	0	0.01	0.01	0	0.01	1.59
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.08	0.02	0.04	0.02	0	0	0.01	0.01	0	0	0	0	0	0.17
Fuel Consumption (000 gallons)														
Gasoline	802.7	218.15	380.27	166.01	18.86	11.24	5.08	0.63	0.54	0.26	0.79	4.46	4.86	1613.86
Diesel	0.22	0.97	0.12	0.08	2.31	3.84	42.99	79.95	2.55	2.97	7.27	1.02	0	144.29

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 Prop Plan CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	477,036	14,561,222	7,800.14	1,622.31	6,177.83	10.00%	617.78	5,560.05	1.75
LDT1	98,639	3,176,476	2,123.53	396.29	1,727.24	10.00%	172.72	1,554.51	0.49
LDT2	167,262	5,419,978	3,688.76	484.07	3,204.69	10.00%	320.47	2,884.22	0.91
MDV	50,706	1,742,367	1,612.34	206.57	1,405.78	10.00%	140.58	1,265.20	0.40
Total	**793,642**	**24,900,043**	**15,224.77**	**2,709.24**	**12,515.54**	**10.00%**	**1,251.55**	**11,263.98**	**3.55**

2020 Prop Plan Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**4.18336**	**0.00011**	**0.00004**	**4.19866**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	3.54582	0.00010	0.00004	3.55913	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.63754	0.00002	0.00001	0.63953	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : 2020 S7 SJ
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2011/03/08 12:29:52
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	478836	99011	167893	50897	5579	4664	6580	2580	523	529	305	5534	23255	846186
VMT/1000	14616	3188	5440	1749	209	171	347	434	23	22	38	64	192	26494
Trips	2982620	601411	1038790	315562	159447	112886	207828	18199	17788	2118	1218	554	46505	5504920
Total Organic Gas Emissions														
Run Exh	0.82	0.35	0.52	0.22	0.03	0.03	0.06	0.23	0.01	0.01	0.04	0.01	0.6	2.92
Idle Exh	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.56	0.19	0.31	0.13	0.04	0.04	0.06	0.02	0.01	0	0	0	0.12	1.5
Total Ex	1.38	0.54	0.83	0.35	0.07	0.07	0.12	0.3	0.02	0.02	0.04	0.01	0.72	4.48
Diurnal	0.22	0.08	0.1	0.03	0	0	0	0	0	0	0	0	0.04	0.47
Hot Soak	0.47	0.15	0.2	0.06	0.01	0.01	0	0	0	0	0	0	0.02	0.91
Running	0.97	0.64	0.8	0.21	0.06	0.08	0.03	0.01	0.01	0	0	0	0.06	2.87
Resting	0.15	0.06	0.08	0.02	0	0	0	0	0	0	0	0	0.02	0.33
Total	3.19	1.47	2.01	0.67	0.14	0.16	0.15	0.31	0.03	0.02	0.04	0.01	0.86	9.06
Carbon Monoxide Emissions														
Run Exh	17.77	7.91	11.54	4.23	0.21	0.25	0.62	1.09	0.08	0.11	0.16	0.22	4.04	48.24
Idle Exh	0	0	0	0	0.04	0.02	0.03	0.21	0	0.01	0	0	0	0.31
Start Ex	7.06	2.58	4.11	1.57	0.51	0.43	0.91	0.35	0.21	0.01	0.01	0.01	0.55	18.31
Total Ex	24.83	10.5	15.65	5.8	0.75	0.7	1.57	1.65	0.29	0.14	0.17	0.22	4.59	66.87
Oxides of Nitrogen Emissions														
Run Exh	1.44	0.72	1.24	0.47	0.15	0.22	0.96	2.11	0.1	0.18	0.59	0.09	0.23	8.5
Idle Exh	0	0	0	0	0	0.01	0.04	0.55	0	0.02	0	0	0	0.62
Start Ex	0.41	0.14	0.34	0.14	0.22	0.14	0.1	0.04	0.03	0	0	0	0.02	1.59
Total Ex	1.85	0.85	1.58	0.61	0.38	0.37	1.1	2.71	0.13	0.21	0.59	0.09	0.25	10.71
Carbon Dioxide Emissions (000)														
Run Exh	7.46	2.04	3.53	1.55	0.2	0.15	0.52	0.87	0.03	0.03	0.09	0.05	0.04	16.56
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.23	0.06	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0.45
Total Ex	7.69	2.09	3.64	1.59	0.21	0.15	0.53	0.9	0.03	0.04	0.09	0.05	0.04	17.05
PM10 Emissions														
Run Exh	0.28	0.08	0.27	0.09	0	0	0.05	0.08	0	0.01	0.01	0	0	0.89
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.3	0.08	0.29	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.94
TireWear	0.13	0.03	0.05	0.02	0	0	0	0.02	0	0	0	0	0	0.25
BrakeWr	0.2	0.04	0.08	0.02	0	0	0	0.01	0	0	0	0	0	0.37
Total	0.63	0.15	0.41	0.14	0.01	0.01	0.06	0.11	0	0.01	0.01	0	0.01	1.56
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.07	0.02	0.04	0.02	0	0	0.01	0.01	0	0	0	0	0	0.16
Fuel Consumption (000 gallons)														
Gasoline	791.59	215.13	375.01	163.7	18.93	11.29	5.1	0.63	0.54	0.26	0.8	4.47	4.85	1592.31
Diesel	0.22	0.97	0.12	0.08	2.32	3.86	43.16	80.25	2.56	2.98	7.29	1.02	0	144.83

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (2020 S7 SJ)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	478,836	14,616,165	7,691.66	1,599.62	6,092.04	10.00%	609.20	5,482.84	1.73
LDT1	99,011	3,188,462	2,094.11	390.74	1,703.37	10.00%	170.34	1,533.04	0.48
LDT2	167,893	5,440,428	3,637.36	477.29	3,160.07	10.00%	316.01	2,844.07	0.90
MDV	50,897	1,748,941	1,589.84	203.67	1,386.17	10.00%	138.62	1,247.56	0.39
Total	**796,637**	**24,993,996**	**15,012.97**	**2,671.31**	**12,341.66**	**10.00%**	**1,234.17**	**11,107.49**	**3.50**

2020 Scenario 7 Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**4.13781**	**0.00011**	**0.00004**	**4.15294**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	3.49656	0.00010	0.00004	3.50968	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.64125	0.00002	0.00001	0.64326	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : 2020 S7A SJ
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2011/03/08 12:31:57
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	478814	99007	167885	50895	5578	4664	6580	2580	523	529	305	5534	23254	846148
VMT/1000	14616	3188	5440	1749	209	171	347	434	23	22	38	64	192	26493
Trips	2982490	601383	1038740	315548	159439	112880	207818	18199	17787	2118	1218	554	46503	5504680
Total Organic Gas Emissions														
Run Exh	0.82	0.35	0.52	0.22	0.03	0.03	0.06	0.23	0.01	0.01	0.04	0.01	0.6	2.92
Idle Exh	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.56	0.19	0.31	0.13	0.04	0.04	0.06	0.02	0.01	0	0	0	0.12	1.5
Total Ex	1.38	0.54	0.83	0.35	0.07	0.07	0.12	0.3	0.02	0.02	0.04	0.01	0.72	4.48
Diurnal	0.22	0.08	0.1	0.03	0	0	0	0	0	0	0	0	0.04	0.47
Hot Soak	0.47	0.15	0.2	0.06	0.01	0.01	0	0	0	0	0	0	0.02	0.91
Running	0.97	0.64	0.8	0.21	0.06	0.08	0.03	0.01	0.01	0	0	0	0.06	2.87
Resting	0.15	0.06	0.08	0.02	0	0	0	0	0	0	0	0	0.02	0.33
Total	3.19	1.47	2.01	0.67	0.14	0.16	0.15	0.31	0.03	0.02	0.04	0.01	0.86	9.07
Carbon Monoxide Emissions														
Run Exh	17.77	7.91	11.54	4.23	0.21	0.25	0.62	1.09	0.08	0.11	0.16	0.22	4.04	48.24
Idle Exh	0	0	0	0	0.04	0.02	0.03	0.21	0	0.01	0	0	0	0.31
Start Ex	7.06	2.58	4.11	1.57	0.51	0.43	0.91	0.35	0.21	0.01	0.01	0.01	0.55	18.31
Total Ex	24.83	10.5	15.65	5.8	0.75	0.7	1.57	1.65	0.29	0.14	0.17	0.22	4.59	66.86
Oxides of Nitrogen Emissions														
Run Exh	1.44	0.72	1.24	0.47	0.15	0.22	0.96	2.11	0.1	0.18	0.59	0.09	0.23	8.5
Idle Exh	0	0	0	0	0	0.01	0.04	0.55	0	0.02	0	0	0	0.62
Start Ex	0.41	0.14	0.34	0.14	0.22	0.14	0.1	0.04	0.03	0	0	0	0.02	1.59
Total Ex	1.85	0.85	1.58	0.61	0.38	0.37	1.1	2.71	0.13	0.21	0.59	0.09	0.25	10.71
Carbon Dioxide Emissions (000)														
Run Exh	7.46	2.04	3.53	1.55	0.2	0.15	0.52	0.87	0.03	0.03	0.09	0.05	0.04	16.56
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.23	0.06	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0.45
Total Ex	7.69	2.09	3.64	1.59	0.21	0.15	0.53	0.9	0.03	0.04	0.09	0.05	0.04	17.05
PM10 Emissions														
Run Exh	0.28	0.08	0.27	0.09	0	0	0.05	0.08	0	0.01	0.01	0	0	0.89
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.3	0.08	0.29	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.94
TireWear	0.13	0.03	0.05	0.02	0	0	0	0.02	0	0	0	0	0	0.25
BrakeWr	0.2	0.04	0.08	0.02	0	0	0	0.01	0	0	0	0	0	0.37
Total	0.63	0.15	0.41	0.14	0.01	0.01	0.06	0.11	0	0.01	0.01	0	0.01	1.56
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.07	0.02	0.04	0.02	0	0	0.01	0.01	0	0	0	0	0	0.16
Fuel Consumption (000 gallons)														
Gasoline	791.72	215.16	375.07	163.73	18.93	11.29	5.1	0.63	0.54	0.26	0.8	4.47	4.85	1592.56
Diesel	0.22	0.97	0.12	0.08	2.32	3.86	43.15	80.25	2.56	2.98	7.29	1.02	0	144.82

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (2020 S7A SJ)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	478,815	14,615,508	7,692.95	1,599.89	6,093.05	10.00%	609.31	5,483.75	1.73
LDT1	99,007	3,188,318	2,094.46	390.81	1,703.65	10.00%	170.37	1,533.29	0.48
LDT2	167,885	5,440,182	3,637.96	477.37	3,160.60	10.00%	316.06	2,844.54	0.90
MDV	50,895	1,748,862	1,590.10	203.70	1,386.40	10.00%	138.64	1,247.76	0.39
Total	**796,601**	**24,992,870**	**15,015.47**	**2,671.77**	**12,343.71**	**10.00%**	**1,234.37**	**11,109.34**	**3.50**

2020 Scenario 7A Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**4.13840**	**0.00011**	**0.00004**	**4.15352**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	3.49714	0.00010	0.00004	3.51027	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.64125	0.00002	0.00001	0.64326	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : SJ 35 No Proj CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:26:20
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	564154	116370	197507	60422	6618	5536	7886	2492	611	599	345	6444	27339	996324
VMT/1000	17114	3769	6330	2038	242	202	413	410	32	25	43	75	224	30917
Trips	3497880	709896	1200400	365265	192514	134788	249853	14884	19654	2397	1379	645	54673	6444220
Total Organic Gas Emissions														
Run Exh	0.5	0.14	0.41	0.16	0.01	0.01	0.04	0.13	0	0.01	0.02	0	0.74	2.19
Idle Exh	0	0	0	0	0.01	0	0.01	0.04	0	0	0	0	0	0.06
Start Ex	0.17	0.05	0.15	0.06	0.03	0.02	0.03	0.01	0	0	0	0	0.14	0.67
Total Ex	0.67	0.19	0.56	0.23	0.05	0.04	0.08	0.18	0.01	0.01	0.02	0	0.88	2.92
Diurnal	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0.05	0.27
Hot Soak	0.25	0.07	0.17	0.05	0.01	0	0	0	0	0	0	0	0.02	0.56
Running	0.74	0.28	0.64	0.2	0.06	0.03	0.02	0	0	0	0	0	0.07	2.05
Resting	0.07	0.02	0.08	0.03	0	0	0	0	0	0	0	0	0.02	0.23
Total	1.81	0.59	1.53	0.54	0.12	0.07	0.11	0.18	0.01	0.01	0.02	0	1.04	6.03
Carbon Monoxide Emissions														
Run Exh	10.89	3.05	8.08	3.4	0.1	0.11	0.5	0.64	0.04	0.08	0.1	0.02	4.55	31.56
Idle Exh	0	0	0	0	0.04	0.03	0.04	0.2	0	0.01	0	0	0	0.32
Start Ex	2.99	0.8	2.28	1	0.46	0.28	0.5	0.13	0.08	0.01	0.01	0	0.66	9.2
Total Ex	13.87	3.85	10.35	4.4	0.61	0.41	1.04	0.96	0.12	0.1	0.11	0.02	5.21	41.08
Oxides of Nitrogen Emissions														
Run Exh	0.77	0.22	0.64	0.24	0.07	0.09	0.42	1.04	0.03	0.12	0.4	0.03	0.27	4.34
Idle Exh	0	0	0	0	0	0.01	0.05	0.56	0	0.02	0	0	0	0.64
Start Ex	0.13	0.04	0.13	0.05	0.24	0.13	0.07	0.01	0.01	0	0	0	0.02	0.85
Total Ex	0.9	0.26	0.78	0.3	0.32	0.23	0.53	1.61	0.05	0.15	0.4	0.03	0.29	5.83
Carbon Dioxide Emissions (000)														
Run Exh	9.71	2.7	4.63	2.03	0.24	0.17	0.62	0.82	0.05	0.04	0.09	0.06	0.04	21.2
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.27	0.07	0.12	0.05	0.01	0.01	0	0	0	0	0	0	0	0.53
Total Ex	9.98	2.77	4.75	2.08	0.25	0.18	0.62	0.85	0.05	0.04	0.09	0.06	0.05	21.76
PM10 Emissions														
Run Exh	0.41	0.11	0.41	0.14	0	0	0.04	0.04	0	0.01	0.01	0	0	1.18
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.43	0.11	0.43	0.15	0.01	0	0.04	0.04	0	0.01	0.01	0	0.01	1.24
TireWear	0.15	0.03	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0.29
BrakeWr	0.24	0.05	0.09	0.03	0	0	0.01	0.01	0	0	0	0	0	0.43
Total	0.82	0.2	0.57	0.19	0.01	0.01	0.06	0.07	0	0.01	0.01	0	0.01	1.96
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.1	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0.21
Fuel Consumption (000 gallons)														
Gasoline	1024	283.66	488.24	213.53	22.56	13.48	6.17	0.35	0.5	0.25	1.24	5.29	5.91	2065.16
Diesel	0.01	0.15	0.01	0.01	2.4	4.44	50.86	76.37	3.88	3.44	6.67	1.04	0	149.28

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 No Proj CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	564,154	17,113,600	9,978.79	3,236.80	6,741.99	10.00%	674.20	6,067.79	1.91
LDT1	116,370	3,769,168	2,765.83	864.42	1,901.41	10.00%	190.14	1,711.27	0.54
LDT2	197,507	6,329,693	4,751.30	1,069.36	3,681.94	10.00%	368.19	3,313.74	1.04
MDV	60,422	2,038,440	2,078.35	464.65	1,613.70	10.00%	161.37	1,452.33	0.46
Total	**938,453**	**29,250,901**	**19,574.27**	**5,635.23**	**13,939.04**	**10.00%**	**1,393.90**	**12,545.14**	**3.95**

2035 No Project Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**4.63719**	**0.00013**	**0.00005**	**4.65416**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	3.94912	0.00011	0.00004	3.96394	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.68806	0.00002	0.00001	0.69022	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : SJ 35 Prop Plan CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:29:15
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	631889	130342	221221	67676	7413	6200	8833	2791	684	671	386	7218	30622	1115950
VMT/1000	19168	4222	7090	2283	271	227	462	459	36	28	48	84	251	34629
Trips	3917850	795129	1344520	409120	215628	150971	279851	16671	22014	2685	1545	722	61238	7217950
Total Organic Gas Emissions														
Run Exh	0.58	0.16	0.47	0.19	0.01	0.01	0.05	0.15	0	0.01	0.02	0	0.84	2.51
Idle Exh	0	0	0	0	0.01	0.01	0.01	0.04	0	0	0	0	0	0.07
Start Ex	0.19	0.05	0.17	0.07	0.04	0.02	0.04	0.01	0.01	0	0	0	0.15	0.75
Total Ex	0.78	0.22	0.64	0.26	0.06	0.04	0.09	0.2	0.01	0.01	0.02	0	1	3.33
Diurnal	0.09	0.03	0.1	0.03	0	0	0	0	0	0	0	0	0.05	0.31
Hot Soak	0.28	0.08	0.18	0.06	0.01	0	0	0	0	0	0	0	0.02	0.63
Running	0.83	0.32	0.71	0.22	0.07	0.04	0.03	0	0	0	0	0	0.08	2.3
Resting	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0.03	0.26
Total	2.05	0.67	1.73	0.61	0.13	0.08	0.12	0.2	0.01	0.01	0.03	0	1.17	6.82
Carbon Monoxide Emissions														
Run Exh	12.35	3.46	9.16	3.86	0.11	0.12	0.56	0.72	0.05	0.09	0.11	0.02	5.11	35.73
Idle Exh	0	0	0	0	0.05	0.03	0.04	0.22	0	0.01	0	0	0	0.36
Start Ex	3.34	0.89	2.55	1.12	0.52	0.31	0.56	0.14	0.09	0.01	0.01	0	0.74	10.3
Total Ex	15.69	4.36	11.71	4.98	0.68	0.46	1.17	1.08	0.14	0.11	0.13	0.03	5.85	46.39
Oxides of Nitrogen Emissions														
Run Exh	0.87	0.25	0.73	0.27	0.08	0.1	0.47	1.16	0.04	0.14	0.45	0.03	0.3	4.89
Idle Exh	0	0	0	0	0	0.01	0.06	0.62	0	0.03	0	0	0	0.72
Start Ex	0.15	0.04	0.15	0.06	0.27	0.15	0.07	0.02	0.01	0	0	0	0.02	0.95
Total Ex	1.02	0.29	0.88	0.34	0.36	0.26	0.6	1.8	0.05	0.16	0.45	0.03	0.33	6.56
Carbon Dioxide Emissions (000)														
Run Exh	11.14	3.09	5.32	2.33	0.26	0.19	0.69	0.92	0.05	0.04	0.1	0.07	0.05	24.27
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.3	0.08	0.13	0.06	0.01	0.01	0	0	0	0	0	0	0	0.59
Total Ex	11.44	3.17	5.45	2.38	0.28	0.2	0.7	0.95	0.05	0.05	0.1	0.07	0.05	24.9
PM10 Emissions														
Run Exh	0.47	0.13	0.48	0.16	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.37
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0.06
Total Ex	0.5	0.13	0.5	0.17	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.44
TireWear	0.17	0.04	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0.32
BrakeWr	0.27	0.06	0.1	0.03	0	0	0.01	0.01	0	0	0	0	0	0.49
Total	0.93	0.23	0.66	0.22	0.01	0.01	0.06	0.08	0	0.01	0.01	0	0.01	2.24
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.11	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0.24
Fuel Consumption (000 gallons)														
Gasoline	1174.27	325.31	559.9	244.88	25.27	15.1	6.91	0.4	0.56	0.28	1.39	5.92	6.68	2366.85
Diesel	0.01	0.16	0.01	0.02	2.69	4.97	56.97	85.54	4.35	3.85	7.47	1.16	0	167.2

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 Prop Plan CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	631,889	19,168,322	11,443.55	3,711.96	7,731.59	10.00%	773.16	6,958.43	2.19
LDT1	130,342	4,221,710	3,171.93	991.36	2,180.57	10.00%	218.06	1,962.51	0.62
LDT2	221,221	7,089,662	5,448.96	1,226.39	4,222.57	10.00%	422.26	3,800.32	1.20
MDV	67,676	2,283,183	2,383.60	532.90	1,850.70	10.00%	185.07	1,665.63	0.52
Total	**1,051,128**	**32,762,877**	**22,448.04**	**6,462.61**	**15,985.43**	**10.00%**	**1,598.54**	**14,386.89**	**4.53**

2035 Prop Plan Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**5.30077**	**0.00015**	**0.00005**	**5.32018**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	4.52889	0.00013	0.00005	4.54589	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.77187	0.00002	0.00001	0.77429	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : 2035 SJ S7
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2011/03/09 14:46:37
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	635702	131040	222506	68273	7479	6254	8948	2623	693	667	384	7243	30790	1122600
VMT/1000	19305	4250	7138	2306	274	229	468	433	36	28	47	85	253	34853
Trips	3941610	799632	1352350	412747	218498	152600	283747	15323	22158	2669	1536	725	61573	7265170
Total Organic Gas Emissions														
Run Exh	0.56	0.16	0.45	0.18	0.01	0.01	0.05	0.14	0	0.01	0.02	0	0.83	2.44
Idle Exh	0	0	0	0	0.01	0.01	0.01	0.04	0	0	0	0	0	0.07
Start Ex	0.19	0.05	0.17	0.07	0.04	0.02	0.04	0.01	0.01	0	0	0	0.16	0.75
Total Ex	0.75	0.21	0.62	0.26	0.06	0.04	0.09	0.19	0.01	0.01	0.02	0	0.99	3.26
Diurnal	0.09	0.03	0.1	0.03	0	0	0	0	0	0	0	0	0.05	0.31
Hot Soak	0.28	0.08	0.19	0.06	0.01	0	0	0	0	0	0	0	0.02	0.63
Running	0.83	0.32	0.72	0.22	0.07	0.04	0.03	0	0	0	0	0	0.08	2.31
Resting	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0.03	0.26
Total	2.04	0.67	1.72	0.6	0.14	0.08	0.12	0.19	0.01	0.01	0.02	0	1.17	6.77
Carbon Monoxide Emissions														
Run Exh	12.36	3.46	9.17	3.87	0.11	0.12	0.57	0.65	0.05	0.09	0.11	0.02	5.1	35.7
Idle Exh	0	0	0	0	0.05	0.03	0.04	0.21	0	0.01	0	0	0	0.35
Start Ex	3.36	0.9	2.57	1.13	0.53	0.31	0.57	0.11	0.08	0.01	0.02	0	0.74	10.35
Total Ex	15.72	4.36	11.74	5.01	0.69	0.46	1.19	0.98	0.13	0.12	0.13	0.03	5.84	46.4
Oxides of Nitrogen Emissions														
Run Exh	0.87	0.25	0.72	0.27	0.08	0.1	0.47	1.09	0.04	0.13	0.39	0.03	0.31	4.76
Idle Exh	0	0	0	0	0	0.01	0.06	0.59	0	0.03	0	0	0	0.69
Start Ex	0.15	0.04	0.15	0.06	0.28	0.15	0.08	0.01	0.01	0	0	0	0.02	0.96
Total Ex	1.02	0.29	0.88	0.34	0.36	0.26	0.6	1.69	0.06	0.16	0.39	0.03	0.33	6.4
Carbon Dioxide Emissions (000)														
Run Exh	10.93	3.03	5.22	2.29	0.27	0.2	0.7	0.87	0.05	0.04	0.09	0.07	0.05	23.81
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.3	0.08	0.13	0.06	0.01	0.01	0	0	0	0	0	0	0	0.59
Total Ex	11.23	3.11	5.35	2.35	0.28	0.2	0.71	0.9	0.05	0.05	0.09	0.07	0.05	24.44
PM10 Emissions														
Run Exh	0.45	0.12	0.46	0.16	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.32
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0.06
Total Ex	0.48	0.13	0.48	0.17	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.38
TireWear	0.17	0.04	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0.32
BrakeWr	0.27	0.06	0.1	0.03	0	0	0.01	0.01	0	0	0	0	0	0.49
Total	0.92	0.22	0.64	0.22	0.01	0.01	0.06	0.07	0	0.01	0.01	0	0.01	2.19
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.11	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0.24
Fuel Consumption (000 gallons)														
Gasoline	1152.24	319.09	549.85	241.23	25.71	15.31	7.06	0.32	0.54	0.29	1.76	5.96	6.66	2326.02
Diesel	0.01	0.08	0	0.01	2.63	4.99	57.65	80.72	4.48	3.81	6.38	1.13	0	161.89

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (2035 SJ S7)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	635,702	19,305,290	11,228.26	3,642.12	7,586.14	10.00%	758.61	6,827.52	2.15
LDT1	131,040	4,250,238	3,110.28	972.36	2,137.92	10.00%	213.79	1,924.13	0.61
LDT2	222,506	7,138,462	5,350.71	1,204.28	4,146.43	10.00%	414.64	3,731.78	1.17
MDV	68,273	2,305,897	2,347.80	524.91	1,822.89	10.00%	182.29	1,640.60	0.52
Total	**1,057,521**	**32,999,887**	**22,037.05**	**6,343.68**	**15,693.37**	**10.00%**	**1,569.34**	**14,124.04**	**4.45**

2035 Scenario 7 Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**5.20259**	**0.00014**	**0.00005**	**5.22164**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	4.44615	0.00012	0.00005	4.46283	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.75645	0.00002	0.00001	0.75881	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Title : 2035 SJ S7A
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2011/03/09 14:49:17
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	635654	131030	222489	68267	7478	6253	8947	2622	693	667	384	7242	30787	1122520
VMT/1000	19304	4250	7138	2306	274	229	468	433	36	28	47	85	253	34850
Trips	3941310	799571	1352250	412716	218481	152588	283725	15322	22156	2669	1536	724	61569	7264610
Total Organic Gas Emissions														
Run Exh	0.56	0.16	0.45	0.18	0.01	0.01	0.05	0.14	0	0.01	0.02	0	0.83	2.44
Idle Exh	0	0	0	0	0.01	0.01	0.01	0.04	0	0	0	0	0	0.07
Start Ex	0.19	0.05	0.17	0.07	0.04	0.02	0.04	0.01	0.01	0	0	0	0.16	0.75
Total Ex	0.75	0.21	0.62	0.26	0.06	0.04	0.09	0.19	0.01	0.01	0.02	0	0.99	3.26
Diurnal	0.09	0.03	0.1	0.03	0	0	0	0	0	0	0	0	0.05	0.31
Hot Soak	0.28	0.08	0.19	0.06	0.01	0	0	0	0	0	0	0	0.02	0.63
Running	0.83	0.32	0.72	0.22	0.07	0.04	0.03	0	0	0	0	0	0.08	2.31
Resting	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0.03	0.26
Total	2.04	0.67	1.72	0.6	0.14	0.08	0.12	0.19	0.01	0.01	0.02	0	1.17	6.77
Carbon Monoxide Emissions														
Run Exh	12.36	3.46	9.17	3.87	0.11	0.12	0.57	0.65	0.05	0.09	0.11	0.02	5.1	35.7
Idle Exh	0	0	0	0	0.05	0.03	0.04	0.21	0	0.01	0	0	0	0.35
Start Ex	3.36	0.9	2.57	1.13	0.53	0.31	0.57	0.11	0.08	0.01	0.02	0	0.74	10.35
Total Ex	15.72	4.36	11.74	5.01	0.69	0.46	1.19	0.98	0.13	0.12	0.13	0.03	5.84	46.4
Oxides of Nitrogen Emissions														
Run Exh	0.87	0.25	0.72	0.27	0.08	0.1	0.47	1.09	0.04	0.13	0.39	0.03	0.31	4.76
Idle Exh	0	0	0	0	0	0.01	0.06	0.59	0	0.03	0	0	0	0.69
Start Ex	0.15	0.04	0.15	0.06	0.28	0.15	0.08	0.01	0.01	0	0	0	0.02	0.96
Total Ex	1.02	0.29	0.88	0.34	0.36	0.26	0.6	1.69	0.06	0.16	0.39	0.03	0.33	6.4
Carbon Dioxide Emissions (000)														
Run Exh	10.93	3.03	5.22	2.29	0.27	0.2	0.7	0.87	0.05	0.04	0.09	0.07	0.05	23.82
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.3	0.08	0.13	0.06	0.01	0.01	0	0	0	0	0	0	0	0.59
Total Ex	11.23	3.11	5.35	2.35	0.28	0.2	0.71	0.9	0.05	0.05	0.09	0.07	0.05	24.45
PM10 Emissions														
Run Exh	0.45	0.12	0.46	0.16	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.32
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0.06
Total Ex	0.48	0.13	0.48	0.17	0.01	0	0.05	0.04	0	0.01	0.01	0	0.01	1.38
TireWear	0.17	0.04	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0.32
BrakeWr	0.27	0.06	0.1	0.03	0	0	0.01	0.01	0	0	0	0	0	0.49
Total	0.92	0.22	0.64	0.22	0.01	0.01	0.06	0.07	0	0.01	0.01	0	0.01	2.2
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.11	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0.24
Fuel Consumption (000 gallons)														
Gasoline	1152.66	319.2	550.05	241.32	25.71	15.31	7.06	0.32	0.54	0.29	1.76	5.96	6.66	2326.84
Diesel	0.01	0.08	0	0.01	2.63	4.99	57.65	80.72	4.48	3.81	6.38	1.13	0	161.88

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (2035 SJ S7A)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	635,654	19,303,812	11,232.35	3,643.45	7,588.90	10.00%	758.89	6,830.01	2.15
LDT1	131,030	4,249,914	3,111.41	972.71	2,138.69	10.00%	213.87	1,924.82	0.61
LDT2	222,489	7,137,919	5,352.65	1,204.72	4,147.93	10.00%	414.79	3,733.14	1.18
MDV	68,267	2,305,721	2,348.66	525.10	1,823.56	10.00%	182.36	1,641.20	0.52
Total	**1,057,440**	**32,997,366**	**22,045.07**	**6,345.99**	**15,699.08**	**10.00%**	**1,569.91**	**14,129.18**	**4.45**

2035 Scenario 7A Ann GHG

Annual GHG Emissions	(Million Metric Tons / Year)	CO2	CH4	N2O	CO2e	Notes
On-Road Vehicles		**5.20484**	**0.00014**	**0.00005**	**5.22389**	
	(LDA, LDT1, LDT2, MDV after Pavley 1 and LCFS)	4.44777	0.00012	0.00005	4.46446	convert using BAAQMD EI Table B (gas); equiv per BAAQMD EI Table A
	Other On-Road Vehicles (MDT, HDDT, Buses, MC)	0.75707	0.00002	0.00001	0.75944	(CSV * 1000 -pp prior reductions, tpd)*347*0.9072; convert using BAAQMD EI Table B (diesel); equiv per BAAQMD EI Table A

Santa Clara County GHG Emissions (metric tons/year) for Selected Off-Road Equipment Classes
(Based on Default County-Level OFFROAD2007 Outputs)

		2008				2020				2035			
Cat No	Equipment Class	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
1	Lawn and Garden Equipment	26,242	46	18	32,835	29,191	43	19	35,895	33,297	48	21	40,886
2	Construction Equipment	335,770	53	2	337,583	400,598	29	2	401,963	482,180	21	3	483,531
3	Industrial Equipment	325,397	193	21	335,809	407,910	101	19	415,789	564,082	123	23	573,714
4	Light Commercial Equipment	56,043	52	15	61,702	66,995	60	18	73,855	83,963	92	26	93,815
5	Agricultural Equipment	35,538	6	0	35,809	33,462	2	0	33,644	31,109	1	0	31,285
6	Airport Ground Support Equipment	11,484	3	1	11,894	13,555	1	1	13,872	16,637	1	1	17,001
7	Pleasure Craft	18,187	10	4	19,771	24,910	8	5	26,557	38,012	10	6	40,165
	TOTALS	808,663	362	62	835,403	976,621	244	64	1,001,575	1,249,281	297	80	1,280,397

Santa Clara County & City of San Jose Population and Employment Forecasts
(Source: ABAG, 2009 Projections)

		Calendar Year										
Entity	Parameter	1980	1990	2000	2005	*2008*	2010	2015	2020	2025	2030	2035
County	Population	1,295,073	1,497,577	1,682,585	1,763,000	*1,798,400*	1,822,000	1,945,300	2,063,100	2,185,800	2,310,800	2,431,400
County	Households	458,914	520,180	565,863	595,700	*606,680*	614,000	653,810	696,530	739,820	785,090	827,330
County	Jobs	702,922	890,930	1,044,130	872,860	*892,906*	906,270	981,230	1,071,980	1,177,520	1,292,490	1,412,620
City of San Jose	Population	629,442	782,224	894,943	943,300	*965,920*	981,000	1,063,600	1,137,700	1,219,500	1,299,700	1,380,900
City of San Jose	Households	209,905	250,211	276,598	293,930	*300,656*	305,140	330,390	356,470	382,900	409,640	435,110
City of San Jose	Jobs	281,737	319,090	417,500	348,960	*361,284*	369,500	425,100	493,060	562,350	633,700	708,980
Cnty/City	Population	2.06	1.91	1.88	1.87	*1.86*	1.86	1.83	1.81	1.79	1.78	1.76
Cnty/City	Households	2.19	2.08	2.05	2.03	*2.02*	2.01	1.98	1.95	1.93	1.92	1.90
Cnty/City	Jobs	2.49	2.79	2.50	2.50	*2.47*	2.45	2.31	2.17	2.09	2.04	1.99
County Service Population (Popn + Jobs):		1,997,995	2,388,507	2,726,715	2,635,860	*2,691,306*	2,728,270	2,926,530	3,135,080	3,363,320	3,603,290	3,844,020

City of San Jose General Plan Population and Employment Forecasts by Plan Alternative

Parameter	2008 Baseline	2020 Plan	2020 No Proj	2035 Plan	2035 No Proj
Population	985,307	1,093,492	1,047,115	1,313,811	1,197,868
Households	309,350	357,350	342,194	429,350	391,461
Jobs	369,450	557,450	471,670	839,450	625,000
Service Population (Popn + Jobs)	1,354,757	1,650,942	1,518,785	2,153,261	1,822,868

Scaling Ratios to Estimate Off-Road Equipment City of San Jose Emissions from Santa Clara County Emissions

Cat No	Equipment Class	Method	2008 Baseline	2020 Plan	2020 No Proj	2035 Plan	2035 No Proj
1	Lawn and Garden Equipment	HHs+Jobs	2.21	1.93	2.17	1.77	2.20
2	Construction Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
3	Industrial Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
4	Light Commercial Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
5	Agricultural Equipment	Assumed negligible emissions from this category within City of San Jose					
6	Airport Ground Support Equipment	All GSE in Santa Clara County from San Jose Intl -- used OFFROAD values for 2008, scaled 2020 and 2035 by latest 2027 forecast of air carrier & cargo operations at SJC from 8th EIR Addendum Report					
7	Pleasure Craft	Calculated separately from local boating activity data - OFFROAD not used					

Off-Road Vehicle & Equipment Emissions (metric tons/year) for City of San Jose

		2008 Baseline				2020 Plan				2020 No Project				2035 Plan				2035 No Project			
Method	Equipment Class	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Scaled	Lawn and Garden Equipment	11,879	21	8	14,863	15,100	22	10	18,567	13,434	20	9	16,519	18,861	27	12	23,160	15,110	22	10	18,554
Scaled	Construction Equipment	138,929	22	1	139,679	208,319	15	1	209,028	176,263	13	1	176,863	286,536	12	2	287,338	213,336	9	1	213,934
Scaled	Industrial Equipment	134,637	80	8	138,945	212,121	52	10	216,218	179,480	44	8	182,947	335,206	73	13	340,930	249,573	55	10	253,834
Scaled	Light Commercial Equipment	23,189	22	6	25,530	34,839	31	9	38,406	29,478	26	8	32,496	49,895	55	15	55,750	37,148	41	11	41,508
N/A	Agricultural Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct-SJC	Airport Ground Support Equipment	11,484	3	1	11,894	15,622	3	2	16,179	15,622	3	2	16,179	20,794	5	2	21,536	20,794	5	2	21,536
Direct-RecAct	Pleasure Craft	19,013	12	5	20,663	21,870	7	4	23,329	20,943	7	4	22,340	27,627	7	5	29,175	25,189	6	4	26,601

Santa Clara County
Parks & Recreation Department
Boating Activity 2009

Park Name	Power Boats PB	Personal Watercraft PWC	Non-Power Boats NPB	In City of San Jose
Anderson Lake	8,176	1,272	484	0.50
Calero	4,068	1,476	495	1.00
Chesbro Reservoir				
Coyote Lake	3,118	873	538	
Ed Levin				
Grans				
Hellyer				
Lexington			1,711	
Los Gatos Creek				
Stevens Creek			1,391	
Uvas Canyon				
Vasona				
County Totals	15,362	3,621	4,619	

	PB	PWC	NPB	2009 City Population
SJ City Totals:	**8,156**	**2,112**	**737**	1,006,753

Scenario	City Population	2020 Projected Boating Activity PB	PWC	NPB
General Plan	1,093,492	**8,859**	**2,294**	**800**
No Project	1,047,115	**8,483**	**2,197**	**767**

Scenario	Pop Factor
General Plan	1.086
No Project	1.040

Scenario	City Population	2035 Projected Boating Activity PB	PWC	NPB
General Plan	1,313,811	**10,644**	**2,756**	**962**
No Project	1,197,868	**9,704**	**2,513**	**877**

Scenario	Pop Factor
General Plan	1.305
No Project	1.190

Calculation of Pleasure Craft GHG Emissions (tons/day) by Analysis Year and Scenario Based on OFFROAD Model Emission Factors and Parks & Rec Activity at Selected Lakes

Calendar Year:	**2009**			
Emissions (tpd)	CO2	CH4	N2O	CO2e
PB	53.30024	0.02407	0.01266	
PWC	4.02788	0.01117	0.00101	
NPB	0.09080	0.00008	0.00002	
Totals	**57.41892**	**0.03532**	**0.01369**	62.40352
Metric Tons/Year	19013	12	5	20663

	2020				
Emissions (tpd)		CO2	CH4	N2O	CO2e
General Plan	PB	60.83113	0.01680	0.01165	
	PWC	5.11908	0.00480	0.00107	
	NPB	0.09862	0.00007	0.00002	
	Totals	**66.04884**	**0.02167**	**0.01274**	70.45417
	MT/Year	21870	7	4	23329

Emissions (tpd)		CO2	CH4	N2O	CO2e
No Project	PB	58.25117	0.01609	0.01115	
	PWC	4.90197	0.00460	0.00103	
	NPB	0.09444	0.00006	0.00002	
	Totals	**63.24759**	**0.02075**	**0.01220**	67.46608
	MT/Year	20943	7	4	22340

	2035				
Emissions (tpd)		CO2	CH4	N2O	CO2e
General Plan	PB	77.14221	0.01564	0.01242	
	PWC	6.17369	0.00468	0.00126	
	NPB	0.11849	0.00007	0.00003	
	Totals	**83.43440**	**0.02038**	**0.01370**	88.11064
	MT/Year	27627	7	5	29175

Emissions (tpd)		CO2	CH4	N2O	CO2e
No Project	PB	70.33446	0.01426	0.01132	
	PWC	5.62887	0.00426	0.00115	
	NPB	0.10804	0.00006	0.00002	
	Totals	**76.07136**	**0.01858**	**0.01249**	80.33493
	MT/Year	25189	6	4	26601

Calculation of Passenger Rail GHG Emissions for Travel Through San Jose City

Caltrain:

Diridon North

Activity:	50	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	2.42	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	2,790.6	metric tons/year
Calculated CH4 Emissions:	0.1	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	2,799.3	metric tons/year

Tamien North

Activity:	34	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	4.54	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	3,560.0	metric tons/year
Calculated CH4 Emissions:	0.1	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	3,571.1	metric tons/year

Tamien South

Activity:	6	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	14.91	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	2,063.2	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	2,069.6	metric tons/year

ACE:

Dirdiron

Activity:	6	daily weekday passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	616.7	riders/train	(average weekday)	http://www.vta.org/news/factsheets/ace.pdf
Train Miles in City:	3.27	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	499.4	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	501.0	metric tons/year

Capitol Corridor:

Dirdiron

Activity:	14	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	145	riders/train	(average daily)	http://www.capitolcorridor.org/included/docs/business_plans/09_11_Business_Plan.pdf
Train Miles in City:	3.27	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	384.7	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	385.9	metric tons/year

Greenhouse Gas Inventories Report (2020 & 2035)

sierra research

Technical Report
Greenhouse Gas Inventories
City of San Jose

prepared for:

David J. Powers & Associates, Inc.

Final: December 2010

prepared by:

Sierra Research, Inc.
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(916) 444-6666

Technical Report
Greenhouse Gas Inventories
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1.0 EXECUTIVE SUMMARY

The City of San Jose (City) publishes updates to its Draft General Plan, called Envision San Jose 2040,[1,2*] projecting its future for the period 2010 through 2040. This evolving document describes the preferred alternative for the purpose of evaluating its potential environmental impacts as required by the California Environmental Quality Act (CEQA). The alternative is No Project, which is equivalent to a continuation of previous planning.

The evaluation of potential environmental impacts from implementing Envision San Jose 2040 and alternatives requires discussion of numerous types of environmental impacts, including the quantification of the potential generation of greenhouse gas (GHG) emissions from each alternative. Once the GHG emission levels are determined for the two alternatives, the potential impacts of the different emissions can be discussed in the context of global and regional climate change.

For the largest GHG-emitting activities that occur within cities, this report estimates the GHG emissions expected to be generated within the City for two key future years: 2020 and 2035. The year 2020 is the target date set by the State of California to reduce GHG emissions to the same level that existed in the year 1990. The second key year is 2035, when GHG emissions need to be reduced to a level approximately 40% below the 1990 level if the State is to meet its goal of reducing GHG emissions 80% below the 1990 level by 2050.[3]

As requested by the City, a separate estimate of calendar year 2008 baseline GHG emissions was also developed for the transportation sector.

The method of estimating GHG emissions is described for each of the following largest GHG-emitting activities within the City:

- Electric energy use (including conveyance of raw water and sewage), separated by residential, commercial/industrial, and municipal categories;
- Non-electric energy (natural gas) use for building space heating, separated by residential, commercial/industrial, and municipal categories;
- Combustion and other enterprise process use of energy;
- Leakage of natural gas, perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs);
- Off-road equipment use for construction, industry, lawn and garden care, etc.;
- On-road transportation;
- Other transportation by trains, aircraft, and ships;

* Numeric superscripts refer to citations provided in Section 6.0.

- Solid waste management; and
- Sewage treatment (excluding conveyance).

The resulting GHG emission inventories are summarized in Tables ES-1 and ES-2 for two different methods of accounting for emissions from on-road transportation, as follows: (1) Within City, which accounts for all travel within the City limits, including pass-through travel; and (2) City-Generated, representing travel from all trips generated or produced by City land uses.

The largest category generating GHG emissions for both alternatives in 2020 and 2035, both for Within-City VMT[*] and City-Generated VMT, is that of mobile sources, which consists primarily of on-road vehicles. Mobile sources also include off-road vehicles and equipment such as locomotives, construction and lawn/garden equipment. Generally speaking, across both General Plan alternatives and the two projection years, City-Generated travel activity, represented as daily vehicle miles traveled (VMT), was roughly one fifth higher than Within-City travel. This is because the City-Generated travel includes substantial VMT occurring beyond the City limits (e.g., a commute trip from Oakland to San Jose). Although guidance from the Bay Area Air Quality Management District (BAAQMD) suggests GHG emissions be estimated on a Within-City basis, on-road GHG emissions were estimated both ways in this study because the Within-City approach does not account for all the traffic resulting from City-related land uses. Under both geographic representations, the potential GHG emission increases resulting from VMT increases of 13% to 28% from 2020 to 2035 are generally offset by expected improvements in vehicle fuel economy, and the associated reductions in GHG emissions, from recently adopted vehicle and fuel GHG standards.[†]

The second largest category is commercial/industrial energy use, including both electric energy and natural gas combustion, with the latter being the overwhelmingly dominant type of fuel (i.e., liquefied petroleum gas [LPG] or propane, wood, and other fuels are minor amounts). Commercial and industrial use of energy is combined because of confidentiality rules imposed by the California Public Utilities Commission on PG&E and other utility companies.[‡]

The third largest contributing category is residential energy, including both electric energy and natural gas consumption.

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[*] VMT = vehicle-miles traveled

[†] Pavley I + Low Carbon Fuel Standard

[‡] 15/15 Rule: The 15/15 Rule was adopted by the CPUC in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 rule requires that any aggregated information provided by the Utilities must be made up of at least 15 customers and a single customer's load must be less than 15 percent of an assigned category. If the number of customers in the complied data is below 15, or if a single customer's load is more than 15 percent of the total data, categories must be combined before the information is released. The Rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened once already using the 15/15 Rule, the customer be dropped from the information provided. In addition to the 15/15 Rule, the CPUC further determined that no information about customers with demands above 500 kW should be included in the distributed information.

Table ES-1
Summarized GHG Emission Inventory, 2020 and 2035
Within-City VMT Emissions Only

Category	GHG Emissions ($MMTCO_2e$)[a]			
	2020		2035	
	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
Residential Energy	1.45	1.38	1.74	1.58
Commercial/Industrial Energy	1.74	1.40	2.73	1.88
Municipal/Public/Quasi-public	0.42	0.16	0.93	0.30
Industrial/commercial combustion and other process uses of natural gas	0.71	0.42	1.34	0.63
Leakage of natural gas, PFCs, and HFCs [b]	0.73	0.67	0.95	0.80
Mobile Sources				
- Off-Road Equipment (lawn & garden, construction, industrial, light commercial)	0.48	0.41	0.71	0.53
- Transportation				
- On-Road	3.51	3.41	4.14	3.95
- Off-Road (ships, aircraft, trains)	0.049	0.048	0.060	0.057
Subtotal	4.04	3.87	4.91	4.53
Waste Management				
- Solid Waste Management	0.15	0.14	0.17	0.16
- Sewage treatment	0.40	0.36	0.52	0.44
Subtotal	0.54	0.50	0.69	0.59
Total GHG Emissions	9.62	8.41	13.28	10.32
City of San Jose Service Population	1,650,942	1,518,785	2,153,261	1,822,868
GHG Emission Efficiency (metric tons CO_2e/SP)[c]	5.8	5.5	6.2	5.7

Note: Some sums are rounded.
[a] Million metric tons carbon dioxide equivalent
[b] Perfluorocarbons and hydrofluorocarbons.
[c] Calculated by dividing Total GHG Emissions in $MMTCO_2e$ by City of San Jose Service Population

The GHG emission projections for electric energy use conservatively use the 2008 GHG emissions per unit electric energy provided by PG&E instead of attempting to forecast potential improvements in efficiency that various yet-to-be-implemented regulations may produce by 2020 and 2035. This "business as usual" approach follows the same procedure taken by the Air Resources Board for the statewide GHG emission inventory.[4]

Separately, the City may want to estimate emission reductions that might result from implementation of the state Scoping Plan required by the 2006 Global Warming Solutions Act (Assembly Bill [AB] 32) or imposition of city-derived mitigations yet to be developed.

Table ES-2
Summarized GHG Emission Inventory, 2020 and 2035
City-Generated VMT Emissions Only

Category	GHG Emissions ($MMTCO_2e$)[a]			
	2020		2035	
	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
Residential Energy	1.45	1.38	1.74	1.58
Commercial/Industrial Energy	1.74	1.40	2.73	1.88
Municipal/Public/Quasi-public	0.42	0.16	0.93	0.30
Industrial/commercial combustion and other process uses of natural gas	0.71	0.42	1.34	0.63
Leakage of natural gas, PFCs and HFCs [b]	0.73	0.67	0.95	0.80
Mobile Sources				
- Off-Road Equipment (lawn & garden, construction, industrial, light commercial)	0.48	0.41	0.71	0.53
- Transportation				
- On-Road	4.20	3.86	5.32	4.65
- Off-Road (ships, aircraft, trains)	0.049	0.048	0.060	0.057
Subtotal	4.73	4.32	6.09	5.24
Waste Management				
- Solid Waste Management	0.15	0.14	0.17	0.16
- Sewage treatment	0.40	0.36	0.52	0.44
Subtotal	0.54	0.50	0.69	0.59
Total GHG Emissions	10.31	8,86	14.46	11.02
City of San Jose Service Population	1,650,942	1,518,785	2,153,261	1,822,868
GHG Emission Efficiency (metric tons CO_2e/SP)[c]	6.2	5.8	6.7	6.0

Note: Some sums are rounded.
[a] Million metric tons carbon dioxide equivalent
[b] Perfluorocarbons and hydrofluorocarbons.
[c] Calculated by dividing Total GHG Emissions in $MMTCO_2e$ by City of San Jose Service Population

The approach of applying current levels of resource consumption and efficiency to the 2020 and 2035 projections for all activity categories except on-road transportation is conservative, and internally consistent in avoiding the uncertainties of forecasting without adequate supporting data. Supporting legislation[*] has been enacted and a regulatory modeling tool[†] has been developed for estimating greater fuel economy and the resulting lower emissions from on-road vehicles.

[*] Senate Bill (SB) 375 – Redesigning Communities to Reduce Greenhouse Gases, October 1, 2008.
[†] Pavley I + Low Carbon Fuel Standard Postprocessor, Version I, Air Resources Board *http://www.arb.ca.gov/cc/sb375/tools/pavleylcfs-userguide.pdf*

The BAAQMD calculates GHG emission efficiency as the total annual GHG emissions divided by the service population (defined as the sum of the population and employment), expressed as metric tons of carbon dioxide equivalent (CO_2e) per service population. The District calculated this measure for the year 2020 as a target GHG emission efficiency for planning purposes. That value is 6.6 metric tons CO_2e per service population,[5] found by dividing the total state inventory GHG emission rate of 426,600,000 metric tons CO_2e, by the sum of the state service population. The GHG emission efficiency calculated for the City ranges from a high of 6.7 in 2035 for the Envision San Jose 2040 General Plan and City-Generated VMT to a low of 5.5 in 2020 for the No Project/Existing General Plan alternative and only Within-City VMT. Although GHG emission generation per service population increases between 2020 and 2035 for both alternatives, only the Preferred General Plan alternative in 2035 using the City-generated VMT methodology marginally exceeds the BAAQMD efficiency target of 6.6 metric tons CO_2e/SP. GHG emissions under all other analysis scenarios are comfortably below this BAAQMD threshold.

Finally, Table ES-3 presents a summary of 2008 baseline GHG emissions estimates for the transportation sector, which consists of both on-road vehicles and off-road vehicles (e.g. locomotives, aircraft and boats). Baseline emissions for the transportation sector are shown for both Within City and City Generated on-road travel scenarios. As can be seen, the baseline GHG emissions for the City-Generated scenario are about 6% higher than for the Within-City scenario.

Table ES-3
2008 Baseline Transportation Sector GHG Emission Inventory

	2008 GHG Emissions ($MMTCO_2e$)	
	Within City	City-Generated
On-Road Vehicles	**3.270**	**3.475**
Light-Duty Vehicles[a]	2.808	2.995
Medium- and Heavy-Duty Vehicles	0.462	0.481
Off-Road Vehicles	**0.042**	**0.042**
Locomotives	0.009	0.009
Ships & Boats	0.021	0.021
Commercial Aircraft & Ground Support Equip.	0.012	0.012
Total Transportation Sector GHG Emissions	**3.312**	**3.517**

[a] Includes medium-duty passenger vehicles (commercial medium-duty vehicles represented in row below).

###

2.0 INTRODUCTION

David J. Powers & Associates, Inc. (Powers) contracted with Sierra Research to develop greenhouse gas (GHG) inventories for the City of San Jose projected to the years 2020 and 2035 under the two following growth scenarios, which are also the CEQA alternatives:

- Envision San Jose 2040 General Plan/Preferred Alternative; and
- Existing General Plan/ No Project Alternative.

The year 2020 is selected for the first projected inventory because it corresponds to the year that the State of California has targeted for reaching the goal of reducing GHG emissions to the same level as in 1990. The second key year is 2035, when GHG emissions need to be reduced to a level approximately 40% below the 1990 level if the State is to meet its goal of reducing GHG emissions 80% below the 1990 level by 2050.

The first growth scenario is the preferred alternative, based on the Envision San Jose 2040 General Plan, which the City is evolving as a living document (see References 1 and 2). The No Project Alternative is the existing General Plan.

Under a supplemental task, a 2008 baseline GHG inventory was also developed for the City of San Jose for transportation sector sources only, which consists of on-road and off-road vehicles.

Two larger geographic scale GHG emission inventories have been developed by other governmental agencies—one by the state Air Resources Board (ARB) and the other by the Bay Area Air Quality Management District (BAAQMD or District)—that include, but do not separate out, the City of San Jose. The ARB has developed several GHG emission inventories for the entire state, including summarized annual inventories for each of the years 2000 through 2006, a detailed inventory for the baseline year 1990, and a projected inventory for the year 2020. The BAAQMD recently published a GHG emission inventory[6] for Santa Clara County in the year 2007, the six other counties wholly contained within its jurisdiction,[*] and the portions of the other two counties partially contained within its jurisdiction (Solano and Sonoma).

This study used methodologies drawn from Version 1.0 of the Local Government Operations Protocol[7] that has been used by the City of Santa Clara and other cities to

[*] Alameda, Contra Costa, Marin, Napa, San Francisco, and San Mateo.

develop the City government operations inventory, and from recent guidance issued by the BAAQMD on developing GHG inventories.[8]

An important concept in developing the two GHG emission inventories for the City is the extent to which GHG emissions from within and without the City should be included. The BAAQMD provided guidance with the statement that its "greenhouse gas inventory only includes GHGs that are emitted within the Bay Area, as well as GHGs emitted in the production of electricity that is imported to the region. The inventory does not include GHGs associated with other goods or products that are imported into the region."[9] The GHG emissions projected in this report from the City in 2020 and 2035 have been estimated similarly. GHG emissions generated outside of the City but associated with other non-electric energy resources or products imported into the City have not been included. GHG emissions generated outside of the City for on-road travel generated by the City's activities and land uses (e.g., municipal solid waste transfer to a landfill) are included.

The BAAQMD calculated a "target" GHG emission efficiency of 6.6 metric tons CO_2e[*] per service population[†] for the year 2020 in Table 7 of its December 7, 2009 guidance[10] by dividing the total state inventory GHG emission rate of 426,600,000 metric tons CO_2e (or 426.6 million metric tons CO_2e [MMT CO_2e]), by the sum of the state population and employment (called the service population). This efficiency is used as a quantitative goal for city planning to help reduce future GHG emissions and any associated environmental impacts.

The remainder of the report is organized to present the calculation methodologies for each of the GHG emission categories (Section 3.0), show the two citywide GHG emission inventories under each of the two geographic-based definitions of on-road vehicular travel (Section 4.0), discuss conclusions drawn from the two different inventories, two projection years, and two General Plan alternatives (Section 5.0), list the reference documents used in the study (Section 6.0), and provide the various input data used to calculate the GHG emission inventories (Appendix A).

###

[*] CO_2e means the carbon dioxide (CO_2) equivalent emission when accounting for all six GHG categories of CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), and their respective global warming potentials.

[†] Service population is the sum of the resident population and the number of people employed with jobs within city limits.

3.0 METHODOLOGIES

This section describes the methodology used to calculate GHG emissions for each of the following source categories:

- Electric energy;
- Natural gas space heating;
- Combustion and other process use;
- Leakage of natural gas, PFCs, and HFCs;
- On-road transportation;
- Off-road mobile sources;
- Solid waste management; and
- Sewage treatment.

Inventory data for each category are presented in Section 4.0, and the input data used in the inventory calculations are included in Appendix A.

3.1 Electric Energy

The City of San Jose obtains its electric energy from PG&E. PG&E provided the actual annual electric energy use, in kilowatt-hours, during 2008 for the three following community sectors: industrial plus commercial, public (including municipal), and residential. PG&E also calculates the GHG emission intensity for its entire system of generation and importation of electric energy, in units of pounds of carbon dioxide (CO_2) per megawatt hour (MWh), to which the intensities for methane and nitrous oxide emissions were added to account for the emission of all three combustion greenhouse gases. This adjustment amounts to only a 0.094% increase. Three power plants are located within the City: Metcalf Energy Center, Los Esteros Critical Energy Facility, and the Agnews Power Plant. The PG&E data for CO_2 emissions associated with the large (605 MW) Metcalf Energy Center are included in the electric energy category, while the CO_2 emissions associated with the smaller Los Esteros Critical Energy Facility (188 MW) and Agnews Power Plant (28 MW) are included in the use of natural gas for the non-electric energy category.[11] These two categories are separated out by PG&E and shown separately in the next Section 4.0 detailed GHG inventories, but are combined in the Summary Tables ES-1 and ES-2 under the combined category Commercial/Industrial Energy. Because the CO_2e emissions from the Los Esteros Critical Energy Facility are only 3.6% of the CO_2e emissions from the Metcalf Energy Center in 2008, and the PG&E data do not disclose how much electric energy emissions in 2008 might have been

imported from other power plants, no attempt has been made to move the Los Esteros CO_2 emissions from the non-electric energy category to the electric energy category.

For each of the projection years, the City estimated the growth in building floor area (in square feet) of the three following community sectors: (1) industrial; (2) commercial; and (3) municipal/public use. Assuming that the total electric energy used by each of these community sectors is proportional to the building area of each sector, the electric energy that would be used by each sector in each of the two growth alternatives for each projection year was calculated. The amounts of electric energy used by each sector during 2008[*] were adjusted by the change in sector building floor area for each of the two growth alternatives in each of the two projection years. The combined electric energy used by the industrial and commercial sectors was separated into its two parts through use of an independent assessment of the electric energy used by the industrial sector in 2008.[12]

Residential electric energy use was projected for each growth alternative slightly differently, in which the number of single-family detached units and multi-family attached units are projected rather than the total floor area for each of these two types of housing units. Because the number of each type of housing unit is known for 2008, along with the electric energy used by the combined total of those units in 2008, future residential energy use in each scenario is calculated under the conservative assumption of constant electric energy use per housing unit. Any improvement homeowners may make in their use of electric energy (e.g., increased use of compact fluorescent lamps) is not forecasted.

3.2 Natural Gas Building Heating[†]

Similar to electric energy-derived GHG emissions, emissions from natural gas building heating are projected for each growth alternative and projection year in the total of four community sectors (i.e., industrial/office/R&D, commercial, public/quasi-public, and residential). The California mandatory GHG emission reporting regulation provides emission factors for CO_2, methane (CH_4), and nitrous oxide (N_2O) from combustion of natural gas.[13] The amount of natural gas used by each of three of the community sectors (industrial/office/R&D, commercial and public/quasi-public) was calculated by multiplying the building area projected for that sector by the natural gas energy intensity factor for space heating published by the U.S. Department of Energy.[14] The residential use of natural gas for space heating was calculated from the total use of residential natural gas in California[15] on the basis of the ratio of City population to state population, with that methodology containing the implicit assumption that the mix of residences in San Jose has an average natural gas consumption equal to the average for all residences in California.

[*] 2008 is the most recent year for which adequate data on all needed variables are available.
[†] Building heating includes space (air) heating, water heating, and cooking.

3.3 Combustion and Other Process Use

Because processes are diverse throughout the industrial community sector and vary widely in the amount of natural gas used for boilers, furnaces, process heaters, ovens, and other emitting units, the GHG emissions generated by these processes can be most accurately calculated directly from specific emitting unit consumption of fuel taken from natural gas consumption records kept by the individual facilities and by the natural gas supplier, PG&E. PG&E is not allowed to release detailed fuel consumption data for identified individual users. Therefore, an alternate approach was taken using the BAAQMD GHG emission inventory for all of Santa Clara County. That inventory separated these combustion and process uses into the following categories:

- Cement manufacturing plants (i.e., where cement is made by heating limestone with small quantities of other materials, such as clay minerals.);
- Commercial cooking;
- Ozone-depleting substance substitute use and natural gas distribution;
- Reciprocating engines;
- Turbines;
- Natural gas use for major combustion sources;
- Natural gas use for minor combustion sources; and
- Other fuel combustion.

The second and second- and third-to-last categories include natural gas used for building heating of food, space, and water, and therefore are already included in the PG&E data for the City. The natural gas consumed within the City for the variety of non-building heating/process uses, and reported as the category "Industrial/commercial combustion and other process uses of natural gas" in the GHG inventories, was calculated as the difference between the total natural gas supplied to the City for all activity sectors and the natural gas consumed for building heating of the four sectors.

3.4 Leakage of Natural Gas, PFCs, and HFCs

The BAAQMD developed information on the amounts of natural gas, perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs) that leak from pipelines and refrigeration units throughout Santa Clara County in 2007.[6] The county amount was proportioned down to the appropriate amount for the City by the ratio of the City and county service populations.

3.5 On-Road Transportation

On-road vehicle activity forecasts for each scenario (2 projection years × 2 General Plan alternatives) were provided by the City's transportation consultant Fehr and Peers. These on-road vehicle activity estimates were supplied as both total daily VMT (vehicle miles

traveled) and distributions of VMT by 5 mph-wide speed bin for input to ARB's EMFAC2007 vehicle emissions model.

In consultation with Powers, Sierra requested these on-road activity estimates for two distinct geographic representations both to assure consistency with BAAQMD guidance and to better inform the planning process. Each of these geographic on-road vehicle activity representations is described below:

1. Within City* – In accordance with the BAAQMD Plan-Level GHG Inventory Guidance,[8] on-road VMT forecasts were developed for the geographic area entirely within the city boundaries (i.e., city limits). This Within City activity also specifically included VMT from "pass-thru" vehicle trips going through the City, but not starting or ending within the City. In this definition, examples of pass-thru VMT include not just long-haul truck travel, but also travel from vehicle trips modeled to pass through the City but begin and end outside it. Following the BAAQMD guidance, this pass-thru VMT includes only the portion of these external trips traveling on roads within the city limits, not the entire trip.

2. City-Generated† – Prior to the recent release of the BAAQMD guidance, urban area or Plan-level on-road vehicle GHG emission inventories were often calculated on a different basis that represented all vehicle travel produced or attracted by land uses within the area being considered, including portions of travel that occurred beyond the area's geographic boundaries. As a result, separate City-Generated on-road travel estimates were also prepared by Fehr and Peers to represent VMT associated with any vehicle trips generated by City of San Jose land uses. This includes both trips that start and end within the City (Internal-Internal trips), as well as trips that start outside and end within the City (External-Internal trips) or vice versa. VMT from External-Internal (or Internal-External) trips were discounted by 50% to account for the fact that a portion of the GHG emissions of a trip leaving the City or traveling into it from an outside point-of-origin was also related to land use outside the City. Because an Internal-External trip may start or end either many miles from or just outside the city limits, this 50% trip discounting is not the same as truncating trip VMT exactly at the City boundary as done for the Within City VMT described earlier. City-Generated travel also excludes all pass-thru (External-External) VMT, by definition.

Separate estimates of on-road vehicle GHG emissions were calculated for both Within City and City-Generated travel as defined above. Emissions from Within City VMT provide a more consistent basis for comparison of community or Plan-level inventories to the BAAQMD significance threshold (and follow the BAAQMD guidance), although this method attributes VMT that is passing through the City to the City, but yet has no real association with the City. A Bay Area example is VMT from pass-through trips on I-80 in Emeryville from non-Emeryville commuters bound for San Francisco or Oakland that

* Provided by Fehr and Peers as "City Roadway" activity
† Provided by Fehr and Peers as "City Land Use" activity

has no association with Emeryville. Emissions estimated on the basis of City-Generated VMT may provide a better representation of the on-road vehicle activity over which an individual city has jurisdictional responsibility in that they reflect the VMT associated with the land uses in the City. For purposes of CEQA, City-Generated VMT provides a more direct estimate of the impacts attributable to the project.

Table 3-1 summarizes the on-road VMT estimates for San Jose generated by Fehr and Peers by calendar year and General Plan alternative for both the Within City and City-Generated vehicle travel representations defined above.

As shown in Table 3-1, City-Generated VMT is nominally higher than Within-City VMT in the 2008 base year. This difference (between City-Generated and Within-City VMT) increases over time and is larger for the Preferred General Plan alternative than the No Project alternative. The larger difference for the Preferred alternative is the result of greater vehicle trip-producing land use compared to the No Project alternative.

Table 3-1
On-Road Vehicle Travel Forecasts (Daily VMT) by Calendar Year and General Plan Alternative

	2008	2020		2035	
Item	Baseline	Preferred	No Project	Preferred	No Project
Within-City	19,167,864	23,833,672	23,303,397	29,665,932	28,472,812
City-Generated	19,806,977	26,394,500	24,744,721	34,628,903	30,916,900

Tables 3-2 and 3-3 present the distributions of daily VMT by speed bin (as a percentage of total VMT across all bins), analysis year and General Plan alternative for the Within-City and City-Generated travel scenarios, respectively that were provided by Fehr and Peers. In addition to the total VMT estimates, these VMT by speed distributions are the other primary input that was used to calculate on-road vehicle emissions for the General Plan alternatives.

Table 3-2
Distribution of Within-City Travel by Speed Bin (Pct of Daily VMT) for Each Analysis Year and General Plan Alternative

Speed Bin (mph)	2008	2020		2035	
	Baseline	Preferred	No Project	Preferred	No Project
0-7.49	0.55%	4.52%	4.74%	7.86%	8.12%
7.5-12.49	0.89%	3.07%	3.12%	4.92%	4.92%
12.5-17.49	2.53%	4.21%	4.27%	5.61%	5.66%
17.5-22.49	6.32%	7.82%	7.90%	9.08%	9.17%
22.5-27.49	21.53%	21.21%	21.42%	20.94%	21.33%
27.5-32.49	13.56%	13.53%	14.16%	13.50%	14.64%
32.5-37.49	9.23%	9.89%	9.60%	10.45%	9.90%
37.5-42.49	4.84%	5.33%	5.14%	5.73%	5.39%
42.5-47.49	8.45%	6.21%	6.22%	4.33%	4.42%
47.5-52.49	11.04%	7.55%	7.27%	4.61%	4.24%
52.5-57.49	21.07%	16.68%	16.17%	12.98%	12.20%
57.5-62.49	0.00%	0.00%	0.00%	0.00%	0.00%
62.5-67.49	0.00%	0.00%	0.00%	0.00%	0.00%
67.5-72.49	0.00%	0.00%	0.00%	0.00%	0.00%
72.5-77.49	0.00%	0.00%	0.00%	0.00%	0.00%
77.5-82.49	0.00%	0.00%	0.00%	0.00%	0.00%
82.5+	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

As seen in both Tables 3-2 and 3-3, there is generally little difference in the speed distributions between the Preferred and No Project General Plan alternatives for the same analysis year. However, comparisons across the three analysis years show that less high speed travel (e.g., in the 52.5-57.49 mph bin) and more low speed travel (e.g., in the 0-7.49 mph bin) occurs in future years than in the baseline year.

Table 3-3 Distribution of City-Generated Travel by Speed Bin (Pct of Daily VMT) for Each Analysis Year and General Plan Alternative					
Speed Bin (mph)	2008	2020		2035	
	Baseline	Preferred	No Project	Preferred	No Project
0-7.49	1.69%	9.55%	10.56%	15.85%	16.90%
7.5-12.49	1.40%	3.37%	3.65%	4.95%	5.25%
12.5-17.49	2.96%	4.25%	4.53%	5.28%	5.66%
17.5-22.49	6.37%	7.37%	7.16%	8.18%	7.72%
22.5-27.49	20.98%	19.37%	19.58%	18.08%	18.58%
27.5-32.49	12.81%	12.38%	12.60%	12.04%	12.46%
32.5-37.49	9.05%	9.06%	8.79%	9.07%	8.60%
37.5-42.49	5.94%	5.63%	5.41%	5.38%	5.03%
42.5-47.49	8.13%	6.15%	5.78%	4.56%	4.10%
47.5-52.49	10.12%	6.92%	6.59%	4.36%	4.07%
52.5-57.49	20.55%	15.95%	15.35%	12.26%	11.64%
57.5-62.49	0.00%	0.00%	0.00%	0.00%	0.00%
62.5-67.49	0.00%	0.00%	0.00%	0.00%	0.00%
67.5-72.49	0.00%	0.00%	0.00%	0.00%	0.00%
72.5-77.49	0.00%	0.00%	0.00%	0.00%	0.00%
77.5-82.49	0.00%	0.00%	0.00%	0.00%	0.00%
82.5+	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

The EMFAC computer model EMFAC2007 (the most recent version of ARB's vehicle emissions model) was used to estimate carbon dioxide (CO_2) emissions separately for each projection year and scenario. EMFAC2007 estimates the emission rates of motor vehicles for the calendar years 1970 to 2040 operating in California. Emission rates in grams per mile traveled at specified speeds are calculated by the model for reactive organic gases (ROG), carbon monoxide (CO), nitrogen oxides (NOx), particulate matter from combustion, tire wear, and brake wear, lead, sulfur oxides (SOx), and CO_2. Emissions are calculated for passenger cars, eight different classes of trucks, motorcycles, urban and school buses and motor homes. EMFAC can be used to calculate current and future inventories of motor vehicle emissions at the state, county, air district, air basin, or county-within-air-basin level.

EMFAC contains pre-loaded default vehicle activity and fleet characteristics data for each geographic region within California. These default data can be used to estimate a motor vehicle emission inventory in tons/day for a specific geographic area, day, month, or season, and as a function of ambient temperature, relative humidity, vehicle population, mileage accrual, miles of travel, and speeds. The EMFAC default data can easily be modified via a series of input screens within the model's graphical user interface.

To generate CO_2 (and GHG) vehicle emission estimates for the City of San Jose, county-level EMFAC defaults for daily VMT and VMT by speed bin distributions were modified with the city-specific travel data presented earlier in Tables 3-1 through 3-3. For simplicity, the data presented in Tables 3-1 and 3-3 were tabulated on a daily average basis. These data were actually generated for the three separate time-of-day periods employed in the City's travel demand model:

1. AM Peak period (5-9 AM);
2. PM Peak period (3-7 PM); and
3. Off-Peak period (remaining 16 hours).

In performing the city-level EMFAC runs, separate VMT and speed distribution inputs for each of these three daily periods were used. County-level default vehicle population and trip estimates were also modified to city levels and input to the model based on scaled ratios of city to county VMT.

On-road vehicle CO_2 emission estimates for city-level activity were calculated in this manner using the EMFAC2007 model. Since the EMFAC2007 model was released in late 2006, ARB has adopted two statewide regulations that will result in reduced per-mile on-road vehicle fleet emissions:

1. Pavley new vehicle GHG emission standards (covering model years 2009 through 2016 for light-duty and medium-duty passenger vehicles); and

2. Low Carbon Fuel Standard (LCFS), which will reduce the carbon intensity in vehicle fuels (by a minimum of 10% by 2020).

The EMFAC2007 model has not yet been updated to account for reductions in future-year on-road vehicle GHG emissions associated with these adopted regulations (although ARB plans to release an updated version of EMFAC late in 2010). In the interim, ARB released a spreadsheet-based post-processor utility, referred to as the Pavley Post-Processor,[*] that applies the benefits of these regulations to outputs from the EMFAC2007 model for the specific light- and medium-duty vehicle categories affected under these regulations. City-level outputs from EMFAC2007 model were input to the Pavley Post-Processor to account for the effects of these regulations in 2020 and 2035 for each General Plan alternative. A series of spreadsheets were used to generate these outputs by vehicle type (passenger car, light truck, etc.) and fuel type (gas vs. Diesel) and convert the tons per day EMFAC and Pavley Post-Processor CO_2 outputs to metric tons per year. Appendix B contains both EMFAC 2007 and Pavley Post-Processor outputs.

It is important to note that the Pavley and LCFS regulations were collectively estimated to reduce total on-road emissions by approximately 22% in 2020 and 31% in 2035 for the scenarios considered in this analysis.

[*] Pavley I + Low Carbon Fuel Standard Postprocessor, Version I, Air Resources Board *http://www.arb.ca.gov/cc/sb375/tools/pavleylcfs-userguide.pdf.*

On-road vehicle emission estimates for CH_4 and N_2O were calculated from the gasoline and Diesel-fueled CO_2 outputs using relative emission factors for these two gases developed from generalized GHG emission factors by fuel type contained in the BAAQMD GHG Inventory.[16] Finally, the total estimates of GHG emissions were converted to CO_2 equivalents (CO_2e), which weight the contribution of each gas by its relative global warming potential (GWP). The relative GWP weightings used in the BAAQMD GHG Inventory[17] were used to generate the City of San Jose CO_2e emissions for on-road vehicles.

3.6 Off-Road Mobile Sources

Off-road mobile sources consist of two groups:

1. Off-Road Vehicles – aircraft (and related ground support equipment), locomotives, ships and boats; and

2. Off-Road Equipment – lawn and garden equipment (mowers and trimmers), construction equipment (graders, scrapers, dozers, etc.), industrial equipment (forklifts, material handling equipment, etc.), and light commercial equipment (air compressors, pumps, welders, etc.).

GHG emissions within each of these groups were generally calculated using emission factors from ARB's OFFROAD2007 model, which calculates county-level GHG and criteria pollutant emissions for an array of off-road vehicle and equipment categories.

(As recently reported,[18,19] ARB has acknowledged errors in the underlying data and assumptions in its OFFROAD2007 model that all tend toward overstating emissions estimated by the model, particularly for construction and mining equipment. While the agency works toward correcting these errors, the currently available OFFROAD2007 is still the official tool for estimating regional/county-level off-road vehicle and equipment emissions in California. Thus, the GHG emissions based on the OFFROAD2007 model presented for off-road equipment in this report can be considered conservative or overstated estimates of actual GHG emissions.)

The methodologies, data and key assumptions used to calculate off-road vehicle and equipment emissions within each of these two groups are described separately below.

Off-Road Vehicles

Aircraft and Ground Support Equipment (GSE) – In accordance with the GHG inventory guidance from the BAAQMD,[8] commercial and military air travel was not included in the General Plan-level emissions inventory. (BAAQMD's guidance in this area notes that methods to apportion emissions from air travel to community inventories are currently inconsistent and highly speculative.) However, per the BAAQMD guidance GSE emissions were included in this GHG inventory. The Norman Y. Mineta San Jose

International Airport (SJC) is the only commercial airport with GSE activity in the City and Santa Clara County. (All other civilian airports located within the City and Santa Clara County are general aviation facilities and do not use ground support equipment.) These estimates reflect a projection of continued use of Diesel- and gasoline-powered ground service equipment (GSE) through 2035. This represents a conservatively high estimate of future GHG emissions from GSE because the San Jose International Airport Master Plan includes the installation of ground power and battery recharge stations at all gates. Installation of these facilities was recently completed for all existing gates in 2010 and will be part of new infrastructure at any future gates. This will allow airlines to switch from GSE that is Diesel- and gasoline-powered to GSE that is electric-powered.

The OFFROAD2007 model was executed for calendar years 2008, 2020, and 2035 using default equipment fleet characteristics and activity assumptions contained in the model. However, the future year GSE emission projections in the default OFFROAD2007 runs are based on future growth assumptions developed for the model over several years ago that preceded recent changes to the airport master plan for SJC. Instead of the default future activity growth rates for Santa Clara County in the OFFROAD2007 model (which are exclusively from SJC), forecasted GSE activity growth was based on the latest commercial passenger and cargo aircraft operation projections from the San Jose Airport EIR 8th Addendum report[20] published in February 2010. (It was assumed that GSE activity and emissions changes were directly related to changes in projected commercial passenger and cargo aircraft operations.) Table 3-4 compares the relative GSE growth rates (to baseline 2008 activity) between the defaults in OFFROAD2007 and those used for this inventory based on the recent 8th Addendum report.

Table 3-4
Comparison of Future GSE Activity Factors (relative to 2008 Baseline) Between Airport EIR Projections and OFFROAD2007 Defaults

Data Source	2008	2020	2035
SJC Airport EIR 8th Addendum Report[a]	1.00	1.36	1.81
OFFROAD2007 Defaults	1.00	1.18	1.45

[a] SJC Airport EIR operations estimates were provided for calendar years 2008 and 2027. The 2020 and 2035 GSE growth factors were developed from interpolation and extrapolation of these estimates.

The OFFROAD2007 GSE emission estimates for the 2008 baseline were based on the default activity in the model. For the future analysis years (2020 and 2035), the OFFROAD2007 GSE emissions for those years were scaled by the relative differences in the Airport EIR vs. default growth factors presented in Table 3-4 to ensure the future year GSE estimates were consistent with the latest activity projections at SJC.

Locomotives – Locomotive sources within San Jose consist of (1) Caltrain service; (2) Altamont Commuter Express (ACE) service; and (3) Capitol Corridor service. In accordance with the Plan-level GHG inventory guidance from the BAAQMD,[8] emissions from heavy rail (e.g., freight) operations are not included in this GHG inventory. The

BAAQMD guidance notes that heavy rail emissions are operated as part of a large regional system and should therefore be excluded from community-level inventories.

Thus, the Off-Road Vehicle emissions reflected in this inventory are simply those from the three services listed above. City and Powers staff provided estimated miles of track associated with each service within the City as well as daily train trips. These data were combined with a passenger rail CO_2 emission factor of 0.35 lb per passenger mile based on an analysis[21] of several nationwide Diesel passenger rail operations and estimated[22] average ridership levels for each of these three services (ranging from 145 to 617 passengers per train) to estimate GHG emissions in both the 2020 and 2035 calendar years.

A sample calculation is shown below for the Caltrain service from the edge of the city limit to the Diridon station.

50 train trips/day × 0.35 lb CO_2/psngr mile × 398 psngrs/day × 2.42 miles = 16,855 lb CO_2/day
= 2,791 MT CO_2/year

Emission factor ratios for CH_4 and N_2O (relative to CO_2) by fuel type from the BAAQMD GHG inventory were used to calculate the Diesel locomotive emission contributions of these two additional GHG.

Ships and Boats – This category includes both commercial vessels and recreational boats (pleasure craft). Within the City of San Jose, only pleasure crafts have appreciable GHG emissions.* To account for the fact that the OFFROAD2007 model pleasure craft emissions and activity can only be estimated at the county level (for all of Santa Clara County) recreational boating activity data collected by the Santa Clara County Parks and Recreation Department by individual lake/reservoir within the county were used to determine that portion of boating activity (and emissions) within the City of San Jose. The boating activity data were provided for calendar year 2009 on the basis of annual attendance at each of twelve parks within the county and classified as either: (1) power boats (PB); (2) personal watercraft (PWC); or (3) non-power boats† (e.g. sailboats). Of the twelve county parks, two of them were located within San Jose: Anderson Lake and Calero. (Anderson Lake straddles the city boundary; half its activity was assumed to occur within the City.)

Pleasure craft emission factors (in tons per day per vessel) for each of these three classifications were back-calculated from the emissions and vessel populations for Santa Clara County from the OFFROAD2007 model outputs. These emission factors were then multiplied by the 2009 vessel/attendance counts for those parks (or portions) within the

* Boating emissions were not included from the Alviso Marina, which just opened earlier in 2010. No motorized boating activity data for the marina are yet available. However, the number of motorized boats that will launch from this location will be relatively low, given the depth/tidal limits of the South Bay and lack of berths. As shown elsewhere in the report, GHG emissions from all other boating activities within the City of San Jose are extremely small, representing roughly 0.1% of total GHG emissions. Thus, exclusion of emissions from Alviso Marina is not likely to be significant.

† Emissions from non-power boats occur when small motors are used to navigate within a marina or docking/launching area.

City of San Jose. Projected populations for the City of San Jose from 2009 to 2020 and 2035 were then used to generate GHG emission estimates for the 2020 and 2035 analysis years. (No differences in boating activity and emissions were assumed between the Preferred and No Project General Plan alternatives for a given analysis year.)

Off-Road Equipment

Off-road equipment emissions were calculated by scaling emission estimates reflected in the BAAQMD GHG Inventory for Santa Clara County based on ratios of population, households, and employment between the City and County of Santa Clara. Off-road equipment emissions in the BAAQMD GHG Inventory were based on the OFFROAD2007 model. The OFFROAD2007 model was executed for calendar years 2020 and 2035 using default equipment fleet characteristics and activity assumptions contained in the model. The BAAQMD provided a spreadsheet-based mapping scheme to translate OFFROAD model emissions by detailed category into the following sub-categories[*] used by the agency in reporting its county-level GHG emission inventories:

1. Lawn and garden equipment;
2. Construction equipment;
3. Industrial equipment; and
4. Light commercial equipment.

Once the OFFROAD2007 model runs were generated and the category mapping scheme used by the BAAQMD was applied, these County-level emissions were then scaled to City-level estimates for each of the four sub-categories. Table 3-5 shows how these scaling ratios were calculated.

The first six rows of Table 3-5 contain Santa Clara County and City population, household, and employment (jobs) forecasts for 2020 and 2035. The County forecasts were obtained from Association of Bay Area Governments (ABAG) projections prepared in 2009. The City forecasts were provided by San Jose City staff and include separate estimates by both calendar year and General Plan alternative.

The remaining rows in Table 3-5 present the resulting scaling ratios or factors for each of the four off-road equipment categories calculated by dividing County-wide attributes (e.g., jobs) by corresponding City values. In these rows, the "Parameters" column identifies the specific parameter or parameter combination used to generate the scaling factors in the most appropriate manner for each equipment type. For example, lawn and garden equipment emissions were scaled by summing households (HHs) and jobs at the County and City levels.

The scaling factors presented in Table 3-5 were then divided into County-level GHG emissions to produce City-specific GHG emission estimates. The County-to-City scaling factors were applied for each of the four off-road equipment categories developed for

[*] The BAAQMD inventory and the OFFROAD2007 model also include agricultural equipment emissions. However, agricultural equipment emissions within the City of San Jose were assumed to be negligible.

Table 3-5
Development of County-to-City Scaling Factors for Off-Road Equipment Emissions

Entity/Category	Parameter	2008	2020		2035	
		Baseline	Preferred	No Project	Preferred	No Project
County[a]	Population	1,798,400	2,063,100		2,431,400	
	Households	606,680	696,530		827,330	
	Jobs	892,906	1,071,980		1,412,620	
City[b]	Population	985,307	1,093,492	1,047,115	1,313,811	1,197,868
	Households	309,350	357,350	342,194	429,350	391,461
	Jobs	369,450	557,450	471,670	839,450	625,000
Lawn & Garden Equip	HHs+Jobs	2.21	1.93	2.17	1.77	2.20
Construction Equip	Jobs	2.42	1.92	2.27	1.68	2.26
Industrial Equip	Jobs	2.42	1.92	2.27	1.68	2.26
Lt Commercial Equip	Jobs	2.42	1.92	2.27	1.68	2.26

[a] Source: Association of Bay Area Governments (ABAG)
[b] City of San Jose. Table of Service Populations and VMT by speed range, June 7, 2010.

calendar years 2020 and 2035 from the aforementioned OFFROAD model runs. Appendix B also contains supporting calculations for both the offroad equipment and Caltrain passenger rail emissions.

An alternative approach to calculating lawn and garden and construction equipment emissions within the Off-Road Equipment sector was also considered using the URBEMIS model. However, this approach became problematic when trying to match or map the land use category scheme supplied by the City to the categories required for inputting data to URBEMIS. URBEMIS uses estimates of land uses, in dwelling/building units or acreage, to estimate types and amounts of off-road equipment used for sources such as construction. As a result of the difficulty in mapping the land use schemes between the City's database and URBEMIS, and the resulting uncertainty/variation in calculated equipment and emissions, this approach was rejected. It was believed that the scaling approach described above was more defensible.

3.7 Solid Waste Management

One of the important municipal responsibilities of the City is the collection and disposal of residential and commercial solid waste (municipal solid waste, MSW). The

BAAQMD estimated the GHG emissions in 2007* from total Santa Clara County,[23] which were proportioned by service population to estimate the GHG emissions for solid waste management in the City. The total mass of MSW disposed in 2007 and projected to be disposed of in the two planning scenarios for 2020 and 2035 were provided by the City, and used to proportionally estimate the GHG emissions associated with MSW management in the four scenarios. Similar to the methodology used for projecting electric energy use, any improvement residential homeowners and commercial businesses may make in their generation of MSW (e.g., increased recycling of various materials) is not forecasted.

3.8 Sewage Treatment

Besides handling and disposing of MSW, the City builds the necessary infrastructure to transport and treat sewage generated by City residents and workers. The electric energy needed to convey raw water to all four community sectors and convey the sewage generated by the activities of these same sectors to the wastewater treatment plant was included in the calculation of the GHG emissions generated by electric energy usage discussed above in Section 3.1, but not broken out as a separate line item in the GHG emission inventories presented in Section 4.0. The primary and secondary sewage treatment processes and the final discharge of effluent generate the following GHG emissions:

- CH_4 from the incomplete combustion of digester gas in engines;
- Process CH_4 from wastewater treatment lagoons; and
- Process N_2O emissions from discharge of the wastewater treatment plant effluent to surface water (e.g., to south San Francisco Bay).

The CO_2 generated in the wastewater treatment is not included in the calculation of GHG emissions from this category, following BAAQMD guidance,[8] and based on the short-term cycle of CO_2 being captured from the atmosphere by the food chain and released again to the atmosphere by the generation of waste by humans and other animals in the food chain.

The GHG emissions calculated for these three generation processes are proportional to the service population, and the detailed equations, obtained from Local Government Operations Protocol guidance,[24] were used as follows:

- Equation 10.2 was used for the default calculation of CH_4 from the incomplete combustion of digester gas in engines, as found on page 102 of Chapter 10, which was taken from page 8-9 of Chapter 8 in USEPA (2008),[25] as follows:
  - CH_4 emissions (metric tons per year) = P x Digester Gas x F_{CH4} x ρ (CH_4) x (1-DE) x 0.0283 x 365.25 x 10^{-6}

* Although 2008 was the baseline for some parameters, the BAAQMD GHG inventory was developed for 2007.[6]

- P = San Jose population served by the waste water treatment plant using anaerobic digesters
- Digester Gas = volume of digester gas produced (ft^3/person/day) = 1
- F_{CH4} = fraction of CH_4 in biogas = 0.65
- ρ (CH_4) = density of methane (g/m^3) = 662.00
- DE = CH_4 destruction efficiency = 0.99
- 0.0283 = conversion factor from ft^3 to m^3 (m^3/ft^3)
- 365.25 = conversion factor (day/year)
- 10^{-6} = conversion factor from grams to metric tons (metric tons/gram)

- Equation 10.4 was used for the default calculation of process CH_4 from wastewater treatment lagoons, as found on page 103 of Chapter 10, which was taken from page 8-9 of Chapter 8 in USEPA (2008), and from Tchobanoglous et al (2003)[26], as follows:

  - CH_4 emissions (metric tons per year) = P x BOD_5 load x (1-F_p) x Bo x $MCF_{anaerobic}$ x $F_{removed}$ x 365.25 x 10^{-3}
    - P = San Jose population served by lagoons and adjusted for industrial discharge, if applicable
    - BOD_5 load = amount of BOD_5 produced (kg BOD5/person/day) = 0.090
    - F_p = fraction of BOD_5 removed in primary treatment, if present = 0.3[26]
    - Bo = maximum methane-producing capacity for domestic waste water (kg CH_4/kg BOD_5 removed) = 0.6
    - $MCF_{anaerobic}$ = CH_4 correction factor for anaerobic systems = 0.8
    - $F_{removed}$ = fraction of overall lagoon biological oxygen demand (BOD_5) removal performance = 1
    - 365.25 = conversion factor (day/year)
    - 10^{-3} = conversion factor from kg to metric tons (metric tons/kg)

- Equation 10.10 was used for the default calculation of process N_2O emissions from discharge of the treatment plant effluent to surface water as found on page 107 of Chapter 10, which was taken from page 8-14 of Chapter 8 in USEPA (2008),[25] and from Grady et al (1999),[27] as follows:

  - N_4O emissions (metric tons per year) = P x (Total N load – N uptake x BOD_5 load) x $EF_{effluent}$ x 44/28 x (1 – F plant nit/denit) x 365.25 x 10^{-3}
    - P = San Jose population served by waste water treatment plant with effluent discharge and adjusted for industrial discharge, if applicable
    - Total N load[*] = total nitrogen load (kg N/person/day) = 0.026

[*] The default total nitrogen load is derived based on the following default values from Chapter 8, page 8-14 and Table 8.11 in Reference 24: Average US protein intake (41.9 kg/person-year) x default fraction of N in

- N uptake = nitrogen uptake for call growth in aerobic system (kg N/kg BOD_5) = 0.05[27]
- N uptake = nitrogen uptake for call growth in anaerobic system (e.g., lagoon) (kg N/kg BOD_5) = 0.005[27]
- BOD_5 load = amount of BOD_5 produced (kg BOD5/person/day) = 0.090
- $EF_{effluent}$ = emission factor (kg N_2O-N/kg sewage-N produced) = 0.005
- 44/28 = molecular weight ratio of N_2O to N_2
- F plant nit/denit = fraction of nitrogen removed for the centralized waste water treatment plant with nitrification/denitrification = 0.7[27]
- F plant nit/denit = fraction of nitrogen removed for the centralized waste water treatment plant without nitrification/denitrification = 0[27]
- 365.25 = conversion factor (day/year)
- 10^{-3} = conversion factor from kg to metric tons (metric tons/kg)

The GHG emissions from these three processes are combined to give the total GHG emissions associated with sewage treatment, and presented in Section 4.0.

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protein (0.16 kg N/kg protein) x factor for non-consumed protein added to water (1.4)/days per year (365.25) = 0.026 kg N/person/day.

4.0 GREENHOUSE GAS EMISSION INVENTORIES

The GHG emission inventories for each of the two scenarios (Within City and city-Generated) in 2020 and 2035 are shown in Tables 4-1 and 4-2, with the only, but important, difference being that the on-road transportation emissions in Table 4-1 include only GHG emissions from travel occurring within city limits, while Table 4-2 is based on City-generated VMT that includes trip activity that extends beyond the San Jose city limits.

The largest category generating GHG emissions for both alternatives in 2020 and 2035, both for Within-City VMT* and City-Generated VMT, is that of mobile sources, which consists primarily of on-road vehicles. Mobile sources also include off-road vehicles and equipment such as locomotives, and construction and lawn/garden equipment. Generally speaking, across both General Plan alternatives and the two projection years, City-Generated travel activity, represented as daily vehicle miles traveled (VMT), was roughly one-fifth higher than Within-City travel. This is because the City-Generated travel includes substantial VMT occurring beyond the City limits (e.g., a commute trip from Oakland to San Jose). Although guidance from the Bay Area Air Quality Management District (BAAQMD) suggests GHG emissions be estimated on a Within-City basis, on-road GHG emissions were estimated both ways in this study because the Within-City approach does not account for all the traffic resulting from City-related land uses. Under both geographic representations, the potential GHG emission increases resulting from VMT increases of 13% to 28% from 2020 to 2035 are generally offset by expected improvements in vehicle fuel economy, and the associated reductions in GHG emissions, from recently adopted vehicle and fuel GHG standards.

The second largest category is commercial/industrial energy use, including both electric energy and natural gas combustion, with the latter being the overwhelmingly dominant type of fuel (i.e., LPG or propane, wood, and other fuels are minor amounts).

The third largest contributing category is residential energy, including both electric energy and natural gas consumption.

* VMT = vehicle-miles traveled

Table 4-1
GHG Emission Inventory, 2020 and 2035
Within-City VMT Emissions Only

Category	Units	GHG Emissions ($MMTCO_2e$)			
		2020		2035	
		Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
Electric Energy					
- Commercial/Industrial use	$MMTCO_2e$	1.45	1.17	2.27	1.56
- Municipal/public use[a]		0.41	0.16	0.92	0.29
- Residential use		0.65	0.62	0.78	0.71
Electric Energy Subtotal		2.52	1.95	3.97	2.57
Non-Electric Energy Industrial/Commercial/Institutional/Residential					
- Natural gas building heating	$MMTCO_2e$				
- Commercial/Industrial/Office/R&D area		0.29	0.23	0.45	0.31
- Public/Quasi-public		0.0058	0.0023	0.013	0.0041
- Residential use[b,c,d,e,f]		0.80	0.76	0.96	0.87
Natural Gas Building Heating Subtotal		1.09	1.00	1.42	1.119
- Industrial/commercial combustion and other process uses of natural gas[g]		0.71	0.42	1.34	0.63
Leakage of natural gas, PFCs, and HFCs	$MMTCO_2e$	0.73	0.67	0.95	0.80
Mobile Sources					
- Off-Road Equipment (lawn & garden, construction, industrial, light commercial)[h]	$MMTCO_2e$	0.48	0.41	0.71	0.53
- Transportation					
- On-Road [i]		3.51	3.41	4.14	3.95
- Off-Road (ships, aircraft, trains)[j]		0.049	0.048	0.060	0.057
Mobile Source Subtotal		4.04	3.87	4.91	4.53
Waste Management					
- Solid Waste Management[k]	$MMTCO_2e$	0.15	0.14	0.17	0.16
- Sewage treatment[l]		0.40	0.36	0.52	0.44
Waste Management Subtotal		0.54	0.50	0.69	0.59
Total GHG Emissions:		9.62	8.41	13.3	10.3
City of San Jose Service Population	-	1,650,942	1,518,785	2,152,261	1,822,868

Table 4-1 GHG Emission Inventory, 2020 and 2035 Within-City VMT Emissions Only					
		GHG Emissions ($MMTCO_2e$)			
		2020		2035	
Category	Units	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
GHG Emission Efficiency	**(metric tons CO_2e/SP)**	**5.8**	**5.5**	**6.2**	**5.7**

NOTE: This inventory accounts for on-road transportation GHG emissions generated only within city limits. Some sums are rounded.

[a] GHG emissions associated with the transport of water to and throughout a community (e.g., City of San Jose) are included in the emissions reported for electric energy use by the electric utility company (e.g., PG&E for San Jose)..

[b] Natural gas CO_2 emission factor = 53.02 kg/MMBtu = 116.6 lbs/MMBtu = 0.1198 lbs/scf = 0.05445 kg/scf .
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[c] Natural gas CH_4 emission factor = 0.0009 kg/MMBtu = 0.00198 lbs/MMBtu = 2.033E-06 lb/scf = 9.243E-07 kg/scf . (Reference 13, page A-9) CH_4 global warming potential = 21 (Reference 13, page A-4)
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
CH_4 global warming potential = 21.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[d] Natural gas N_2O emission factor = 0.0001 kg/MMBtu = 0.00022 lbs/MMBtu = 2.259E-07 lbs/scf = 1.027E-07 kg/scf. (Reference 13, page A-9, N_2O global warming potential = 310 (Reference 13, page A-4).
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
N_2O global warming potential = 310.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[e] LPG use for residential building heating within the City of San Jose is considered de minimis because residential LPG GHG emissions in Santa Clara County are only 2.6% of the GHG emissions from residential natural gas use, and the overwhelming location for LPG use is in rural Santa Clara County, not the City of San Jose where natural gas is available in all residential areas.

[f] Wood use for residential space heating within the City is excluded as a biogenic emission of GHG, following BAAQMD guidance. (Reference 8, page 2)

[g] Equal to the difference in GHG emissions between those associated with the total natural gas supplied by PG&E to the City and the GHG emissions associated with the natural gas combusted for building heating in all four activity sectors (commercial, industrial, public/quasi-public, and residential).

[h] Scaled by service population from BAAQMD GHG Inventory for Santa Clara County, which was based on OFFROAD2007 model.

[i] Based on Within City VMT and speed distributions combined with EMFAC2007 model and Pavley/LCFS post-processor.

[j] See Locomotive, SanJosePC and SJCGSE sheets in San Jose_TranspEmis_082310 Within City.xls.

[k] Accounts for direct methane emissions from landfilled MSW and alternative daily cover, future emissions from solid waste landfilled in specified year, and other methodological guidance provided by the BAAQMD in Section 1.4 (Waste Sector) on page 6 of "GHG Plan Level Quantification Guidance", April 15, 2010.

[l] GHG emissions to transport raw water and sewage are included in electric energy category to run the water pumps.

Table 4-2
GHG Emission Inventory, 2020 and 2035
City-Generated VMT Emissions Only

Category	Units	GHG Emissions ($MMTCO_2e$)			
		2020		2035	
		Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
Electric Energy					
- Commercial/Industrial use	$MMTCO_2e$	1.45	1.17	2.27	1.56
- Municipal/public use[a]		0.41	0.16	0.92	0.29
- Residential use		0.65	0.62	0.78	0.71
Electric Energy Subtotal		2.52	1.95	3.97	2.57
Non-Electric Energy Industrial/Commercial/Institutional/Residential\					
- Natural gas building heating	$MMTCO_2e$				
- Commercial/Industrial/Office/R&D area		0.29	0.23	0.45	0.31
- Public/Quasi-public		0.0058	0.0023	0.013	0.0041
- Residential use([b,c,d,e,f]		0.80	0.76	0.96	0.87
Natural Gas Building Heating Subtotal		1.09	1.00	1.42	1.19
- Industrial/commercial combustion and other process uses of natural gas[g]		0.71	0.42	1.34	0.63
Leakage of natural gas, PFCs, and HFCs	$MMTCO_2e$	0.73	0.67	0.95	0.80
Mobile Sources					
- Off-Road Equipment (lawn & garden, construction, industrial, light commercial)[h]	$MMTCO_2e$	0.48	0.41	0.71	0.53
- Transportation					
- On-Road [i]		4.20	3.86	5.32	4.65
- Off-Road (ships, aircraft, trains)[j]		0.049	0.048	0.060	0.057
Mobile Source Subtotal		4.73	4.32	6.09	5.24
Waste Management					
- Solid Waste Management[k]	$MMTCO_2e$	0.15	0.14	0.17	0.16
- Sewage treatment[l]		0.40	0.36	0.52	0.44
Waste Management Subtotal		0.54	0.50	0.69	0.59
Total GHG Emissions:		10.3	8.89	14.5	11.0
City of San Jose Service Population	-	1,650,942	1,518,785	2,152,261	1,822,868

Table 4-2 GHG Emission Inventory, 2020 and 2035 City-Generated VMT Emissions Only					
		GHG Emissions ($MMTCO_2e$)			
		2020		2035	
Category	Units	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative	Envision San Jose 2040 General Plan Preferred Alternative	Existing General Plan/ No Project Alternative
GHG Emission Efficiency	**(metric tons CO_2e/SP)**	**6.2**	**5.8**	**6.7**	**6.0**

NOTE: This inventory accounts for on-road transportation GHG emissions generated by the city resident population and employment, whether emitted within city limits or outside. Some sums are rounded.

[a] GHG emissions associated with the transport of water to and throughout a community (e.g., City of San Jose) are included in the emissions reported for electric energy use by the electric utility company (e.g., PG&E for San Jose)..

[b] Natural gas CO_2 emission factor = 53.02 kg/MMBtu = 116.6 lbs/MMBtu = 0.1198 lbs/scf = 0.05445 kg/scf .
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[c] Natural gas CH_4 emission factor = 0.0009 kg/MMBtu = 0.00198 lbs/MMBtu = 2.033E-06 lb/scf = 9.243E-07 kg/scf . (Reference 13, page A-9) CH_4 global warming potential = 21 (Reference 13, page A-4)
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
CH_4 global warming potential = 21.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[d] Natural gas N_2O emission factor = 0.0001 kg/MMBtu = 0.00022 lbs/MMBtu = 2.259E-07 lbs/scf = 1.027E-07 kg/scf. (Reference 13, page A-9, N_2O global warming potential = 310 (Reference 13, page A-4).
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.
N_2O global warming potential = 310.
ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, *http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf*.

[e] LPG use for residential building heating within the City of San Jose is considered de minimis because residential LPG GHG emissions in Santa Clara County are only 2.6% of the GHG emissions from residential natural gas use, and the overwhelming location for LPG use is in rural Santa Clara County, not the City of San Jose where natural gas is available in all residential areas.

[f] Wood use for residential space heating within the City is excluded as a biogenic emission of GHG, following BAAQMD guidance. (Reference 8, page 2)

[g] Equal to the difference in GHG emissions between those associated with the total natural gas supplied by PG&E to the City and the GHG emissions associated with the natural gas combusted for building heating in all four activity sectors (commercial, industrial, public/quasi-public, and residential).

[h] Scaled by service population from BAAQMD GHG Inventory for Santa Clara County, which was based on OFFROAD2007 model.

[i] Based on City-Generated VMT and speed distributions combined with EMFAC2007 model and Pavley/LCFS post-processor.

[j] See Locomotive, SanJosePC and SJCGSE sheets in San Jose_TranspEmis_082310 City Generated.xls.

[k] Accounts for direct methane emissions from landfilled MSW and alternative daily cover, future emissions from solid waste landfilled in specified year, and other methodological guidance provided by the BAAQMD in Section 1.4 (Waste Sector) on page 6 of "GHG Plan Level Quantification Guidance", April 15, 2010.

[l] GHG emissions to transport raw water and sewage are included in electric energy category to run the water pumps.

The BAAQMD calculates GHG emission efficiency as the total annual GHG emissions divided by the service population (defined as the sum of the population and employment), expressed as metric tons of carbon dioxide equivalent (CO_2e) per service population. The District calculated this measure for the year 2020 as a target GHG emission efficiency for planning purposes. That value is 6.6 metric tons CO_2e per service population,[28] found by dividing the total state inventory GHG emission rate of 426,600,000 metric tons CO_2e, by the sum of the state service population. The GHG emission efficiency calculated for the City ranges from a high of 6.7 in 2035 for the Envision San Jose 2040 General Plan and City-Generated VMT to a low of 5.5 in 2020 for the No Project/Existing General Plan alternative and only Within-City VMT. The GHG emission generation per service population increases between 2020 and 2035 for both alternatives, indicating that changes in travel and other uses of fossil fuel-based energy would need to be implemented to consistently achieve the target efficiency.

The 2008 Baseline inventory for the transportation sector as additionally requested by the City is presented in Table 4-3, which shows baseline year emissions under both the Within City and City-Generated scenarios. As shown in Table 4-3, this baseline transportation sector inventory includes both on-road and off-road vehicles.

Table 4-3
2008 Baseline Transportation Sector GHG Emission Inventory

	2008 GHG Emissions ($MMTCO_2e$)	
	Within City	City-Generated
On-Road Vehicles	**3.270**	**3.475**
Light-Duty Vehicles[a]	2.808	2.995
Medium- and Heavy-Duty Vehicles	0.462	0.481
Off-Road Vehicles	**0.042**	**0.042**
Locomotives	0.009	0.009
Ships & Boats	0.021	0.021
Commercial Aircraft & Ground Support Equip.	0.012	0.012
Total Transportation Sector GHG Emissions	**3.312**	**3.517**

[a] Includes medium-duty passenger vehicles (commercial medium-duty vehicles represented in row below).

###

5.0 CONCLUSIONS

Both City of San Jose GHG emission inventories shown in Tables 4-1 and 4-2 (i.e., those based on Within-City and City-Generated on-road travel) have a GHG emission efficiency in the range of 5.5 to 6.7 metric tons CO_2e/SP, depending on the projection year and scenario. This range surrounds the 2020 state "target" efficiency of 6.6 metric tons CO_2e/SP as defined by the BAAQMD. The choice of using the less intensive Within-City inventory would require that the City, and presumably all cities doing similar GHG emission inventories, agrees that the only on-road transportation emissions that should be attributed to a city are those that occur within city limits. This approach logically avoids the problem of double-counting vehicle travel and GHG emissions outside the limits of each city. However, the Within City approach assigns pass-through VMT to a jurisdiction that has no role in generating that VMT (e.g., San Francisco commuter pass-through trips in Emeryville) and does not account for VMT generated by land uses in a City that occurs outside its jurisdiction. For purposes of disclosing a project's impacts to the environment pursuant to CEQA, which is unrelated to jurisdictional boundaries, City-Generated VMT provides a more direct estimate of the impacts attributable to the Project (i.e., General Plan) in that it reflects the VMT associated with the land uses over which the City has jurisdictional responsibility.

The three largest contributing categories to the City's GHG emissions are on-road transportation, commercial/industrial energy use (including electricity generated for these categories), and residential energy use.

Emissions were estimated using different approaches according to the availability of data for each activity sector. On-road transportation category emissions were calculated from a detailed foundation of VMT in the different vehicle classes and speed ranges, while the other GHG emission categories were scaled from the activity level and GHG emissions in earlier years (e.g., 2005, 2007 and 2008), or from ratios of City to Santa Clara County or state-level activity. Both approaches inherently include the uncertainty in the projections of population and employment within the City.

###

6.0 REFERENCES

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4. Air Resources Board (ARB). *Greenhouse Gas Inventory – 2020 Forecast,* http://www.arb.ca.gov/cc/inventory/data/forecast.htm
5. BAAQMD. *California Environmental Quality Act Guidelines Update – Proposed Thresholds of Significance,* Table 7, page 23, December 7, 2009.
6. BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions,* Updated February 2010.
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8. BAAQMD. *GHG Plan Level Quantification Guidance,* April 15, 2010.
9. BAAQMD. *Draft Bay Area 2010 Clean Air Plan,* p. 2-57, http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx.
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11. PG&E. Email to John Baty of the City of San Jose at 4:51 PM on October 26, 2010.
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15. U.S. Energy Information Administration. Natural Gas Consumption by End Use, California, Annual,

http://www.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm and http://www.eia.doe.gov/dnav/ng/hist/n3010ca2a.htm

16. Table B, *Source Inventory of Bay Area Greenhouse Gas Emissions Base Year 2007*, BAAQMD, February 2010.
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18. *http://www.healthycal.org/arb-concedes-error-in-off-road-truck-rule-plans-to-revise-regulation.html/print/*
19. *http://www.sacbee.com/2010/09/01/2996833/california-slump-results-in-lower.html*
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28. BAAQMD. *California Environmental Quality Act Guidelines Update – Proposed Thresholds of Significance*, Table 7, page 23, December 7, 2009.

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APPENDIX A

Input Data Used in Non-Mobile Source Inventory Calculations

Table A-1
Input Information Matrix
Greenhouse Gas Emission Inventories
City of San Jose

Category	Units	1990	2000	2003	2005	2006	2007	2008	2009	2010	Input Metric to Calculate GHG Emissions: 2020 Envision 2040 General Plan	2020 No Project/ Existing General Plan Alternative	2035 Envision 2040 General Plan	2035 No Project/ Existing General Plan Alternative	Notes
City of San Jose (citywide, not just government operations)															
1) Population	Number				941,435 (a)	956,813 (a)	972,190 (b)	985,307 (c)	1,006,846 (a)	1,023,083 (a)	1,093,492 (d)	1,047,115 (d)	1,313,811 (d)	1,197,868 (d)	
2) Employment	Number				349,000 (e)	373,500 (f)	398,000 (e)	369,450 (g)		405,170 (h)	557,450	471,670	839,450	625,000	
Service Population of the City of San Jose					1,290,435	1,330,313	1,370,190	1,354,757		1,428,253	1,650,942	1,518,785	2,153,261	1,822,868	
Population of Santa Clara County[(i)]		1,498,307 (j)	1,686,154 (j)	1,671,012 (j)	1,687,956 (j)	1,707,810 (j)	1,731,958 (j)	1,764,499 (j)	1,784,642 (k)	1,880,870 (l)	2,063,100 (m)		2,431,400 (m)		
Employment in Santa Clara County[(i)]							912,972 (n)				1,071,980 (m)		1,412,620 (m)		
Service Population of Santa Clara County							2,644,930 (n)				3,135,080 (m)		3,844,020 (m)		
Population of California[(o)]	Number		33,994,571	35,251,107	35,795,255	35,979,208		36,580,371 (k)		38,648,090 (i)	44,135,923 (m)		51,753,503 (m)		
3) Electric Energy															
3A) Commercial/Industrial use, PG&E	megawatt hours							3,100,574 (p)			4,966,214	3,997,545	7,764,675	5,343,002	Conservatively assumes the 2008 electric energy use per unit area remains constant for each of these three types of use through 2035.
3A) Municipal/public use, PG&E	megawatt hours							254,242 (p)			1,411,916	550,522	3,148,426	994,941	
3A) Residential use, PG&E	megawatt hours							1,916,298 (c)			2,213,639	2,119,754	2,659,650	2,424,943	
4.) Non-Electric Energy															
4A) Natural gas "building" heating (air, water and food)															
Industrial/Office/R&D area	sq. ft.							63,978,468 (q)			125,799,416 (d)	94,837,914 (d)	218,530,839 (d)	141,127,084 (d)	
Commercial area	sq. ft.							48,989,772 (q)			55,142,728 (d)	50,811,132 (d)	64,372,161 (d)	53,543,171 (d)	
Public/Quasi-public	sq. ft.							652,168 (q)			3,621,768 (d)	1,412,168 (d)	8,076,168 (d)	2,552,168 (d)	
Total:	sq. ft.							113,620,408			184,563,912	147,061,214	290,979,168	197,222,423	
Natural gas use for "building" heating[(r)]	MMBtu										5,555,374	4,426,543	8,758,473	5,936,395	
Natural gas energy intensity for air, water and food ("building") heating in Pacific Region[(s)]	1000Btu/ sq.ft./yr			30.1											
Commercial+Industrial/Office/R&D, PG&E								0.4371			0.700	0.564	1.095	0.753	
Public/Quasi-public, PG&E								0.0613			0.340	0.133	0.759	0.240	
Residential, PG&E								0.6552			0.757	0.725	0.909	0.829	
Subtotal, PG&E								1.154			1.797	1.421	2.763	1.822	
Total Natural Gas Building Heating (bldg area method)											1.092	0.998	1.423	1.188	
4B) Industrial/commercial combustion and other processes											0.705	0.423	1.340	0.634	
4C) Citywide natural gas and refrigerant leakage	$MMTCO_2e$						0.605 (t)				0.729 (u)	0.670 (u)	0.950 (u)	0.805 (u)	
Countywide natural gas and refrigerant leakage	$MMTCO_2e$						1.17 (ap)								
5) Mobile Sources		See Appendix B													
6) Waste Management															
Solid Waste Management (by City)							0.140 (t)								
6A) Total City To landfills	tons MSW						753,749 (w)		649,844 (x)						
6A) Total City Residential diversion	tons MSW						568,713 (w)								
6A) Total City Other diversion	tons MSW						546,741 (w)								
6A) Total City	tons MSW/day						5,958					6,110 (y)		6,823 (y)	
6A) City Total:	tons MSW						1,869,203 (w)	1,932,076 (z)		1,943,659 (aa)	2,001,599 (d)	1,916,708 (d)	2,341,264 (d)	2,134,648 (d)	
Total County of Santa Clara	$MMTCO_2e$						0.271 (ab)								
Sewage Treated	million gal/day				15.25				13.3		89 (ac)	85 (ac)	102 (ac)	93 (ac)	
Stationary CH_4 emissions from incomplete combustion of digester gas [(ad)]	metric tons CH_4/yr							60.3			73.4	67.6	95.8	81.1	
Process CH_4 emissions from wastewater treatment lagoons [(ae)]	metric tons CH_4/yr							14,964			18,235	16,775	23,783	20,134	
Process N_2O emissions with nitrification/denitrification [(af)]	metric tons N_2O/yr							0.0			0.0	0.0	0.0	0.0	Not used at San Jose Water Pollution Treatment Plant.[(ag)]
Process N_2O emissions from effluent discharge [(ah)]	metric tons N_2O/yr							29.8			36.3	33.4	47.4	40.1	
7) Residential Fuel Usage															
Detached housing units	Number							210,730 (ai)			211,776 (ac)	213,772 (ac)	213,344 (ac)	218,335 (ac)	
Attached housing units	Number							98,620 (ai)			145,574 (ac)	128,422 (ac)	216,006 (ac)	173,126 (ac)	
Total housing units	Number						299,000 (e)	309,350 (ai)			357,350	342,194	429,350	391,461	
Natural gas to California residents [(aj)]	million scf	514,507	516,730	497,955	483,699	491,777		489,304			590,368		692,262		2008 use projected to 2020 and 2035 by population.
Natural gas to City of San Jose residents	million scf		0			13,078		13,180			14,627	14,006	17,574	16,023	CA n.g. use proportioned to City by population.
Wood[(ak)]	dry short tons										Excluded as biogenic, following guidance in BAAQMD (2010)[(al)]				
PG&E GHG intensity[(am)]	lbs CO_2/MWh			620	489	456	636	644.1	644.1		644.1	644.1	644.1	644.1	Assumes 2008 intensity is constant through 2035. Intensities before 2008 only account for CO_2 emissions.
8) Agriculture/ Farming	Assumed de minimis within the city limits of San Jose.														

Table A-1
Input Information Matrix
Greenhouse Gas Emission Inventories
City of San Jose

Category	Units	1990	2000	2003	2005	2006	2007	2008	2009	2010	Input Metric to Calculate GHG Emissions				Notes
											2020		2035		
											Envision 2040 General Plan	No Project/ Existing General Plan Alternative	Envision 2040 General Plan	No Project/ Existing General Plan Alternative	

a) City of San Jose website with 2006 calculated as the arithmetic mean of 2005 and 2007 populations, http://www.sanjoseca.gov/planning/data/population/Population_1900_to_2035.xls.
b) City of San Jose, attributed to California Dept of Finance, http://www.sanjoseca.gov/about.asp
c) Assumptions for 2008 San Jose Community GHG Baseline, September 11, 2009, and data needs table updated by DJP&A on August 3, 2010 and emailed at 4:12 PM.
d) Updated Data Needs Table emailed by DJP&A at 4:12 PM on August 3, 2010.
e) Center for the Continuing Study of the California Economy. *Projections of Jobs, Population and Households For the City of San Jose,* Appendix B - A Summary of Results and Methodology, August 2008.
f) Calculated as the arithmetic mean of employment in 2005 and 2007.
g) Envision 2040 General Plan, taken from State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties and the State, 2001-2010 with 2000 Benchmark,* Sacramento, California, May 2010.
h) Email from Nora Monette of DJP&A at 5:55 PM on August 5, 2010, attributed to Table 3.14-2 in ADEIR for the Envision 2040 General Plan, and taken from Association of Bay Area Governments (ABAG), *Projections 2007 Forecasts for the SanFrancisco Bay Area to the Year 2035.*
i) *Table E-1: State/County Population Estimates with Annual Percent Change January 1, 2009 and 2010* , http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2009-10/documents/E-1_2010.xls
j) Google. Population, Estimates of the resident population, http://www.google.com/publicdata?ds=uspopulation&met=population&idim=county:06085&dl=en&hl=en&q=population+of+santa+clara+county
Santa Clara County population in 2007 = 1,805,000 according to BAAQMD (2010). Reference in next footnote.
k) City of Santa Clara. *City of Santa Clara 2010-2035 Draft General Plan* , Table 5.2-1, p. 5-10, March 2010, http://santaclaraca.gov/Modules/ShowDocument.aspx?documentid=2339.
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m) Santa Clara County population projections from Association of Bay Area Governments (via Akoni Danielson at David J. Powers & Associates, Inc.).
n) Google. Population, Estimates of the resident population, http://www.google.com/publicdata?ds=uspopulation&met=population&idim=county:06085&dl=en&hl=en&q=population+of+santa+clara+county
Santa Clara County population in 2007 = 1,805,000 according to BAAQMD (2010). Reference in next footnote.
o) Table 1 - *Annual Estimates of the Population for the United States, Regions, States and Puerto Rico, April 1, 2000 to July 1, 2009* , http://www.census.gov/popest/states/tables/NST-EST2009-01.xls
p) PG&E data for commercial + industrial minus industrial component.
q) City of San Jose land non-residential land use area workbook received from DJP&A in 4:12 PM email on August 3, 2010.
r) Total natural gas to County in 2005 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 199 BAAQMD
Total natural gas to County in 2020 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 259 (2008), p. 6.3.2-
Total natural gas to County in 2035 for residential, commercial, industrial and PG&E's own use (million scf/dy) = 289 1
The multiplying factor of 1.45 for 2035 is based on the BAAQMD's factor for 2030 (i.e., 1.40) plus 0.05, the incremental increase in the factor for each additional 5 years used by the District after 2020.
s) US Department of Energy, Energy Information Agency, Table E7A - Natural Gas Consumption (Btu) amd Energy Intensities by End Use for All Buildings, 2003, http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003excel/e07a.xls.
t) Proportioned by the service populations of the City of San Jose and County of Santa Clara.
u) Proportioned by the service populations of the City in 2007 and in each projected scenario.
v) BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions,* updated February 2010 for natural gas distribution leakage.
w) Provided by City of San Jose via July 19, 2010 email from DJP&A, and checked for applicable year of 2006.
x) California Department of Resources Recycling and Recovery, Disposal Reporting Systen (DRS). *Jurisdiction Disposal By Facility, Disposal during 2008 for San Jose.*
y) Calculated.
z) Residential MSW in Footnote bc citation scaled from 2006 by population; commercial and C&D MSW scaled from 2006 by employment; and city facility, non-franchised haul and additional diversion MSW scaled from 2006 by service population.
aa) R3 Consulting Group. *Needs Assessment for the Integrated Waste Management Zero Waste Strategic Plan Development, Appendix A, Table 2A, page 2-3,* November 3, 2008.
ab) BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions,* updated February 2010 for landfill fugitive sources and combustion sources.
ac) Email from DJPW at 2:30 PM on July 16, 2010.
ad) Default Eq. 10.2 from Ref. "a", Ch. 10, p. 102, which was taken from Ref "aj" Ch. 8, p.8-9.
ae) Default Eq. 10.4 from Ref. "a", Ch. 10, p. 103, which was taken from Ref "aj" Ch.8, p.8-9, and Tchobanogloous et al (2003).
Tchobanogloous, G., F.L. Burton, and H.D. Stensel, *Wastewater Engineering: Treatment and Reuse, 4th Edition, p. 473, 2003.*
af) Eq. 10.7 from Ref. "a", Ch. 10, p. 105, which was taken from Ref "aj" Ch.8, p.8-14.
ag) Email from Akoni Danielsen at David J. Powers & Associates, Inc. at 8:18 AM on June 1, 2010.
ah) Default Eq. 10.10 from Ref. "a", Ch. 10, p. 107, which was taken from Ref "aj" Ch.8, p.8-14, and Grady et al (1999).
Grady, C.P., Jr., G.T. Daigger, and H.C. Lim, *Biological Wastewater Treatment, 2nd Edition, pp. 108-109 and 644, 1999.*
ai) Email from John Baty (City of San Jose) at 8:50 AM on July 27, 2010.
aj) US Energy Information Administration. *Natural Gas Consumption by End Use, California, Annual,* http://www.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm and http://www.eia.doe.gov/dnav/ng/hist/n3010ca2a.htm
ak) Total wood to County in 2005 for residential fireplaces and woodstoves (tons/dy) = 244 BAAQMD
Total wood to County in 2020 for residential fireplaces and woodstoves (tons/dy) = 278 (2008), p. 7.3.2-
Total wood to County in 2035 for residential fireplaces and woodstoves (tons/dy) = 319 1
The multiplying factors of 1.31 and 1.30 fireplaces and woodstoves in 2035, respectively, are estimated to be the BAAQMD's factors for 2030 (i.e., 1.26 and 1.25, respectively) plus 0.05, the incremental increase in the factors for each additional 5 years used by the District after 2025 and 2010, respectively.
al) BAAQMD. *GHG Plan Level Quantification Guidance,* April 15, 2010.
am) PG&E. *GHG data REFERENCE KEY v7*

RATE DATA ANALYSIS: GHG_PHASE1 GAS AND ELECTRIC GHG SUMMARY FOR SAN JOSE

			RESIDENTIAL ELECTRIC ENERGY					COMMMERCIAL					INDUSTRIAL ELECTRIC ENERGY					
TOTCITY	**YEAR**	**CATEGORY**	**AVG MONTHLY USE PER ENTITY (KWH)**	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY (KWH)**	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (KWH)	**TOTAL USE** (KWH)	**CO_2** (metric tonnes)	CLIM USE (KWH)	CLIM(lbs)	1515 RULE
SAN JOSE	2008	NONGOVENT	531	1,916,298,390	557,175	9,486,149	4,970,742	10,987	3,100,573,937	901,510	15,536,115	8,140,924						FAIL
SAN JOSE	2008	(3) COUNTY	2,683	1,336,104	388			16,918	38,789,741	11,278			777,695	37,897,092	11,019			
SAN JOSE	2008	(4) CITY	910	65,167	19			4,480	93,440,362	27,168	35,840	18,780	821,370	66,144,913	19,232			
SAN JOSE	2008	(5) DISTRICT	1,395	16,745	5			19,168	120,594,106	35,063			2,244,553	26,934,641	7,831			

Sector Totals (kW-hr):	1,917,716,406	3,353,398,146		130,976,646
Overall Total (kW-hr):	5,402,091,198			
Sector Totals (MTCO2):	557,587	975,019		38,082
Overall Total (MTCO2):	1,570,688			

RATE DATA ANALYSIS: GHG_PHA

TOTCITY	YEAR	CATEGORY	DA KWH	RESIDENTIAL NATURAL GAS					COMMMERCIAL NATURAL GAS					INDUSTRIAL NATURAL GAS					
				AVG MONTHLY USE PER ENTITY (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	**AVG MONTHLY USE PER ENTITY** (THM)	**TOTAL USE** (THM)	**CO_2** (metric tonnes)	CLIM USE (THM)	CLIM(lbs)	1515 RULE
SAN JOSE	2008	NONGOVENT	855,836,339	41	123,349,836	654,628	489,361	6,579,948	632	82,278,484	436,659	966,407	12,994,309						FAIL
SAN JOSE	2008	(3) COUNTY		371	137,957	732			1,685	1,509,526	8,011				516,737	2,742			
SAN JOSE	2008	(4) CITY		19	689	4			1,110	2,052,044	10,890	45,024	605,393		3,457,437	18,349			
SAN JOSE	2008	(5) DISTRICT	16,546,333	98	1,170	6			1,054	3,347,556	17,766				508,809	2,700			

Sector Totals (kW-hr):
Overall Total (kW-hr):

Sector Totals (MTCO2):
Overall Total (MTCO2):

APPENDIX B

Data Used in Mobile Source Inventory Calculations

Title : SJ 08 Base CR
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:34:03
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-DSL	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	341169	71628	119501	36116	4023	3377	4663	2108	386	385	221	388	4010	16606	604192
VMT/1000	10354	2249	4086	1387	179	118	245	312	21	16	27	5	44	130	19168
Total Organic Gas Emissions															
Run Exh	1.96	0.78	0.73	0.24	0.06	0.09	0.11	0.48	0.01	0.01	0.04	0	0.04	0.46	5.03
Idle Exh	0	0	0	0	0	0	0	0.06	0	0	0	0	0	0	0.07
Start Ex	1.65	0.43	0.57	0.2	0.06	0.08	0.18	0.07	0.02	0	0	0	0	0.1	3.37
Total Ex	3.61	1.22	1.3	0.45	0.13	0.17	0.29	0.61	0.03	0.02	0.04	0	0.04	0.56	8.46
Diurnal	0.33	0.09	0.09	0.02	0	0	0	0	0	0	0	0	0	0.03	0.57
Hot Soak	0.55	0.15	0.14	0.03	0.01	0.01	0.01	0	0	0	0	0	0	0.02	0.93
Running	1.87	0.78	0.74	0.15	0.06	0.1	0.07	0.01	0	0	0	0	0	0.12	3.9
Resting	0.18	0.05	0.05	0.01	0	0	0	0	0	0	0	0	0	0.02	0.31
Total	6.54	2.3	2.32	0.65	0.19	0.29	0.36	0.63	0.03	0.02	0.04	0	0.05	0.76	14.17
Carbon Monoxide Emissions															
Run Exh	38.19	15.29	16.49	5.13	0.62	0.93	1.27	2.47	0.13	0.18	0.22	0.01	1.07	4.56	86.55
Idle Exh	0	0	0	0	0.03	0.02	0.02	0.18	0	0.01	0	0	0	0	0.27
Start Ex	16.24	4.95	6.36	2.07	0.72	0.94	1.89	0.98	0.22	0.02	0.01	0	0.01	0.36	34.75
Total Ex	54.43	20.24	22.85	7.2	1.37	1.89	3.18	3.63	0.35	0.21	0.22	0.01	1.08	4.92	121.57
Oxides of Nitrogen Emissions															
Run Exh	3.51	1.45	2.19	0.8	0.31	0.42	2.5	5.8	0.2	0.18	0.57	0.05	0.15	0.18	18.25
Idle Exh	0	0	0	0	0	0	0.03	0.37	0	0.01	0	0	0	0	0.42
Start Ex	1.07	0.26	0.6	0.21	0.17	0.13	0.15	0.09	0.02	0	0	0	0	0.01	2.72
Total Ex	4.57	1.71	2.79	1	0.48	0.56	2.69	6.26	0.23	0.2	0.57	0.05	0.15	0.19	21.39
Carbon Dioxide Emissions (000)															
Run Exh	4.33	1.15	2.11	0.98	0.17	0.1	0.37	0.6	0.03	0.02	0.07	0.01	0.04	0.02	9.99
Idle Exh	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0.03
Start Ex	0.18	0.04	0.08	0.03	0	0	0	0	0	0	0	0	0	0	0.34
Total Ex	4.5	1.19	2.18	1.01	0.17	0.11	0.38	0.63	0.03	0.03	0.07	0.01	0.04	0.02	10.35
PM10 Emissions															
Run Exh	0.13	0.04	0.11	0.03	0	0.01	0.07	0.21	0	0.01	0.01	0	0	0	0.63
Idle Exh	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0.01
Start Ex	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0.03
Total Ex	0.15	0.04	0.11	0.04	0	0.01	0.07	0.22	0	0.01	0.01	0	0	0.01	0.67
TireWear	0.09	0.02	0.04	0.01	0	0	0	0.01	0	0	0	0	0	0	0.18
BrakeWr	0.14	0.03	0.06	0.02	0	0	0	0.01	0	0	0	0	0	0	0.27
Total	0.38	0.09	0.21	0.07	0.01	0.01	0.08	0.24	0	0.01	0.01	0	0	0.01	1.12
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.04	0.01	0.02	0.01	0	0	0	0.01	0	0	0	0	0	0	0.1
Fuel Consumption (000 gallons)															
Gasoline	469.94	123.16	227.09	104.24	15.13	8.06	3.81	1.63	0.69	0.26	0.32	0	3.25	3.02	960.6
Diesel	0.94	2.15	0.34	0.18	2.49	2.71	31.06	55.44	2.01	2.08	6.32	0.68	0.68	0	106.39

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2008 (SJ 08 Base CR)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	341,170	10,353,638	4,504.63	0.00	4,504.63	0.00%	0.00	4,504.63	1.42
LDT1	71,628	2,249,306	1,191.56	0.00	1,191.56	0.00%	0.00	1,191.56	0.38
LDT2	119,501	4,086,440	2,182.32	0.00	2,182.32	0.00%	0.00	2,182.32	0.69
MDV	36,116	1,386,934	1,007.67	0.00	1,007.67	0.00%	0.00	1,007.67	0.32
Total	**568,414**	**18,076,318**	**8,886.18**	**0.00**	**8,886.18**	**0.00%**	**0.00**	**8,886.18**	**2.80**

Title : SJ 20 No Proj CR
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:36:25
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-DSL	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	421170	87087	147673	44767	1074	4907	4102	5788	2269	460	466	268	4868	20454	744280
VMT/1000	12856	2804	4785	1538	39	184	151	305	382	20	19	33	56	169	23303
Total Organic Gas Emissions															
Run Exh	0.62	0.27	0.4	0.16	0.01	0.02	0.03	0.05	0.2	0.01	0.01	0.03	0.01	0.5	2.31
Idle Exh	0	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.05
Start Ex	0.49	0.17	0.27	0.12	0	0.04	0.03	0.05	0.02	0.01	0	0	0	0.11	1.32
Total Ex	1.11	0.44	0.67	0.28	0.01	0.07	0.06	0.11	0.26	0.02	0.01	0.04	0.01	0.61	3.69
Diurnal	0.19	0.07	0.09	0.02	0	0	0	0	0	0	0	0	0	0.04	0.41
Hot Soak	0.41	0.13	0.18	0.05	0	0	0.01	0	0	0	0	0	0	0.01	0.8
Running	0.85	0.56	0.7	0.19	0	0.06	0.07	0.03	0	0	0	0	0	0.06	2.52
Resting	0.14	0.05	0.07	0.02	0	0	0	0	0	0	0	0	0	0.02	0.29
Total	2.7	1.25	1.71	0.56	0.01	0.13	0.14	0.13	0.27	0.02	0.01	0.04	0.01	0.73	7.72
Carbon Monoxide Emissions															
Run Exh	15.05	6.65	9.76	3.58	0.05	0.19	0.22	0.55	0.96	0.07	0.1	0.14	0.19	3.5	40.97
Idle Exh	0	0	0	0	0	0.03	0.02	0.03	0.18	0	0.01	0	0	0	0.27
Start Ex	6.21	2.27	3.61	1.38	0	0.45	0.38	0.8	0.31	0.18	0.01	0.01	0	0.48	16.11
Total Ex	21.26	8.93	13.38	4.96	0.05	0.66	0.62	1.38	1.45	0.26	0.12	0.15	0.2	3.99	57.35
Oxides of Nitrogen Emissions															
Run Exh	1.22	0.61	1.05	0.4	0.1	0.13	0.19	0.84	1.86	0.09	0.16	0.52	0.08	0.2	7.35
Idle Exh	0	0	0	0	0	0	0.01	0.04	0.48	0	0.02	0	0	0	0.55
Start Ex	0.36	0.12	0.3	0.12	0	0.2	0.12	0.09	0.04	0.02	0	0	0	0.01	1.4
Total Ex	1.58	0.73	1.35	0.52	0.11	0.33	0.32	0.97	2.38	0.12	0.18	0.52	0.08	0.22	9.29
Carbon Dioxide Emissions (000)															
Run Exh	6.02	1.64	2.85	1.25	0.02	0.18	0.13	0.46	0.76	0.03	0.03	0.08	0.05	0.03	13.52
Idle Exh	0	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.03
Start Ex	0.2	0.05	0.09	0.04	0	0.01	0	0	0	0	0	0	0	0	0.4
Total Ex	6.23	1.7	2.95	1.29	0.02	0.18	0.13	0.46	0.79	0.03	0.03	0.08	0.05	0.03	13.95
PM10 Emissions															
Run Exh	0.21	0.06	0.21	0.07	0	0	0	0.04	0.07	0	0.01	0.01	0	0	0.69
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0.04
Total Ex	0.23	0.06	0.22	0.08	0	0	0	0.04	0.07	0	0.01	0.01	0	0	0.74
TireWear	0.11	0.02	0.04	0.01	0	0	0	0	0.01	0	0	0	0	0	0.22
BrakeWr	0.18	0.04	0.07	0.02	0	0	0	0	0.01	0	0	0	0	0	0.33
Total	0.52	0.13	0.33	0.11	0	0.01	0.01	0.05	0.1	0	0.01	0.01	0	0.01	1.28
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.06	0.02	0.03	0.01	0	0	0	0	0.01	0	0	0	0	0	0.13
Fuel Consumption (000 gallons)															
Gasoline	641.26	174.26	303.76	132.58	0	16.65	9.93	4.49	0.55	0.47	0.23	0.7	3.93	4.14	1292.96
Diesel	0.19	0.85	0.1	0.07	2.04	2.04	3.39	37.96	70.59	2.25	2.62	6.42	0.9	0	127.39

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 No Proj CR)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	421,170	12,855,933	6,229.26	1,295.03	4,934.23	10.00%	493.42	4,440.81	1.40
LDT1	87,087	2,804,475	1,696.37	316.29	1,380.08	10.00%	138.01	1,242.07	0.39
LDT2	147,673	4,785,236	2,945.33	386.35	2,558.98	10.00%	255.90	2,303.08	0.72
MDV	44,767	1,538,314	1,287.21	164.83	1,122.39	10.00%	112.24	1,010.15	0.32
Total	**700,698**	**21,983,958**	**12,158.17**	**2,162.49**	**9,995.68**	**10.00%**	**999.57**	**8,996.11**	**2.83**

Title : SJ 20 Prop Plan CR
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:38:47
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-DSL	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-DSL	UB-TOT	MH-DSL	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	430754	89069	151034	45786	5019	1815	4195	5919	2321	471	476	207	274	547	4979	20920	761216
VMT/1000	13148	2868	4894	1573	188	66	154	312	391	21	20	26	34	6	58	173	23834
Total Organic Gas Emissions																	
Run Exh	0.64	0.28	0.41	0.17	0.02	0.01	0.03	0.05	0.21	0.01	0.01	0.02	0.04	0	0.01	0.52	2.39
Idle Exh	0	0	0	0	0.01	0	0	0	0.04	0	0	0	0	0	0	0	0.06
Start Ex	0.51	0.17	0.28	0.12	0.04	0	0.03	0.05	0.02	0.01	0	0	0	0	0	0.11	1.35
Total Ex	1.15	0.45	0.69	0.29	0.07	0.01	0.07	0.11	0.27	0.02	0.01	0.02	0.04	0	0.01	0.63	3.79
Diurnal	0.2	0.07	0.09	0.02	0	0	0	0	0	0	0	0	0	0	0	0.04	0.42
Hot Soak	0.42	0.14	0.18	0.05	0	0	0.01	0	0	0	0	0	0	0	0	0.01	0.82
Running	0.87	0.57	0.72	0.19	0.06	0	0.08	0.03	0	0	0	0	0	0	0	0.06	2.58
Resting	0.14	0.05	0.07	0.02	0	0	0	0	0	0	0	0	0	0	0	0.02	0.3
Total	2.77	1.28	1.75	0.58	0.13	0.01	0.15	0.14	0.27	0.02	0.01	0.02	0.04	0	0.01	0.75	7.91
Carbon Monoxide Emissions																	
Run Exh	15.47	6.84	10.04	3.68	0.19	0.07	0.23	0.56	0.98	0.08	0.1	0.09	0.15	0.01	0.2	3.57	42.09
Idle Exh	0	0	0	0	0.03	0	0.02	0.03	0.19	0	0.01	0	0	0	0	0	0.28
Start Ex	6.35	2.32	3.7	1.41	0.46	0	0.39	0.82	0.32	0.19	0.01	0	0.01	0	0	0.5	16.47
Total Ex	21.83	9.17	13.73	5.09	0.68	0.07	0.63	1.41	1.48	0.26	0.13	0.09	0.16	0.01	0.2	4.07	58.84
Oxides of Nitrogen Emissions																	
Run Exh	1.25	0.62	1.07	0.41	0.14	0.17	0.2	0.86	1.9	0.09	0.17	0.51	0.53	0.04	0.08	0.21	7.52
Idle Exh	0	0	0	0	0	0.01	0.01	0.04	0.49	0	0.02	0	0	0	0	0	0.56
Start Ex	0.37	0.12	0.31	0.12	0.2	0	0.13	0.09	0.04	0.02	0	0	0	0	0	0.01	1.43
Total Ex	1.62	0.75	1.38	0.53	0.34	0.18	0.33	0.99	2.44	0.12	0.19	0.51	0.53	0.04	0.08	0.22	9.52
Carbon Dioxide Emissions (000)																	
Run Exh	6.21	1.7	2.94	1.29	0.18	0.04	0.13	0.47	0.78	0.03	0.03	0.07	0.08	0.01	0.05	0.03	13.92
Idle Exh	0	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0	0.03
Start Ex	0.21	0.05	0.09	0.04	0.01	0	0	0	0	0	0	0	0	0	0	0	0.41
Total Ex	6.42	1.75	3.04	1.33	0.19	0.04	0.14	0.47	0.81	0.03	0.03	0.07	0.08	0.01	0.05	0.03	14.36
PM10 Emissions																	
Run Exh	0.22	0.06	0.21	0.07	0	0	0	0.04	0.07	0	0.01	0.01	0.01	0	0	0	0.71
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0.04
Total Ex	0.23	0.07	0.23	0.08	0	0	0	0.04	0.07	0	0.01	0.01	0.01	0	0	0	0.76
TireWear	0.12	0.03	0.04	0.01	0	0	0	0	0.02	0	0	0	0	0	0	0	0.22
BrakeWr	0.18	0.04	0.07	0.02	0	0	0	0	0.01	0	0	0	0	0	0	0	0.34
Total	0.53	0.13	0.34	0.11	0.01	0	0.01	0.05	0.1	0	0.01	0.01	0.01	0	0	0.01	1.32
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.06	0.02	0.03	0.01	0	0	0	0	0.01	0	0	0	0	0	0	0	0.14
Fuel Consumption (000 gallons)																	
Gasoline	660.76	179.56	313.01	136.61	17.03	0	10.15	4.59	0.57	0.49	0.24	0	0.72	0	4.02	4.24	1331.99
Diesel	0.2	0.87	0.11	0.08	2.08	3.47	3.47	38.82	72.19	2.3	2.68	6.56	6.56	0.92	0.92	0	130.29

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 Prop Plan CR)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	430,754	13,148,475	6,418.88	1,334.50	5,084.38	10.00%	508.44	4,575.94	1.44
LDT1	89,069	2,868,290	1,747.95	325.93	1,422.02	10.00%	142.20	1,279.82	0.40
LDT2	151,034	4,894,126	3,035.02	398.13	2,636.88	10.00%	263.69	2,373.20	0.75
MDV	45,786	1,573,320	1,326.42	169.85	1,156.57	10.00%	115.66	1,040.91	0.33
Total	**716,642**	**22,484,211**	**12,528.26**	**2,228.41**	**10,299.85**	**10.00%**	**1,029.98**	**9,269.86**	**2.92**

Title : SJ 35 No Proj CR
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:41:22
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-DSL	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-DSL	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	519556	107171	181894	55645	6095	2169	5098	7263	2295	430	562	552	318	5935	25178	917561
VMT/1000	15761	3471	5829	1877	223	79	186	380	378	24	29	23	39	69	207	28473
Total Organic Gas Emissions																
Run Exh	0.39	0.11	0.31	0.13	0.01	0.01	0.01	0.04	0.12	0	0	0.01	0.02	0	0.64	1.79
Idle Exh	0	0	0	0	0.01	0	0	0.01	0.04	0	0	0	0	0	0	0.06
Start Ex	0.16	0.04	0.14	0.06	0.03	0	0.02	0.03	0.01	0	0	0	0	0	0.13	0.62
Total Ex	0.54	0.15	0.45	0.19	0.05	0.01	0.03	0.08	0.16	0	0.01	0.01	0.02	0	0.77	2.46
Diurnal	0.07	0.03	0.08	0.03	0	0	0	0	0	0	0	0	0	0	0.04	0.25
Hot Soak	0.23	0.06	0.15	0.05	0.01	0	0	0	0	0	0	0	0	0	0.02	0.52
Running	0.68	0.26	0.59	0.18	0.06	0	0.03	0.02	0	0	0	0	0	0	0.06	1.89
Resting	0.07	0.02	0.08	0.03	0	0	0	0	0	0	0	0	0	0	0.02	0.21
Total	1.59	0.53	1.35	0.47	0.11	0.01	0.06	0.1	0.16	0	0.01	0.01	0.02	0	0.91	5.33
Carbon Monoxide Emissions																
Run Exh	9.7	2.72	7.19	3.03	0.09	0.07	0.1	0.46	0.59	0.03	0.04	0.08	0.09	0.02	4.08	28.18
Idle Exh	0	0	0	0	0.04	0	0.02	0.03	0.18	0	0	0.01	0	0	0	0.3
Start Ex	2.75	0.73	2.1	0.92	0.43	0	0.26	0.46	0.12	0	0.07	0.01	0.01	0	0.61	8.47
Total Ex	12.45	3.45	9.29	3.95	0.56	0.07	0.38	0.96	0.89	0.03	0.11	0.09	0.1	0.02	4.69	36.95
Oxides of Nitrogen Emissions																
Run Exh	0.68	0.2	0.57	0.21	0.07	0.07	0.09	0.38	0.96	0.03	0.03	0.11	0.37	0.02	0.25	3.93
Idle Exh	0	0	0	0	0	0.01	0.01	0.05	0.51	0	0	0.02	0	0	0	0.59
Start Ex	0.12	0.03	0.12	0.05	0.22	0	0.12	0.06	0.01	0	0.01	0	0	0	0.02	0.78
Total Ex	0.8	0.23	0.69	0.26	0.3	0.08	0.21	0.49	1.48	0.03	0.05	0.13	0.37	0.02	0.27	5.3
Carbon Dioxide Emissions (000)																
Run Exh	8.09	2.25	3.86	1.69	0.22	0.05	0.16	0.57	0.76	0.04	0.04	0.04	0.08	0.06	0.04	17.86
Idle Exh	0	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0.03
Start Ex	0.25	0.06	0.11	0.05	0.01	0	0	0	0	0	0	0	0	0	0	0.48
Total Ex	8.34	2.31	3.97	1.74	0.23	0.05	0.17	0.58	0.78	0.04	0.04	0.04	0.08	0.06	0.04	18.37
PM10 Emissions																
Run Exh	0.31	0.08	0.32	0.11	0	0	0	0.04	0.04	0	0	0.01	0.01	0	0	0.93
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.33	0.09	0.33	0.11	0	0	0	0.04	0.04	0	0	0.01	0.01	0	0	0.98
TireWear	0.14	0.03	0.05	0.02	0	0	0	0.01	0.01	0	0	0	0	0	0	0.27
BrakeWr	0.22	0.05	0.08	0.03	0	0	0	0.01	0.01	0	0	0	0	0	0	0.4
Total	0.69	0.17	0.47	0.16	0.01	0	0.01	0.05	0.06	0	0	0.01	0.01	0	0.01	1.64
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.08	0.02	0.04	0.02	0	0	0	0.01	0.01	0	0	0	0	0	0	0.18
Fuel Consumption (000 gallons)																
Gasoline	856.16	237.12	408.17	178.49	20.77	0	12.41	5.68	0.33	0	0.46	0.23	1.14	4.87	5.24	1731.07
Diesel	0.01	0.13	0.01	0.01	2.21	4.09	4.09	46.84	70.34	3.58	3.58	3.17	6.14	0.95	0	137.48

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 No Proj CR)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	519,556	15,760,712	8,341.93	2,705.74	5,636.18	10.00%	563.62	5,072.57	1.60
LDT1	107,171	3,471,202	2,311.82	722.46	1,589.35	10.00%	158.94	1,430.42	0.45
LDT2	181,894	5,829,308	3,971.20	893.76	3,077.44	10.00%	307.74	2,769.70	0.87
MDV	55,645	1,877,295	1,736.88	388.28	1,348.60	10.00%	134.86	1,213.74	0.38
Total	**864,265**	**26,938,517**	**16,361.82**	**4,710.24**	**11,651.58**	**10.00%**	**1,165.16**	**10,486.42**	**3.30**

Title : SJ 35 Prop Plan CR
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:43:54
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-DSL	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	541327	111662	189516	57977	6351	5312	7567	2391	448	586	575	331	6184	26233	956011
VMT/1000	16421	3617	6074	1956	232	194	396	394	25	30	24	41	72	215	29666
Total Organic Gas Emissions															
Run Exh	0.41	0.12	0.33	0.13	0.01	0.01	0.04	0.13	0	0	0.01	0.02	0	0.67	1.88
Idle Exh	0	0	0	0	0.01	0	0.01	0.04	0	0	0	0	0	0	0.06
Start Ex	0.16	0.05	0.14	0.06	0.03	0.02	0.03	0.01	0	0	0	0	0	0.13	0.64
Total Ex	0.57	0.16	0.47	0.19	0.05	0.03	0.08	0.17	0	0.01	0.01	0.02	0	0.8	2.58
Diurnal	0.08	0.03	0.08	0.03	0	0	0	0	0	0	0	0	0	0.05	0.26
Hot Soak	0.24	0.07	0.16	0.05	0.01	0	0	0	0	0	0	0	0	0.02	0.54
Running	0.71	0.27	0.61	0.19	0.06	0.03	0.02	0	0	0	0	0	0	0.07	1.97
Resting	0.07	0.02	0.08	0.03	0	0	0	0	0	0	0	0	0	0.02	0.22
Total	1.67	0.55	1.41	0.49	0.11	0.07	0.1	0.17	0	0.01	0.01	0.02	0	0.95	5.57
Carbon Monoxide Emissions															
Run Exh	10.17	2.85	7.55	3.18	0.1	0.1	0.48	0.61	0.03	0.04	0.08	0.1	0.02	4.23	29.51
Idle Exh	0	0	0	0	0.04	0.03	0.04	0.19	0	0	0.01	0	0	0	0.31
Start Ex	2.87	0.77	2.19	0.96	0.44	0.27	0.48	0.12	0	0.07	0.01	0.01	0	0.63	8.82
Total Ex	13.04	3.62	9.73	4.14	0.58	0.39	1	0.93	0.04	0.12	0.1	0.11	0.02	4.87	38.64
Oxides of Nitrogen Emissions															
Run Exh	0.71	0.21	0.59	0.22	0.07	0.09	0.4	1	0.03	0.03	0.12	0.38	0.02	0.26	4.1
Idle Exh	0	0	0	0	0	0.01	0.05	0.53	0	0	0.02	0	0	0	0.62
Start Ex	0.13	0.04	0.13	0.05	0.23	0.13	0.06	0.01	0	0.01	0	0	0	0.02	0.81
Total Ex	0.84	0.24	0.72	0.28	0.31	0.22	0.51	1.54	0.03	0.05	0.14	0.38	0.03	0.28	5.53
Carbon Dioxide Emissions (000)															
Run Exh	8.51	2.36	4.06	1.78	0.23	0.17	0.59	0.79	0.04	0.05	0.04	0.08	0.06	0.04	18.75
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0.04
Start Ex	0.26	0.07	0.11	0.05	0.01	0	0	0	0	0	0	0	0	0	0.5
Total Ex	8.77	2.43	4.17	1.83	0.24	0.17	0.6	0.82	0.04	0.05	0.04	0.08	0.06	0.04	19.29
PM10 Emissions															
Run Exh	0.33	0.09	0.33	0.12	0	0	0.04	0.04	0	0	0.01	0.01	0	0	0.98
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.35	0.09	0.35	0.12	0.01	0	0.04	0.04	0	0	0.01	0.01	0	0	1.03
TireWear	0.14	0.03	0.05	0.02	0	0	0.01	0.02	0	0	0	0	0	0	0.28
BrakeWr	0.23	0.05	0.08	0.03	0	0	0.01	0.01	0	0	0	0	0	0	0.42
Total	0.72	0.17	0.49	0.17	0.01	0.01	0.05	0.07	0	0	0.01	0.01	0	0.01	1.72
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.08	0.02	0.04	0.02	0	0	0.01	0.01	0	0	0	0	0	0	0.19
Fuel Consumption (000 gallons)															
Gasoline	899.85	249.22	429	187.6	21.65	12.93	5.92	0.34	0	0.48	0.24	1.19	5.07	5.47	1818.96
Diesel	0.01	0.14	0.01	0.01	2.3	4.26	48.8	73.28	3.73	3.73	3.3	6.4	0.99	0	143.24

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 Prop Plan CR)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	541,327	16,421,142	8,767.72	2,843.86	5,923.85	10.00%	592.39	5,331.47	1.68
LDT1	111,662	3,616,658	2,429.83	759.35	1,670.48	10.00%	167.05	1,503.43	0.47
LDT2	189,516	6,073,580	4,173.93	939.39	3,234.55	10.00%	323.45	2,911.09	0.92
MDV	57,977	1,955,960	1,825.57	408.11	1,417.46	10.00%	141.75	1,275.71	0.40
Total	**900,482**	**28,067,340**	**17,197.04**	**4,950.71**	**12,246.33**	**10.00%**	**1,224.63**	**11,021.70**	**3.47**

Title : SJ 08 Base CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 13:40:38
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	352545	74017	123485	37320	4157	3489	4818	2178	399	397	229	4144	17160	624338
VMT/1000	10699	2324	4223	1433	185	121	253	322	22	17	28	46	134	19807
Total Organic Gas Emissions														
Run Exh	2.14	0.85	0.8	0.27	0.06	0.1	0.11	0.5	0.01	0.01	0.04	0.04	0.48	5.42
Idle Exh	0	0	0	0	0	0	0	0.06	0	0	0	0	0	0.07
Start Ex	1.71	0.45	0.59	0.21	0.06	0.08	0.18	0.08	0.02	0	0	0	0.11	3.48
Total Ex	3.85	1.3	1.39	0.48	0.13	0.18	0.3	0.63	0.03	0.02	0.04	0.04	0.59	8.97
Diurnal	0.34	0.1	0.09	0.02	0	0	0	0	0	0	0	0	0.04	0.59
Hot Soak	0.57	0.16	0.15	0.03	0.01	0.01	0.01	0	0	0	0	0	0.02	0.96
Running	1.93	0.8	0.76	0.15	0.06	0.11	0.07	0.02	0	0	0	0	0.12	4.03
Resting	0.18	0.05	0.05	0.01	0	0	0	0	0	0	0	0	0.02	0.32
Total	6.88	2.42	2.44	0.69	0.2	0.3	0.38	0.65	0.03	0.02	0.04	0.05	0.79	14.87
Carbon Monoxide Emissions														
Run Exh	40.16	16.13	17.33	5.39	0.64	0.96	1.31	2.55	0.13	0.19	0.22	1.11	4.73	90.85
Idle Exh	0	0	0	0	0.03	0.02	0.03	0.19	0	0.01	0	0	0	0.28
Start Ex	16.78	5.11	6.57	2.14	0.74	0.98	1.95	1.01	0.22	0.02	0.01	0.01	0.37	35.91
Total Ex	56.95	21.24	23.9	7.53	1.41	1.95	3.29	3.75	0.36	0.21	0.23	1.12	5.1	127.04
Oxides of Nitrogen Emissions														
Run Exh	3.66	1.51	2.29	0.83	0.32	0.43	2.59	5.99	0.21	0.19	0.59	0.15	0.18	18.96
Idle Exh	0	0	0	0	0	0	0.03	0.38	0	0.01	0	0	0	0.44
Start Ex	1.1	0.27	0.62	0.22	0.17	0.14	0.16	0.09	0.03	0	0	0	0.01	2.81
Total Ex	4.76	1.78	2.91	1.05	0.49	0.58	2.78	6.47	0.24	0.2	0.59	0.15	0.2	22.2
Carbon Dioxide Emissions (000)														
Run Exh	4.62	1.23	2.25	1.04	0.17	0.11	0.38	0.63	0.03	0.03	0.08	0.04	0.02	10.62
Idle Exh	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0.03
Start Ex	0.18	0.05	0.08	0.03	0	0	0	0	0	0	0	0	0	0.35
Total Ex	4.8	1.27	2.33	1.08	0.18	0.11	0.39	0.65	0.03	0.03	0.08	0.04	0.02	11
PM10 Emissions														
Run Exh	0.15	0.04	0.12	0.04	0	0.01	0.07	0.22	0	0.01	0.01	0	0.01	0.68
Idle Exh	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0.01
Start Ex	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0.03
Total Ex	0.16	0.05	0.13	0.04	0	0.01	0.07	0.23	0	0.01	0.01	0	0.01	0.72
TireWear	0.09	0.02	0.04	0.01	0	0	0	0.01	0	0	0	0	0	0.19
BrakeWr	0.15	0.03	0.06	0.02	0	0	0	0.01	0	0	0	0	0	0.28
Total	0.4	0.1	0.22	0.07	0.01	0.01	0.08	0.25	0.01	0.01	0.01	0	0.01	1.18
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.05	0.01	0.02	0.01	0	0	0	0.01	0	0	0	0	0	0.11
Fuel Consumption (000 gallons)														
Gasoline	501.11	131.32	242.2	111.2	15.63	8.32	3.94	1.68	0.71	0.27	0.33	3.36	3.15	1023.24
Diesel	0.97	2.22	0.36	0.19	2.57	2.8	32.09	57.29	2.07	2.15	6.53	0.7	0	109.94

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2008 (SJ 08 Base CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	352,545	10,698,867	4,804.82	0.00	4,804.82	0.00%	0.00	4,804.82	1.51
LDT1	74,017	2,324,306	1,270.29	0.00	1,270.29	0.00%	0.00	1,270.29	0.40
LDT2	123,485	4,222,698	2,328.11	0.00	2,328.11	0.00%	0.00	2,328.11	0.73
MDV	37,320	1,433,180	1,075.11	0.00	1,075.11	0.00%	0.00	1,075.11	0.34
Total	**587,367**	**18,679,051**	**9,478.33**	**0.00**	**9,478.33**	**0.00%**	**0.00**	**9,478.33**	**2.98**

Title : SJ 20 No Proj CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:13:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-DSL	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	447219	92474	156807	47536	5210	1884	4356	6146	2410	489	495	284	5169	21719	790313
VMT/1000	13651	2978	5081	1633	195	69	160	324	406	21	21	35	60	179	24745
Total Organic Gas Emissions															
Run Exh	0.76	0.32	0.48	0.2	0.02	0.01	0.03	0.05	0.22	0.01	0.01	0.04	0.01	0.56	2.72
Idle Exh	0	0	0	0	0.01	0	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.52	0.18	0.29	0.12	0.04	0	0.04	0.05	0.02	0.01	0	0	0	0.11	1.4
Total Ex	1.29	0.5	0.77	0.33	0.07	0.01	0.07	0.11	0.28	0.02	0.01	0.04	0.01	0.67	4.17
Diurnal	0.2	0.08	0.09	0.03	0	0	0	0	0	0	0	0	0	0.04	0.44
Hot Soak	0.44	0.14	0.19	0.05	0.01	0	0.01	0	0	0	0	0	0	0.02	0.85
Running	0.9	0.59	0.75	0.2	0.06	0	0.08	0.03	0	0	0	0	0	0.06	2.68
Resting	0.14	0.05	0.07	0.02	0	0	0	0	0	0	0	0	0	0.02	0.31
Total	2.97	1.37	1.88	0.62	0.13	0.01	0.15	0.14	0.29	0.02	0.01	0.04	0.01	0.8	8.46
Carbon Monoxide Emissions															
Run Exh	16.47	7.34	10.69	3.92	0.2	0.07	0.24	0.58	1.02	0.08	0.11	0.15	0.2	3.79	44.78
Idle Exh	0	0	0	0	0.03	0	0.02	0.03	0.19	0	0.01	0	0	0	0.29
Start Ex	6.59	2.41	3.84	1.47	0.47	0	0.4	0.85	0.33	0.19	0.01	0.01	0	0.51	17.1
Total Ex	23.06	9.75	14.53	5.39	0.7	0.07	0.66	1.46	1.54	0.27	0.13	0.16	0.21	4.3	62.17
Oxides of Nitrogen Emissions															
Run Exh	1.34	0.67	1.15	0.44	0.14	0.18	0.21	0.89	1.97	0.1	0.17	0.55	0.08	0.22	7.92
Idle Exh	0	0	0	0	0	0.01	0.01	0.04	0.51	0	0.02	0	0	0	0.58
Start Ex	0.38	0.13	0.32	0.13	0.21	0	0.13	0.1	0.04	0.03	0	0	0	0.01	1.49
Total Ex	1.72	0.8	1.47	0.57	0.35	0.18	0.34	1.03	2.53	0.12	0.19	0.55	0.08	0.23	9.99
Carbon Dioxide Emissions (000)															
Run Exh	6.93	1.89	3.28	1.44	0.19	0.04	0.14	0.49	0.81	0.03	0.03	0.08	0.05	0.03	15.39
Idle Exh	0	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.03
Start Ex	0.22	0.05	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0	0.42
Total Ex	7.15	1.95	3.38	1.48	0.2	0.04	0.14	0.49	0.84	0.03	0.03	0.08	0.05	0.04	15.85
PM10 Emissions															
Run Exh	0.26	0.07	0.25	0.09	0	0	0	0.05	0.07	0	0.01	0.01	0	0	0.83
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0.04
Total Ex	0.28	0.08	0.27	0.09	0	0	0	0.05	0.07	0	0.01	0.01	0	0	0.88
TireWear	0.12	0.03	0.04	0.01	0	0	0	0	0.02	0	0	0	0	0	0.23
BrakeWr	0.19	0.04	0.07	0.02	0	0	0	0	0.01	0	0	0	0	0	0.35
Total	0.59	0.14	0.39	0.13	0.01	0	0.01	0.05	0.1	0	0.01	0.01	0	0.01	1.46
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.07	0.02	0.03	0.01	0	0	0	0	0.01	0	0	0	0	0	0.15
Fuel Consumption (000 gallons)															
Gasoline	735.5	199.88	348.43	152.1	17.68	0	10.54	4.77	0.59	0.5	0.25	0.74	4.18	4.52	1479.67
Diesel	0.21	0.91	0.11	0.08	2.16	3.6	3.6	40.31	74.95	2.39	2.79	6.81	0.95	0	135.27

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 No Proj CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	447,219	13,651,078	7,146.62	1,486.25	5,660.37	10.00%	566.04	5,094.33	1.60
LDT1	92,474	2,977,932	1,945.73	363.04	1,582.69	10.00%	158.27	1,424.42	0.45
LDT2	156,807	5,081,204	3,379.56	443.45	2,936.11	10.00%	293.61	2,642.50	0.83
MDV	47,536	1,633,460	1,477.15	189.23	1,287.92	10.00%	128.79	1,159.13	0.36
Total	**744,035**	**23,343,674**	**13,949.06**	**2,481.97**	**11,467.09**	**10.00%**	**1,146.71**	**10,320.38**	**3.25**

Title : SJ 20 Prop Plan CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:17:29
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	477036	98639	167262	50706	5558	4646	6555	2570	521	528	303	5514	23167	843005
VMT/1000	14561	3176	5420	1742	208	171	346	433	23	22	37	64	191	26394
Total Organic Gas Emissions														
Run Exh	0.84	0.36	0.54	0.22	0.03	0.03	0.06	0.23	0.01	0.01	0.04	0.01	0.61	2.98
Idle Exh	0	0	0	0	0.01	0	0	0.04	0	0	0	0	0	0.06
Start Ex	0.56	0.19	0.31	0.13	0.04	0.04	0.06	0.02	0.01	0	0	0	0.12	1.49
Total Ex	1.4	0.55	0.85	0.36	0.07	0.07	0.12	0.3	0.02	0.01	0.04	0.01	0.73	4.54
Diurnal	0.22	0.08	0.1	0.03	0	0	0	0	0	0	0	0	0.04	0.47
Hot Soak	0.47	0.15	0.2	0.06	0.01	0.01	0	0	0	0	0	0	0.02	0.91
Running	0.96	0.63	0.8	0.21	0.06	0.08	0.03	0.01	0.01	0	0	0	0.06	2.86
Resting	0.15	0.06	0.08	0.02	0	0	0	0	0	0	0	0	0.02	0.33
Total	3.21	1.47	2.02	0.67	0.14	0.16	0.15	0.3	0.03	0.02	0.04	0.01	0.87	9.1
Carbon Monoxide Emissions														
Run Exh	17.79	7.94	11.55	4.23	0.21	0.25	0.62	1.09	0.08	0.11	0.16	0.22	4.05	48.3
Idle Exh	0	0	0	0	0.04	0.02	0.03	0.21	0	0.01	0	0	0	0.31
Start Ex	7.03	2.57	4.09	1.57	0.5	0.43	0.91	0.35	0.21	0.01	0.01	0.01	0.55	18.24
Total Ex	24.82	10.51	15.64	5.8	0.75	0.7	1.56	1.64	0.29	0.14	0.17	0.22	4.6	66.85
Oxides of Nitrogen Emissions														
Run Exh	1.44	0.72	1.24	0.47	0.15	0.22	0.95	2.11	0.1	0.18	0.59	0.09	0.23	8.49
Idle Exh	0	0	0	0	0	0.01	0.04	0.55	0	0.02	0	0	0	0.62
Start Ex	0.41	0.14	0.34	0.14	0.22	0.14	0.1	0.04	0.03	0	0	0	0.02	1.58
Total Ex	1.85	0.86	1.58	0.61	0.38	0.37	1.1	2.7	0.13	0.21	0.59	0.09	0.25	10.7
Carbon Dioxide Emissions (000)														
Run Exh	7.57	2.07	3.59	1.57	0.2	0.15	0.52	0.86	0.03	0.03	0.09	0.05	0.04	16.77
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0.04
Start Ex	0.23	0.06	0.1	0.04	0.01	0	0	0	0	0	0	0	0	0.45
Total Ex	7.8	2.12	3.69	1.61	0.21	0.15	0.53	0.89	0.03	0.04	0.09	0.05	0.04	17.25
PM10 Emissions														
Run Exh	0.29	0.08	0.28	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.92
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.31	0.08	0.3	0.1	0	0	0.05	0.08	0	0.01	0.01	0	0	0.97
TireWear	0.13	0.03	0.05	0.02	0	0	0	0.02	0	0	0	0	0	0.25
BrakeWr	0.2	0.04	0.07	0.02	0	0	0	0.01	0	0	0	0	0	0.37
Total	0.64	0.16	0.42	0.14	0.01	0.01	0.06	0.11	0	0.01	0.01	0	0.01	1.59
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.08	0.02	0.04	0.02	0	0	0.01	0.01	0	0	0	0	0	0.17
Fuel Consumption (000 gallons)														
Gasoline	802.7	218.15	380.27	166.01	18.86	11.24	5.08	0.63	0.54	0.26	0.79	4.46	4.86	1613.86
Diesel	0.22	0.97	0.12	0.08	2.31	3.84	42.99	79.95	2.55	2.97	7.27	1.02	0	144.29

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2020 (SJ 20 Prop Plan CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	477,036	14,561,222	7,800.14	1,622.31	6,177.83	10.00%	617.78	5,560.05	1.75
LDT1	98,639	3,176,476	2,123.53	396.29	1,727.24	10.00%	172.72	1,554.51	0.49
LDT2	167,262	5,419,978	3,688.76	484.07	3,204.69	10.00%	320.47	2,884.22	0.91
MDV	50,706	1,742,367	1,612.34	206.57	1,405.78	10.00%	140.58	1,265.20	0.40
Total	**793,642**	**24,900,043**	**15,224.77**	**2,709.24**	**12,515.54**	**10.00%**	**1,251.55**	**11,263.98**	**3.55**

Title : SJ 35 No Proj CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:26:20
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-DSL	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	564154	116370	197507	60422	6618	5536	7886	2492	611	599	227	345	6444	27339	996324
VMT/1000	17114	3769	6330	2038	242	202	413	410	32	25	28	43	75	224	30917
Total Organic Gas Emissions															
Run Exh	0.5	0.14	0.41	0.16	0.01	0.01	0.04	0.13	0	0.01	0.02	0.02	0	0.74	2.19
Idle Exh	0	0	0	0	0.01	0	0.01	0.04	0	0	0	0	0	0	0.06
Start Ex	0.17	0.05	0.15	0.06	0.03	0.02	0.03	0.01	0	0	0	0	0	0.14	0.67
Total Ex	0.67	0.19	0.56	0.23	0.05	0.04	0.08	0.18	0.01	0.01	0.02	0.02	0	0.88	2.92
Diurnal	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0	0.05	0.27
Hot Soak	0.25	0.07	0.17	0.05	0.01	0	0	0	0	0	0	0	0	0.02	0.56
Running	0.74	0.28	0.64	0.2	0.06	0.03	0.02	0	0	0	0	0	0	0.07	2.05
Resting	0.07	0.02	0.08	0.03	0	0	0	0	0	0	0	0	0	0.02	0.23
Total	1.81	0.59	1.53	0.54	0.12	0.07	0.11	0.18	0.01	0.01	0.02	0.02	0	1.04	6.03
Carbon Monoxide Emissions															
Run Exh	10.89	3.05	8.08	3.4	0.1	0.11	0.5	0.64	0.04	0.08	0.06	0.1	0.02	4.55	31.56
Idle Exh	0	0	0	0	0.04	0.03	0.04	0.2	0	0.01	0	0	0	0	0.32
Start Ex	2.99	0.8	2.28	1	0.46	0.28	0.5	0.13	0.08	0.01	0	0.01	0	0.66	9.2
Total Ex	13.87	3.85	10.35	4.4	0.61	0.41	1.04	0.96	0.12	0.1	0.06	0.11	0.02	5.21	41.08
Oxides of Nitrogen Emissions															
Run Exh	0.77	0.22	0.64	0.24	0.07	0.09	0.42	1.04	0.03	0.12	0.38	0.4	0.03	0.27	4.34
Idle Exh	0	0	0	0	0	0.01	0.05	0.56	0	0.02	0	0	0	0	0.64
Start Ex	0.13	0.04	0.13	0.05	0.24	0.13	0.07	0.01	0.01	0	0	0	0	0.02	0.85
Total Ex	0.9	0.26	0.78	0.3	0.32	0.23	0.53	1.61	0.05	0.15	0.38	0.4	0.03	0.29	5.83
Carbon Dioxide Emissions (000)															
Run Exh	9.71	2.7	4.63	2.03	0.24	0.17	0.62	0.82	0.05	0.04	0.07	0.09	0.06	0.04	21.2
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0.04
Start Ex	0.27	0.07	0.12	0.05	0.01	0.01	0	0	0	0	0	0	0	0	0.53
Total Ex	9.98	2.77	4.75	2.08	0.25	0.18	0.62	0.85	0.05	0.04	0.07	0.09	0.06	0.05	21.76
PM10 Emissions															
Run Exh	0.41	0.11	0.41	0.14	0	0	0.04	0.04	0	0.01	0.01	0.01	0	0	1.18
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0.05
Total Ex	0.43	0.11	0.43	0.15	0.01	0	0.04	0.04	0	0.01	0.01	0.01	0	0.01	1.24
TireWear	0.15	0.03	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0	0.29
BrakeWr	0.24	0.05	0.09	0.03	0	0	0.01	0.01	0	0	0	0	0	0	0.43
Total	0.82	0.2	0.57	0.19	0.01	0.01	0.06	0.07	0	0.01	0.01	0.01	0	0.01	1.96
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.1	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0	0.21
Fuel Consumption (000 gallons)															
Gasoline	1024	283.66	488.24	213.53	22.56	13.48	6.17	0.35	0.5	0.25	0	1.24	5.29	5.91	2065.16
Diesel	0.01	0.15	0.01	0.01	2.4	4.44	50.86	76.37	3.88	3.44	6.67	6.67	1.04	0	149.28

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 No Proj CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	564,154	17,113,600	9,978.79	3,236.80	6,741.99	10.00%	674.20	6,067.79	1.91
LDT1	116,370	3,769,168	2,765.83	864.42	1,901.41	10.00%	190.14	1,711.27	0.54
LDT2	197,507	6,329,693	4,751.30	1,069.36	3,681.94	10.00%	368.19	3,313.74	1.04
MDV	60,422	2,038,440	2,078.35	464.65	1,613.70	10.00%	161.37	1,452.33	0.46
Total	**938,453**	**29,250,901**	**19,574.27**	**5,635.23**	**13,939.04**	**10.00%**	**1,393.90**	**12,545.14**	**3.95**

Title : SJ 35 Prop Plan CL
Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
Run Date : 2010/07/12 14:29:15
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : Santa Clara County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-DSL	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Vehicles	631889	130342	221221	67676	7413	6200	8833	2791	684	671	254	386	7218	30622	1115950
VMT/1000	19168	4222	7090	2283	271	227	462	459	36	28	31	48	84	251	34629
Total Organic Gas Emissions															
Run Exh	0.58	0.16	0.47	0.19	0.01	0.01	0.05	0.15	0	0.01	0.02	0.02	0	0.84	2.51
Idle Exh	0	0	0	0	0.01	0.01	0.01	0.04	0	0	0	0	0	0	0.07
Start Ex	0.19	0.05	0.17	0.07	0.04	0.02	0.04	0.01	0.01	0	0	0	0	0.15	0.75
Total Ex	0.78	0.22	0.64	0.26	0.06	0.04	0.09	0.2	0.01	0.01	0.02	0.02	0	1	3.33
Diurnal	0.09	0.03	0.1	0.03	0	0	0	0	0	0	0	0	0	0.05	0.31
Hot Soak	0.28	0.08	0.18	0.06	0.01	0	0	0	0	0	0	0	0	0.02	0.63
Running	0.83	0.32	0.71	0.22	0.07	0.04	0.03	0	0	0	0	0	0	0.08	2.3
Resting	0.08	0.03	0.09	0.03	0	0	0	0	0	0	0	0	0	0.03	0.26
Total	2.05	0.67	1.73	0.61	0.13	0.08	0.12	0.2	0.01	0.01	0.02	0.03	0	1.17	6.82
Carbon Monoxide Emissions															
Run Exh	12.35	3.46	9.16	3.86	0.11	0.12	0.56	0.72	0.05	0.09	0.07	0.11	0.02	5.11	35.73
Idle Exh	0	0	0	0	0.05	0.03	0.04	0.22	0	0.01	0	0	0	0	0.36
Start Ex	3.34	0.89	2.55	1.12	0.52	0.31	0.56	0.14	0.09	0.01	0	0.01	0	0.74	10.3
Total Ex	15.69	4.36	11.71	4.98	0.68	0.46	1.17	1.08	0.14	0.11	0.07	0.13	0.03	5.85	46.39
Oxides of Nitrogen Emissions															
Run Exh	0.87	0.25	0.73	0.27	0.08	0.1	0.47	1.16	0.04	0.14	0.43	0.45	0.03	0.3	4.89
Idle Exh	0	0	0	0	0	0.01	0.06	0.62	0	0.03	0	0	0	0	0.72
Start Ex	0.15	0.04	0.15	0.06	0.27	0.15	0.07	0.02	0.01	0	0	0	0	0.02	0.95
Total Ex	1.02	0.29	0.88	0.34	0.36	0.26	0.6	1.8	0.05	0.16	0.43	0.45	0.03	0.33	6.56
Carbon Dioxide Emissions (000)															
Run Exh	11.14	3.09	5.32	2.33	0.26	0.19	0.69	0.92	0.05	0.04	0.08	0.1	0.07	0.05	24.27
Idle Exh	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0.04
Start Ex	0.3	0.08	0.13	0.06	0.01	0.01	0	0	0	0	0	0	0	0	0.59
Total Ex	11.44	3.17	5.45	2.38	0.28	0.2	0.7	0.95	0.05	0.05	0.08	0.1	0.07	0.05	24.9
PM10 Emissions															
Run Exh	0.47	0.13	0.48	0.16	0.01	0	0.05	0.04	0	0.01	0.01	0.01	0	0.01	1.37
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.02	0.01	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0.06
Total Ex	0.5	0.13	0.5	0.17	0.01	0	0.05	0.04	0	0.01	0.01	0.01	0	0.01	1.44
TireWear	0.17	0.04	0.06	0.02	0	0	0.01	0.02	0	0	0	0	0	0	0.32
BrakeWr	0.27	0.06	0.1	0.03	0	0	0.01	0.01	0	0	0	0	0	0	0.49
Total	0.93	0.23	0.66	0.22	0.01	0.01	0.06	0.08	0	0.01	0.01	0.01	0	0.01	2.24
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.11	0.03	0.05	0.02	0	0	0.01	0.01	0	0	0	0	0	0	0.24
Fuel Consumption (000 gallons)															
Gasoline	1174.27	325.31	559.9	244.88	25.27	15.1	6.91	0.4	0.56	0.28	0	1.39	5.92	6.68	2366.85
Diesel	0.01	0.16	0.01	0.02	2.69	4.97	56.97	85.54	4.35	3.85	7.47	7.47	1.16	0	167.2

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Santa Clara - 2035 (SJ 35 Prop Plan CL)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	631,889	19,168,322	11,443.55	3,711.96	7,731.59	10.00%	773.16	6,958.43	2.19
LDT1	130,342	4,221,710	3,171.93	991.36	2,180.57	10.00%	218.06	1,962.51	0.62
LDT2	221,221	7,089,662	5,448.96	1,226.39	4,222.57	10.00%	422.26	3,800.32	1.20
MDV	67,676	2,283,183	2,383.60	532.90	1,850.70	10.00%	185.07	1,665.63	0.52
Total	**1,051,128**	**32,762,877**	**22,448.04**	**6,462.61**	**15,985.43**	**10.00%**	**1,598.54**	**14,386.89**	**4.53**

Santa Clara County GHG Emissions (metric tons/year) for Selected Off-Road Equipment Classes
(Based on Default County-Level OFFROAD2007 Outputs)

		2008				2020				2035			
Cat No	Equipment Class	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
1	Lawn and Garden Equipment	26,242	46	18	32,835	29,191	43	19	35,895	33,297	48	21	40,886
2	Construction Equipment	335,770	53	2	337,583	400,598	29	2	401,963	482,180	21	3	483,531
3	Industrial Equipment	325,397	193	21	335,809	407,910	101	19	415,789	564,082	123	23	573,714
4	Light Commercial Equipment	56,043	52	15	61,702	66,995	60	18	73,855	83,963	92	26	93,815
5	Agricultural Equipment	35,538	6	0	35,809	33,462	2	0	33,644	31,109	1	0	31,285
6	Airport Ground Support Equipment	11,484	3	1	11,894	13,555	1	1	13,872	16,637	1	1	17,001
7	Pleasure Craft	18,187	10	4	19,771	24,910	8	5	26,557	38,012	10	6	40,165
	TOTALS	808,663	362	62	835,403	976,621	244	64	1,001,575	1,249,281	297	80	1,280,397

Santa Clara County & City of San Jose Population and Employment Forecasts
(Source: ABAG, 2009 Projections)

		Calendar Year										
Entity	Parameter	1980	1990	2000	2005	*2008*	2010	2015	2020	2025	2030	2035
County	Population	1,295,073	1,497,577	1,682,585	1,763,000	*1,798,400*	1,822,000	1,945,300	2,063,100	2,185,800	2,310,800	2,431,400
County	Households	458,914	520,180	565,863	595,700	*606,680*	614,000	653,810	696,530	739,820	785,090	827,330
County	Jobs	702,922	890,930	1,044,130	872,860	*892,906*	906,270	981,230	1,071,980	1,177,520	1,292,490	1,412,620
City of San Jose	Population	629,442	782,224	894,943	943,300	*965,920*	981,000	1,063,600	1,137,700	1,219,500	1,299,700	1,380,900
City of San Jose	Households	209,905	250,211	276,598	293,930	*300,656*	305,140	330,390	356,470	382,900	409,640	435,110
City of San Jose	Jobs	281,737	319,090	417,500	348,960	*361,284*	369,500	425,100	493,060	562,350	633,700	708,980
Cnty/City	Population	2.06	1.91	1.88	1.87	*1.86*	1.86	1.83	1.81	1.79	1.78	1.76
Cnty/City	Households	2.19	2.08	2.05	2.03	*2.02*	2.01	1.98	1.95	1.93	1.92	1.90
Cnty/City	Jobs	2.49	2.79	2.50	2.50	*2.47*	2.45	2.31	2.17	2.09	2.04	1.99
County Service Population (Popn + Jobs):		1,997,995	2,388,507	2,726,715	2,635,860	*2,691,306*	2,728,270	2,926,530	3,135,080	3,363,320	3,603,290	3,844,020

City of San Jose General Plan Population and Employment Forecasts by Plan Alternative

Parameter	2008 Baseline	2020 Plan	2020 No Proj	2035 Plan	2035 No Proj
Population	985,307	1,093,492	1,047,115	1,313,811	1,197,868
Households	309,350	357,350	342,194	429,350	391,461
Jobs	369,450	557,450	471,670	839,450	625,000
Service Population (Popn + Jobs)	1,354,757	1,650,942	1,518,785	2,153,261	1,822,868

Scaling Ratios to Estimate Off-Road Equipment City of San Jose Emissions from Santa Clara County Emissions

Cat No	Equipment Class	Method	2008 Baseline	2020 Plan	2020 No Proj	2035 Plan	2035 No Proj
1	Lawn and Garden Equipment	HHs+Jobs	2.21	1.93	2.17	1.77	2.20
2	Construction Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
3	Industrial Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
4	Light Commercial Equipment	Jobs	2.42	1.92	2.27	1.68	2.26
5	Agricultural Equipment	Assumed negligible emissions from this category within City of San Jose					
6	Airport Ground Support Equipment	All GSE in Santa Clara County from San Jose Intl -- used OFFROAD values for 2008, scaled 2020 and 2035 by latest 2027 forecast of air carrier & cargo operations at SJC from 8th EIR Addendum Report					
7	Pleasure Craft	Calculated separately from local boating activity data - OFFROAD not used					

Off-Road Vehicle & Equipment Emissions (metric tons/year) for City of San Jose

		2008 Baseline				2020 Plan				2020 No Project				2035 Plan				2035 No Project			
Method	Equipment Class	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Scaled	Lawn and Garden Equipment	11,879	21	8	14,863	15,100	22	10	18,567	13,434	20	9	16,519	18,861	27	12	23,160	15,110	22	10	18,554
Scaled	Construction Equipment	138,929	22	1	139,679	208,319	15	1	209,028	176,263	13	1	176,863	286,536	12	2	287,338	213,336	9	1	213,934
Scaled	Industrial Equipment	134,637	80	8	138,945	212,121	52	10	216,218	179,480	44	8	182,947	335,206	73	13	340,930	249,573	55	10	253,834
Scaled	Light Commercial Equipment	23,189	22	6	25,530	34,839	31	9	38,406	29,478	26	8	32,496	49,895	55	15	55,750	37,148	41	11	41,508
N/A	Agricultural Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct-SJC	Airport Ground Support Equipment	11,484	3	1	11,894	15,622	3	2	16,179	15,622	3	2	16,179	20,794	5	2	21,536	20,794	5	2	21,536
Direct-RecAct	Pleasure Craft	19,013	12	5	20,663	21,870	7	4	23,329	20,943	7	4	22,340	27,627	7	5	29,175	25,189	6	4	26,601

Santa Clara County
Parks & Recreation Department
Boating Activity 2009

Park Name	Power Boats PB	Personal Watercraft PWC	Non-Power Boats NPB	In City of San Jose
Anderson Lake	8,176	1,272	484	0.50
Calero	4,068	1,476	495	1.00
Chesbro Reservoir				
Coyote Lake	3,118	873	538	
Ed Levin				
Grans				
Hellyer				
Lexington			1,711	
Los Gatos Creek				
Stevens Creek			1,391	
Uvas Canyon				
Vasona				
County Totals	15,362	3,621	4,619	

	PB	PWC	NPB	2009 City Population
SJ City Totals:	**8,156**	**2,112**	**737**	1,006,753

Scenario	City Population	2020 Projected Boating Activity PB	PWC	NPB
General Plan	1,093,492	**8,859**	**2,294**	**800**
No Project	1,047,115	**8,483**	**2,197**	**767**

Scenario	Pop Factor
General Plan	1.086
No Project	1.040

Scenario	City Population	2035 Projected Boating Activity PB	PWC	NPB
General Plan	1,313,811	**10,644**	**2,756**	**962**
No Project	1,197,868	**9,704**	**2,513**	**877**

Scenario	Pop Factor
General Plan	1.305
No Project	1.190

Calculation of Pleasure Craft GHG Emissions (tons/day) by Analysis Year and Scenario Based on OFFROAD Model Emission Factors and Parks & Rec Activity at Selected Lakes

Calendar Year:	**2009**			
Emissions (tpd)	CO2	CH4	N2O	CO2e
PB	53.30024	0.02407	0.01266	
PWC	4.02788	0.01117	0.00101	
NPB	0.09080	0.00008	0.00002	
Totals	**57.41892**	**0.03532**	**0.01369**	62.40352
Metric Tons/Year	19013	12	5	20663

	2020				
Emissions (tpd)		CO2	CH4	N2O	CO2e
General Plan	PB	60.83113	0.01680	0.01165	
	PWC	5.11908	0.00480	0.00107	
	NPB	0.09862	0.00007	0.00002	
	Totals	**66.04884**	**0.02167**	**0.01274**	70.45417
	MT/Year	21870	7	4	23329

Emissions (tpd)		CO2	CH4	N2O	CO2e
No Project	PB	58.25117	0.01609	0.01115	
	PWC	4.90197	0.00460	0.00103	
	NPB	0.09444	0.00006	0.00002	
	Totals	**63.24759**	**0.02075**	**0.01220**	67.46608
	MT/Year	20943	7	4	22340

	2035				
Emissions (tpd)		CO2	CH4	N2O	CO2e
General Plan	PB	77.14221	0.01564	0.01242	
	PWC	6.17369	0.00468	0.00126	
	NPB	0.11849	0.00007	0.00003	
	Totals	**83.43440**	**0.02038**	**0.01370**	88.11064
	MT/Year	27627	7	5	29175

Emissions (tpd)		CO2	CH4	N2O	CO2e
No Project	PB	70.33446	0.01426	0.01132	
	PWC	5.62887	0.00426	0.00115	
	NPB	0.10804	0.00006	0.00002	
	Totals	**76.07136**	**0.01858**	**0.01249**	80.33493
	MT/Year	25189	6	4	26601

Calculation of Passenger Rail GHG Emissions for Travel Through San Jose City

Caltrain:

Diridon North

Activity:	50	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	2.42	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	2,790.6	metric tons/year
Calculated CH4 Emissions:	0.1	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	2,799.3	metric tons/year

Tamien North

Activity:	34	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	4.54	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	3,560.0	metric tons/year
Calculated CH4 Emissions:	0.1	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	3,571.1	metric tons/year

Tamien South

Activity:	6	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	398	riders/train	(Limited routes, weekday)	http://www.caltrain.com/pdf/annual_ridership_counts/2010_Caltrain_Ridership_Counts.pdf
Train Miles in City:	14.91	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	2,063.2	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	2,069.6	metric tons/year

ACE:

Dirdiron

Activity:	6	daily weekday passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	616.7	riders/train	(average weekday)	http://www.vta.org/news/factsheets/ace.pdf
Train Miles in City:	3.27	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	499.4	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	501.0	metric tons/year

Capitol Corridor:

Dirdiron

Activity:	14	daily passby trips		See Powers 7/7/10 e-mail
Emission Factor:	0.35	lb CO2/passenger mile		http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions
Average Ridership:	145	riders/train	(average daily)	http://www.capitolcorridor.org/included/docs/business_plans/09_11_Business_Plan.pdf
Train Miles in City:	3.27	miles		See Powers 7/7/10 e-mail

Calculated CO2 Emissions:	384.7	metric tons/year
Calculated CH4 Emissions:	0.0	metric tons/year
Calculated NO2 Emissions:	0.0	metric tons/year
CO2e Emissions:	385.9	metric tons/year