



UC Davis-Caltrans Air Quality Project

Project Assessments for 8-Hour Ozone Conformity in Isolated Rural Areas

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SIMPLIFIED CONFORMITY ANALYSIS

Motivation:

- Conformity determination required for regionally significant transportation projects.
- Emissions are forecasted to drop \downarrow
- VMT change unlikely to overcome the substantial emission reductions \downarrow
- Most projects will have little trouble passing

"No-greater-than-base-year" emissions test

Future year emissions \leq 2002 emissions

Conservative assumptions

- Do not consider congestion reduction
- Worst case assumptions in case of congestion increase

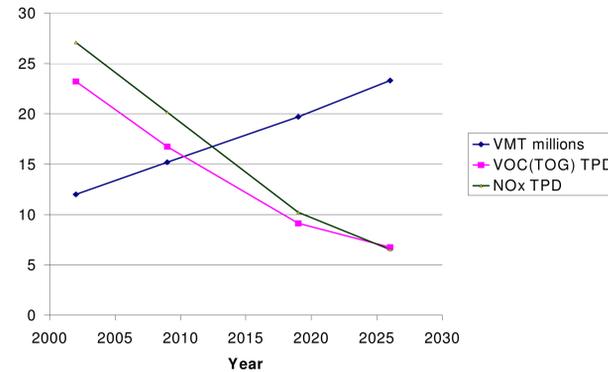


FIGURE 1 Declining on-road emissions, and increasing VMT, for California Mountain Counties, as predicted by EMFAC2002 with default settings.

Additional work for detailed analysis:

- 1) Without travel demand model:
 - VMT by road functional class, hour-of-day and/or vehicle type, age, and speed bin
 - VMT forecast based on historic growth, demographic projections, and/or corridor analysis
- 2) Travel demand model

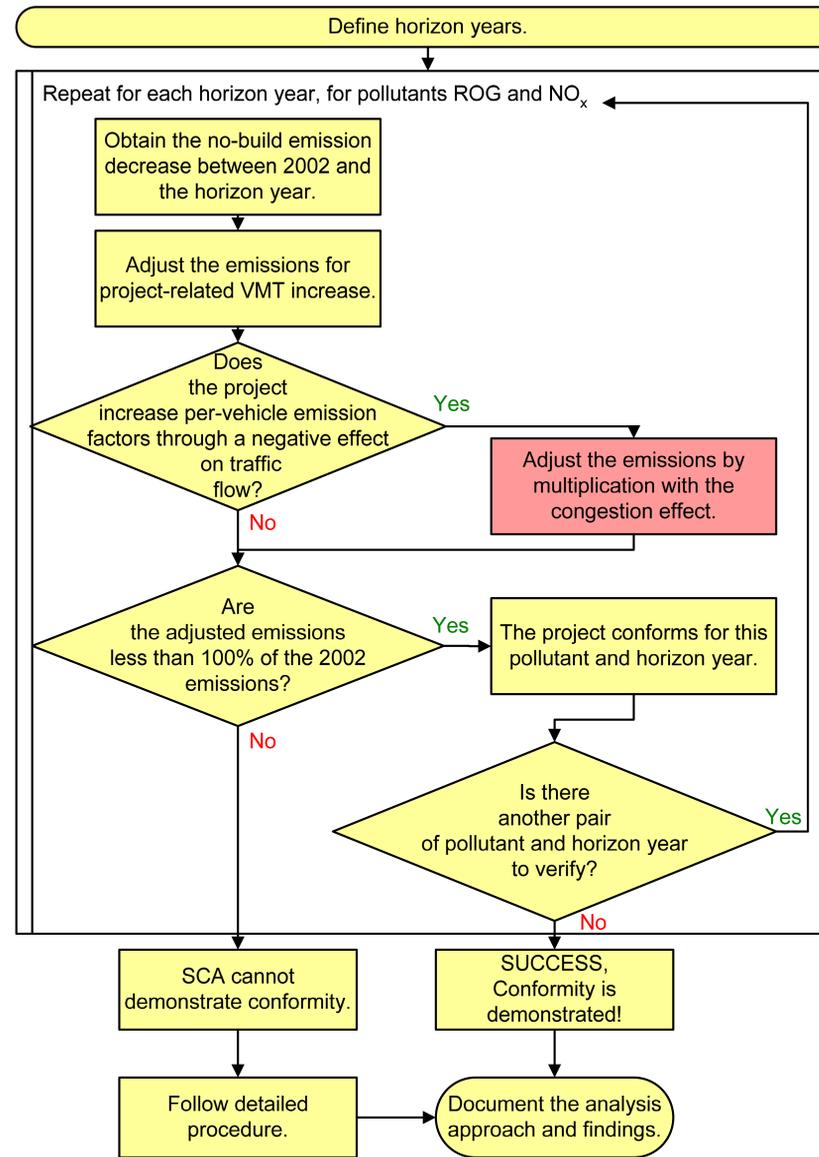


FIGURE 2 Flowchart of the simplified conformity analysis (SCA) using the no-greater-than-base-year test.

	A	B	C	D	E	F	G
1	Simplified conformity analysis for California Mountain Counties						
2	INPUT						
3	County	Amador	Choose from:	Amador	Calaveras	Mariposa	Ne
4	Horizon year	2018	2002-2035				
5	VMT increase	1.6%	Project contribution to VMT				
6	x	2%	Fraction of county VMT affected by project to red				
7	SCF ROG	10	ROG speed correction factor for increased conge				
8	SCF Nox	2.6	Nox speed correction factor for increased conges				
9	OUTPUT						
10	County #	1					
11	ROG Eh	44.5%	No-build county ROG emissions, as fraction of 2002				
12	Ep	45.2%	Build county ROG emissions, not counting increa				
13	Ec	53.3%	Build county ROG emissions, counting increased				
14	ROG Result	Pass ROG	Fail if Ec>100%				
15	Nox Eh	49.5%					
16	Ep	50.3%	Build county emissions, not counting increased c				
17	Ec	51.9%	Build county emissions, counting increased cong				
18	Nox Result	Pass Nox	Fail if Ec>100%				
19	Overall Result	Pass	Pass if both NOx and ROG pass.				
20							

FIGURE 4 Excel tool screenshot of the example with added congestion.

HYPOTHETICAL EXAMPLE

- Amador County
- Add 22 lane miles to existing 1300.
- Scheduled to be completed in 2008
- No travel demand model available
- **Horizon years:**
 - 2008, project completion
 - 2018, long-term trend
- EMFAC2002 predicts **baseline NOx emissions**
 - 85.6% and 49.5% of 2002 values
 - in 2008 and 2018 respectively. (Figure 5)
- **ROG** emissions projected to decrease even more.
- Assume **VMT increases** proportional to added lane miles (1.6%) (absent better estimates).
- No negative impacts on traffic flow
- No increase of the speed limit

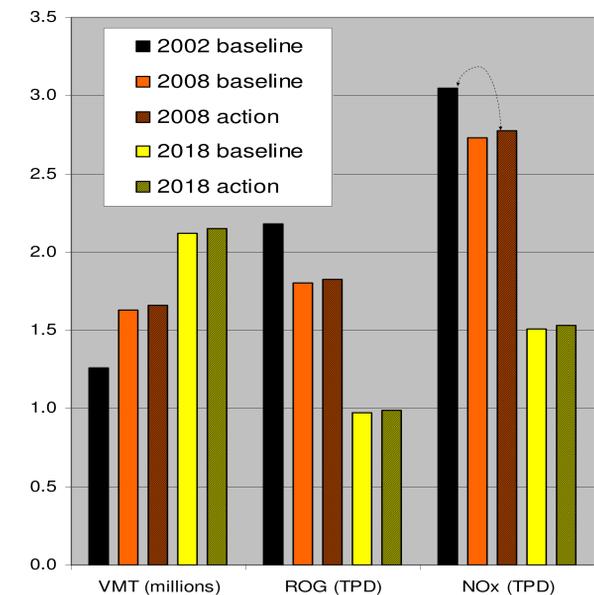


FIGURE 5 Project emissions are negligible compared to changes in default emissions over time. Baseline data are the EMFAC2002 projections for Amador

Example Conclusion:

- Horizon year emissions, adjusted for VMT (■, ■), \leq 100% of base-year emissions (■).
- The project conforms.

ADJUST FOR CONGESTION

$$\text{Congestion Effect} = \text{Affected VMT fraction} \times \frac{\text{Worst case speed emission factor}}{\text{Optimal speed emission factor}}$$

Fraction for which travel conditions worsened

Conservative estimate:
50mph \rightarrow 2.5mph
ROG x10
NO_x x2.6
(Figure 3)

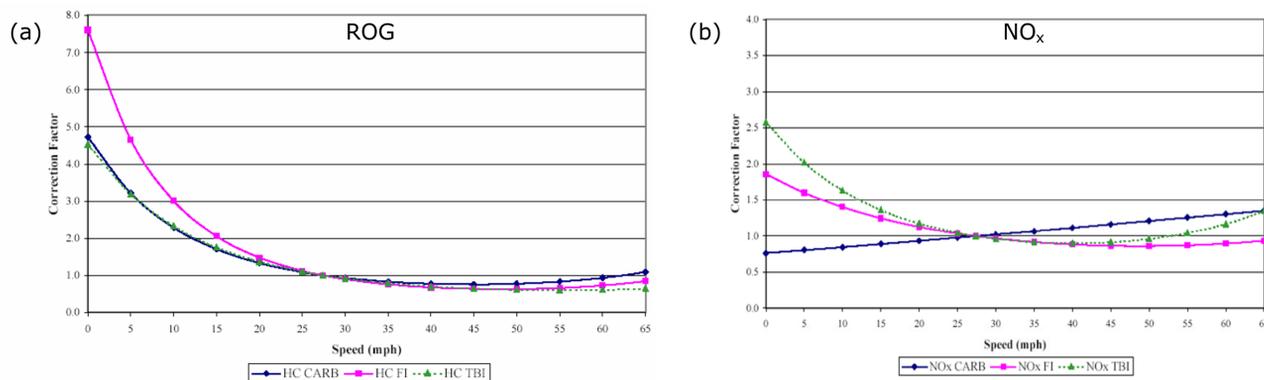


FIGURE 3 EMFAC2002 LDV speed correction factors for (a) ROG expressed as hydrocarbons (HC) and (b) NO_x; adapted from (California Air Resources Board, 2004).