

CALTRANS - UCD AIR QUALITY PROJECT

ENVIRONMENTAL PROGRAM MS-27

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Memo To: Southern California Association of Governments, Conformity Working Group

From: Doug Eisinger and Tom Kear

Subject: Conformity Emission Reduction Targets for the SCAG RTP

This memorandum provides information to assist SCAG in conducting its conformity analyses of the 1997 draft regional transportation plan (RTP). The information presented supplements earlier correspondence, which detailed the RTP's conformity emission reduction targets as established by the 1994 South Coast Ozone SIP. The information detailed in this correspondence reduces the RTP-related emission reductions required to conform to the 1994 ozone SIP. The new emission reduction targets reflect three updated analyses related to (1) heavy duty vehicles, (2) forecasted vehicle use as divided among the different motor vehicle classes (e.g., car use vs. light duty truck use), and (3) preliminary emission reduction estimates associated with the South Coast's voluntary trip reduction program. Credits from these analysis are approximate, and should be confirmed using the same modeling tools employed to develop the 1994 SIP.

The information presented here represents a distillation of materials prepared previously. As you know, over the past several months we have been working with SCAG and an informal multi-agency workgroup comprised of representatives from federal, state, and local agencies, to assist in the RTP conformity analysis process. As part of that multi-agency effort, we prepared and distributed extensive documentation such as detailed spreadsheets and explanatory materials that detailed the emissions analyses undertaken. Our analyses identified a number of transportation system changes and data assumptions that, when updated, alter the RTP's emission reduction targets. This memorandum presents only a subset of these findings. In addition to the findings presented here, we identified system changes which we believe further reduce the emission reduction targets (such as improving the representation of the diurnal distribution of heavy-duty vehicle activity). However, quantifying those additional emission reductions is difficult, and would require significant time to develop consensus among the region's stakeholders as to the analytical procedures and assumptions involved. Given the time left to develop the RTP, we are limiting our

presentation to those key findings for which there is broad consensus. Feel free to contact us if you would like further explanation or copies of the more detailed information presented earlier in this work effort.

The Caltrans/UC Davis air quality assessment team determined in mid-September that emission reductions of 14.28 tons/day of ROG and 15.25 tons/day of NO_x would be required for the 1997 RTP to demonstrate conformity with the emission budgets established in the 1994 SIP. During the course of that analysis, we also determined that several transportation system changes have occurred since the preparation of the SIP, that these system changes are not addressed in the RTP, and that these changes influence the magnitude of the RTP-related emission reduction targets. A summary of the quantifiable emission impacts of these transportation system changes is presented in Table 1 below. As detailed in Table 1, these changes have a significant impact on both the NO_x and ROG targets required to demonstrate conformity. Please note that the emission estimates presented are a function of the Baseline BURDEN7F forecast, dated 7/22/97, provided to us by SCAG staff -- changes to that baseline will impact the results presented here.

Table 1
Summary of Estimated 2010 Emission Impacts* from
Transportation System Changes Identified by Caltrans/UC Davis

Recommended Calculation Adjustments (values for 1, 2, and 3 represent emission reductions to be deducted from the targets)	ROG (tons/day)	NO _x (tons/day)
RTP Emission Reduction Target**	14.28	15.25
1. Heavy-Duty Vehicle Travel Reduction (reflects lower population and employment forecasts)	1.22	10.68
2. Revised Vehicle Class Travel Distribution (reflects more recent data on passenger car and truck vehicle use)	2.03	4.27
3. Rule 2202 (reflects preliminary assessment of voluntary program effectiveness)	2.90	3.61
Net Recommended Adjustment***	6.06	17.79
Transportation Reduction Target (Reduction Target - Net Recom. Adj)	8.22	-2.54

* Emission estimates are based on spreadsheet computations and may differ from values produced by BURDEN7F.

** Emission reduction targets as based on 1994 Ozone SIP and 1994 RME modeling assumptions.

*** Note that 1, 2, and 3 are not fully additive due to overlapping emissions changes associated with new heavy duty vehicle data.

Our assessment of these transportation system changes is that they represent the most recent data available detailing current and forecasted vehicle use in the SCAG planning area. Therefore, we recommend that the emission impacts of these transportation system changes be incorporated into the conformity determination of the 1997 RTP. As shown in Table 1, the net recommended adjustment is not entirely additive, because some of the system changes overlap the heavy-duty vehicle category. The net adjustments are shown to more than satisfy the NO_x emission reduction target and to diminish the ROG emission reduction target by 42% to 8.22 tons/day. Presented below is a discussion of each system change and the method used to derive the emissions impact.

Heavy-Duty Travel Reduction - This represents an adjustment due to lower forecasted year 2010 population and employment estimates. The California Air Resources Board's BURDEN7F model was used to estimate heavy-duty vehicle emissions for the 1994 SIP, and baseline transportation network in the 1997 RME. A comparison of BURDEN7F outputs for the 94 SIP and the 97 Baseline show that despite a 10.7% reduction in forecasted year 2010 travel for light and medium-duty vehicles and motorcycles (the result of lower population and employment projections), there was no change in the estimate of travel for heavy-duty trucks and buses. Discussions with ARB indicated that the forecasts for heavy-duty trucks are taken directly from Caltrans's Statewide Transportation Model. That model showed no change in SCAG heavy-duty truck travel in 2010 between the 1994 forecast and the 1997 forecast. The estimates for heavy-duty buses are produced by combining the growth rate in heavy-duty travel forecast by Caltrans with a base year estimate of bus VMT developed by ARB.

Discussions with SCAG and Caltrans led to a decision to reduce the forecast of heavy-duty vehicle VMT (both trucks and buses) in proportion to the change in employment forecast in 2010 between the 94 SIP and the 97 Baseline (a reduction of 6.4%). Lacking a more detailed model of future heavy duty vehicle activity, we selected employment forecast changes as a surrogate measure for changed heavy duty vehicle activity. We shared this approach with the multi-agency workgroup, and with SCAG staff. A key consideration in our selection of this methodology was that using employment data resulted in a 6.4% decrease in activity, which was more conservative than the 10.7% reduction forecasted for light and medium duty vehicle activity.

The benefits of this option were computed by revising the baseline BURDEN7F emission estimates and then following the SIP analysis methodology to determine their impact on the applicable emissions budgets.

Revise Vehicle Class Travel Distribution - This represents two adjustments. First, the changes incorporate new data which reflect that people are driving more light duty trucks such as sport utility vehicles and vans, and fewer light duty passenger cars. Second, the changes incorporate new data showing that heavy-duty truck travel is increasingly a function of smaller trucks such as delivery vans, and less a function of very heavy trucks such as large tractor trailers.

The vehicle class travel distributions contained in BURDEN7F and MVEI7G for 2010

are substantially different. As shown in Figure 1, passenger car travel is projected to decline from 72.9% to 60.7%, while light-duty truck travel is projected to increase from 14.3 to 25.7 %. These changes are projected to increase NOx emissions from the vehicle fleet. Offsetting this increase is the revised distribution of heavy-duty vehicle travel presented in Figure 2. It shows a significant increase in travel from the light and medium-heavy duty vehicles at the expense of the heavy-heavy-duty vehicles.

The benefits of this option were computed by substituting MVEI7G vehicle class travel distributions into EMFAC7F to evaluate their impact on fleet average emissions. The results were used to revise the baseline BURDEN7F emission estimates. The SIP analysis methodology was then followed to determine their impact on the applicable emissions budgets.

Rule 2202 - This adjustment represents a preliminary estimate of the emission reduction benefits associated with the region's recently revised (and now voluntary) trip reduction program. Rule 2202, On-Road Motor Vehicle Mitigation Options, is the successor to Rule 1501, Work Trip Reduction Plans. In 1996, SB 836 (Lewis) was enacted to provide an approach for the gradual replacement of Rule 2202's mandatory reductions with voluntary ridesharing and other replacement measures.

With the passage of SB 836, the worksite threshold subject to Rule 2202 was changed from employers of 100 employees and above to employers with 250 employees and above. The deregulated worksites are no longer required to comply with Rule 2202 for a demonstration period of 18 months. The ultimate replacement of 2202 with a voluntary trip reduction program will depend on whether the latter can achieve equivalent emission reductions by December 31, 1997. Earlier this year, a team of contractors developed a methodology to analyze the benefits of SB 836. Separately, a contractor was hired to collect data characterizing travel activity under the voluntary program. SCAG is currently selecting a contractor to analyze the collected travel data and quantify the emission reductions. The results of that analysis are expected by the end of the year. Until that analysis is completed, no official estimates of the benefits of Rule 2202 are available.

As a preliminary estimate, SCAG has indicated that the revised Rule 2202 is expected to reduce VMT by 8,552,595 miles per day and eliminate 570,173 trips per day. These reductions are assumed to apply only to automobiles and light-duty trucks. The 2010 fleet average emission rates for these vehicle classes were weighted together in proportion to their share of light-duty travel activity. Those values were combined with the SCAG estimates of travel reductions to compute the emission reductions associated with the revised Rule.

SCAG staff has indicated that the estimate of Rule 2202 travel reductions employed in this analysis is likely to change.

