



**AIR POLLUTION
CONTROL DISTRICT**
COUNTY OF SAN LUIS OBISPO

June 18, 2010

James Worthley
SLO Council of Governments
1114 Marsh Street
San Luis Obispo, CA 93401

Subject: Additional Greenhouse Gas Emission Simulation Results for the 2010 SLO RTP / PSCS

Dear Mr. Worthley,

On June 8, 2010, the San Luis Obispo County Air Pollution Control District (APCD) submitted a table that summarizes modeled baseline (2008) and future (2020 and 2035) scenario CO₂ emissions for your organization to include in the RTP/PSCS.

Geoffrey Chiapella contacted me the next morning to discuss the results. He noted that by including the greenhouse gas (GHG) reductions associated with future more stringent CAFE and low-carbon fuel standards, it made it difficult to clearly understand the effectiveness that the potential SLOCOG development scenarios would have on GHG reductions.

In response to this concern, the APCD prepared two attached tables that are summarized below. As required by SB375, both tables demonstrate GHG emissions from automobiles and light duty trucks which include the first four of the thirteen vehicle classes that are modeled in the state's EMFAC2007 vehicular emissions model. As we noted in our previous letter, although SB375 does not require evaluation of the other nine vehicle classes, they account for about 17% of the total vehicular GHG emissions in the SLO County.

Table 1. Greenhouse Gas Emission Simulation Results for 2010 SLO RTP / PSCS with Pavley I + LCFS Corrections

- This table modestly updates the table that we submitted to SLOCOG on June 8, 2010 (i.e. slight title change, formatting change, and minor text changes in table footnotes 1 and 5)
- This table is a summary of the GHG emission benefits from the combination of emission reduction four factors:
 1. EMFAC2007 assumed future SLO County fleet and related emission factors;
 2. An adjustment of those emissions resulting from lower fuel use of automobiles and light duty trucks as a result of legislation (Pavley I) required improvements to the CAFE standards;
 3. A further adjustment of those emissions resulting from lower CO₂ emissions because of future low carbon fuel standards; and
 4. Impacts on vehicle miles traveled and vehicular speeds from future potential SLOCOG development scenarios.
- This table is limited to the CO₂ component of tailpipe GHG emissions, which is approximately 97 to 98% of these emissions.

Table 2. Greenhouse Gas Emission Simulation Results for 2010 SLO RTP / PSCS without Pavley I + LCFS Corrections in 2020 & 2035

- This table is a summary of the GHG emission benefits from the combination of emission reduction two factors:
 1. EMFAC2007 assumed future SLO County fleet and related emission factors; and
 2. Impacts on vehicle miles traveled and vehicular speeds from future potential SLOCOG development scenarios.
- This table includes a summary of the CO₂ component of tailpipe GHG emissions, for comparison to Table 1
- Since SB375 calls for GHG reductions in total, this table also includes a summary of the total tailpipe GHG emissions in terms of CO₂ equivalence. The other two tailpipe GHGs are nitrous oxide (N₂O) and methane (C₄), both of which are emitted at a much lower mass than CO₂, though they are more potent GHGs than CO₂.
- Relative to Table 1, Table 2 which does not include future reductions from Pavley I and LCFS, and therefore, it is somewhat easier to evaluate the GHG impacts of the future potential SLOCOG development scenarios.

The APCD requests a meeting with SLOCOG to review and discuss the results presented in the Tables, answer questions, and to determine how the results will be included in the 2010 Regional Transportation Plan / Preliminary Sustainable Communities Strategies.

Please contact me if you have any questions about this letter. Please contact me to schedule the proposed APCD/SLOCOG meeting.

Sincerely,



for Andrew J. Mutziger

AJM/ksj

cc Dennis Wade, ARB

Attachments

Table 1. Greenhouse Gas Emission Simulation Results for 2010 SLO RTP / PSCS with Pavley I + LCFS Corrections ¹

Land use & 4-D Improvements only ²	SLOCOG's RTP Scenarios					% Increase / % Reduction			
	2008EC	2020_s1	2020_s2	2035_s1	2035_s2	2008EC vs. 2020s1	2008EC vs. 2020s2	2008EC vs. 2035s1	2008EC vs. 2035s2
SLOCOG Provided VMT for II and Half IX & XI; no XX; Matches EMFAC's Weekday VMT ³	5,409,888	5,469,649	5,419,563	6,322,736	6,159,976	1.1%	0.2%	16.9%	13.9%
Average Daily VMT ⁴	5,139,579	5,196,353	5,148,771	6,006,816	5,852,188	1.1%	0.2%	16.9%	13.9%
Average Daily VMT per Capita	19.08	18.04	17.88	18.16	17.69	-5.5%	-6.3%	-4.9%	-7.3%
Annual CO ₂ Emission (MMT) ⁵	0.7357	0.5349	0.5300	0.5342	0.5200	-27.3%	-28.0%	-27.4%	-29.3%
Average Daily CO ₂ Emissions (kg)	2,014,167	1,464,575	1,451,125	1,462,444	1,423,657	-27.3%	-28.0%	-27.4%	-29.3%
Average Daily kg CO ₂ per Capita	7.48	5.09	5.04	4.42	4.30	-32.0%	-32.6%	-40.9%	-42.5%
Land use & 4-D Improvements and transit & TDM Improvements; w QRT ⁶									
SLOCOG Provided VMT for II and Half IX & XI; no XX; Matches EMFAC's Weekday VMT ³	5,409,888	5,414,929	5,328,517	6,109,041	5,946,834	0.1%	-1.5%	12.9%	9.9%
Average Daily VMT ⁴	5,139,579	5,144,367	5,062,274	5,803,798	5,649,696	0.1%	-1.5%	12.9%	9.9%
Average Daily VMT per Capita	19.08	17.86	17.58	17.54	17.08	-6.4%	-7.9%	-8.1%	-10.5%
Annual CO ₂ Emission (MMT) ⁵	0.7357	0.5296	0.5211	0.5161	0.5020	-28.0%	-29.2%	-29.8%	-31.8%
Average Daily CO ₂ Emissions (kg)	2,014,167	1,449,923	1,426,746	1,413,017	1,374,397	-28.0%	-29.2%	-29.8%	-31.8%
Average Daily kg CO ₂ per Capita	7.48	5.03	4.95	4.27	4.15	-32.7%	-33.8%	-42.9%	-44.4%
SLOCOG Provided Population Values	269,300	288,000	288,000	330,800	330,800	6.9%	6.9%	22.8%	22.8%
SLOCOG Quick Response Tool Reduction Rate (QRT) ⁵	-	-1.00%	-1.68%	-3.38%	-3.46%	-	-	-	-

¹ SLO County APCD staff prepared this table for baseline and SLOCOG identified future land-use development scenarios. The information in this table is directly comparable and is intended to facilitate preliminary Sustainable Community Strategies efforts that are part of SLOCOG's 2010 Regional Transportation Plan. The information is not a complete evaluation of vehicle greenhouse gas (GHG) emissions that occur in SLO County, but can be used to compare the effects of the potential development scenarios.

² The SLOCOG TransCAD model was used to provide vehicle miles traveled (VMT) and vehicular speed information (speed bins) inputs for the EMFAC2007 vehicular emissions model. The TransCAD model is a single mode vehicular model that accounts for VMT impacts of actual and proposed land use development. 4-D stands for design, density, diversity and destination; i.e. compact, urban design in the allocation of new development.

³ SLOCOG TransCAD single mode transportation model provided VMT values that include 100% of the mileage from trips starting and ending in SLO County (II), 50% of the mileage from trips that start in SLO County and end in another county (IX), 50% of the mileage from trips that start in another county and end in SLO County (XI), 0% of the mileage of trips that pass through SLO County but start and end in other counties. The mileage not accounted for in the EMFAC emission simulations and is roughly 26% of the total mileage in the county.

⁴ The factor to convert 'Weekday value to Average Daily' is 347/365.25 and is based on ARB's recommendation for adjusting EMFAC's exclusive weekday emission output to average daily emissions.

⁵ Annual CO₂ emissions are extrapolated from the TransCAD weekday VMT information provided by SLOCOG and will be most accurate if that information is representative of the average weekday within the year. SB375 exclusively targets greenhouse gas (GHG) reductions from automobiles and light trucks (the first 4 of 13 vehicle classes in the EMFAC model). It should be noted that not including the other vehicle classes underestimates the total GHG emissions from vehicles in SLO County by about 17% (based on the 2008 Existing Condition EMFAC simulation). The EMFAC CO₂ emissions for the 2020 and 2035 simulations were adjusted with ARB's Version 1.0 Pavley I + LCFS postprocessor (www.arb.ca.gov/cc/sb375/tools/postprocessor.htm) to account for the benefits of legislative GHG reductions from future improved vehicle CAFE standards and low carbon fuel standards that are not included in the EMFAC2007 model. Therefore, this table demonstrates the combined GHG benefits from future legislation and proposed development scenarios. Note that based on modeling results, CO₂ is roughly 97 to 98% of the tailpipe greenhouse gas (GHG) emissions. The other two tailpipe GHGs are nitrous oxide (N₂O) and methane (CH₄) and were not included in this combined benefit evaluation based on ARB's recommendation.

⁶ The QRT is a post-processor tool that SLOCOG uses to approximate the VMT reduction benefits of transit and transportation demand management (TDM) methods that the single mode TransCAD model does not include. H:\PLAN\Climate Change\SB375\EMFACwork\FinalTransCADRunFromSLOCOG\APCDs_EMFAC_Summary_forSLOCOG\2010RTP-PSCS_ver2_Table1.xls\EMFAC CO2 Summary For SLOCOG

Table 2. Greenhouse Gas Emission Simulation Results for 2010 SLO RTP / PSCS without Pavley / + LCFS Corrections in 2020 & 2035 ¹

	SLOCOG's RTP Scenarios						% Increase / % Reduction			
	2008EC	2020_s1	2020_s2	2035_s1	2035_s2	2008EC vs. 2020s1	2008EC vs. 2020s2	2008EC vs. 2035s1	2008EC vs. 2035s2	
Land use & 4-D Improvements only ²										
SLOCOG Provided VMT for II and Hair IX & XI; no XX; Matches EMFAC's Weekday VMT ³	5,411,000	5,470,000	5,420,000	6,324,000	6,159,000	1.1%	0.2%	16.9%	13.8%	
Average Daily VMT ⁴	5,140,635	5,196,687	5,149,185	6,008,016	5,851,261	1.1%	0.2%	16.9%	13.8%	
Average Daily VMT per Capita	19.09	18.04	17.88	18.16	17.69	-5.5%	-6.3%	-4.9%	-7.3%	
Annual CO ₂ Emission (MMT) ⁵	0.7366	0.7272	0.7240	0.8342	0.8122	-1.3%	-1.7%	13.2%	10.3%	
Average Daily CO ₂ Emissions (kg)	2,016,744	1,990,889	1,982,270	2,283,920	2,223,590	-1.3%	-1.7%	13.2%	10.3%	
Average Daily Kg CO ₂ per Capita	7.49	6.91	6.88	6.90	6.72	-7.7%	-8.1%	-7.8%	-10.2%	
Annual CO ₂ e Emission (MMT) ⁶	0.7609	0.7415	0.7383	0.8473	0.8250	-2.5%	-3.0%	11.4%	8.4%	
Average Daily CO ₂ e Emissions (kg)	2,083,112	2,030,244	2,021,379	2,319,860	2,258,719	-2.5%	-3.0%	11.4%	8.4%	
Average Daily Kg CO ₂ e per Capita	7.74	7.05	7.02	7.01	6.83	-8.9%	-9.3%	-9.3%	-11.7%	
Land use & 4-D Improvements and transit & TDM Improvements; w QRT ⁷										
SLOCOG Provided VMT for II and Hair IX & XI; no XX; Matches EMFAC's Weekday VMT ³	5,411,000	5,415,000	5,329,000	6,109,000	5,947,000	0.1%	-1.5%	12.9%	9.9%	
Average Daily VMT ⁴	5,140,635	5,144,435	5,062,732	5,803,759	5,649,854	0.1%	-1.5%	12.9%	9.9%	
Average Daily VMT per Capita	19.09	17.86	17.58	17.54	17.08	-6.4%	-7.9%	-8.1%	-10.5%	
Annual CO ₂ Emission (MMT) ⁵	0.7366	0.72402	0.7083	0.8090	0.7838	-1.7%	-3.8%	9.8%	6.4%	
Average Daily CO ₂ Emissions (kg)	2,016,744	1,982,270	1,939,177	2,214,971	2,146,023	-1.7%	-3.8%	9.8%	6.4%	
Average Daily Kg CO ₂ per Capita	7.49	6.88	6.73	6.70	6.49	-8.1%	-10.1%	-10.6%	-13.4%	
Annual CO ₂ e Emission (MMT) ⁶	0.7609	0.7383	0.7223	0.8218	0.7963	-3.0%	-5.1%	8.0%	4.7%	
Average Daily CO ₂ e Emissions (kg)	2,083,112	2,021,354	1,977,487	2,249,854	2,180,023	-3.0%	-5.1%	8.0%	4.7%	
Average Daily Kg CO ₂ e per Capita	7.74	7.02	6.87	6.80	6.59	-9.3%	-11.2%	-12.1%	-14.8%	
SLOCOG Provided Population Values	269,300	288,000	288,000	330,800	330,800	6.9%	6.9%	22.8%	22.8%	
SLOCOG Quick Response Tool Reduction Rate (QRT) ⁷	-	-1.00%	-1.88%	-3.38%	-3.46%	-	-	-	-	
¹ SLO County APCD staff prepared this table for baseline and SLOCOG identified future land-use development scenarios. The information in this table is directly comparable and is intended to facilitate preliminary Sustainable Community Strategies efforts that are part of SLOCOG's 2010 Regional Transportation Plan. The information is not a complete evaluation of vehicle greenhouse gas (GHG) emissions that occur in SLO County, but can be used to compare the effects of the potential development scenarios.										
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⁴ The factor to convert Weekday value to Average Daily is 347/365.25 and is based on ARB's recommendation for adjusting EMFAC's exclusive weekday emission output to average daily emissions.										
⁵ Annual CO ₂ emissions are extrapolated from the TransCAD weekday VMT information provided by SLOCOG and will be most accurate if that information is representative of the average weekday within the year. SB375 exclusively targets greenhouse gas (GHG) reductions from automobiles and light trucks (the first 4 of 13 vehicle classes in the EMFAC model). It should be noted that not including the other vehicle classes underestimates the total GHG emissions from vehicles in SLO County by about 17% (based on the 2008 Existing Condition EMFAC simulation). The EMFAC CO ₂ emissions for the 2020 and 2035 simulations presented in this table are NOT adjusted to account for the benefits of the future legislative GHG reductions from future improved vehicle CAFE standards (Paveley) and low carbon fuel standards. This future legislative is not included in the EMFAC2007 model. With these two future GHG reductions not included in this table, the impacts of the scenario changes is more readily observed.										
⁶ ARB is currently recommending that metropolitan planning organizations (MPOs) use vehicular CO ₂ tailpipe emissions in evaluating GHG impacts for RTP/PSCS updates. Based on modeling results, CO ₂ is roughly 97 to 98% of the tailpipe greenhouse gas (GHG) emissions. The other two tailpipe GHGs are nitrous oxide (N ₂ O) and methane (CH ₄), both of which are emitted at a much lower mass than CO ₂ , though they are more potent GHGs than CO ₂ . The combination of these three tailpipe GHG pollutants, corrected for CO ₂ potency is referred to as CO ₂ e equivalence or CO ₂ e. CO ₂ & CO ₂ e information is presented here because it is currently unclear whether future RTP/PSCS work will focus on CO ₂ or CO ₂ e.										
⁷ The QRT is a post processor tool that SLOCOG uses to approximate the VMT reduction benefits of transit and transportation demand management (TDM) methods that the single mode TransCAD model does not include.										

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