sierra research

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Cost/Effectiveness of Possible Revisions to the California Smog Check Program

Task Report:
ARB Contract No. A994-183

prepared for:

California Air Resources Board

January 16, 1991

prepared by:

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COST/EFFECTIVENESS OF POSSIBLE REVISIONS TO THE CALIFORNIA SMOG CHECK PROGRAM

1. SUMMARY

In response to a request from Mobile Source Division staff, Sierra has estimated the cost/effectiveness of several possible revisions to the current vehicle inspection and maintenance (I/M) program. Based on effectiveness estimates generated by the CALIMFAC model, the cost/effectiveness of the current program with and without a variety of possible changes is summarized in Table 1.

As indicated in the table, annual inspection frequency is the least cost/effective of the program changes evaluated, with an incremental cost/effectiveness of $4.67 per pound of hydrocarbons (HC) plus oxides of nitrogen (NOx) emissions in the year 2000 timeframe. However, this is still competitive with the cost/effectiveness of other programs adopted by ARB and the local air pollution control districts. Given the significant increase in emission reductions, a change to annual inspection frequency may warrant further consideration. Other potential program changes, such as more stringent idle emission standards and loaded mode testing, appear to be capable of improving the cost/effectiveness of the current program to an even greater degree.

Table 1

Estimated Effect of Program Changes
on Smog Check Program Benefits and Cost/Effectiveness
for the Year 2000 Timeframe

	Emission -- Reductions ---			-- Cost/Effectiveness ($/pound) -- -- Overall ----		- Incremental -	
	HC	CO	NOx	HC + NOx	CO	HC + NOx	CO
Current Program (baseline)	18.1%	25.3%	10.4%	$3.69	$0.34	n.a.	n.a.
With Addition Of:							
Annual Inspections	27.6%	34.7%	18.6%	$4.08	$0.45	$4.67	$0.77
More Stringent Stds.	19.8%	27.0%	12.0%	$3.24	$0.32	$0.39	$0.13
Loaded Mode Testing	22.2%	29.2%	16.9%	$3.32	$0.38	$2.14	$0.66
No Repair Cost Limit	19.4%	26.9%	11.4%	$3.58	$0.33	$2.04	$0.18
Better Mechanics	19.9%	27.3%	11.7%	$3.68	$0.35	$3.60	$0.49
All of the Above	36.7%	41.9%	28.6%	$3.35	$0.44	$3.11	$0.60
Above w/3yr Exemption	36.0%	41.5%	28.3%	$2.98	$0.39	$2.44	$0.47

The analysis also indicated that very little effectiveness is sacrificed by exempting new vehicles from I/M for several years. Under an annual program, only 0.1% lower emission reduction is projected when new vehicles are allowed to skip I/M on their first registration renewal (which is the "standard" exemption). As shown in Table 1, the loss in benefits only increases by 0.7% for HC when new vehicles are allowed to skip three years. Giving new cars exemptions for five years would cause HC benefits to drop considerably more, from 36.7% to 34.3%. Because of the limited emissions benefits associated with the inspection and maintenance of new cars, program cost/effectiveness improves when new vehicles are exempted. However, the feasibility of pursuing this type of program change may be more of a political than a technical issue.

Because of the favorable cost/effectiveness estimates for several potential program changes, it might be desirable to refine the analytical techniques employed in this analysis. Specifically, more accurate calculation of failure rates and repair costs would be desirable. This could be accomplished through revision of the CALIMFAC model to output the specific failure rates that are projected for all scenarios. The cost/effectiveness values shown in Table 1 are all based on the assumption that the product of repair cost and failure rate is proportional to the emission reductions projected for a particular program variation. The starting point for this proportional adjustment is a 35% failure rate and $50 average repair cost used to represent the current program.

In addition, further work with CALIMFAC could provide insight into the extent to which "errors of commission" (false failures) are affected by various program changes. The error of commission rate is one factor that would need to be addressed before pursuing any significant change in the Smog Check program emission standards.

The conclusions of this analysis are inconsistent with views that Sierra staff have previously expressed regarding the relative cost/effectiveness of annual inspection frequency. It should be noted that there are two factors regarding the manner in which the CALIMFAC model treats vehicles that fail the emission standards that could lead to optimistic projections of annual inspection frequency benefits. First, the movement of failed vehicles into lower emission categories is affected by mechanic performance. With better mechanic performance, fewer vehicles should leave an inspection cycle in a condition where they would fail during the next cycle (and thereby receive a second chance to achieve significant emission reductions). As a result, the benefits of going to annual inspection frequency are expected to decline as mechanic performance improves. Second, vehicles that fail twice in two years might be more difficult to diagnose and repair than other vehicles in the same emitter category.

Notwithstanding the above rationalization, the benefits of annual inspection frequency predicted by the model are so large that further investigation appears to be warranted. Additional CALIMFAC sensitivity runs could be structured to evaluate annual inspection

frequency under future scenarios when improved mechanic performance might be expected.

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2. INTRODUCTION

Under Contract No. A994-183 ("Performance of Analysis and Research Tasks for the California Smog Check Program - Series II"), Sierra Research, Inc. provides a variety of services to the California Air Resources Board (ARB) and the California I/M Review Committee related to the state's motor vehicle inspection and maintenance (I/M) program. This report summarizes a task Sierra performed under the contract involving estimation of the cost/effectiveness of potential changes to the program.

Under a previous contract (Agreement No. A6-173-64), Sierra developed a computer model of vehicle inspection and maintenance to evaluate the emissions effect of possible changes in the California Smog Check program.* The model, called "CALIMFAC", can accept over 100 different user-selectable inputs to evaluate changes in program features such as repair cost ceilings; emissions standards stringency; mechanic performance; inspection frequency; and the model year range of vehicles subject to the program. Estimated changes in emissions benefits for a variety of different options were developed using the latest version of the CALIMFAC model. This report was prepared in response to ARB's request to develop I/M benefits estimates, cost estimates, and cost/effectiveness calculations for a wide range of possible program changes.

Background

In an April 1987 report to the Legislature†, the benefits of the Smog Check program were calculated based on the actual change in emissions from the "undercover" vehicles taken to Smog Check stations by ARB. The testing was done under a program that is commonly referred to as the "First I/M Evaluation Program". Because only vehicles that were likely to fail an I/M test were included in the sample, it was necessary to compute the expected effect on the entire vehicle fleet by accounting for that portion of the vehicle fleet expected to pass the Smog Check test. A detailed description of the methodology used is contained in the 1987 report. The baseline fleet emissions and current Smog Check benefits were estimated to be as shown in Table 2.

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* "Development of the CALIMFAC California I/M Benefits Model," Sierra Research Inc., Report No. SR91-01-01, January 1991.

† "Evaluation of the California Smog Check Program - Technical Appendix," Sierra Research, Inc., April 1987.

Table 2

Estimated Effects of the Smog Check Program
on the Exhaust Emissions of Vehicles Subject to the Program
During 1986

	grams/mile		
	HC	CO	NOx
Baseline, before I/M	2.11	23.7	1.55
After I/M	1.85	21.4	1.49
I/M Reduction	12.3%	9.8%	3.9%

The 1987 report contained no estimate of cost-effectiveness. However, Sierra subsequently computed the cost-effectiveness associated with the emission reductions presented in the 1987 report using the costs of the program at the time the vehicles were tested. Table 3 uses the average 1986-timeframe inspection fee ($20), certificate cost ($6), failure rate (35%), and repair cost ($35) in the calculation of a cost-effectiveness value for the combined HC plus NOx and carbon monoxide (CO) emissions reductions associated with the 1986 version of the Smog Check program. As indicated in the table, an average annual mileage accumulation rate of 10,000 miles per vehicle is assumed. In addition, costs have been divided between the three principal automotive pollutants. 50% of the cost has been assigned to HC plus NOx control and the other 50% to CO. The net result is that HC + NOx cost/effectiveness was computed to be $1.35/pound. CO cost/effectiveness was computed to be $0.19/pound.

In its 1987 report to the Legislature, the I/M Review Committee identified several deficiencies in the Smog Check program and made a series of recommendations for how program benefits might be increased. Based on those recommendations, new program requirements added by the Legislature (through Senate Bill 1997) included:

- expanding warranty coverage for new cars;
- keeping 1966 and later models in the program indefinitely;
- increasing mechanic qualifications;
- restricting the issuance of waivers to BAR or a referee facility;
- raising the cost ceiling from $50 for non-tampering defects to a range of $50-300 based on the model year of the vehicle; and
- substantially enhancing requirements for Test Analyzer Systems.

Table 3

Estimated Cost/Effectiveness
of the Original Smog Check Program During 1986

Costs:

$20 ÷ 2 =	$10	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($35 × 0.35) ÷ 2 =	6	(annual avg. repair cost per vehicle)
	$19	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$9.50	(annual cost for HC + NOx control)
	$9.50	(annual cost of CO control)

Emission Reductions:

2.11 g/mi HC × 12.3% =	0.26 g/mi	(HC reduction)
1.55 g/mi NOx × 3.9% =	0.06 g/mi	(NOx reduction)
	0.32 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	7.05 pounds of HC + NOx	(annual reduction)

23.71 g/mi CO × 9.8% =	2.32 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	51.10 pounds of CO	(annual reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $9.50 ÷ 7.05 lbs. = $1.35/pound

CO Cost/Effectiveness Ratio = $9.50 ÷ 51.10 lbs. = $0.19/pound

These program enhancements took effect in 1990 and ARB has recently implemented a second evaluation of the Smog Check program to measure the effectiveness of the changes. The evaluation will involve the use of more than 1,000 undercover vehicles that will be tested at ARB's El Monte laboratory before and after they are taken through the enhanced program by ARB employees posing as ordinary citizens.

Hard evidence of the effectiveness of the current Smog Check program won't be available until a significant amount of test data is obtained by ARB; however, the changes made in 1990 were designed to improve the emission reductions achieved under the program to at least 25% for HC and CO. Based on the assumption that these targets are achieved,

Table 4

Sierra's First 1990s Timeframe Estimate of the
Cost/Effectiveness of the Smog Check Program
Under Senate Bill 1997

Costs:

$30 ÷ 2 =	$15	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($100 × 0.35) ÷ 2 =	17.50	(annual avg. repair cost per vehicle)
	$35.50	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$17.75	(annual cost for HC + NOx control)
	$17.75	(annual cost for CO control)

Emission Reductions:

1.00 g/mi HC × 25.0% =	0.25 g/mi	(HC reduction)
1.00 g/mi NOx × 10.0% =	0.10 g/mi	(NOx reduction)
	0.35 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	7.71 pounds of HC + NOx	(annual reduction)
10.00 g/mi CO × 25.0% =	2.50 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	55.07 pounds of CO	(annual reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $17.75 ÷ 7.71 lbs. = $2.30/pound

CO Cost/Effectiveness Ratio = $17.75 ÷ 55.07 lbs. = $0.32/pound

Sierra has previously estimated the cost/effectiveness of the new version of the program, as shown in Table 4.

The estimates shown in Table 4 were prepared by Sierra during consideration of Senate Bill 1997 and subsequently presented in a report to ARB that was submitted at the completion of the contract

under which the estimates were performed.* Cost for inspections was estimated at approximately $30 due to the cost of new analyzers and the additional time required for mechanics to perform more thorough inspections. (Inspection costs did subsequently increase to about $30 in early 1990; however, BAR has recently stated that average inspection costs are still higher.) The estimated increase in repair cost to $100 was based on the assumption that the failure rate would remain unchanged, but increasing emission reductions by 2-3 times would cause a corresponding increase in repair cost from the $35 baseline cost. (Based on Sierra's analysis of Smog Check data for the first half of 1990, average repair costs have risen only to $42; however, the cost of preinspection repairs may not be included in this average.)

Using the above-stated cost assumptions, Table 4 shows how the cost/effectiveness of the improved program was projected to change when the average emissions of vehicles subject to the program were reduced to 1.0 gram per mile for HC and NOx and 10.0 g/mi for CO. Based on ARB's emissions factors model (EMFAC), this was projected to occur during the 1990s. As the table shows, the cost/effectiveness ratio for HC + NOx is projected to rise to $2.30/pound. CO cost/effectiveness rises to $0.32/pound.

The potential emissions benefits and associated cost/effectiveness of several further changes to the Smog Check program were also addressed in the previously referenced study of Emissions Deterioration, Post-I/M Tampering, and Cost/Effectiveness of the California Smog Check Program. Specifically, Sierra considered the possible effects of annual inspection frequency and improved diagnostic capability achieved through on-board diagnostic (OBD) systems and/or loaded mode testing. However, the emissions estimates for such changes used in that study were rather crude, first-order approximations. Now that the new I/M computer model (CALIMFAC) has been completed, a more sophisticated tool is available for estimating the change in emissions reductions associated with variations in I/M program features.

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* T.C. Austin, et al, "A Study of Emissions Deterioration, Post-I/M Tampering, and Cost/Effectiveness of the Smog Check Program," Sierra Research, Inc., Report No. SR90-06-02, June 7, 1990.

3. METHODOLOGY

The approach used to develop cost/effectiveness estimates for potential I/M program changes involved using the CALIMFAC model to estimate how the changes would affect vehicle emissions and then developing cost estimates for the changes. The percent reduction due to I/M calculated by the model was translated into a gram/mile (g/mi) emission reduction using the emission factors generated by EMFAC7E and BURDEN. Details of the methods used to exercise the model and construct the cost estimates are outlined below.

CALIMFAC Model

The CALIMFAC model uses a number of "technology categories" to separate advanced technology vehicles from older vehicles with fundamentally different emission control systems. Within each technology category, the fleet is divided into five different "emitter categories" or "regimes" (Normals; Moderates; Highs; Very Highs; and Supers).

Within the model, the distribution of the fleet among the five emitter categories is based on the actual distribution of emissions observed from vehicles recruited by ARB under the in-use surveillance and I/M evaluation programs. The effect of I/M on vehicles in each emitter category is based on what was observed during the I/M Evaluation Program and restorative maintenance/repair efforts by ARB staff. To represent the baseline level of mechanic training and enforcement, movement between categories is based on the 1987 I/M Evaluation Program. To represent the maximum theoretical benefits of I/M, the effect of repairs by ARB technicians are used by the model.

Table 5 shows how the emission benefits for the Smog Check program computed from the new I/M model compare to the manually calculated benefits used in the 1987 report to the Legislature from the California I/M Review Committee. As the table shows, the benefits

Table 5

Comparison of Predicted Benefits: Baseline Program

	Pollutant		
	HC	CO	NOx
I/M Model	12.4%	13.2%	5.6%
Manual Calculation	12.3	9.8	3.9

predicted by the I/M model correspond reasonably well with the benefits calculated manually.

It should be noted that the benefit estimates manually calculated for the 1987 report to the Legislature were computed for one complete I/M cycle (about mid-1986). However, the deterioration characteristics of repaired vehicles appear to be such that benefits become compounded over time. Using a preliminary version of the CALIMFAC model, the Smog Check program benefits for 1988 (after two I/M cycles) were estimated to have increased to about 16% for hydrocarbons and 18% for carbon monoxide. (The current version of the CALIMFAC model incorporates more conservative assumptions that would lead to somewhat lower estimated benefits.)

One of the advantages of the I/M model is that it provides for the simulation of I/M programs that differ from the current program in certain ways. For example, the effect of improving repair quality can be evaluated by using the data from repairs by ARB technicians. Future-year programs can be simulated by modifying the population of vehicles within each technology category.

Sensitivity analyses performed with the model involved investigation of changes in the following parameters:

- inspection frequency (annual vs. biennial);
- test type (idle vs. loaded mode);
- emission standard stringency;
- repair cost limits ($50 to no limit);
- mechanic performance; and
- vehicle exemptions.

The results of the sensitivity runs were converted to gram per mile (g/mi) emission estimates for the fleet and then combined with estimates of the associated changes in program costs to calculate cost/effectiveness ratios for the various program configurations.

Baseline Emission Factors

The percent reductions in emissions computed by the CALIMFAC model were translated into changes in exhaust emission rates (in g/mi) using EMFAC7E and BURDEN output for calendar year 2000. Because of changes in the emission factors and the CALIMFAC model since Sierra last prepared cost/effectiveness estimates for I/M, it was considered appropriate to determine both non-I/M and baseline I/M emission factors. This was necessary to allow recalculation of the cost/effectiveness of the "baseline" SB 1997 program using the same version of the model used to evaluate the effectiveness of program

variations. (Otherwise, the relative cost/effectiveness of the possible program variations might end up being compared to the previous estimates of I/M cost/effectiveness prepared by Sierra.)

Table 6 shows the composite exhaust emission factors Sierra computed using BURDEN and the non-I/M factors that were back-calculated.*

Table 6

Composite Emission Factors
for Cars and Light Trucks

	HC	CO	NOx
2000 with I/M (g/mi)	0.44	5.81	0.73
Baseline I/M Reductions	18.4%	25.3%	8.4%
2000 without I/M (g/mi)	0.54	7.78	0.80

Cost Estimation

To deal with the differences in emissions control feasibility, air pollution control officials generally try to determine how much control is technologically and economically feasible. Using this approach, the ratio of control cost to emission reductions has become a standard measure of performance for an air pollution control program. At the federal level, cost/effectiveness is usually expressed in units of "dollars per ton" of emissions reduced. In California, units of "dollars per pound" are more commonly used.

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* It should be noted that the "baseline" I/M reductions used to back out the non-I/M emission factors are those used in EMFAC7E. Sierra has recently determined that there were two minor errors in the assumptions used in the CALIMFAC model runs used to generate the I/M emission factors within EMFAC7E. An attempt to compute year 2000 I/M reductions from the model runs presented in this report would result in slightly higher I/M benefits (by a few tenths of a percent for each pollutant). In addition, the projected HC and NOx reductions being below the targets of SB 1997 (25% for HC and 10% for NOx) is not a particular concern given the conservative nature of some of the assumptions being used within the model. Relative minor changes in repair effectiveness would be sufficient to achieve a 25% reduction. Further tuning of the model will be possible after data become available from the new I/M Evaluation Program being conducted by ARB.

Another difference between cost/effectiveness calculations involves the manner in which the time value of money is accounted for. At the federal level, cost/effectiveness values are usually computed based on the "Net Present Value" of the costs. A Net Present Value (NPV) computation reduces a series of cash flows that occurs in the future to a single "net" value in the present through the application of a "discount rate". (This approach recognizes that $1 available in the present is more valuable than $1 that will not become available until later because of the interest that could be earned by investing the money in the interim.) In California, NPV is sometimes used for stationary source-related measures but is not used for evaluating mobile source strategies. In previous analyses of cost/effectiveness for I/M programs, Sierra has used a hybrid approach in which capital costs are amortized over a specific period of time using an interest rate estimated to reflect the cost of funds for secured items, and all costs and benefits are computed on an annualized basis rather than a Net Present Value basis. This is the approach taken in the calculations appearing below.

Specific assumptions used to estimate the cost of various program changes are addressed in conjunction with the results of calculations summarized below. In each case, the product of repair cost and failure rate is assumed to be proportional to the emission reductions projected for a particular program variation. The starting point for this proportional adjustment is a failure rate and average repair cost for the current program. This simplification was needed because the specific failure rates internally calculated by the CALIMFAC model are not an output and code revisions to retrieve this information would have increased the resources required to complete the task substantially.

All cost estimates are presented in current dollars.

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4. EFFECTIVENESS ESTIMATES

CALIMFAC model output for all of the runs conducted is contained in Appendix A. Each run begins with a display of the input assumptions that follow the statement, "THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS." Sierra's previously referenced final report on the development of the CALIMFAC model explains the range of input assumptions available and how they are applied within the model. Briefly, the "baseline" assumptions for the SB 1997 version of the Smog Check program are:

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00%
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standards Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

The entry "program start year" should be self explanatory. However, it should be noted that there are <u>two</u> program start years for each of the scenarios that were run. 1984 is the first program start year for all scenarios, and the assumptions associated with that start year represent the "original" version of the Smog Check program that operated from 1984 through 1989. 1990 is the program start year for the second phase of the Smog Check program. <u>All alternative program assumptions modeled under this project were assumed to start in 1990</u>. Use of the same start time for all scenarios ensures that the results are comparable.

In the example shown above for the baseline program, "biennial" inspection frequency supplemented by "change-of-ownership" inspections for 17% of the fleet are associated with the SB 1997 program. The inspection test type is "idle plus 2500", the standard two-mode, no-load test involving measurement of HC and CO.

Under the category of "visual/functional checks", the "better" option is selected. (The selection of the better or "enhanced" visual/functional inspections is necessary to correct an error in previous model runs to simulate the SB 1997 program; the "SB 1997" option for visual/functional inspections does <u>not</u> include all of the checks

actually required under SB 1997 and the "enhanced" or "better" level does.)

Under the "emissions standards stringency" category, the standards have not changed from the "88 LEVEL" that existed under the original program. The "SB 1997" level of "repair cost limits" reflects the $50 to $300 range as a function of vehicle model year. Mechanic performance associated with fixing failed vehicles is assumed to be at the "ENHANCED" level, under the level of mechanic qualifications and enforcement projected under the Bureau of Automotive Repair's efforts to enforce Senate Bill 1997. (As used in this report, "enhanced" mechanic performance is less than the "best" mechanic performance; it compares to the "1990" level of performance described in Sierra's final report on the CALIMFAC model.)

In the category of "model years included", consistent with SB 1997, 1966 and later models are in the program, but the limitations of EMFAC7E result in only the last 25 years of vehicles being considered. As far as exemptions are concerned, the baseline assumption used in this report is different from that used in earlier work with CALIMFAC. A minor error in the earlier work with the model is that it was assumed that half of all new vehicles would be called in for a Smog Check on their first registration renewal. In fact, the Department of Motor Vehicles has <u>not</u> been requiring Smog Checks until the <u>second</u> registration renewal for half the cars and the <u>third</u> renewal for the other half (based on the last VIN digit). The selection of a one-year exemption reflects this fact.

Finally, neither the baseline scenario nor any others assumes that "pass" vehicles will be able to skip the next inspection and 24% of the failed vehicles are assumed to be very difficult to repair. (This is an ARB-developed assumption that adds to the conservative nature of the I/M benefits projected by the model.)

For each scenario run, three pages of model output follow the single page of input assumptions. As shown on page A-3 of Appendix A, the first page of output lists the "No I/M" and "I/M" emission factors and the percent reduction for each pollutant for calendar years 1980 through 2020. All emission factors are reported in units of grams per mile. The "EVAP" results are all zeros because that portion of the CALIMFAC model is not yet operational. The first page of model output for each scenario is for passenger cars. The following two pages are for light-duty trucks and medium-duty trucks. A brief, one-line description of the input assumptions is included at the top of each page of output for reference.

The following subsections of the report describe a series of sensitivity runs in which various program assumptions were changed and then compared to the baseline (SB 1997) program. Individual changes are described first, followed by combinations of assumptions. In the narrative and graphical summaries that follow, calendar years 2000 and 2010 are highlighted and all of the results presented are for passenger cars. Appendix A contains the results for all other

calendar years and for light-duty trucks and medium-duty vehicles as well. Although a brief description of the various assumptions is provided, Sierra's final report on the development of the CALIMFAC model provides more detailed information on the specific changes associated with many of the assumptions (e.g., the percentage of failed vehicles fixed under various assumptions for repair cost ceilings and mechanic performance).

New Car Exemptions

Figures 1 and 2 show the effect of exempting new vehicles from the program for various periods of time. For the year 2000 case (Figure 1), the one-year exemption currently provided results in I/M reductions of 18.1% HC, 25.3% CO, and 10.4% NOx. Rounding the results to the nearest 0.1%, there is no benefit associated with eliminating the one-year exemption currently provided. As the figure shows, the effect of a two-year exemption would also be negligible. A three-year exemption drops the HC and CO reductions by only 0.3%. An additional 0.3% benefit reduction occurs with a four-year exemption. With a five-year exemption the rate of benefit loss starts to grow and the net benefits are reduced to 17.0% HC, 24.0% CO, and 10.2% NOx. Slightly greater losses are shown for the year 2010 results displayed in Figure 2.

Annual Inspection Frequency

Figures 3 and 4 illustrate the effect of increasing the inspection frequency from biennial to annual while simultaneously dropping the change-of-ownership inspection requirement. The year 2000 baseline program benefits of 18.1% HC, 25.3% CO, and 10.4% NOx are increased to 27.6% HC, 34.7% CO, and 18.6% NOx if the same one-year exemption for new vehicles is retained. Fairly modest reductions in program benefits are projected for new vehicle exemptions ranging from 2-5 years.

More Stringent Testing Procedures and Standards

Figures 5 and 6 illustrate the effects of more stringent testing procedures. Under the scenario for "stricter idle standards", the 100 ppm HC/1.0% CO idle standards for 3-way catalyst-equipped vehicles are tightened to 60 ppm HC/0.5% CO. The 2500 rpm standards drop from 220 ppm HC/1.2% CO to 120 ppm HC/1.0% CO. Less significant changes are made to other standard categories. (Details of all of the standard changes are contained in Sierra's final report on the development of the CALIMFAC model.) As shown in Figure 5 for year 2000, the benefits of the stricter standards increase from 18.1% HC, 25.3% CO, and 10.4% NOx to 19.8% HC, 27.0% CO, and 12.0% NOx. Also shown in the figure are the results of adding loaded mode (dynamometer) testing. At one level of standard stringency, program benefits increase to 22.2% HC, 29.2% CO, and 16.9% NOx. More stringent standards add another 1-2%. (Sierra's final report on the

Figure 1

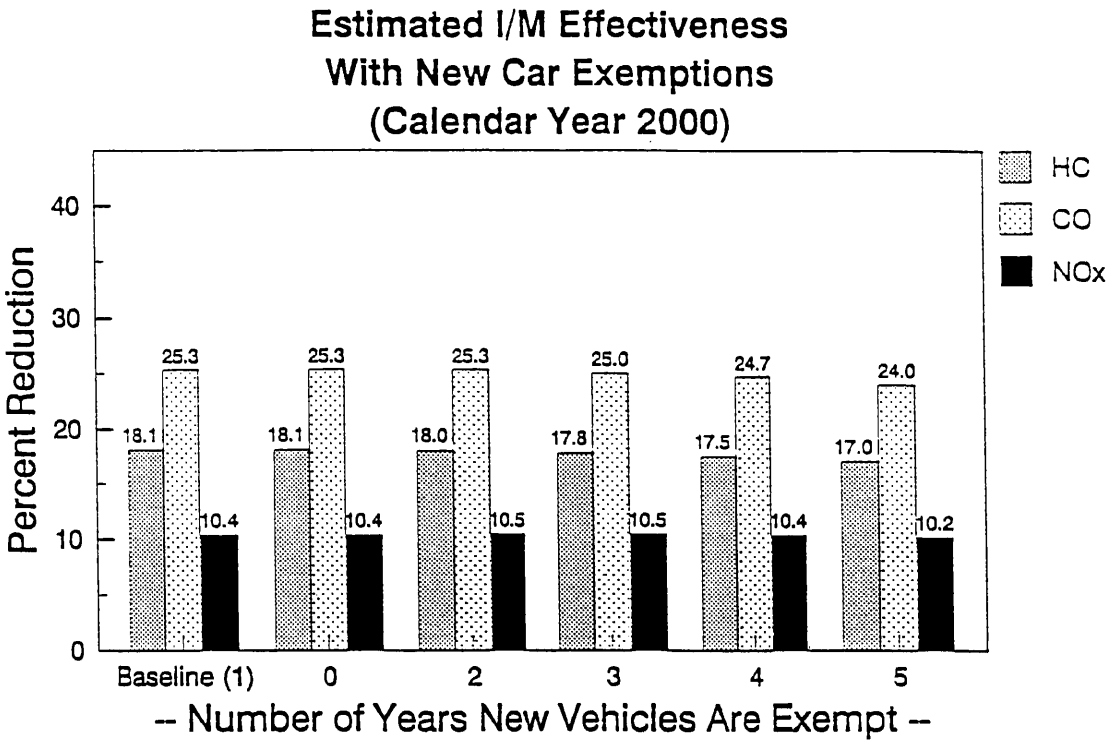


Figure 2

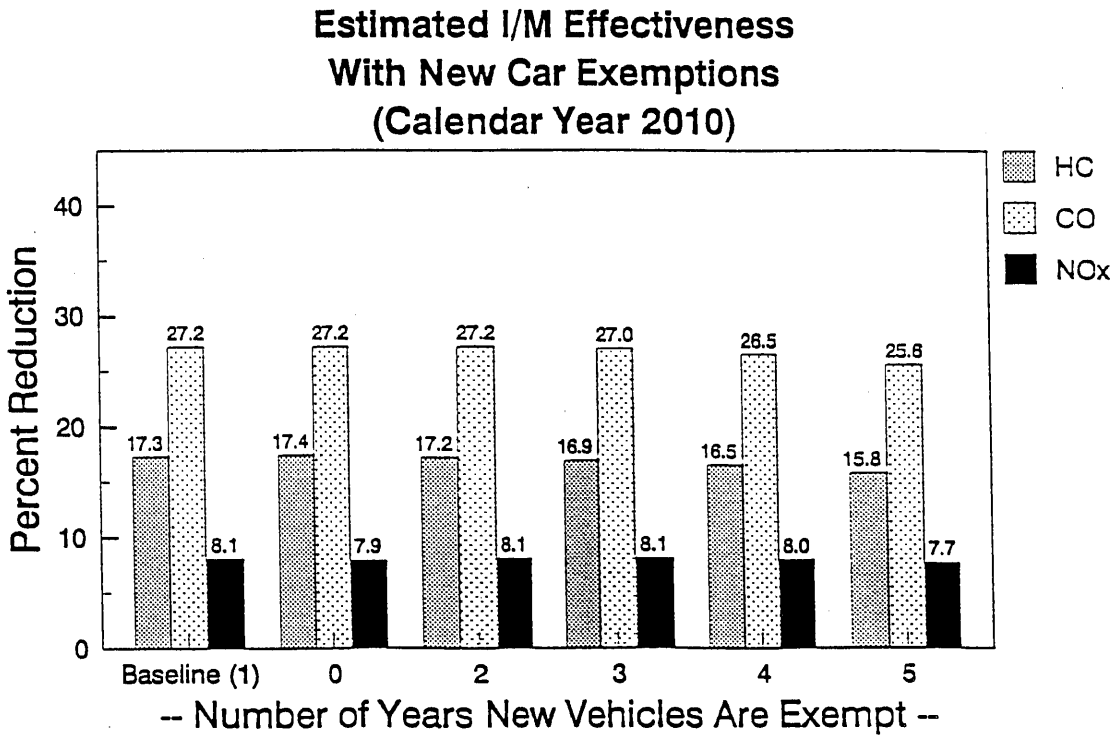


Figure 3

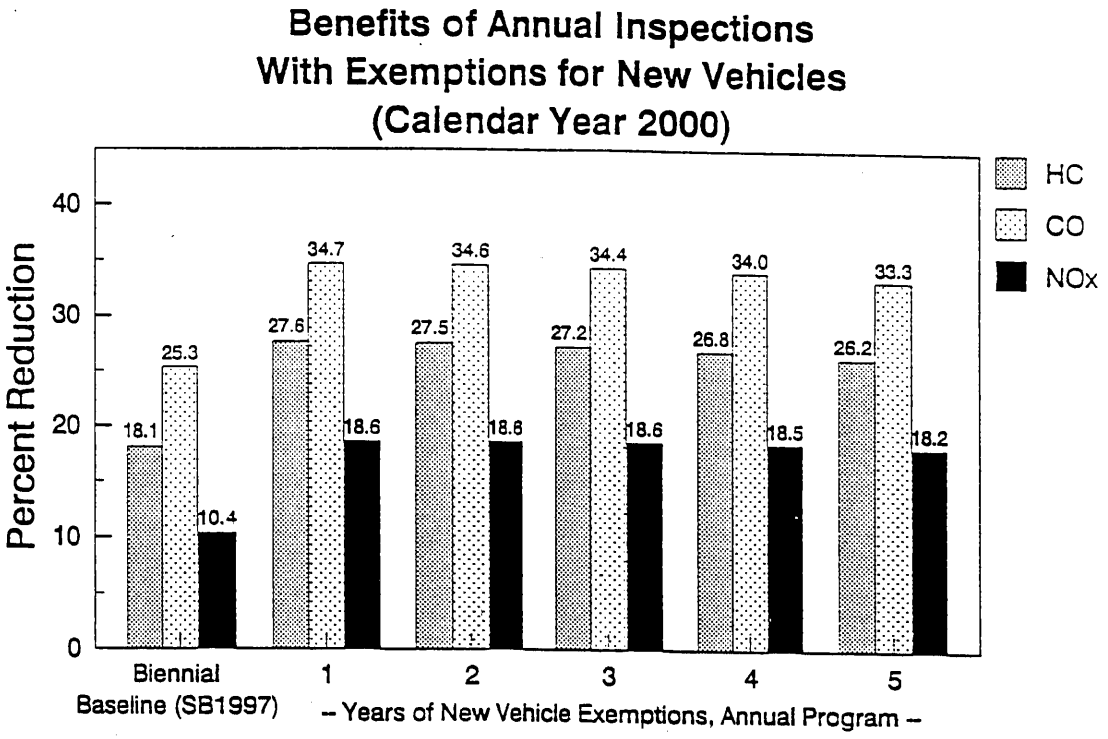


Figure 4

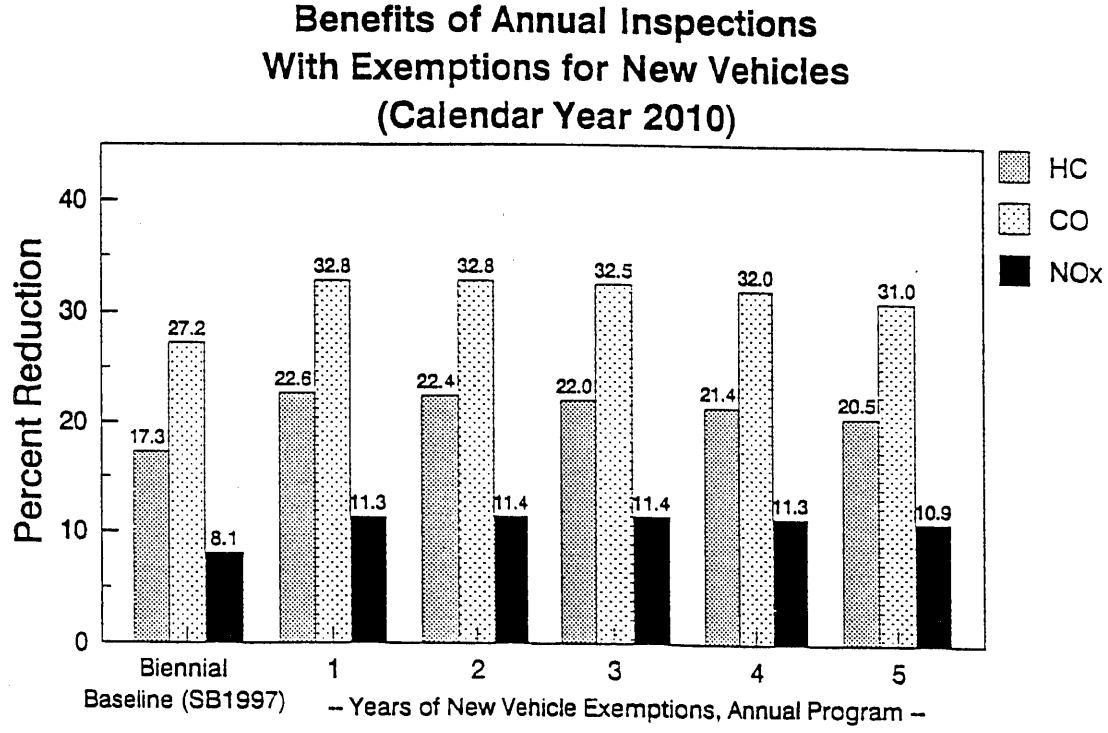


Figure 5

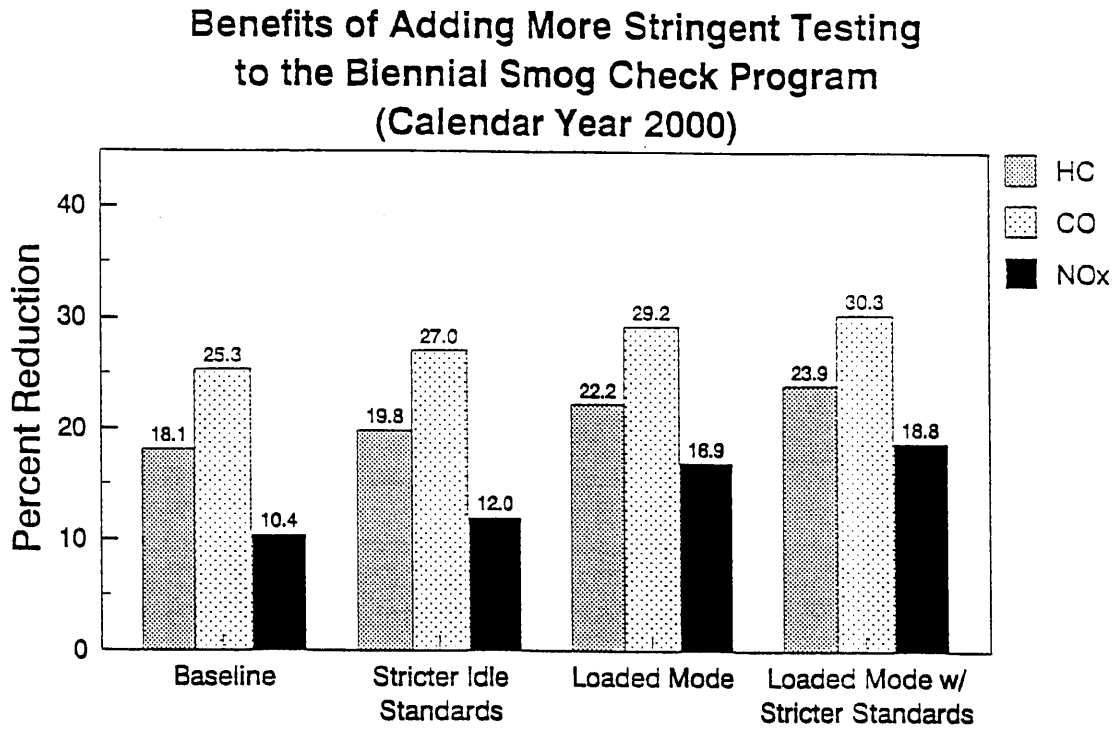
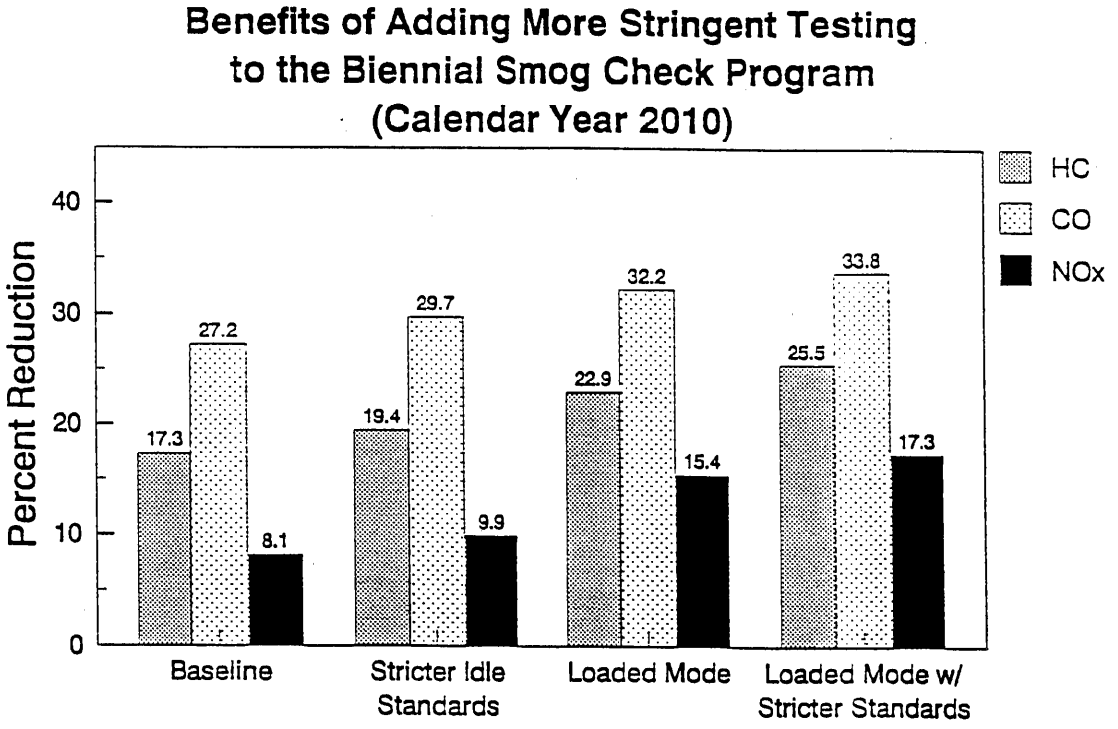


Figure 6



development of the CALIMFAC model contains details of the loaded mode emission standards and test procedures specifically evaluated.)

No Repair Cost Ceiling

Figures 7 and 8 show the effect of removing the current repair cost ceilings that apply to the Smog Check program. This change is projected to increase the benefits of the program in calendar year 2000 from 18.1% HC, 25.3% CO, and 10.4% NOx to 19.4% HC, 26.9% CO, and 11.4% NOx. The benefits of no repair cost ceiling are reduced somewhat in 2010 because almost all of the cars on the road are subject to the highest ($300) repair cost ceiling under the baseline program that applies to 1990 and later models.

Better Mechanic Performance

Figures 9 and 10 show the effect of improved mechanic performance. This change is projected to increase the benefits of the program in calendar year 2000 from 18.1% HC, 25.3% CO, and 10.4% NOx to 19.9% HC, 27.3% CO, and 11.7% NOx. A similar improvement is projected for the 2010 case.

Maximum Effort Program

Figures 11 and 12 show the projected results of combining the most effective individual program enhancements. The results shown in the figures are for annual inspection frequency, stringent loaded mode standards, improved mechanic performance, and no repair cost ceiling. For the year 2000 case, these changes are projected to increase the benefits of the program from 18.1% HC, 25.3% CO, and 10.4% NOx to 36.7% HC, 41.9% CO, and 28.6% NOx. The figures also illustrate the effect of extending exemptions for new cars from 1-5 years.

Figures 13 and 14 show how the retention of biennial inspection frequency would affect an otherwise maximum effort program. For year 2000, the maximum effort biennial program yields intermediate benefits of 28.2% HC, 34.6% CO, and 22.2% NOx, closer to the maximum effort annual program than the baseline biennial program.

Figures 15 and 16 show the effects of retaining idle/2500, no-load testing in an otherwise maximum effort program. For year 2000, the maximum effort idle/2500 program yields intermediate benefits of 32.3% HC, 38.9% CO, and 22.3% NOx, much closer to the maximum effort loaded mode program than the baseline program.

Figure 7

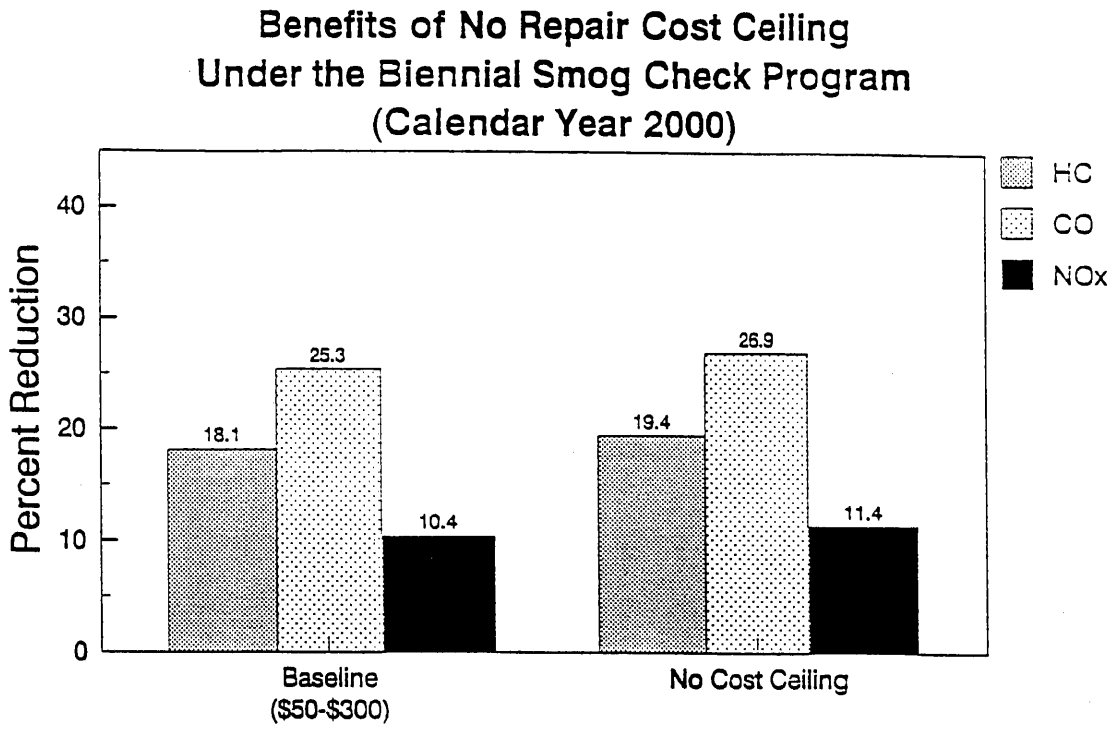


Figure 8

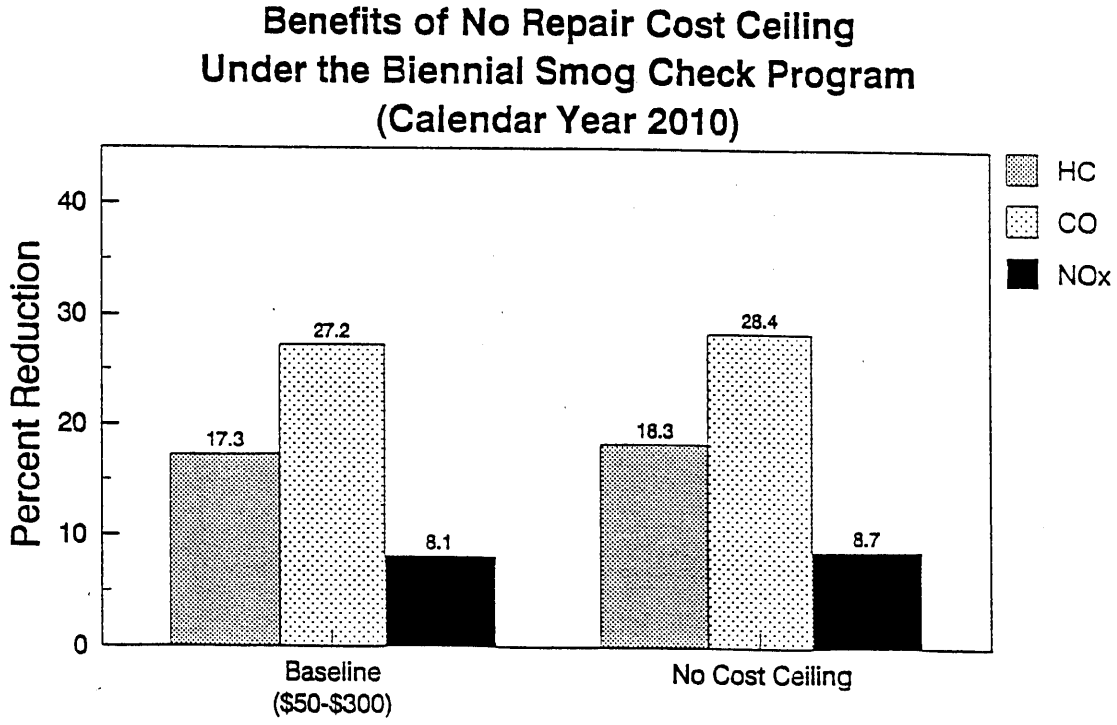


Figure 9

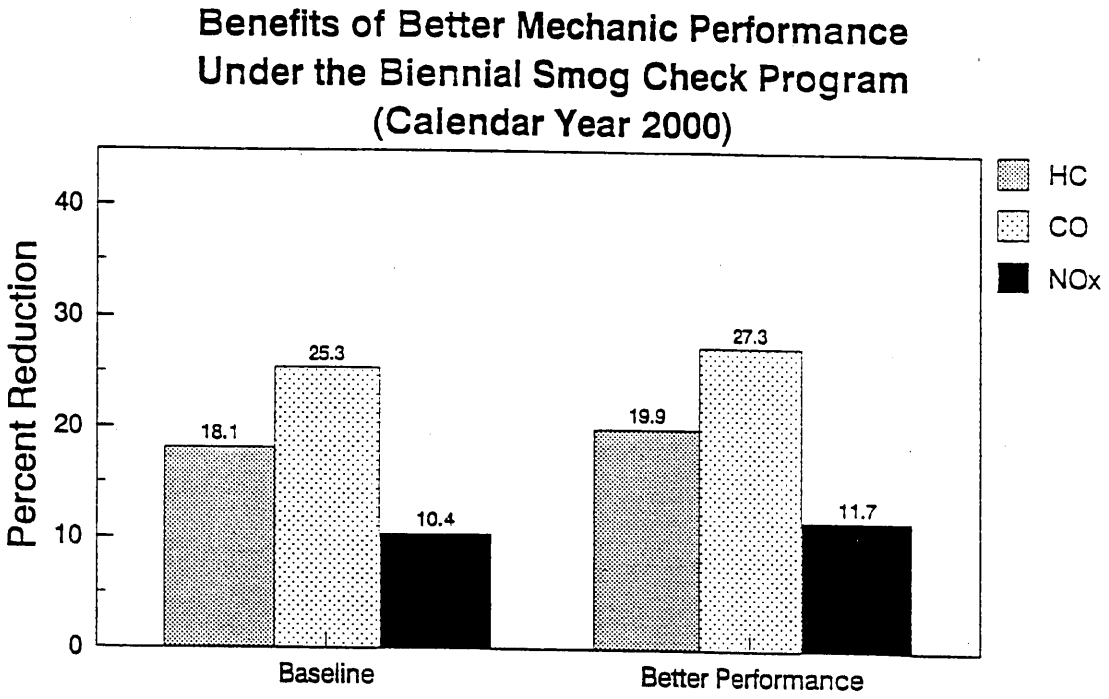


Figure 10

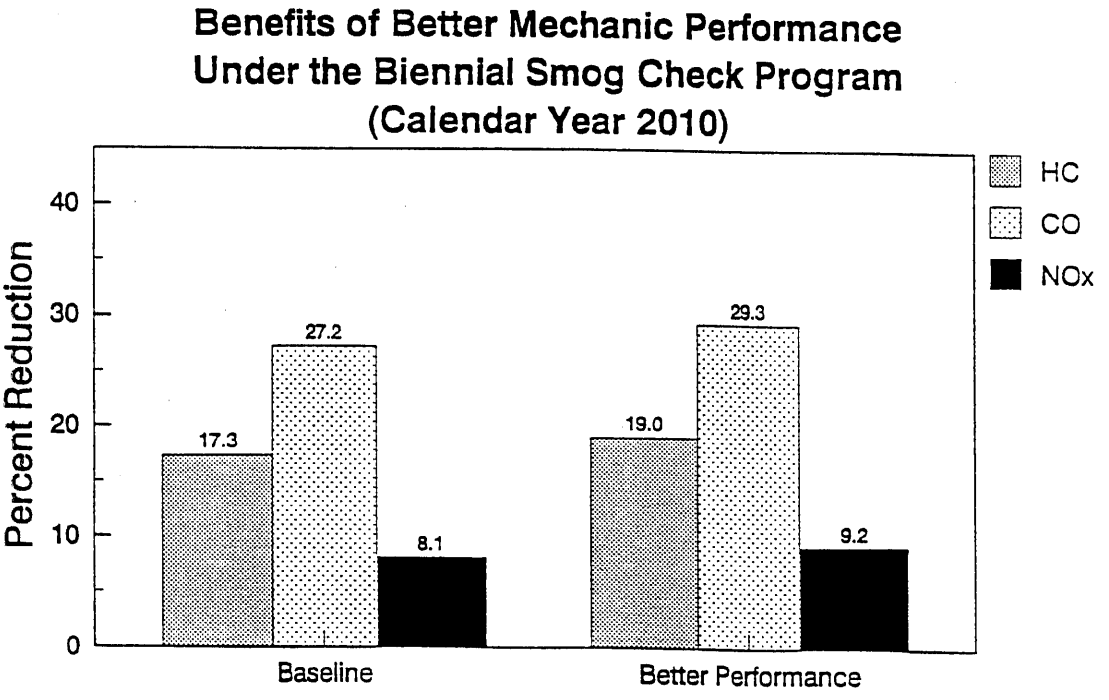


Figure 11

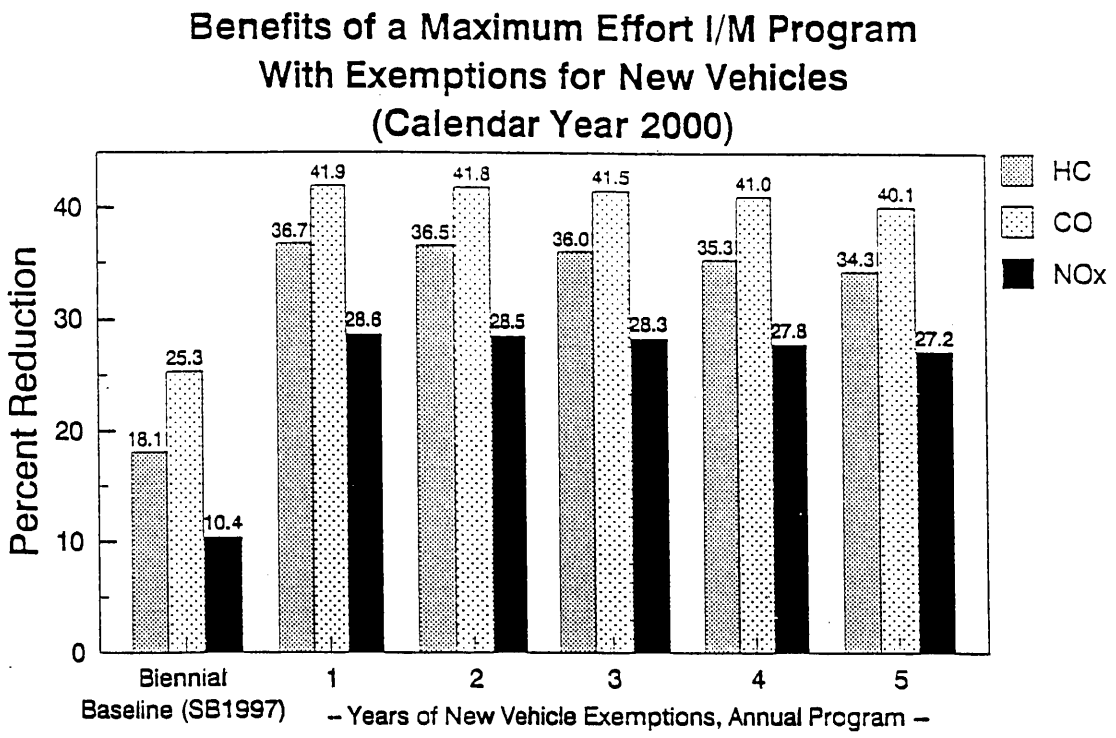


Figure 12

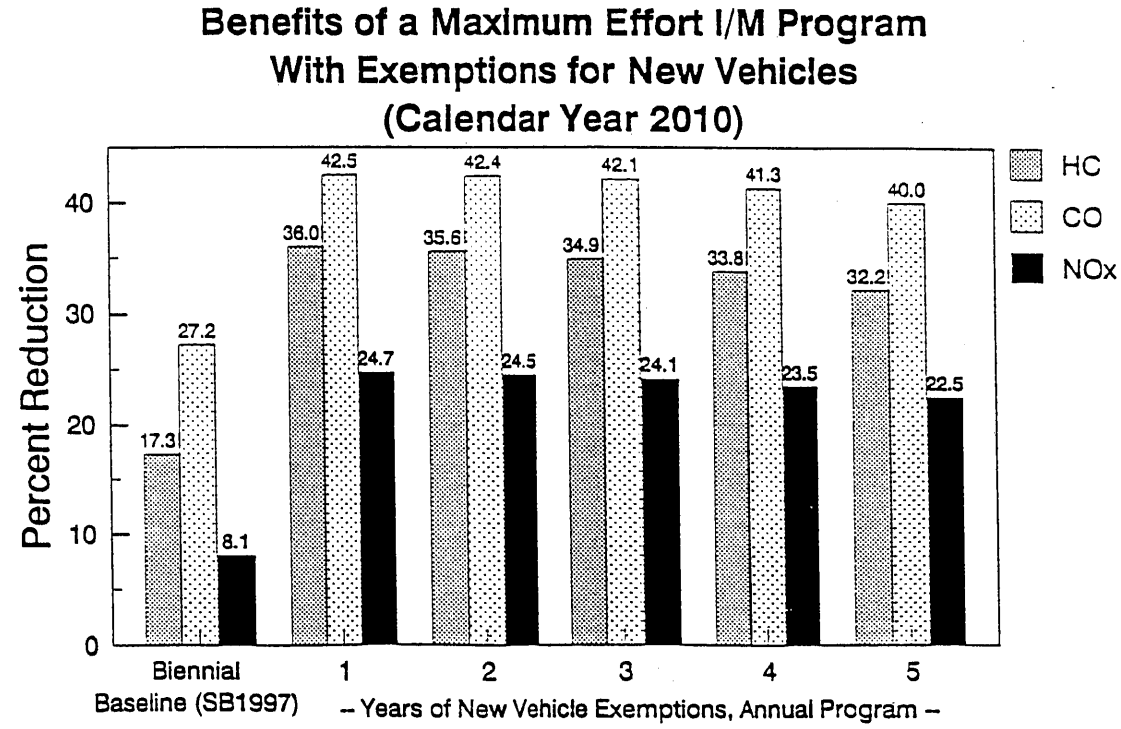


Figure 13

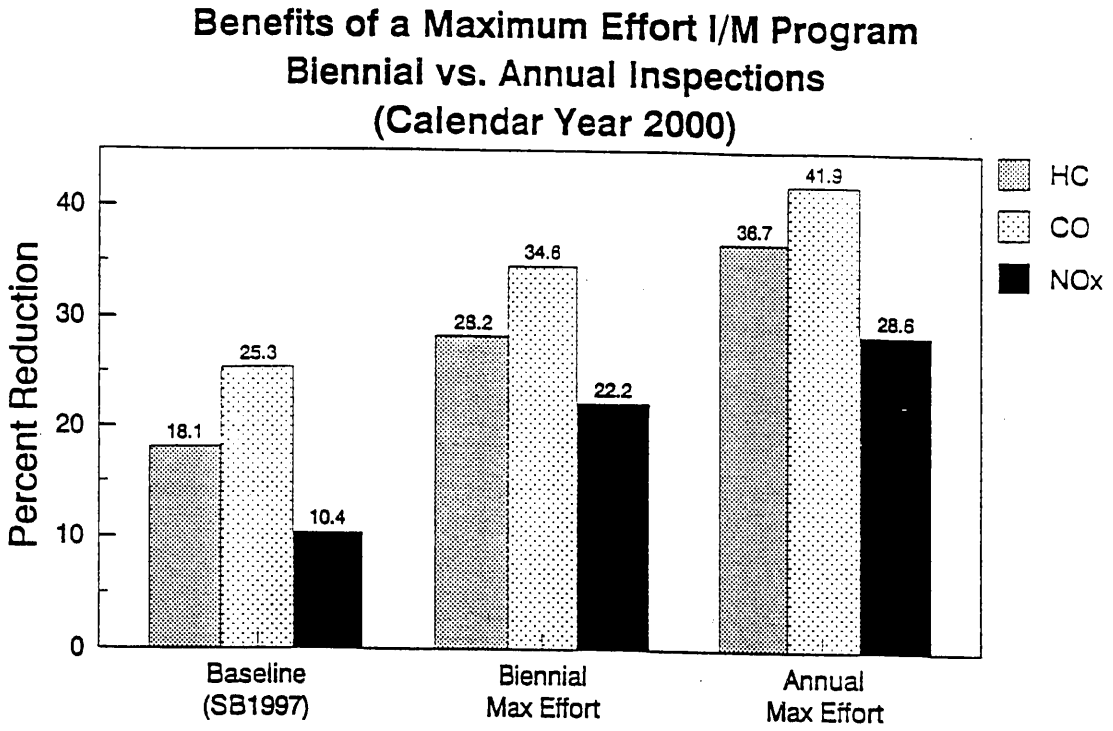


Figure 14

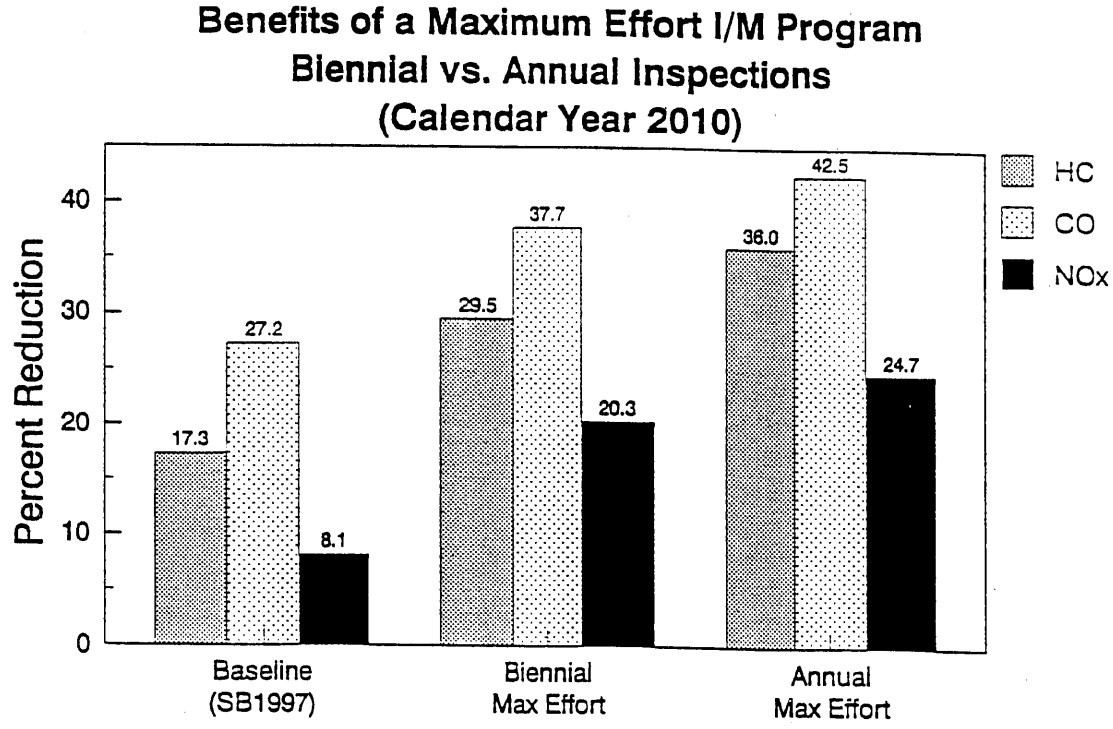


Figure 15

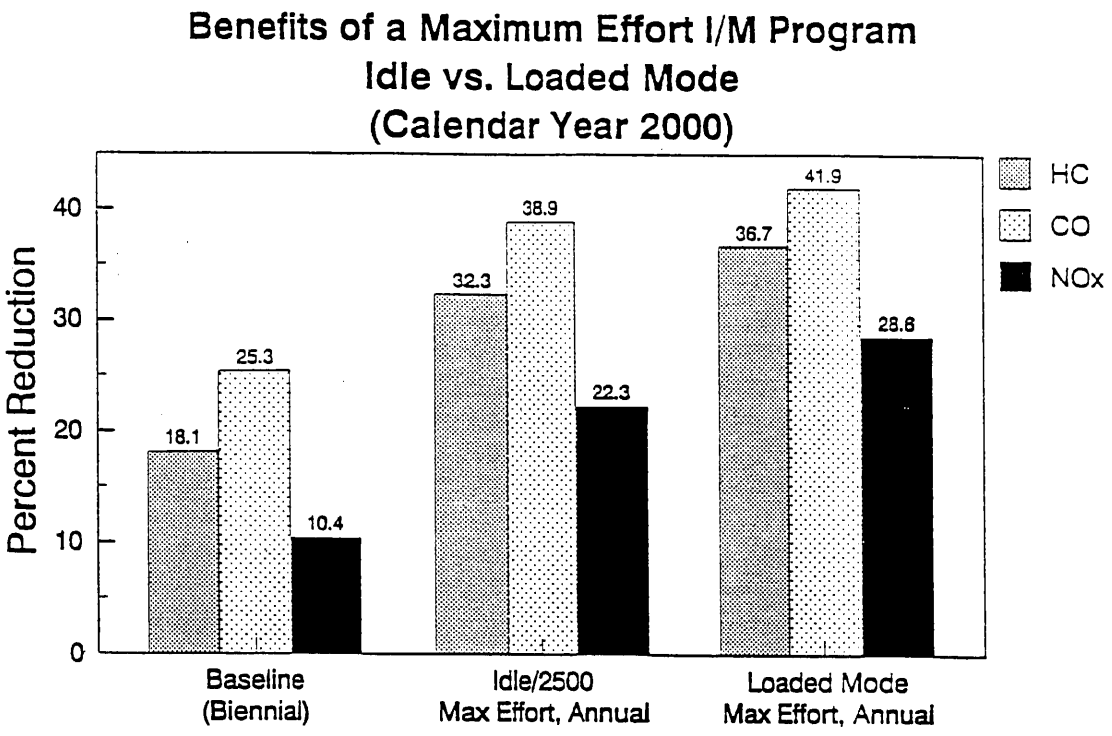
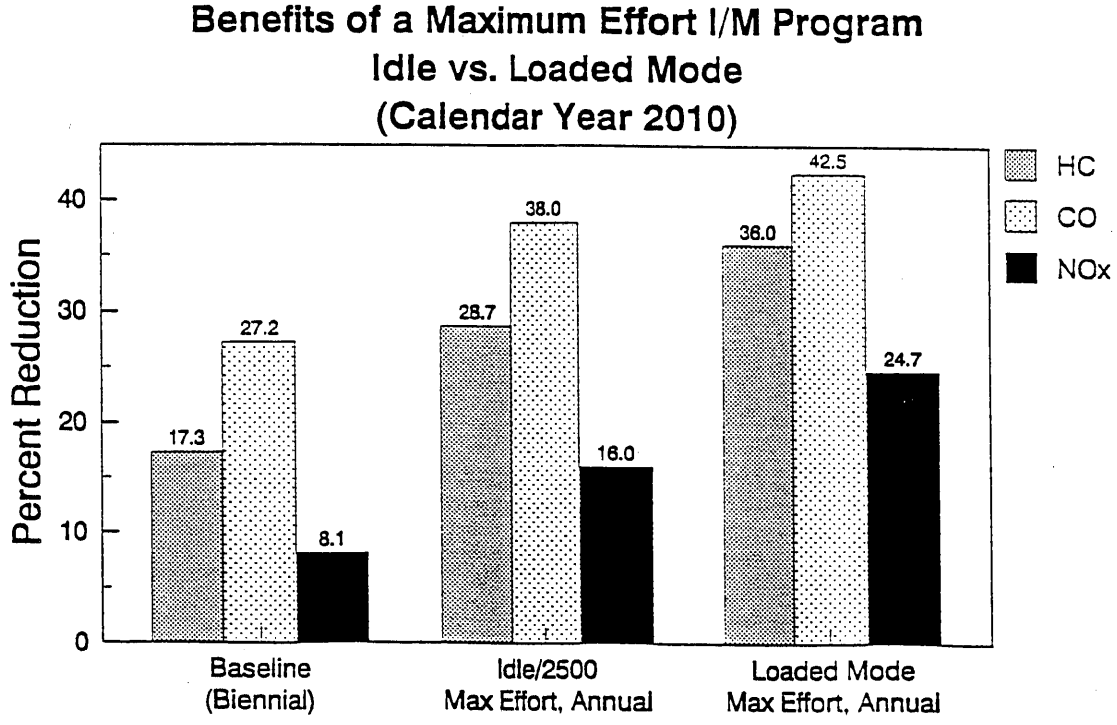


Figure 16



Summary of Sensitivity Runs

Table 7 shows in one table, highlights of the sensitivity runs discussed above for the year 2000. As the table shows, using the maximum stringency of all options results in estimated emission reductions of 36.7% for HC, 41.9% for CO and 28.6% for NOx. These are approximately double the reductions achieved under the current (baseline) program for HC, 65% greater reductions for CO, and almost triple the benefits for NOx emissions. As indicated in the table, increasing the inspection frequency from biennial to annual has the largest effect.

It also should be noted that Table 7 shows what the projected emission reductions would have been if the original version of the Smog Check program had continued without the enhancements of SB 1997. The CALIMFAC model predicts that the benefits of the original program would have peaked about ten years earlier and declined to less than half the peak effectiveness by year 2000.

Table 7

Effect of Smog Check Program Variations
Predicted by the CALIMFAC Model
for Calendar Year 2000

	Incremental Reduction			Total Reduction		
	HC	CO	NOx	HC	CO	NOx
Original (1984) Program	n.a.	n.a.	n.a.	6.0%	9.0%	2.0%
SB 1997 Program (baseline)	-	-	-	18.1%	25.3	10.4%
Annual Inspections	+9.5%	+9.4%	+8.2%	27.6%	34.7%	18.6%
More Stringent Standards	+1.7%	+1.7%	+1.6%	19.8%	27.0%	12.0%
Loaded Mode	+4.1%	+3.9%	+6.5%	22.2%	29.2%	16.9%
No Repair Cost Limit	+1.3%	+1.6%	+1.0%	19.4%	26.9%	11.4%
Better Mechanics	+1.8%	+2.0%	+1.3%	19.9%	27.3%	11.7%
All of the Above	+18.6%	+16.6%	+18.2%	36.7%	41.9%	28.6%

Table 8 shows how the CALIMFAC model predictions for calendar year 2010 are affected by changing the stringency of various program elements. Note that the reductions for the "baseline" program are projected to change only slightly. Using the maximum stringency of all options results in estimated emission reductions of 36.0% for HC, 42.5% for CO and 24.7% for NOx. Increasing the inspection frequency from biennial to annual still has a large, although smaller effect. Loaded mode testing becomes the single most significant program enhancement.

Table 8

Effect of Smog Check Program Variations
Predicted by the CALIMFAC Model
for Calendar Year 2010

	Incremental Reduction			Total Reduction		
	HC	CO	NOx	HC	CO	NOx
Original (1984) Program	n.a.	n.a.	n.a.	5.0%	8.0%	1.0%
SB 1997 Program (baseline)	-	-	-	17.3%	27.2	8.1%
Annual Inspections	+5.3%	+5.6%	+3.2%	22.6%	32.8%	11.3%
More Stringent Standards	+2.1%	+2.5%	+1.8%	19.4%	29.7%	9.9%
Loaded Mode	+5.6%	+5.0%	+7.3%	22.9%	32.2%	15.4%
No Repair Cost Limit	+1.0%	+1.2%	+0.6%	18.3%	28.4%	8.7%
Better Mechanics	+1.7%	+2.1%	+1.1%	19.0%	29.3%	9.2%
All of the Above	+18.7%	+15.3%	+16.6%	36.0%	42.5%	24.7%

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5. COST/EFFECTIVENESS ESTIMATES

In the following tables, the cost, effectiveness, and cost/effectiveness ratio of the various program variations are presented in the same basic form as the original cost/effectiveness calculations for the original Smog Check program (Table 3). The accompanying narrative explains the basis for the cost assumptions. All computations are presented for the calendar year 2000 case.

Baseline Cost Effectiveness

As shown in Table 9, costs of the current Smog Check program have been estimated based on the assumption that the inspection fee will stabilize at $35, the certificate cost will stay at $6, and the repair cost will average $50 under the new repair cost limits. All of these estimates are based on actual trends reported by BAR or calculated by Sierra from TAS data. In the absence of software to extract the precise failure rates from the CALIMFAC model, it is assumed that the failure rate stays at close to the 35% level. Using the latest emission factors and CALIMFAC predictions, the cost/effectiveness of the program is calculated to be quite similar to Sierra's earlier estimates. HC plus NOx is estimated at $3.69/lb. While this is significantly higher than Sierra's earlier estimate of $2.30/lb for the 1990s timeframe, most of the difference is due to the lower emissions projected for vehicles in calendar year 2000. The lower no-I/M emissions obviously reduces the cost/effectiveness ratio even if the percentage reduction and cost of the program is unchanged.

Annual Inspection Frequency

Obviously, annual inspection frequency will increase the frequency with which vehicle owners must incur the costs of vehicle inspections and certificates of compliance. However, it is possible that annual inspection frequency could introduce some economies of scale into I/M testing, thereby reducing the cost of each test. To investigate this possibility, Sierra previously performed an extensive analysis of Test Analyzer System data. Based on Sierra's analysis, most Smog Check stations perform relatively few tests per day on the average; 23.8% average only one test per day. Almost 80% of the stations perform six or fewer tests per day. However, only 40% of the tests are performed by stations that average six or fewer tests per day. Because of the unequal distribution of the testing volume, the utilization of analyzers and garage space may not be substantially improved under an annual inspection program. Because more than half of the testing volume is associated with stations that do more than six tests per day, no discounts are projected for the increased testing load associated with a change to annual inspection frequency.

Table 9

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
Under Senate Bill 1997

Costs:

$35 ÷ 2 =	$17.50	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($ 50 × 0.35) ÷ 2 =	8.75	(annual avg. repair cost per vehicle)
	$29.25	(total annual cost per vehicle)
	÷ 2	(50% of costs assigned to HC + NOx)
	$14.63	(annual cost for HC + NOx control)
	$14.63	(annual cost for CO control)

Emission Reductions:

0.54 g/mi HC × 18.1% =	0.10 g/mi	(HC reduction)
0.80 g/mi NOx × 10.4% =	0.08 g/mi	(NOx reduction)
	0.18 g/mi	(HC + NOx reduction)
	× 10,000 miles/year	(annual vehicle mileage)
	3.96 pounds of HC + NOx	(annual reduction)

7.78 g/mi CO × 25.3% =	1.97 g/mi	(CO reduction)
	× 10,000 miles/year	(annual vehicle mileage)
	43.39 pounds of CO	(annual reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $14.63 ÷ 3.96 lbs. = $3.69/pound

CO Cost/Effectiveness Ratio = $14.63 ÷ 43.39 lbs. = $0.34/pound

Failure rate would also be expected to drop under more frequent inspections. The CALIMFAC model can be modified to predict precisely what the change in failure rate would be. However, modification of the model was considered beyond the scope of the current task. Instead, Sierra made the conservative assumption that the total number of failures would be proportional to the benefits (HC + CO + NOx) achieved over a two-year period. As a result, the failure rate for annual inspections is estimated to be slightly lower than the failure rate for biennial inspections.

Table 10 shows the projected effects of annual inspection frequency on the cost/effectiveness of the Smog Check program in year 2000. Note that the table has been modified to show the net cost/effectiveness with annual inspection frequency in addition to the incremental cost/effectiveness of adding the annual inspection requirement.

As shown in Table 10, the addition of annual inspection frequency is projected to have very little effect on the cost/effectiveness of the Smog Check program in 2000. For HC plus NOx, cost/effectiveness increases to $4.08/lb from $3.69/lb. The incremental cost/effectiveness of increasing the inspection frequency is estimated at $4.67/lb for HC plus NOx.

Loaded Mode Testing

CALIMFAC estimates the effectiveness of loaded mode testing based on the results of routine, steady-state loaded mode tests that ARB has been conducting on vehicles tested at the El Monte laboratory. Based on ARB's test results, the application of loaded mode testing would significantly increase the rate at which defective vehicles are identified. Additional emissions reductions are calculated by the model based on the assumption (which Sierra believes to be reasonable) that vehicles within each emitter category (supers, very highs, etc.) will be corrected with the same efficiency regardless of whether they failed because of an idle or a loaded mode test.

Repair cost would be expected to increase because the failure rate would increase due to an increased defects identification rate. In the absence of software changes to determine the precise failure rate predicted by the CALIMFAC model, it is assumed that the increase in the failure rate will be proportional to the increased emission reductions predicted by the model. Repair costs per repaired vehicle are assumed to be unchanged. (This assumption is consistent with Sierra's earlier analysis of data from the First I/M Evaluation program. Of six 1980 and later models that achieved NOx emission benefits of 50% or more, five had disconnected or leaking vacuum lines that resulted in failure of the EGR system. Review of the diagnostic comments on vehicles that were not repaired also indicates that simple vacuum line problems are a common cause of increased NOx emissions.)

Table 10

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With Annual Inspection Frequency

Costs:

	$35.00	(annual inspection fee)
	6.00	(annual cost for Smog Certificate)
+ ($ 50 × 0.26) =	13.00	(annual repair cost per vehicle)
	$54.00	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$27.00	(annual cost for HC + NOx control)
-	14.63	(baseline cost for HC + NOx)
	12.37	(incremental cost for HC + NOx)

similarly:

$27.00	(annual cost for CO control)
$12.37	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 27.6% =	0.15 g/mi	(HC reduction)
0.80 g/mi NOx × 18.6% =	0.15 g/mi	(NOx reduction)
	0.30 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	6.61 pounds of HC + NOx	(annual reduction)
-	3.96 pounds of HC + NOx	(base reduction)
	2.65 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 34.7% =	2.70 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	59.47 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	16.08 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $27.00 ÷ 6.61 lbs. = $4.08/pound
Incremental HC + NOx C/E Ratio = $12.37 ÷ 2.65 lbs. = $4.67/pound

CO Cost/Effectiveness Ratio = $27.00 ÷ 59.47 lbs. = $0.45/pound
Incremental CO C/E Ratio = $12.37 ÷ 16.08 lbs. = $0.77/pound

Table 11 summarizes the expected cost of dynamometer testing based on a 1988 survey of equipment vendors. As the table shows, the cost of the NOx instrumentation was estimated at about $4,000, and the

Table 11

Incremental Costs for
Steady State Loaded Mode Testing
(1988 Dollars)

NOx Instrumentation	$ 4,000
TAS Modifications to Interface with Dyno	1,000
Dynamometer	8,000
Site Preparation Charges	2,500
Miscellaneous equipment and supplies (cooling fans, etc.)	1,000
	$16,500
With Inflation Adjustment	$19,000

dynamometer at about $8,000. Other costs brought the total cost of steady state loaded mode testing equipment to $16,500 per Smog Check station. Accounting for inflation, $19,000 would be a reasonable current estimate of the hardware costs for retrofitting Smog Check stations for dynamometer testing.

To estimate the effects of loaded mode testing, the worst case (i.e., highest cost) assumption would be that most currently licensed Smog Check stations get involved in loaded mode testing. If 8,000 stations are involved in the program and there are 1,000,000 tests per month, the increased cost per test associated with the amortization of a $19,000 investment for each station would be about $3 computed using a 15% cost of funds and a five-year amortization period, as shown below.

$$\text{annualized cost} = \frac{\text{capital cost} \times i(1+i)^a}{(1+i)^a - 1}$$

where: a = amortization period and i = cost of funds.

$$\text{annualized cost} = \frac{\$19{,}000 \times .302}{1.01} = \$5{,}681$$

$$\text{annualized cost per test} = \$5{,}681 \div 1{,}500 = \$3.79$$

With maintenance and operating cost of the loaded mode testing equipment estimated at 33% of the capital cost, the total increase in test fee associated with the additional equipment would be about $5. However, if the time required to conduct the test increased by about 10 minutes (to account for the time required to secure the vehicle to the dynamometer and remove it), the total inspection cost would be increased by another $8 (at a $45-50/hr labor rate). This would add a total of $13 to the cost of each test, bringing the inspection fee total to $48.

As shown in Table 12, the addition of loaded mode testing is projected to improve the cost/effectiveness of the Smog Check program for HC plus NOx. In year 2000, the cost/effectiveness for HC plus NOx is estimated to drop to $3.32/lb from $3.69/lb. The incremental cost/effectiveness of loaded mode testing is estimated at $2.14/lb for HC plus NOx. In contrast, the cost/effectiveness of CO is degraded by loaded mode testing, from $0.34/lb to $0.38/lb. The incremental cost/effectiveness is $0.66.

More Stringent Standards

As shown in Section 4, more stringent standards were projected to increase the emission reductions achieved under the Smog Check program by almost half of the increased reductions associated with loaded mode testing. Because increased repair costs are the only cost factor expected to change, it would be expected that an increase in standard stringency would produce very favorable cost/effectiveness ratios. Table 13 bears this out. As shown in the tables, the incremental cost/effectiveness of more stringent standards is well under $1 per pound of HC plus NOx in the year 2000 timeframe. The cost/effectiveness for CO is also very favorable.

No Repair Cost Limit

As in the case of more stringent standards, elimination of the repair cost limits is shown to be a very cost/effective measure using the repair cost assumptions being used in this study. However, there is some uncertainty as to how applicable the repair cost assumptions are to this potential change. In addition, the political problems associated with no repair cost limit may outweigh the nominal 1-2% increase in emission reductions. Table 14 contains the calculations for this case.

Better Mechanics

The cost associated with the use of better mechanics was estimated based on the projected increase in repair costs combined with a $5 per inspection increase in the inspection fee to account for the use of mechanics that are paid much higher salaries (approximately $10 per hour more). As shown in Table 15, the cost/effectiveness of the

Table 12

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With Loaded Mode Testing

Costs:

$48 ÷ 2 =	$24.00	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($ 50 × 0.44) ÷ 2 =	11.00	(annual avg. repair cost per vehicle)
	$38.00	(total annual cost per vehicle)
	÷ 2	(50% of costs assigned to HC + NOx)
	$19.00	(annual cost for HC + NOx control)
	- 14.63	(baseline cost for HC + NOx)
	$ 4.37	(incremental cost for HC + NOx)
similarly:		
	$19.00	(annual cost for CO control)
	$ 4.37	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 22.2% =	0.12 g/mi	(HC reduction)
0.80 g/mi NOx × 16.9% =	0.14 g/mi	(NOx reduction)
	0.26 g/mi	(HC + NOx reduction)
	× 10,000 miles/year	(annual vehicle mileage)
	5.73 pounds of HC + NOx	(annual reduction)
	- 3.69 pounds of HC + NOx	(base reduction)
	2.04 pounds of HC + NOx	(incremental red.)
7.78 g/mi CO × 29.2% =	2.27 g/mi	(CO reduction)
	× 10,000 miles/year	(annual vehicle mileage)
	50.00 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	6.61 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $19.00 ÷ 5.73 lbs. = $3.32/pound
Incremental HC + NOx C/E Ratio = $4.37 ÷ 2.04 lbs. = $2.14/pound

CO Cost/Effectiveness Ratio = $19.00 ÷ 50.00 lbs. = $0.38/pound
Incremental CO C/E Ratio = $4.37 ÷ 6.61 lbs. = $0.66/pound

Table 13

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With More Stringent Idle Standards

Costs:

$35 ÷ 2 =	$17.50	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($ 50 × 0.38) ÷ 2 =	9.50	(annual avg. repair cost per vehicle)
	$30.00	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$15.00	(annual cost for HC + NOx control)
-	14.63	(baseline cost for HC + NOx)
	$ 0.37	(incremental cost for HC + NOx)

similarly:

	$15.00	(annual cost for CO control)
	$ 0.37	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 19.8% =	0.11 g/mi	(HC reduction)
0.80 g/mi NOx × 12.0% =	0.10 g/mi	(NOx reduction)
	0.21 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	4.63 pounds of HC + NOx	(annual reduction)
-	3.69 pounds of HC + NOx	(base reduction)
	0.94 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 27.0% =	2.10 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	46.26 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	2.87 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $15.00 ÷ 4.63 lbs. = $3.24/pound
Incremental HC + NOx C/E Ratio = $0.37 ÷ 0.94 lbs. = $0.39/pound

CO Cost/Effectiveness Ratio = $15.00 ÷ 46.26 lbs. = $0.32/pound
Incremental CO C/E Ratio = $0.37 ÷ 2.87 lbs. = $0.13/pound

Table 14

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With No Repair Cost Limit

Costs:

$35 ÷ 2 =	$17.50	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($ 50 × 0.38) ÷ 2 =	9.50	(annual avg. repair cost per vehicle)
	$30.00	(total annual cost per vehicle)
	÷ 2	(50% of costs assigned to HC + NOx)
	$15.00	(annual cost for HC + NOx control)
	- 14.63	(baseline cost for HC + NOx)
	$ 0.47	(incremental cost for HC + NOx)

similarly:

$15.00	(annual cost for CO control)
$ 0.47	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 19.4% = 0.10 g/mi	(HC reduction)
0.80 g/mi NOx × 11.4% = 0.09 g/mi	(NOx reduction)
0.19 g/mi	(HC + NOx reduction)
× 10,000 miles/year	(annual vehicle mileage)
4.19 pounds of HC + NOx	(annual reduction)
- 3.96 pounds of HC + NOx	(base reduction)
0.23 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 26.9% = 2.09 g/mi	(CO reduction)
× 10,000 miles/year	(annual vehicle mileage)
46.04 pounds of CO	(annual reduction)
43.39 pounds of CO	(baseline reduction)
2.65 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $15.00 ÷ 4.19 lbs. = $3.58/pound
Incremental HC + NOx C/E Ratio = $0.47 ÷ 0.23 lbs. = $2.04/pound

CO Cost/Effectiveness Ratio = $15.00 ÷ 46.04 lbs. = $0.33/pound
Incremental CO C/E Ratio = $0.47 ÷ 2.65 lbs. = $0.18/pound

Table 15

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With Better Mechanics

Costs:

$40 ÷ 2 =	$20.00	(annual average inspection fee)
+ 6 ÷ 2 =	3	(annual avg. cost for Smog Certificate)
+ ($ 50 × 0.38) ÷ 2 =	9.50	(annual avg. repair cost per vehicle)
	$32.50	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$16.25	(annual cost for HC + NOx control)
-	14.63	(baseline cost for HC + NOx)
	$ 1.62	(incremental cost for HC + NOx)

similarly:

$16.25	(annual cost for CO control)
$ 1.62	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 19.9% =	0.11 g/mi	(HC reduction)
0.80 g/mi NOx × 11.7% =	0.09 g/mi	(NOx reduction)
	0.20 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	4.41 pounds of HC + NOx	(annual reduction)
-	3.96 pounds of HC + NOx	(base reduction)
	0.45 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 27.3% =	2.12 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	46.70 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	3.31 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $16.25 ÷ 4.41 lbs. = $3.68/pound
Incremental HC + NOx C/E Ratio = $1.62 ÷ 0.45 lbs. = $3.60/pound

CO Cost/Effectiveness Ratio = $16.25 ÷ 46.70 lbs. = $0.35/pound
Incremental CO C/E Ratio = $1.62 ÷ 3.31 lbs. = $0.49/pound

program would be slightly improved despite such a large increase in labor cost in the year 2000 timeframe.

Maximum Enhancements

Table 16 shows the combined effects of all of the enhancements considered during the sensitivity runs. (However, in place of the more stringent idle emissions scenario, more stringent loaded mode standards were assumed.) As the table shows, the model predicts that Smog Check program emission reductions are about double the baseline case for HC, 65% greater for CO, and almost triple for NOx. In addition, the cost/effectiveness is improved for HC and NOx from $3.69 to $3.35. CO cost/effectiveness slips slightly from $0.34 to $0.44/lb.

Table 17 shows the effect of extending the new vehicle exemption from one year to three years. This case was selected for detailed analysis because the loss in I/M benefits is still less than 1% at this exemption level. The effect of this case on program costs was estimated by reducing the fraction of the new vehicle fleet subject to the inspection requirement by 21%, which is the registration fraction of vehicles subject to the baseline program that are in the 2-3 year old category. Since few of these vehicles are projected to require repair, the total repair cost was left unchanged. In addition, since the deletion of these vehicles is not expected to significantly affect BAR's cost for program administration and enforcement, the total cost of certificate sales was left unchanged. As shown in the table, the longer exemption period for new vehicles is projected to improve the cost/effectiveness of the program from $3.35/lb of HC + NOx to $2.98/lb.

###

Table 16

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With All Enhancements

Costs:

	$40.00	(annual inspection fee)
	6.00	(annual cost for Smog Certificate)
+ ($ 50 × 0.35) =	17.50	(annual repair cost per vehicle)
	$63.50	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$31.75	(annual cost for HC + NOx control)
-	14.63	(baseline cost for HC + NOx)
	$17.12	(incremental cost for HC + NOx)

similarly:

$31.75	(annual cost for CO control)
$17.12	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 36.7% =	0.20 g/mi	(HC reduction)
0.80 g/mi NOx × 28.6% =	0.23 g/mi	(NOx reduction)
	0.43 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	9.47 pounds of HC + NOx	(annual reduction)
-	3.96 pounds of HC + NOx	(base reduction)
	5.51 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 41.9% =	3.26 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	71.81 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	28.42 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $31.75 ÷ 9.47 lbs. = $3.35/pound
Incremental HC + NOx C/E Ratio = $17.12 ÷ 5.51 lbs. = $3.11/pound

CO Cost/Effectiveness Ratio = $31.75 ÷ 71.81 lbs. = $0.44/pound
Incremental CO C/E Ratio = $17.12 ÷ 28.42 lbs. = $0.60/pound

Table 17

Year 2000 Estimate of the
Cost/Effectiveness of the Smog Check Program
With All Enhancements Plus Three-Year Exemption for New Vehicles

Costs:

$40 × 0.79 =	$31.60	(annual inspection fee)
	6.00	(annual cost for Smog Certificate)
+ ($ 50 × 0.35) =	17.50	(annual repair cost per vehicle)
	$55.10	(total annual cost per vehicle)
÷	2	(50% of costs assigned to HC + NOx)
	$27.55	(annual cost for HC + NOx control)
-	14.63	(baseline cost for HC + NOx)
	$12.92	(incremental cost for HC + NOx)

similarly:

$27.55	(annual cost for CO control)
$12.92	(incremental cost for CO)

Emission Reductions:

0.54 g/mi HC × 36.0% =	0.19 g/mi	(HC reduction)
0.80 g/mi NOx × 28.3% =	0.23 g/mi	(NOx reduction)
	0.42 g/mi	(HC + NOx reduction)
×	10,000 miles/year	(annual vehicle mileage)
	9.25 pounds of HC + NOx	(annual reduction)
-	3.96 pounds of HC + NOx	(base reduction)
	5.29 pounds of HC + NOx	(incremental red.)

7.78 g/mi CO × 41.5% =	3.23 g/mi	(CO reduction)
×	10,000 miles/year	(annual vehicle mileage)
	71.15 pounds of CO	(annual reduction)
	43.39 pounds of CO	(baseline reduction)
	27.76 pounds of CO	(incremental reduction)

Cost/Effectiveness:

HC + NOx Cost/Effectiveness Ratio = $27.55 ÷ 9.25 lbs. = $2.98/pound
Incremental HC + NOx C/E Ratio = $12.92 ÷ 5.29 lbs. = $2.44/pound

CO Cost/Effectiveness Ratio = $27.55 ÷ 71.15 lbs. = $0.39/pound
Incremental CO C/E Ratio = $12.92 ÷ 27.76 lbs. = $0.47/pound

Appendix A

CALIMFAC Sensitivity Runs

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** Default program with corrected SB 1997 features
**
**      Output file: SENS_SB1997_CORR_DEFAULT.OUT
**
** Date of this run:  1/15/  91
**                   12:22
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** Default program with corrected SB 1997 features
**
** Output file: SENS_SB1997_CORR_DEFAULT.OUT
**
** Date of this run: 1/15/ 91
**   12:22
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.38	19.8%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.1%	15.61	12.51	19.9%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	18.1%	14.70	11.74	20.1%	1.13	0.98	12.7%	0.00	0.00	0.0%
1994	1.06	0.87	18.1%	13.82	10.94	20.8%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	18.2%	12.92	10.11	21.8%	0.98	0.86	12.5%	0.00	0.00	0.0%
1996	0.90	0.74	18.2%	12.07	9.31	22.9%	0.92	0.81	12.3%	0.00	0.00	0.0%
1997	0.83	0.68	18.1%	11.26	8.57	23.9%	0.87	0.76	11.9%	0.00	0.00	0.0%
1998	0.76	0.62	18.0%	10.48	7.87	24.9%	0.82	0.73	11.4%	0.00	0.00	0.0%
1999	0.70	0.58	17.8%	9.77	7.25	25.7%	0.78	0.69	10.9%	0.00	0.00	0.0%
2000	0.66	0.54	18.1%	9.13	6.82	25.3%	0.74	0.66	10.4%	0.00	0.00	0.0%
2001	0.62	0.51	18.3%	8.52	6.31	26.0%	0.71	0.64	10.0%	0.00	0.00	0.0%
2002	0.59	0.48	18.3%	7.98	5.88	26.2%	0.68	0.62	9.7%	0.00	0.00	0.0%
2003	0.56	0.46	17.3%	7.45	5.48	26.4%	0.66	0.60	9.4%	0.00	0.00	0.0%
2004	0.53	0.44	16.9%	6.95	5.10	26.6%	0.64	0.58	9.1%	0.00	0.00	0.0%
2005	0.51	0.42	16.9%	6.50	4.76	26.8%	0.63	0.57	8.8%	0.00	0.00	0.0%
2006	0.49	0.41	16.9%	6.16	4.51	26.8%	0.62	0.56	8.6%	0.00	0.00	0.0%
2007	0.48	0.40	17.0%	5.87	4.29	26.9%	0.61	0.56	8.4%	0.00	0.00	0.0%
2008	0.47	0.39	17.1%	5.63	4.11	27.0%	0.60	0.55	8.2%	0.00	0.00	0.0%
2009	0.46	0.38	17.2%	5.45	3.98	27.1%	0.60	0.55	8.1%	0.00	0.00	0.0%
2010	0.46	0.38	17.3%	5.33	3.88	27.2%	0.60	0.55	8.1%	0.00	0.00	0.0%
2011	0.45	0.37	17.4%	5.24	3.81	27.3%	0.59	0.55	8.0%	0.00	0.00	0.0%
2012	0.45	0.37	17.4%	5.18	3.76	27.4%	0.59	0.54	7.9%	0.00	0.00	0.0%
2013	0.45	0.37	17.4%	5.13	3.73	27.4%	0.59	0.54	7.9%	0.00	0.00	0.0%
2014	0.45	0.37	17.4%	5.09	3.70	27.4%	0.59	0.54	7.9%	0.00	0.00	0.0%
2015	0.45	0.37	17.5%	5.06	3.67	27.5%	0.59	0.54	7.9%	0.00	0.00	0.0%
2016	0.44	0.37	17.5%	5.02	3.64	27.5%	0.59	0.54	7.9%	0.00	0.00	0.0%
2017	0.44	0.36	17.5%	4.98	3.61	27.6%	0.59	0.54	7.9%	0.00	0.00	0.0%
2018	0.44	0.36	17.6%	4.96	3.59	27.7%	0.59	0.54	7.9%	0.00	0.00	0.0%
2019	0.44	0.36	17.6%	4.95	3.58	27.7%	0.59	0.54	7.9%	0.00	0.00	0.0%
2020	0.44	0.36	17.6%	4.95	3.58	27.7%	0.59	0.54	7.9%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** Default program with corrected SB 1997 features
**
** Output file: SENS_SB1997_CORR_DEFAULT.OUT
**
** Date of this run: 1/15/ 91
**   12:22
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.76	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.16	22.0%	19.24	15.17	21.1%	1.31	1.12	13.9%	0.00	0.00	0.0%
1992	1.35	1.05	22.1%	17.78	14.11	20.6%	1.20	1.04	13.6%	0.00	0.00	0.0%
1993	1.24	0.97	21.7%	16.65	13.17	20.9%	1.13	0.98	13.5%	0.00	0.00	0.0%
1994	1.14	0.90	21.6%	15.62	12.20	21.9%	1.07	0.93	13.5%	0.00	0.00	0.0%
1995	1.05	0.82	21.9%	14.50	11.20	22.8%	1.03	0.89	13.3%	0.00	0.00	0.0%
1996	0.97	0.75	22.2%	13.45	10.27	23.7%	0.99	0.86	13.1%	0.00	0.00	0.0%
1997	0.89	0.69	22.4%	12.44	9.36	24.8%	0.97	0.84	12.9%	0.00	0.00	0.0%
1998	0.83	0.64	22.7%	11.60	8.61	25.8%	0.95	0.83	12.7%	0.00	0.00	0.0%
1999	0.77	0.59	22.9%	10.81	7.93	26.6%	0.94	0.82	12.5%	0.00	0.00	0.0%
2000	0.72	0.57	21.3%	10.04	7.37	26.6%	0.93	0.82	12.3%	0.00	0.00	0.0%
2001	0.69	0.54	21.7%	9.51	7.01	26.3%	0.93	0.81	12.1%	0.00	0.00	0.0%
2002	0.66	0.51	22.2%	9.02	6.58	27.0%	0.92	0.81	11.9%	0.00	0.00	0.0%
2003	0.63	0.50	21.1%	8.49	6.16	27.4%	0.91	0.81	11.7%	0.00	0.00	0.0%
2004	0.61	0.48	20.6%	7.97	5.76	27.7%	0.91	0.80	11.6%	0.00	0.00	0.0%
2005	0.58	0.46	20.6%	7.54	5.43	28.0%	0.90	0.80	11.6%	0.00	0.00	0.0%
2006	0.57	0.45	20.6%	7.19	5.16	28.2%	0.89	0.79	11.5%	0.00	0.00	0.0%
2007	0.55	0.44	20.6%	6.90	4.93	28.6%	0.89	0.79	11.4%	0.00	0.00	0.0%
2008	0.55	0.43	20.8%	6.73	4.79	28.8%	0.89	0.79	11.3%	0.00	0.00	0.0%
2009	0.54	0.43	20.9%	6.62	4.69	29.1%	0.89	0.79	11.2%	0.00	0.00	0.0%
2010	0.54	0.43	21.0%	6.55	4.63	29.4%	0.89	0.79	11.2%	0.00	0.00	0.0%
2011	0.54	0.42	21.1%	6.50	4.57	29.6%	0.89	0.79	11.1%	0.00	0.00	0.0%
2012	0.54	0.42	21.1%	6.46	4.53	29.8%	0.89	0.79	11.1%	0.00	0.00	0.0%
2013	0.53	0.42	21.2%	6.42	4.50	29.9%	0.89	0.79	11.1%	0.00	0.00	0.0%
2014	0.53	0.42	21.2%	6.39	4.46	30.1%	0.89	0.79	11.1%	0.00	0.00	0.0%
2015	0.53	0.42	21.2%	6.35	4.43	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2016	0.53	0.42	21.3%	6.31	4.41	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2017	0.53	0.42	21.3%	6.28	4.38	30.2%	0.89	0.79	11.1%	0.00	0.00	0.0%
2018	0.53	0.42	21.3%	6.25	4.37	30.2%	0.89	0.79	11.1%	0.00	0.00	0.0%
2019	0.53	0.42	21.3%	6.25	4.36	30.2%	0.89	0.79	11.1%	0.00	0.00	0.0%
2020	0.53	0.42	21.3%	6.25	4.36	30.2%	0.89	0.79	11.1%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** Default program with corrected SB 1997 features
**
** Output file: SENS_SB1997_CORR_DEFAULT.OUT
**
** Date of this run: 1/15/ 91
**   12:22
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.67	20.5%	2.16	1.97	8.9%	0.00	0.00	0.0%
1986	2.70	2.16	19.9%	29.25	22.69	22.4%	2.05	1.84	10.4%	0.00	0.00	0.0%
1987	2.45	1.92	21.6%	27.39	20.84	23.9%	1.97	1.74	11.7%	0.00	0.00	0.0%
1988	2.23	1.71	23.1%	25.65	19.18	25.2%	1.89	1.65	12.8%	0.00	0.00	0.0%
1989	2.04	1.54	24.6%	24.16	17.77	26.5%	1.83	1.58	13.8%	0.00	0.00	0.0%
1990	1.88	1.39	26.0%	22.93	16.52	28.0%	1.78	1.52	14.7%	0.00	0.00	0.0%
1991	1.74	1.27	27.0%	21.79	15.40	29.3%	1.73	1.47	15.2%	0.00	0.00	0.0%
1992	1.61	1.17	27.8%	20.74	14.41	30.5%	1.68	1.42	15.5%	0.00	0.00	0.0%
1993	1.50	1.08	28.4%	19.82	13.52	31.8%	1.65	1.39	15.7%	0.00	0.00	0.0%
1994	1.41	1.00	28.7%	18.91	12.70	32.8%	1.61	1.36	15.7%	0.00	0.00	0.0%
1995	1.32	0.94	29.1%	18.08	11.98	33.8%	1.59	1.34	15.7%	0.00	0.00	0.0%
1996	1.25	0.88	29.4%	17.36	11.34	34.7%	1.57	1.33	15.5%	0.00	0.00	0.0%
1997	1.19	0.83	29.6%	16.73	10.79	35.5%	1.55	1.31	15.4%	0.00	0.00	0.0%
1998	1.13	0.79	30.0%	16.16	10.32	36.1%	1.54	1.30	15.3%	0.00	0.00	0.0%
1999	1.08	0.75	30.4%	15.67	9.91	36.7%	1.53	1.30	15.1%	0.00	0.00	0.0%
2000	1.04	0.73	29.3%	15.23	9.66	36.6%	1.52	1.29	15.0%	0.00	0.00	0.0%
2001	1.00	0.70	29.4%	14.86	9.46	36.3%	1.51	1.29	14.8%	0.00	0.00	0.0%
2002	0.96	0.68	29.3%	14.55	9.23	36.6%	1.51	1.29	14.7%	0.00	0.00	0.0%
2003	0.94	0.67	28.5%	14.36	9.04	37.0%	1.50	1.28	14.5%	0.00	0.00	0.0%
2004	0.92	0.66	27.7%	14.19	8.88	37.4%	1.49	1.28	14.4%	0.00	0.00	0.0%
2005	0.90	0.65	27.7%	14.04	8.74	37.8%	1.49	1.28	14.2%	0.00	0.00	0.0%
2006	0.89	0.64	27.7%	13.95	8.65	38.0%	1.48	1.27	14.1%	0.00	0.00	0.0%
2007	0.88	0.64	27.7%	13.87	8.56	38.3%	1.48	1.27	14.0%	0.00	0.00	0.0%
2008	0.88	0.63	27.8%	13.82	8.50	38.5%	1.47	1.27	13.9%	0.00	0.00	0.0%
2009	0.88	0.63	27.9%	13.79	8.46	38.7%	1.47	1.27	13.8%	0.00	0.00	0.0%
2010	0.87	0.63	27.9%	13.78	8.42	38.9%	1.47	1.27	13.7%	0.00	0.00	0.0%
2011	0.87	0.63	28.0%	13.77	8.40	39.0%	1.47	1.27	13.6%	0.00	0.00	0.0%
2012	0.87	0.63	28.0%	13.76	8.39	39.0%	1.47	1.27	13.6%	0.00	0.00	0.0%
2013	0.87	0.63	28.0%	13.76	8.38	39.1%	1.47	1.27	13.5%	0.00	0.00	0.0%
2014	0.87	0.63	28.0%	13.75	8.36	39.2%	1.47	1.27	13.4%	0.00	0.00	0.0%
2015	0.87	0.63	28.0%	13.75	8.36	39.2%	1.47	1.27	13.4%	0.00	0.00	0.0%
2016	0.87	0.63	28.0%	13.74	8.35	39.2%	1.47	1.27	13.3%	0.00	0.00	0.0%
2017	0.87	0.63	28.0%	13.74	8.34	39.3%	1.47	1.27	13.3%	0.00	0.00	0.0%
2018	0.87	0.63	28.0%	13.74	8.34	39.3%	1.47	1.27	13.3%	0.00	0.00	0.0%
2019	0.87	0.63	28.0%	13.74	8.34	39.3%	1.47	1.27	13.3%	0.00	0.00	0.0%
2020	0.87	0.63	28.0%	13.74	8.34	39.3%	1.47	1.27	13.3%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, idle inspections, stricter standards
**
**      Output file: SENS_SB1997_IDLE_STRICTER.OUT
**
** Date of this run:  1/15/  91
**                   13: 2
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	STRICTER
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, idle inspections, stricter standards
**
** Output file: SENS_SB1997_IDLE_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 2
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.45	13.9%	2.01	1.87	6.8%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.27	15.7%	1.90	1.75	7.9%	0.00	0.00	0.0%
1986	2.29	1.92	16.1%	24.48	20.27	17.2%	1.79	1.63	8.9%	0.00	0.00	0.0%
1987	2.06	1.72	16.7%	22.65	18.49	18.4%	1.69	1.52	10.0%	0.00	0.00	0.0%
1988	1.86	1.53	17.3%	20.93	16.92	19.2%	1.60	1.42	11.0%	0.00	0.00	0.0%
1989	1.68	1.37	18.0%	19.32	15.51	19.7%	1.51	1.33	11.9%	0.00	0.00	0.0%
1990	1.52	1.24	18.4%	17.93	14.33	20.1%	1.41	1.23	12.7%	0.00	0.00	0.0%
1991	1.38	1.12	18.6%	16.68	13.28	20.4%	1.31	1.14	13.2%	0.00	0.00	0.0%
1992	1.26	1.02	18.7%	15.61	12.40	20.6%	1.21	1.05	13.4%	0.00	0.00	0.0%
1993	1.16	0.94	18.8%	14.70	11.61	21.0%	1.13	0.97	13.6%	0.00	0.00	0.0%
1994	1.06	0.86	18.9%	13.82	10.81	21.8%	1.05	0.91	13.7%	0.00	0.00	0.0%
1995	0.98	0.79	19.1%	12.92	9.96	22.9%	0.98	0.85	13.6%	0.00	0.00	0.0%
1996	0.90	0.73	19.3%	12.07	9.16	24.1%	0.92	0.80	13.5%	0.00	0.00	0.0%
1997	0.83	0.67	19.4%	11.26	8.41	25.3%	0.87	0.75	13.3%	0.00	0.00	0.0%
1998	0.76	0.61	19.4%	10.48	7.72	26.4%	0.82	0.71	12.9%	0.00	0.00	0.0%
1999	0.70	0.57	19.3%	9.77	7.10	27.3%	0.78	0.68	12.5%	0.00	0.00	0.0%
2000	0.66	0.53	19.8%	9.13	6.66	27.0%	0.74	0.65	12.0%	0.00	0.00	0.0%
2001	0.62	0.50	20.0%	8.52	6.15	27.8%	0.71	0.63	11.6%	0.00	0.00	0.0%
2002	0.59	0.47	20.1%	7.98	5.73	28.1%	0.68	0.61	11.4%	0.00	0.00	0.0%
2003	0.56	0.45	19.2%	7.45	5.33	28.4%	0.66	0.59	11.1%	0.00	0.00	0.0%
2004	0.53	0.43	18.9%	6.95	4.96	28.7%	0.64	0.57	10.9%	0.00	0.00	0.0%
2005	0.51	0.41	18.9%	6.50	4.62	29.0%	0.63	0.56	10.6%	0.00	0.00	0.0%
2006	0.49	0.40	18.9%	6.16	4.37	29.0%	0.62	0.55	10.4%	0.00	0.00	0.0%
2007	0.48	0.39	19.1%	5.87	4.15	29.2%	0.61	0.55	10.2%	0.00	0.00	0.0%
2008	0.47	0.38	19.2%	5.63	3.97	29.4%	0.60	0.54	10.1%	0.00	0.00	0.0%
2009	0.46	0.37	19.3%	5.45	3.84	29.5%	0.60	0.54	9.9%	0.00	0.00	0.0%
2010	0.46	0.37	19.4%	5.33	3.75	29.7%	0.60	0.54	9.9%	0.00	0.00	0.0%
2011	0.45	0.36	19.5%	5.24	3.68	29.8%	0.59	0.53	9.8%	0.00	0.00	0.0%
2012	0.45	0.36	19.5%	5.18	3.63	29.9%	0.59	0.53	9.8%	0.00	0.00	0.0%
2013	0.45	0.36	19.6%	5.13	3.60	29.9%	0.59	0.53	9.7%	0.00	0.00	0.0%
2014	0.45	0.36	19.6%	5.09	3.57	30.0%	0.59	0.53	9.7%	0.00	0.00	0.0%
2015	0.45	0.36	19.6%	5.06	3.54	30.0%	0.59	0.53	9.7%	0.00	0.00	0.0%
2016	0.44	0.36	19.6%	5.02	3.51	30.1%	0.59	0.53	9.7%	0.00	0.00	0.0%
2017	0.44	0.36	19.7%	4.98	3.48	30.2%	0.59	0.53	9.7%	0.00	0.00	0.0%
2018	0.44	0.35	19.7%	4.96	3.46	30.2%	0.59	0.53	9.7%	0.00	0.00	0.0%
2019	0.44	0.35	19.7%	4.95	3.45	30.3%	0.59	0.53	9.7%	0.00	0.00	0.0%
2020	0.44	0.35	19.7%	4.95	3.45	30.3%	0.59	0.53	9.7%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, idle inspections, stricter standards
**
** Output file: SENS_SB1997_IDLE_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 2
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.29	16.9%	2.04	1.90	7.3%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.39	18.0%	1.92	1.75	8.6%	0.00	0.00	0.0%
1986	2.44	1.98	18.5%	26.53	21.34	19.6%	1.79	1.61	10.0%	0.00	0.00	0.0%
1987	2.23	1.78	20.0%	25.24	19.81	21.5%	1.68	1.49	11.2%	0.00	0.00	0.0%
1988	1.98	1.57	21.0%	23.44	18.29	22.0%	1.55	1.36	12.4%	0.00	0.00	0.0%
1989	1.78	1.40	21.7%	21.74	16.96	22.0%	1.46	1.26	13.3%	0.00	0.00	0.0%
1990	1.60	1.25	21.7%	19.91	15.72	21.0%	1.36	1.16	14.1%	0.00	0.00	0.0%
1991	1.49	1.16	22.4%	19.24	15.11	21.5%	1.31	1.11	14.7%	0.00	0.00	0.0%
1992	1.35	1.05	22.6%	17.78	14.03	21.1%	1.20	1.03	14.6%	0.00	0.00	0.0%
1993	1.24	0.97	22.3%	16.65	13.08	21.4%	1.13	0.97	14.6%	0.00	0.00	0.0%
1994	1.14	0.89	22.4%	15.62	12.08	22.6%	1.07	0.92	14.8%	0.00	0.00	0.0%
1995	1.05	0.81	22.8%	14.50	11.08	23.6%	1.03	0.88	14.9%	0.00	0.00	0.0%
1996	0.97	0.74	23.3%	13.45	10.14	24.6%	0.99	0.84	14.8%	0.00	0.00	0.0%
1997	0.89	0.68	23.6%	12.44	9.21	26.0%	0.97	0.82	14.7%	0.00	0.00	0.0%
1998	0.83	0.63	24.1%	11.60	8.45	27.1%	0.95	0.81	14.6%	0.00	0.00	0.0%
1999	0.77	0.58	24.4%	10.81	7.77	28.1%	0.94	0.80	14.5%	0.00	0.00	0.0%
2000	0.72	0.55	22.9%	10.04	7.21	28.2%	0.93	0.80	14.3%	0.00	0.00	0.0%
2001	0.69	0.53	23.4%	9.51	6.84	28.1%	0.93	0.79	14.2%	0.00	0.00	0.0%
2002	0.66	0.50	23.9%	9.02	6.42	28.9%	0.92	0.79	14.1%	0.00	0.00	0.0%
2003	0.63	0.49	22.9%	8.49	6.00	29.3%	0.91	0.78	14.0%	0.00	0.00	0.0%
2004	0.61	0.47	22.4%	7.97	5.60	29.7%	0.91	0.78	13.9%	0.00	0.00	0.0%
2005	0.58	0.45	22.5%	7.54	5.27	30.0%	0.90	0.77	13.9%	0.00	0.00	0.0%
2006	0.57	0.44	22.5%	7.19	5.01	30.3%	0.89	0.77	13.8%	0.00	0.00	0.0%
2007	0.55	0.43	22.6%	6.90	4.78	30.8%	0.89	0.77	13.7%	0.00	0.00	0.0%
2008	0.55	0.42	22.7%	6.73	4.64	31.1%	0.89	0.77	13.7%	0.00	0.00	0.0%
2009	0.54	0.42	22.9%	6.62	4.54	31.3%	0.89	0.77	13.6%	0.00	0.00	0.0%
2010	0.54	0.41	23.0%	6.55	4.48	31.6%	0.89	0.77	13.6%	0.00	0.00	0.0%
2011	0.54	0.41	23.1%	6.50	4.43	31.9%	0.89	0.77	13.6%	0.00	0.00	0.0%
2012	0.54	0.41	23.1%	6.46	4.38	32.1%	0.89	0.77	13.5%	0.00	0.00	0.0%
2013	0.53	0.41	23.2%	6.42	4.35	32.3%	0.89	0.77	13.5%	0.00	0.00	0.0%
2014	0.53	0.41	23.2%	6.39	4.32	32.4%	0.89	0.77	13.5%	0.00	0.00	0.0%
2015	0.53	0.41	23.3%	6.35	4.29	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%
2016	0.53	0.41	23.3%	6.31	4.26	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%
2017	0.53	0.41	23.3%	6.28	4.24	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%
2018	0.53	0.40	23.3%	6.25	4.22	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%
2019	0.53	0.40	23.3%	6.25	4.22	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%
2020	0.53	0.40	23.3%	6.25	4.22	32.5%	0.89	0.77	13.5%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, idle inspections, stricter standards
**
** Output file: SENS_SB1997_IDLE_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 2
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.65	20.6%	2.16	1.96	9.0%	0.00	0.00	0.0%
1986	2.70	2.16	20.0%	29.25	22.66	22.6%	2.05	1.83	10.7%	0.00	0.00	0.0%
1987	2.45	1.92	21.7%	27.39	20.79	24.1%	1.97	1.73	12.2%	0.00	0.00	0.0%
1988	2.23	1.71	23.3%	25.65	19.10	25.5%	1.89	1.64	13.5%	0.00	0.00	0.0%
1989	2.04	1.53	24.9%	24.16	17.66	26.9%	1.83	1.56	14.7%	0.00	0.00	0.0%
1990	1.88	1.39	26.4%	22.93	16.38	28.5%	1.78	1.50	15.9%	0.00	0.00	0.0%
1991	1.74	1.26	27.5%	21.79	15.23	30.1%	1.73	1.44	16.6%	0.00	0.00	0.0%
1992	1.61	1.16	28.4%	20.74	14.22	31.4%	1.68	1.40	17.1%	0.00	0.00	0.0%
1993	1.50	1.07	29.2%	19.82	13.30	32.9%	1.65	1.36	17.5%	0.00	0.00	0.0%
1994	1.41	0.99	29.7%	18.91	12.46	34.1%	1.61	1.33	17.7%	0.00	0.00	0.0%
1995	1.32	0.92	30.2%	18.08	11.71	35.2%	1.59	1.31	17.8%	0.00	0.00	0.0%
1996	1.25	0.87	30.6%	17.36	11.06	36.3%	1.57	1.29	17.8%	0.00	0.00	0.0%
1997	1.19	0.82	30.9%	16.73	10.50	37.2%	1.55	1.28	17.8%	0.00	0.00	0.0%
1998	1.13	0.78	31.3%	16.16	10.01	38.1%	1.54	1.27	17.7%	0.00	0.00	0.0%
1999	1.08	0.74	31.9%	15.67	9.59	38.8%	1.53	1.26	17.6%	0.00	0.00	0.0%
2000	1.04	0.72	30.9%	15.23	9.33	38.8%	1.52	1.25	17.5%	0.00	0.00	0.0%
2001	1.00	0.69	31.1%	14.86	9.12	38.6%	1.51	1.25	17.4%	0.00	0.00	0.0%
2002	0.96	0.66	31.1%	14.55	8.88	39.0%	1.51	1.25	17.3%	0.00	0.00	0.0%
2003	0.94	0.65	30.4%	14.36	8.69	39.5%	1.50	1.24	17.2%	0.00	0.00	0.0%
2004	0.92	0.65	29.6%	14.19	8.53	39.9%	1.49	1.24	17.0%	0.00	0.00	0.0%
2005	0.90	0.63	29.7%	14.04	8.38	40.3%	1.49	1.24	16.9%	0.00	0.00	0.0%
2006	0.89	0.63	29.7%	13.95	8.29	40.6%	1.48	1.23	16.9%	0.00	0.00	0.0%
2007	0.88	0.62	29.8%	13.87	8.19	40.9%	1.48	1.23	16.8%	0.00	0.00	0.0%
2008	0.88	0.62	29.8%	13.82	8.13	41.2%	1.47	1.23	16.7%	0.00	0.00	0.0%
2009	0.88	0.61	29.9%	13.79	8.08	41.4%	1.47	1.23	16.6%	0.00	0.00	0.0%
2010	0.87	0.61	30.0%	13.78	8.05	41.6%	1.47	1.23	16.5%	0.00	0.00	0.0%
2011	0.87	0.61	30.1%	13.77	8.02	41.7%	1.47	1.23	16.4%	0.00	0.00	0.0%
2012	0.87	0.61	30.1%	13.76	8.01	41.8%	1.47	1.23	16.4%	0.00	0.00	0.0%
2013	0.87	0.61	30.1%	13.76	8.00	41.8%	1.47	1.23	16.3%	0.00	0.00	0.0%
2014	0.87	0.61	30.1%	13.75	7.99	41.9%	1.47	1.23	16.2%	0.00	0.00	0.0%
2015	0.87	0.61	30.1%	13.75	7.98	41.9%	1.47	1.23	16.2%	0.00	0.00	0.0%
2016	0.87	0.61	30.1%	13.74	7.97	42.0%	1.47	1.23	16.1%	0.00	0.00	0.0%
2017	0.87	0.61	30.1%	13.74	7.97	42.0%	1.47	1.23	16.1%	0.00	0.00	0.0%
2018	0.87	0.61	30.1%	13.74	7.97	42.0%	1.47	1.23	16.1%	0.00	0.00	0.0%
2019	0.87	0.61	30.1%	13.74	7.97	42.0%	1.47	1.23	16.1%	0.00	0.00	0.0%
2020	0.87	0.61	30.1%	13.74	7.97	42.0%	1.47	1.23	16.1%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no repair cost limit
**
**      Output file: SENS_SB1997_NO_COST_LIMIT.OUT
**
** Date of this run:  1/15/  91
**                   13:20
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	NO LIMIT
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no repair cost limit
**
** Output file: SENS_SB1997_NO_COST_LIMIT.OUT
**
** Date of this run: 1/15/ 91
**   13:20
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.36	14.2%	2.01	1.87	6.9%	0.00	0.00	0.0%
1985	2.53	2.14	15.3%	26.40	22.17	16.0%	1.90	1.74	8.0%	0.00	0.00	0.0%
1986	2.29	1.92	16.1%	24.48	20.17	17.6%	1.79	1.63	9.1%	0.00	0.00	0.0%
1987	2.06	1.71	16.7%	22.65	18.39	18.8%	1.69	1.52	10.2%	0.00	0.00	0.0%
1988	1.86	1.53	17.4%	20.93	16.81	19.7%	1.60	1.42	11.2%	0.00	0.00	0.0%
1989	1.68	1.37	18.1%	19.32	15.41	20.3%	1.51	1.32	12.1%	0.00	0.00	0.0%
1990	1.52	1.24	18.5%	17.93	14.23	20.6%	1.41	1.23	12.9%	0.00	0.00	0.0%
1991	1.38	1.12	18.7%	16.68	13.20	20.9%	1.31	1.13	13.3%	0.00	0.00	0.0%
1992	1.26	1.02	18.8%	15.61	12.32	21.1%	1.21	1.05	13.5%	0.00	0.00	0.0%
1993	1.16	0.94	18.8%	14.70	11.54	21.5%	1.13	0.97	13.6%	0.00	0.00	0.0%
1994	1.06	0.86	19.0%	13.82	10.75	22.2%	1.05	0.91	13.6%	0.00	0.00	0.0%
1995	0.98	0.79	19.1%	12.92	9.92	23.2%	0.98	0.85	13.5%	0.00	0.00	0.0%
1996	0.90	0.73	19.2%	12.07	9.12	24.4%	0.92	0.80	13.3%	0.00	0.00	0.0%
1997	0.83	0.67	19.2%	11.26	8.39	25.5%	0.87	0.75	13.0%	0.00	0.00	0.0%
1998	0.76	0.61	19.2%	10.48	7.70	26.5%	0.82	0.72	12.5%	0.00	0.00	0.0%
1999	0.70	0.57	19.0%	9.77	7.10	27.3%	0.78	0.68	12.0%	0.00	0.00	0.0%
2000	0.66	0.53	19.4%	9.13	6.67	26.9%	0.74	0.66	11.4%	0.00	0.00	0.0%
2001	0.62	0.50	19.6%	8.52	6.17	27.5%	0.71	0.63	11.0%	0.00	0.00	0.0%
2002	0.59	0.47	19.6%	7.98	5.76	27.8%	0.68	0.61	10.6%	0.00	0.00	0.0%
2003	0.56	0.46	18.6%	7.45	5.37	27.9%	0.66	0.59	10.3%	0.00	0.00	0.0%
2004	0.53	0.44	18.1%	6.95	5.00	28.0%	0.64	0.58	9.9%	0.00	0.00	0.0%
2005	0.51	0.42	18.0%	6.50	4.67	28.2%	0.63	0.57	9.6%	0.00	0.00	0.0%
2006	0.49	0.41	18.0%	6.16	4.42	28.1%	0.62	0.56	9.3%	0.00	0.00	0.0%
2007	0.48	0.39	18.1%	5.87	4.21	28.2%	0.61	0.55	9.1%	0.00	0.00	0.0%
2008	0.47	0.38	18.2%	5.63	4.03	28.3%	0.60	0.55	8.9%	0.00	0.00	0.0%
2009	0.46	0.38	18.2%	5.45	3.91	28.3%	0.60	0.55	8.8%	0.00	0.00	0.0%
2010	0.46	0.37	18.3%	5.33	3.82	28.4%	0.60	0.54	8.7%	0.00	0.00	0.0%
2011	0.45	0.37	18.3%	5.24	3.75	28.5%	0.59	0.54	8.6%	0.00	0.00	0.0%
2012	0.45	0.37	18.3%	5.18	3.70	28.6%	0.59	0.54	8.6%	0.00	0.00	0.0%
2013	0.45	0.37	18.3%	5.13	3.67	28.6%	0.59	0.54	8.5%	0.00	0.00	0.0%
2014	0.45	0.36	18.3%	5.09	3.64	28.6%	0.59	0.54	8.5%	0.00	0.00	0.0%
2015	0.45	0.36	18.4%	5.06	3.61	28.6%	0.59	0.54	8.5%	0.00	0.00	0.0%
2016	0.44	0.36	18.4%	5.02	3.58	28.7%	0.59	0.54	8.5%	0.00	0.00	0.0%
2017	0.44	0.36	18.4%	4.98	3.55	28.7%	0.59	0.54	8.5%	0.00	0.00	0.0%
2018	0.44	0.36	18.4%	4.96	3.53	28.8%	0.59	0.54	8.5%	0.00	0.00	0.0%
2019	0.44	0.36	18.4%	4.95	3.53	28.8%	0.59	0.54	8.5%	0.00	0.00	0.0%
2020	0.44	0.36	18.4%	4.95	3.53	28.8%	0.59	0.54	8.5%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no repair cost limit
**
** Output file: SENS_SB1997_NO_COST_LIMIT.OUT
**
** Date of this run: 1/15/ 91
**   13:20
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.7%	30.42	25.21	17.1%	2.04	1.89	7.4%	0.00	0.00	0.0%
1985	2.71	2.27	16.1%	28.51	23.30	18.3%	1.92	1.75	8.7%	0.00	0.00	0.0%
1986	2.44	1.98	18.7%	26.53	21.24	19.9%	1.79	1.61	10.1%	0.00	0.00	0.0%
1987	2.23	1.78	20.2%	25.24	19.70	21.9%	1.68	1.49	11.3%	0.00	0.00	0.0%
1988	1.98	1.56	21.2%	23.44	18.18	22.5%	1.55	1.36	12.5%	0.00	0.00	0.0%
1989	1.78	1.39	21.9%	21.74	16.83	22.6%	1.46	1.26	13.4%	0.00	0.00	0.0%
1990	1.60	1.25	22.0%	19.91	15.58	21.7%	1.36	1.16	14.2%	0.00	0.00	0.0%
1991	1.49	1.15	22.9%	19.24	14.99	22.1%	1.31	1.11	14.6%	0.00	0.00	0.0%
1992	1.35	1.04	23.0%	17.78	13.92	21.7%	1.20	1.03	14.5%	0.00	0.00	0.0%
1993	1.24	0.96	22.8%	16.65	12.97	22.1%	1.13	0.97	14.4%	0.00	0.00	0.0%
1994	1.14	0.88	22.8%	15.62	11.98	23.3%	1.07	0.92	14.5%	0.00	0.00	0.0%
1995	1.05	0.81	23.2%	14.50	10.98	24.2%	1.03	0.88	14.4%	0.00	0.00	0.0%
1996	0.97	0.74	23.5%	13.45	10.06	25.2%	0.99	0.85	14.2%	0.00	0.00	0.0%
1997	0.89	0.68	23.8%	12.44	9.15	26.5%	0.97	0.83	13.9%	0.00	0.00	0.0%
1998	0.83	0.63	24.1%	11.60	8.40	27.6%	0.95	0.82	13.8%	0.00	0.00	0.0%
1999	0.77	0.58	24.4%	10.81	7.73	28.4%	0.94	0.81	13.6%	0.00	0.00	0.0%
2000	0.72	0.56	22.8%	10.04	7.19	28.4%	0.93	0.81	13.3%	0.00	0.00	0.0%
2001	0.69	0.53	23.2%	9.51	6.83	28.2%	0.93	0.80	13.2%	0.00	0.00	0.0%
2002	0.66	0.50	23.6%	9.02	6.42	28.8%	0.92	0.80	13.0%	0.00	0.00	0.0%
2003	0.63	0.49	22.6%	8.49	6.01	29.2%	0.91	0.80	12.8%	0.00	0.00	0.0%
2004	0.61	0.47	22.0%	7.97	5.62	29.5%	0.91	0.79	12.7%	0.00	0.00	0.0%
2005	0.58	0.46	22.0%	7.54	5.30	29.7%	0.90	0.79	12.6%	0.00	0.00	0.0%
2006	0.57	0.44	22.0%	7.19	5.04	30.0%	0.89	0.78	12.5%	0.00	0.00	0.0%
2007	0.55	0.43	22.0%	6.90	4.81	30.4%	0.89	0.78	12.4%	0.00	0.00	0.0%
2008	0.55	0.43	22.1%	6.73	4.67	30.6%	0.89	0.78	12.3%	0.00	0.00	0.0%
2009	0.54	0.42	22.3%	6.62	4.57	30.9%	0.89	0.78	12.2%	0.00	0.00	0.0%
2010	0.54	0.42	22.3%	6.55	4.51	31.1%	0.89	0.78	12.2%	0.00	0.00	0.0%
2011	0.54	0.42	22.4%	6.50	4.46	31.4%	0.89	0.78	12.1%	0.00	0.00	0.0%
2012	0.54	0.41	22.5%	6.46	4.42	31.6%	0.89	0.78	12.1%	0.00	0.00	0.0%
2013	0.53	0.41	22.5%	6.42	4.39	31.7%	0.89	0.78	12.1%	0.00	0.00	0.0%
2014	0.53	0.41	22.5%	6.39	4.36	31.8%	0.89	0.78	12.1%	0.00	0.00	0.0%
2015	0.53	0.41	22.6%	6.35	4.33	31.9%	0.89	0.78	12.0%	0.00	0.00	0.0%
2016	0.53	0.41	22.6%	6.31	4.30	31.9%	0.89	0.78	12.0%	0.00	0.00	0.0%
2017	0.53	0.41	22.6%	6.28	4.28	31.9%	0.89	0.78	12.0%	0.00	0.00	0.0%
2018	0.53	0.41	22.6%	6.25	4.26	31.9%	0.89	0.78	12.1%	0.00	0.00	0.0%
2019	0.53	0.41	22.6%	6.25	4.26	31.9%	0.89	0.78	12.1%	0.00	0.00	0.0%
2020	0.53	0.41	22.6%	6.25	4.26	31.9%	0.89	0.78	12.1%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no repair cost limit
**
** Output file: SENS_SB1997_NO_COST_LIMIT.OUT
**
** Date of this run: 1/15/ 91
**   13:20
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.8%	32.80	26.69	18.6%	2.28	2.11	7.5%	0.00	0.00	0.0%
1985	2.96	2.43	17.7%	31.04	24.48	21.1%	2.16	1.96	9.2%	0.00	0.00	0.0%
1986	2.70	2.15	20.1%	29.25	22.48	23.2%	2.05	1.83	10.7%	0.00	0.00	0.0%
1987	2.45	1.91	21.9%	27.39	20.61	24.8%	1.97	1.73	12.2%	0.00	0.00	0.0%
1988	2.23	1.71	23.5%	25.65	18.92	26.2%	1.89	1.64	13.4%	0.00	0.00	0.0%
1989	2.04	1.53	25.0%	24.16	17.49	27.6%	1.83	1.57	14.5%	0.00	0.00	0.0%
1990	1.88	1.38	26.5%	22.93	16.22	29.3%	1.78	1.50	15.5%	0.00	0.00	0.0%
1991	1.74	1.26	27.7%	21.79	15.08	30.8%	1.73	1.45	16.1%	0.00	0.00	0.0%
1992	1.61	1.15	28.5%	20.74	14.09	32.0%	1.68	1.41	16.4%	0.00	0.00	0.0%
1993	1.50	1.06	29.2%	19.82	13.19	33.4%	1.65	1.37	16.7%	0.00	0.00	0.0%
1994	1.41	0.99	29.7%	18.91	12.37	34.6%	1.61	1.34	16.7%	0.00	0.00	0.0%
1995	1.32	0.92	30.1%	18.08	11.64	35.6%	1.59	1.32	16.7%	0.00	0.00	0.0%
1996	1.25	0.87	30.5%	17.36	11.00	36.6%	1.57	1.31	16.6%	0.00	0.00	0.0%
1997	1.19	0.82	30.8%	16.73	10.46	37.5%	1.55	1.30	16.5%	0.00	0.00	0.0%
1998	1.13	0.78	31.2%	16.16	9.99	38.2%	1.54	1.29	16.3%	0.00	0.00	0.0%
1999	1.08	0.74	31.6%	15.67	9.58	38.8%	1.53	1.28	16.2%	0.00	0.00	0.0%
2000	1.04	0.72	30.6%	15.23	9.34	38.7%	1.52	1.28	16.0%	0.00	0.00	0.0%
2001	1.00	0.69	30.7%	14.86	9.15	38.4%	1.51	1.27	15.9%	0.00	0.00	0.0%
2002	0.96	0.66	30.7%	14.55	8.92	38.7%	1.51	1.27	15.7%	0.00	0.00	0.0%
2003	0.94	0.66	29.9%	14.36	8.74	39.2%	1.50	1.27	15.6%	0.00	0.00	0.0%
2004	0.92	0.65	29.2%	14.19	8.57	39.6%	1.49	1.26	15.4%	0.00	0.00	0.0%
2005	0.90	0.64	29.2%	14.04	8.43	39.9%	1.49	1.26	15.3%	0.00	0.00	0.0%
2006	0.89	0.63	29.2%	13.95	8.35	40.2%	1.48	1.26	15.2%	0.00	0.00	0.0%
2007	0.88	0.62	29.3%	13.87	8.25	40.5%	1.48	1.25	15.1%	0.00	0.00	0.0%
2008	0.88	0.62	29.3%	13.82	8.20	40.7%	1.47	1.25	15.0%	0.00	0.00	0.0%
2009	0.88	0.62	29.4%	13.79	8.16	40.9%	1.47	1.25	14.9%	0.00	0.00	0.0%
2010	0.87	0.62	29.5%	13.78	8.12	41.1%	1.47	1.25	14.8%	0.00	0.00	0.0%
2011	0.87	0.62	29.5%	13.77	8.10	41.2%	1.47	1.25	14.7%	0.00	0.00	0.0%
2012	0.87	0.62	29.5%	13.76	8.09	41.2%	1.47	1.25	14.7%	0.00	0.00	0.0%
2013	0.87	0.61	29.5%	13.76	8.08	41.3%	1.47	1.25	14.6%	0.00	0.00	0.0%
2014	0.87	0.61	29.5%	13.75	8.07	41.3%	1.47	1.25	14.5%	0.00	0.00	0.0%
2015	0.87	0.61	29.5%	13.75	8.06	41.4%	1.47	1.25	14.5%	0.00	0.00	0.0%
2016	0.87	0.61	29.5%	13.74	8.05	41.4%	1.47	1.25	14.4%	0.00	0.00	0.0%
2017	0.87	0.61	29.5%	13.74	8.05	41.4%	1.47	1.26	14.4%	0.00	0.00	0.0%
2018	0.87	0.61	29.5%	13.74	8.05	41.4%	1.47	1.26	14.4%	0.00	0.00	0.0%
2019	0.87	0.61	29.5%	13.74	8.05	41.4%	1.47	1.26	14.4%	0.00	0.00	0.0%
2020	0.87	0.61	29.5%	13.74	8.05	41.4%	1.47	1.26	14.4%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, best mechanic performance
**
**      Output file: SENS_SB1997_BEST_MECH_PERF.OUT
**
** Date of this run:  1/15/  91
**                   13:24
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	BEST
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, best mechanic performance
**
** Output file: SENS_SB1997_BEST_MECH_PERF.OUT
**
** Date of this run: 1/15/ 91
**   13:24
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.38	14.4%	28.39	24.35	14.2%	2.01	1.87	7.1%	0.00	0.00	0.0%
1985	2.53	2.13	15.6%	26.40	22.16	16.0%	1.90	1.74	8.3%	0.00	0.00	0.0%
1986	2.29	1.91	16.5%	24.48	20.16	17.6%	1.79	1.62	9.4%	0.00	0.00	0.0%
1987	2.06	1.71	17.1%	22.65	18.38	18.9%	1.69	1.52	10.5%	0.00	0.00	0.0%
1988	1.86	1.53	17.8%	20.93	16.81	19.7%	1.60	1.42	11.4%	0.00	0.00	0.0%
1989	1.68	1.37	18.6%	19.32	15.40	20.3%	1.51	1.32	12.4%	0.00	0.00	0.0%
1990	1.52	1.23	18.9%	17.93	14.23	20.7%	1.41	1.22	13.1%	0.00	0.00	0.0%
1991	1.38	1.11	19.1%	16.68	13.19	20.9%	1.31	1.13	13.6%	0.00	0.00	0.0%
1992	1.26	1.02	19.2%	15.61	12.31	21.1%	1.21	1.05	13.7%	0.00	0.00	0.0%
1993	1.16	0.93	19.3%	14.70	11.54	21.5%	1.13	0.97	13.8%	0.00	0.00	0.0%
1994	1.06	0.86	19.4%	13.82	10.74	22.3%	1.05	0.91	13.8%	0.00	0.00	0.0%
1995	0.98	0.79	19.5%	12.92	9.90	23.3%	0.98	0.85	13.7%	0.00	0.00	0.0%
1996	0.90	0.72	19.6%	12.07	9.11	24.5%	0.92	0.80	13.5%	0.00	0.00	0.0%
1997	0.83	0.67	19.6%	11.26	8.37	25.7%	0.87	0.75	13.1%	0.00	0.00	0.0%
1998	0.76	0.61	19.6%	10.48	7.68	26.8%	0.82	0.72	12.7%	0.00	0.00	0.0%
1999	0.70	0.56	19.5%	9.77	7.07	27.6%	0.78	0.68	12.2%	0.00	0.00	0.0%
2000	0.66	0.53	19.9%	9.13	6.64	27.3%	0.74	0.65	11.7%	0.00	0.00	0.0%
2001	0.62	0.50	20.1%	8.52	6.14	28.0%	0.71	0.63	11.3%	0.00	0.00	0.0%
2002	0.59	0.47	20.1%	7.98	5.72	28.3%	0.68	0.61	10.9%	0.00	0.00	0.0%
2003	0.56	0.45	19.1%	7.45	5.33	28.5%	0.66	0.59	10.6%	0.00	0.00	0.0%
2004	0.53	0.43	18.7%	6.95	4.95	28.7%	0.64	0.58	10.3%	0.00	0.00	0.0%
2005	0.51	0.41	18.6%	6.50	4.62	28.9%	0.63	0.56	10.0%	0.00	0.00	0.0%
2006	0.49	0.40	18.7%	6.16	4.38	28.9%	0.62	0.56	9.8%	0.00	0.00	0.0%
2007	0.48	0.39	18.8%	5.87	4.16	29.0%	0.61	0.55	9.6%	0.00	0.00	0.0%
2008	0.47	0.38	18.9%	5.63	3.99	29.1%	0.60	0.55	9.4%	0.00	0.00	0.0%
2009	0.46	0.37	19.0%	5.45	3.86	29.2%	0.60	0.54	9.3%	0.00	0.00	0.0%
2010	0.46	0.37	19.0%	5.33	3.77	29.3%	0.60	0.54	9.2%	0.00	0.00	0.0%
2011	0.45	0.37	19.1%	5.24	3.70	29.4%	0.59	0.54	9.1%	0.00	0.00	0.0%
2012	0.45	0.36	19.1%	5.18	3.65	29.5%	0.59	0.54	9.1%	0.00	0.00	0.0%
2013	0.45	0.36	19.1%	5.13	3.62	29.5%	0.59	0.53	9.1%	0.00	0.00	0.0%
2014	0.45	0.36	19.1%	5.09	3.59	29.6%	0.59	0.53	9.1%	0.00	0.00	0.0%
2015	0.45	0.36	19.2%	5.06	3.56	29.6%	0.59	0.53	9.1%	0.00	0.00	0.0%
2016	0.44	0.36	19.2%	5.02	3.53	29.6%	0.59	0.53	9.0%	0.00	0.00	0.0%
2017	0.44	0.36	19.2%	4.98	3.50	29.7%	0.59	0.53	9.0%	0.00	0.00	0.0%
2018	0.44	0.36	19.2%	4.96	3.48	29.7%	0.59	0.53	9.0%	0.00	0.00	0.0%
2019	0.44	0.36	19.2%	4.95	3.48	29.8%	0.59	0.53	9.0%	0.00	0.00	0.0%
2020	0.44	0.36	19.2%	4.95	3.48	29.8%	0.59	0.53	9.0%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, best mechanic performance
**
** Output file: SENS_SB1997_BEST_MECH_PERF.OUT
**
** Date of this run: 1/15/ 91
** 13:24
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.58	13.9%	30.42	25.19	17.2%	2.04	1.89	7.6%	0.00	0.00	0.0%
1985	2.71	2.27	16.4%	28.51	23.27	18.4%	1.92	1.74	9.0%	0.00	0.00	0.0%
1986	2.44	1.97	19.0%	26.53	21.21	20.1%	1.79	1.60	10.4%	0.00	0.00	0.0%
1987	2.23	1.77	20.5%	25.24	19.67	22.1%	1.68	1.48	11.5%	0.00	0.00	0.0%
1988	1.98	1.56	21.5%	23.44	18.14	22.6%	1.55	1.36	12.7%	0.00	0.00	0.0%
1989	1.78	1.39	22.3%	21.74	16.80	22.7%	1.46	1.26	13.7%	0.00	0.00	0.0%
1990	1.60	1.24	22.4%	19.91	15.56	21.8%	1.36	1.16	14.4%	0.00	0.00	0.0%
1991	1.49	1.15	23.1%	19.24	14.95	22.3%	1.31	1.11	14.8%	0.00	0.00	0.0%
1992	1.35	1.04	23.3%	17.78	13.89	21.9%	1.20	1.03	14.7%	0.00	0.00	0.0%
1993	1.24	0.96	23.0%	16.65	12.94	22.3%	1.13	0.97	14.6%	0.00	0.00	0.0%
1994	1.14	0.88	23.0%	15.62	11.96	23.4%	1.07	0.92	14.6%	0.00	0.00	0.0%
1995	1.05	0.81	23.4%	14.50	10.96	24.4%	1.03	0.88	14.5%	0.00	0.00	0.0%
1996	0.97	0.74	23.8%	13.45	10.03	25.4%	0.99	0.85	14.4%	0.00	0.00	0.0%
1997	0.89	0.68	24.0%	12.44	9.13	26.7%	0.97	0.83	14.1%	0.00	0.00	0.0%
1998	0.83	0.63	24.4%	11.60	8.38	27.8%	0.95	0.82	13.9%	0.00	0.00	0.0%
1999	0.77	0.58	24.7%	10.81	7.71	28.7%	0.94	0.81	13.7%	0.00	0.00	0.0%
2000	0.72	0.55	23.2%	10.04	7.16	28.8%	0.93	0.81	13.6%	0.00	0.00	0.0%
2001	0.69	0.53	23.6%	9.51	6.80	28.5%	0.93	0.80	13.4%	0.00	0.00	0.0%
2002	0.66	0.50	24.1%	9.02	6.38	29.2%	0.92	0.80	13.2%	0.00	0.00	0.0%
2003	0.63	0.48	23.0%	8.49	5.97	29.7%	0.91	0.79	13.1%	0.00	0.00	0.0%
2004	0.61	0.47	22.5%	7.97	5.58	30.0%	0.91	0.79	13.0%	0.00	0.00	0.0%
2005	0.58	0.45	22.5%	7.54	5.26	30.3%	0.90	0.78	12.9%	0.00	0.00	0.0%
2006	0.57	0.44	22.5%	7.19	5.00	30.5%	0.89	0.78	12.8%	0.00	0.00	0.0%
2007	0.55	0.43	22.5%	6.90	4.77	30.9%	0.89	0.78	12.7%	0.00	0.00	0.0%
2008	0.55	0.42	22.7%	6.73	4.63	31.2%	0.89	0.78	12.6%	0.00	0.00	0.0%
2009	0.54	0.42	22.8%	6.62	4.54	31.5%	0.89	0.78	12.6%	0.00	0.00	0.0%
2010	0.54	0.42	22.9%	6.55	4.47	31.7%	0.89	0.78	12.5%	0.00	0.00	0.0%
2011	0.54	0.41	23.0%	6.50	4.42	32.0%	0.89	0.78	12.5%	0.00	0.00	0.0%
2012	0.54	0.41	23.0%	6.46	4.38	32.2%	0.89	0.78	12.4%	0.00	0.00	0.0%
2013	0.53	0.41	23.1%	6.42	4.35	32.3%	0.89	0.78	12.4%	0.00	0.00	0.0%
2014	0.53	0.41	23.1%	6.39	4.31	32.4%	0.89	0.78	12.4%	0.00	0.00	0.0%
2015	0.53	0.41	23.1%	6.35	4.29	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%
2016	0.53	0.41	23.2%	6.31	4.26	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%
2017	0.53	0.41	23.2%	6.28	4.24	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%
2018	0.53	0.41	23.2%	6.25	4.22	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%
2019	0.53	0.41	23.2%	6.25	4.22	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%
2020	0.53	0.41	23.2%	6.25	4.22	32.5%	0.89	0.78	12.4%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, best mechanic performance
**
** Output file: SENS_SB1997_BEST_MECH_PERF.OUT
**
** Date of this run: 1/15/ 91
** 13:24
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.75	15.1%	32.80	26.72	18.5%	2.28	2.11	7.7%	0.00	0.00	0.0%
1985	2.96	2.42	18.0%	31.04	24.51	21.0%	2.16	1.96	9.3%	0.00	0.00	0.0%
1986	2.70	2.14	20.4%	29.25	22.51	23.1%	2.05	1.83	10.9%	0.00	0.00	0.0%
1987	2.45	1.90	22.3%	27.39	20.63	24.7%	1.97	1.72	12.3%	0.00	0.00	0.0%
1988	2.23	1.70	23.9%	25.65	18.95	26.1%	1.89	1.64	13.5%	0.00	0.00	0.0%
1989	2.04	1.52	25.4%	24.16	17.52	27.5%	1.83	1.56	14.6%	0.00	0.00	0.0%
1990	1.88	1.38	26.9%	22.93	16.25	29.1%	1.78	1.50	15.6%	0.00	0.00	0.0%
1991	1.74	1.25	28.0%	21.79	15.10	30.7%	1.73	1.45	16.2%	0.00	0.00	0.0%
1992	1.61	1.15	28.9%	20.74	14.10	32.0%	1.68	1.41	16.5%	0.00	0.00	0.0%
1993	1.50	1.06	29.6%	19.82	13.19	33.5%	1.65	1.37	16.8%	0.00	0.00	0.0%
1994	1.41	0.98	30.0%	18.91	12.36	34.7%	1.61	1.34	16.9%	0.00	0.00	0.0%
1995	1.32	0.92	30.5%	18.08	11.62	35.7%	1.59	1.32	16.9%	0.00	0.00	0.0%
1996	1.25	0.86	30.9%	17.36	10.97	36.8%	1.57	1.31	16.8%	0.00	0.00	0.0%
1997	1.19	0.82	31.1%	16.73	10.43	37.7%	1.55	1.29	16.7%	0.00	0.00	0.0%
1998	1.13	0.77	31.6%	16.16	9.95	38.4%	1.54	1.28	16.5%	0.00	0.00	0.0%
1999	1.08	0.73	32.1%	15.67	9.54	39.1%	1.53	1.28	16.4%	0.00	0.00	0.0%
2000	1.04	0.71	31.0%	15.23	9.28	39.0%	1.52	1.27	16.3%	0.00	0.00	0.0%
2001	1.00	0.69	31.2%	14.86	9.09	38.8%	1.51	1.27	16.1%	0.00	0.00	0.0%
2002	0.96	0.66	31.2%	14.55	8.86	39.1%	1.51	1.27	16.0%	0.00	0.00	0.0%
2003	0.94	0.65	30.4%	14.36	8.67	39.6%	1.50	1.26	15.8%	0.00	0.00	0.0%
2004	0.92	0.65	29.6%	14.19	8.51	40.0%	1.49	1.26	15.7%	0.00	0.00	0.0%
2005	0.90	0.63	29.6%	14.04	8.37	40.4%	1.49	1.26	15.6%	0.00	0.00	0.0%
2006	0.89	0.63	29.6%	13.95	8.28	40.7%	1.48	1.25	15.5%	0.00	0.00	0.0%
2007	0.88	0.62	29.6%	13.87	8.19	41.0%	1.48	1.25	15.4%	0.00	0.00	0.0%
2008	0.88	0.62	29.7%	13.82	8.13	41.2%	1.47	1.25	15.2%	0.00	0.00	0.0%
2009	0.88	0.62	29.8%	13.79	8.09	41.4%	1.47	1.25	15.1%	0.00	0.00	0.0%
2010	0.87	0.61	29.8%	13.78	8.05	41.5%	1.47	1.25	15.0%	0.00	0.00	0.0%
2011	0.87	0.61	29.9%	13.77	8.03	41.7%	1.47	1.25	14.9%	0.00	0.00	0.0%
2012	0.87	0.61	29.9%	13.76	8.02	41.7%	1.47	1.25	14.9%	0.00	0.00	0.0%
2013	0.87	0.61	29.9%	13.76	8.01	41.8%	1.47	1.25	14.8%	0.00	0.00	0.0%
2014	0.87	0.61	29.9%	13.75	7.99	41.9%	1.47	1.25	14.8%	0.00	0.00	0.0%
2015	0.87	0.61	29.9%	13.75	7.99	41.9%	1.47	1.25	14.7%	0.00	0.00	0.0%
2016	0.87	0.61	29.9%	13.74	7.98	41.9%	1.47	1.25	14.7%	0.00	0.00	0.0%
2017	0.87	0.61	29.9%	13.74	7.98	41.9%	1.47	1.25	14.6%	0.00	0.00	0.0%
2018	0.87	0.61	29.9%	13.74	7.98	41.9%	1.47	1.25	14.6%	0.00	0.00	0.0%
2019	0.87	0.61	29.9%	13.74	7.98	41.9%	1.47	1.25	14.6%	0.00	0.00	0.0%
2020	0.87	0.61	29.9%	13.74	7.98	41.9%	1.47	1.25	14.6%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode
**
**      Output file: SENS_SB1997_LOADED.OUT
**
** Date of this run:  1/15/  91
**                   13:13
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	ALL SLD
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode
**
** Output file: SENS_SB1997_LOADED.OUT
**
** Date of this run: 1/15/ 91
** 13:13
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.2%	28.39	24.40	14.1%	2.01	1.86	7.5%	0.00	0.00	0.0%
1985	2.53	2.14	15.4%	26.40	22.21	15.9%	1.90	1.73	8.7%	0.00	0.00	0.0%
1986	2.29	1.91	16.3%	24.48	20.20	17.5%	1.79	1.61	10.0%	0.00	0.00	0.0%
1987	2.06	1.71	16.9%	22.65	18.40	18.8%	1.69	1.50	11.3%	0.00	0.00	0.0%
1988	1.86	1.53	17.7%	20.93	16.81	19.7%	1.60	1.40	12.5%	0.00	0.00	0.0%
1989	1.68	1.37	18.4%	19.32	15.39	20.4%	1.51	1.30	13.7%	0.00	0.00	0.0%
1990	1.52	1.23	18.9%	17.93	14.19	20.9%	1.41	1.20	14.8%	0.00	0.00	0.0%
1991	1.38	1.11	19.3%	16.68	13.12	21.3%	1.31	1.10	15.6%	0.00	0.00	0.0%
1992	1.26	1.01	19.6%	15.61	12.22	21.7%	1.21	1.02	16.2%	0.00	0.00	0.0%
1993	1.16	0.93	19.8%	14.70	11.42	22.3%	1.13	0.94	16.6%	0.00	0.00	0.0%
1994	1.06	0.85	20.1%	13.82	10.61	23.2%	1.05	0.87	17.1%	0.00	0.00	0.0%
1995	0.98	0.78	20.5%	12.92	9.75	24.5%	0.98	0.81	17.4%	0.00	0.00	0.0%
1996	0.90	0.71	20.9%	12.07	8.94	25.9%	0.92	0.76	17.5%	0.00	0.00	0.0%
1997	0.83	0.65	21.2%	11.26	8.20	27.2%	0.87	0.71	17.5%	0.00	0.00	0.0%
1998	0.76	0.60	21.5%	10.48	7.50	28.4%	0.82	0.68	17.4%	0.00	0.00	0.0%
1999	0.70	0.55	21.6%	9.77	6.89	29.5%	0.78	0.64	17.2%	0.00	0.00	0.0%
2000	0.66	0.51	22.2%	9.13	6.46	29.2%	0.74	0.62	16.9%	0.00	0.00	0.0%
2001	0.62	0.48	22.7%	8.52	5.96	30.0%	0.71	0.59	16.7%	0.00	0.00	0.0%
2002	0.59	0.46	22.9%	7.98	5.55	30.4%	0.68	0.57	16.5%	0.00	0.00	0.0%
2003	0.56	0.44	22.2%	7.45	5.16	30.8%	0.66	0.55	16.4%	0.00	0.00	0.0%
2004	0.53	0.42	21.9%	6.95	4.79	31.1%	0.64	0.54	16.2%	0.00	0.00	0.0%
2005	0.51	0.40	22.1%	6.50	4.46	31.4%	0.63	0.53	16.0%	0.00	0.00	0.0%
2006	0.49	0.38	22.2%	6.16	4.22	31.5%	0.62	0.52	15.8%	0.00	0.00	0.0%
2007	0.48	0.37	22.4%	5.87	4.01	31.7%	0.61	0.51	15.7%	0.00	0.00	0.0%
2008	0.47	0.36	22.7%	5.63	3.83	31.9%	0.60	0.51	15.6%	0.00	0.00	0.0%
2009	0.46	0.36	22.8%	5.45	3.71	32.0%	0.60	0.51	15.5%	0.00	0.00	0.0%
2010	0.46	0.35	22.9%	5.33	3.62	32.2%	0.60	0.50	15.4%	0.00	0.00	0.0%
2011	0.45	0.35	23.0%	5.24	3.55	32.3%	0.59	0.50	15.3%	0.00	0.00	0.0%
2012	0.45	0.35	23.1%	5.18	3.50	32.4%	0.59	0.50	15.3%	0.00	0.00	0.0%
2013	0.45	0.35	23.1%	5.13	3.47	32.4%	0.59	0.50	15.3%	0.00	0.00	0.0%
2014	0.45	0.34	23.1%	5.09	3.44	32.4%	0.59	0.50	15.2%	0.00	0.00	0.0%
2015	0.45	0.34	23.2%	5.06	3.41	32.5%	0.59	0.50	15.2%	0.00	0.00	0.0%
2016	0.44	0.34	23.2%	5.02	3.39	32.5%	0.59	0.50	15.2%	0.00	0.00	0.0%
2017	0.44	0.34	23.2%	4.98	3.36	32.6%	0.59	0.50	15.2%	0.00	0.00	0.0%
2018	0.44	0.34	23.3%	4.96	3.34	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%
2019	0.44	0.34	23.3%	4.95	3.33	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%
2020	0.44	0.34	23.3%	4.95	3.33	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode
**
** Output file: SENS_SB1997_LOADED.OUT
**
** Date of this run: 1/15/ 91
**   13:13
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.7%	30.42	25.25	17.0%	2.04	1.88	7.9%	0.00	0.00	0.0%
1985	2.71	2.27	16.1%	28.51	23.33	18.2%	1.92	1.74	9.3%	0.00	0.00	0.0%
1986	2.44	1.98	18.7%	26.53	21.28	19.8%	1.79	1.59	10.8%	0.00	0.00	0.0%
1987	2.23	1.78	20.2%	25.24	19.74	21.8%	1.68	1.47	12.1%	0.00	0.00	0.0%
1988	1.98	1.56	21.2%	23.44	18.21	22.3%	1.55	1.35	13.4%	0.00	0.00	0.0%
1989	1.78	1.39	22.0%	21.74	16.86	22.4%	1.46	1.25	14.5%	0.00	0.00	0.0%
1990	1.60	1.24	22.2%	19.91	15.61	21.6%	1.36	1.15	15.6%	0.00	0.00	0.0%
1991	1.49	1.15	23.0%	19.24	14.98	22.1%	1.31	1.09	16.3%	0.00	0.00	0.0%
1992	1.35	1.04	23.3%	17.78	13.90	21.8%	1.20	1.00	16.5%	0.00	0.00	0.0%
1993	1.24	0.96	23.2%	16.65	12.93	22.4%	1.13	0.94	16.8%	0.00	0.00	0.0%
1994	1.14	0.88	23.4%	15.62	11.92	23.7%	1.07	0.89	17.2%	0.00	0.00	0.0%
1995	1.05	0.80	24.0%	14.50	10.90	24.9%	1.03	0.85	17.6%	0.00	0.00	0.0%
1996	0.97	0.73	24.6%	13.45	9.95	26.0%	0.99	0.81	17.9%	0.00	0.00	0.0%
1997	0.89	0.67	25.2%	12.44	9.02	27.5%	0.97	0.79	18.1%	0.00	0.00	0.0%
1998	0.83	0.61	25.8%	11.60	8.25	28.9%	0.95	0.78	18.3%	0.00	0.00	0.0%
1999	0.77	0.57	26.3%	10.81	7.57	29.9%	0.94	0.77	18.4%	0.00	0.00	0.0%
2000	0.72	0.54	25.0%	10.04	7.01	30.2%	0.93	0.76	18.5%	0.00	0.00	0.0%
2001	0.69	0.51	25.6%	9.51	6.64	30.2%	0.93	0.75	18.6%	0.00	0.00	0.0%
2002	0.66	0.49	26.2%	9.02	6.22	31.1%	0.92	0.75	18.6%	0.00	0.00	0.0%
2003	0.63	0.47	25.4%	8.49	5.80	31.7%	0.91	0.74	18.6%	0.00	0.00	0.0%
2004	0.61	0.45	24.9%	7.97	5.41	32.1%	0.91	0.74	18.6%	0.00	0.00	0.0%
2005	0.58	0.44	25.0%	7.54	5.09	32.5%	0.90	0.73	18.7%	0.00	0.00	0.0%
2006	0.57	0.43	25.1%	7.19	4.83	32.8%	0.89	0.73	18.6%	0.00	0.00	0.0%
2007	0.55	0.41	25.2%	6.90	4.61	33.3%	0.89	0.72	18.6%	0.00	0.00	0.0%
2008	0.55	0.41	25.4%	6.73	4.47	33.6%	0.89	0.72	18.6%	0.00	0.00	0.0%
2009	0.54	0.40	25.6%	6.62	4.37	33.9%	0.89	0.72	18.5%	0.00	0.00	0.0%
2010	0.54	0.40	25.7%	6.55	4.31	34.2%	0.89	0.72	18.5%	0.00	0.00	0.0%
2011	0.54	0.40	25.8%	6.50	4.26	34.5%	0.89	0.72	18.5%	0.00	0.00	0.0%
2012	0.54	0.40	25.9%	6.46	4.22	34.7%	0.89	0.72	18.5%	0.00	0.00	0.0%
2013	0.53	0.40	25.9%	6.42	4.18	34.9%	0.89	0.72	18.5%	0.00	0.00	0.0%
2014	0.53	0.39	26.0%	6.39	4.15	35.0%	0.89	0.72	18.5%	0.00	0.00	0.0%
2015	0.53	0.39	26.0%	6.35	4.12	35.1%	0.89	0.72	18.4%	0.00	0.00	0.0%
2016	0.53	0.39	26.0%	6.31	4.10	35.1%	0.89	0.72	18.4%	0.00	0.00	0.0%
2017	0.53	0.39	26.0%	6.28	4.07	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2018	0.53	0.39	26.1%	6.25	4.06	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2019	0.53	0.39	26.1%	6.25	4.05	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2020	0.53	0.39	26.1%	6.25	4.05	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode
**
** Output file: SENS_SB1997_LOADED.OUT
**
** Date of this run: 1/15/ 91
** 13:13
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.8%	32.80	26.80	18.3%	2.28	2.10	8.1%	0.00	0.00	0.0%
1985	2.96	2.43	17.7%	31.04	24.60	20.7%	2.16	1.95	9.8%	0.00	0.00	0.0%
1986	2.70	2.15	20.1%	29.25	22.60	22.7%	2.05	1.82	11.4%	0.00	0.00	0.0%
1987	2.45	1.91	21.9%	27.39	20.72	24.4%	1.97	1.71	13.0%	0.00	0.00	0.0%
1988	2.23	1.70	23.6%	25.65	19.02	25.9%	1.89	1.62	14.4%	0.00	0.00	0.0%
1989	2.04	1.53	25.2%	24.16	17.56	27.3%	1.83	1.55	15.7%	0.00	0.00	0.0%
1990	1.88	1.38	26.7%	22.93	16.27	29.1%	1.78	1.48	16.8%	0.00	0.00	0.0%
1991	1.74	1.25	27.9%	21.79	15.10	30.7%	1.73	1.42	17.7%	0.00	0.00	0.0%
1992	1.61	1.15	28.9%	20.74	14.07	32.1%	1.68	1.38	18.3%	0.00	0.00	0.0%
1993	1.50	1.06	29.8%	19.82	13.13	33.8%	1.65	1.34	18.9%	0.00	0.00	0.0%
1994	1.41	0.98	30.4%	18.91	12.27	35.1%	1.61	1.30	19.2%	0.00	0.00	0.0%
1995	1.32	0.91	31.0%	18.08	11.50	36.4%	1.59	1.28	19.6%	0.00	0.00	0.0%
1996	1.25	0.85	31.5%	17.36	10.82	37.7%	1.57	1.26	19.8%	0.00	0.00	0.0%
1997	1.19	0.81	32.0%	16.73	10.24	38.8%	1.55	1.24	20.0%	0.00	0.00	0.0%
1998	1.13	0.76	32.6%	16.16	9.73	39.8%	1.54	1.23	20.2%	0.00	0.00	0.0%
1999	1.08	0.72	33.2%	15.67	9.29	40.7%	1.53	1.22	20.3%	0.00	0.00	0.0%
2000	1.04	0.70	32.4%	15.23	9.02	40.8%	1.52	1.21	20.4%	0.00	0.00	0.0%
2001	1.00	0.67	32.7%	14.86	8.80	40.8%	1.51	1.20	20.5%	0.00	0.00	0.0%
2002	0.96	0.64	32.9%	14.55	8.55	41.2%	1.51	1.20	20.5%	0.00	0.00	0.0%
2003	0.94	0.64	32.2%	14.36	8.35	41.9%	1.50	1.19	20.5%	0.00	0.00	0.0%
2004	0.92	0.63	31.5%	14.19	8.17	42.4%	1.49	1.19	20.5%	0.00	0.00	0.0%
2005	0.90	0.62	31.6%	14.04	8.02	42.9%	1.49	1.18	20.5%	0.00	0.00	0.0%
2006	0.89	0.61	31.7%	13.95	7.93	43.2%	1.48	1.18	20.5%	0.00	0.00	0.0%
2007	0.88	0.60	31.8%	13.87	7.82	43.6%	1.48	1.17	20.4%	0.00	0.00	0.0%
2008	0.88	0.60	31.9%	13.82	7.76	43.8%	1.47	1.17	20.4%	0.00	0.00	0.0%
2009	0.88	0.60	32.1%	13.79	7.71	44.1%	1.47	1.17	20.4%	0.00	0.00	0.0%
2010	0.87	0.59	32.2%	13.78	7.67	44.3%	1.47	1.17	20.3%	0.00	0.00	0.0%
2011	0.87	0.59	32.2%	13.77	7.64	44.5%	1.47	1.17	20.3%	0.00	0.00	0.0%
2012	0.87	0.59	32.2%	13.76	7.63	44.6%	1.47	1.17	20.3%	0.00	0.00	0.0%
2013	0.87	0.59	32.3%	13.76	7.62	44.6%	1.47	1.17	20.2%	0.00	0.00	0.0%
2014	0.87	0.59	32.3%	13.75	7.60	44.7%	1.47	1.17	20.2%	0.00	0.00	0.0%
2015	0.87	0.59	32.3%	13.75	7.59	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2016	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2017	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2018	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2019	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2020	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode, stricter standards
**
**      Output file: SENS_SB1997_LOADED_STRICTER.OUT
**
** Date of this run:  1/15/  91
**                   13:17
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	ALL SLD
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	STRICTER
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode, stricter standards
**
** Output file: SENS_SB1997_LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13:17
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.38	14.3%	28.39	24.38	14.1%	2.01	1.85	7.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.5%	26.40	22.18	16.0%	1.90	1.73	9.0%	0.00	0.00	0.0%
1986	2.29	1.91	16.4%	24.48	20.16	17.6%	1.79	1.61	10.4%	0.00	0.00	0.0%
1987	2.06	1.71	17.1%	22.65	18.36	18.9%	1.69	1.49	11.7%	0.00	0.00	0.0%
1988	1.86	1.52	17.9%	20.93	16.76	19.9%	1.60	1.39	13.0%	0.00	0.00	0.0%
1989	1.68	1.36	18.7%	19.32	15.33	20.7%	1.51	1.29	14.3%	0.00	0.00	0.0%
1990	1.52	1.23	19.3%	17.93	14.12	21.3%	1.41	1.19	15.5%	0.00	0.00	0.0%
1991	1.38	1.11	19.7%	16.68	13.05	21.7%	1.31	1.09	16.5%	0.00	0.00	0.0%
1992	1.26	1.00	20.1%	15.61	12.14	22.2%	1.21	1.00	17.2%	0.00	0.00	0.0%
1993	1.16	0.92	20.5%	14.70	11.34	22.9%	1.13	0.93	17.8%	0.00	0.00	0.0%
1994	1.06	0.84	20.9%	13.82	10.52	23.9%	1.05	0.86	18.3%	0.00	0.00	0.0%
1995	0.98	0.77	21.5%	12.92	9.66	25.2%	0.98	0.80	18.8%	0.00	0.00	0.0%
1996	0.90	0.70	22.0%	12.07	8.85	26.7%	0.92	0.74	19.1%	0.00	0.00	0.0%
1997	0.83	0.64	22.4%	11.26	8.10	28.1%	0.87	0.70	19.2%	0.00	0.00	0.0%
1998	0.76	0.59	22.9%	10.48	7.40	29.4%	0.82	0.66	19.1%	0.00	0.00	0.0%
1999	0.70	0.54	23.2%	9.77	6.79	30.5%	0.78	0.63	19.0%	0.00	0.00	0.0%
2000	0.66	0.50	23.9%	9.13	6.36	30.3%	0.74	0.60	18.8%	0.00	0.00	0.0%
2001	0.62	0.47	24.5%	8.52	5.87	31.1%	0.71	0.58	18.6%	0.00	0.00	0.0%
2002	0.59	0.44	24.9%	7.98	5.45	31.6%	0.68	0.56	18.5%	0.00	0.00	0.0%
2003	0.56	0.42	24.2%	7.45	5.07	32.0%	0.66	0.54	18.3%	0.00	0.00	0.0%
2004	0.53	0.40	24.1%	6.95	4.70	32.4%	0.64	0.52	18.1%	0.00	0.00	0.0%
2005	0.51	0.39	24.4%	6.50	4.37	32.7%	0.63	0.51	17.9%	0.00	0.00	0.0%
2006	0.49	0.37	24.6%	6.16	4.13	32.9%	0.62	0.51	17.8%	0.00	0.00	0.0%
2007	0.48	0.36	24.9%	5.87	3.92	33.1%	0.61	0.50	17.6%	0.00	0.00	0.0%
2008	0.47	0.35	25.2%	5.63	3.75	33.4%	0.60	0.50	17.5%	0.00	0.00	0.0%
2009	0.46	0.34	25.4%	5.45	3.62	33.6%	0.60	0.49	17.4%	0.00	0.00	0.0%
2010	0.46	0.34	25.5%	5.33	3.53	33.8%	0.60	0.49	17.3%	0.00	0.00	0.0%
2011	0.45	0.34	25.6%	5.24	3.46	33.9%	0.59	0.49	17.2%	0.00	0.00	0.0%
2012	0.45	0.33	25.7%	5.18	3.42	34.0%	0.59	0.49	17.2%	0.00	0.00	0.0%
2013	0.45	0.33	25.7%	5.13	3.39	34.0%	0.59	0.49	17.2%	0.00	0.00	0.0%
2014	0.45	0.33	25.8%	5.09	3.36	34.1%	0.59	0.49	17.1%	0.00	0.00	0.0%
2015	0.45	0.33	25.8%	5.06	3.33	34.1%	0.59	0.49	17.1%	0.00	0.00	0.0%
2016	0.44	0.33	25.8%	5.02	3.30	34.2%	0.59	0.49	17.1%	0.00	0.00	0.0%
2017	0.44	0.33	25.9%	4.98	3.27	34.3%	0.59	0.49	17.1%	0.00	0.00	0.0%
2018	0.44	0.33	25.9%	4.96	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%
2019	0.44	0.33	25.9%	4.95	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%
2020	0.44	0.33	25.9%	4.95	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode, stricter standards
**
** Output file: SENS_SB1997_LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
** 13:17
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.7%	30.42	25.23	17.1%	2.04	1.88	8.1%	0.00	0.00	0.0%
1985	2.71	2.27	16.2%	28.51	23.32	18.2%	1.92	1.73	9.7%	0.00	0.00	0.0%
1986	2.44	1.98	18.8%	26.53	21.26	19.9%	1.79	1.59	11.3%	0.00	0.00	0.0%
1987	2.23	1.78	20.3%	25.24	19.72	21.9%	1.68	1.46	12.7%	0.00	0.00	0.0%
1988	1.98	1.56	21.4%	23.44	18.18	22.5%	1.55	1.33	14.1%	0.00	0.00	0.0%
1989	1.78	1.39	22.2%	21.74	16.83	22.6%	1.46	1.23	15.4%	0.00	0.00	0.0%
1990	1.60	1.24	22.4%	19.91	15.58	21.7%	1.36	1.13	16.6%	0.00	0.00	0.0%
1991	1.49	1.14	23.3%	19.24	14.94	22.4%	1.31	1.08	17.6%	0.00	0.00	0.0%
1992	1.35	1.03	23.7%	17.78	13.84	22.2%	1.20	0.99	18.0%	0.00	0.00	0.0%
1993	1.24	0.95	23.7%	16.65	12.86	22.7%	1.13	0.92	18.5%	0.00	0.00	0.0%
1994	1.14	0.87	24.0%	15.62	11.85	24.2%	1.07	0.87	19.1%	0.00	0.00	0.0%
1995	1.05	0.79	24.7%	14.50	10.82	25.4%	1.03	0.83	19.6%	0.00	0.00	0.0%
1996	0.97	0.72	25.4%	13.45	9.87	26.6%	0.99	0.79	19.9%	0.00	0.00	0.0%
1997	0.89	0.66	26.2%	12.44	8.93	28.2%	0.97	0.77	20.2%	0.00	0.00	0.0%
1998	0.83	0.61	26.9%	11.60	8.16	29.7%	0.95	0.76	20.4%	0.00	0.00	0.0%
1999	0.77	0.56	27.6%	10.81	7.48	30.8%	0.94	0.75	20.6%	0.00	0.00	0.0%
2000	0.72	0.53	26.4%	10.04	6.91	31.2%	0.93	0.74	20.7%	0.00	0.00	0.0%
2001	0.69	0.50	27.1%	9.51	6.54	31.2%	0.93	0.73	20.8%	0.00	0.00	0.0%
2002	0.66	0.48	27.9%	9.02	6.11	32.2%	0.92	0.73	20.9%	0.00	0.00	0.0%
2003	0.63	0.46	27.1%	8.49	5.70	32.9%	0.91	0.72	20.9%	0.00	0.00	0.0%
2004	0.61	0.44	26.7%	7.97	5.31	33.4%	0.91	0.72	20.9%	0.00	0.00	0.0%
2005	0.58	0.43	26.9%	7.54	4.99	33.8%	0.90	0.71	20.9%	0.00	0.00	0.0%
2006	0.57	0.41	27.0%	7.19	4.74	34.2%	0.89	0.71	20.9%	0.00	0.00	0.0%
2007	0.55	0.40	27.1%	6.90	4.51	34.6%	0.89	0.70	20.8%	0.00	0.00	0.0%
2008	0.55	0.40	27.4%	6.73	4.38	35.0%	0.89	0.70	20.8%	0.00	0.00	0.0%
2009	0.54	0.39	27.5%	6.62	4.28	35.3%	0.89	0.70	20.8%	0.00	0.00	0.0%
2010	0.54	0.39	27.7%	6.55	4.22	35.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2011	0.54	0.39	27.8%	6.50	4.16	35.9%	0.89	0.70	20.7%	0.00	0.00	0.0%
2012	0.54	0.39	27.9%	6.46	4.12	36.2%	0.89	0.70	20.7%	0.00	0.00	0.0%
2013	0.53	0.38	27.9%	6.42	4.09	36.3%	0.89	0.70	20.7%	0.00	0.00	0.0%
2014	0.53	0.38	28.0%	6.39	4.06	36.5%	0.89	0.70	20.7%	0.00	0.00	0.0%
2015	0.53	0.38	28.0%	6.35	4.03	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2016	0.53	0.38	28.1%	6.31	4.00	36.6%	0.89	0.70	20.6%	0.00	0.00	0.0%
2017	0.53	0.38	28.1%	6.28	3.98	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2018	0.53	0.38	28.1%	6.25	3.97	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2019	0.53	0.38	28.1%	6.25	3.96	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2020	0.53	0.38	28.1%	6.25	3.96	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, all loaded mode, stricter standards
**
** Output file: SENS_SB1997_LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13:17
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.8%	32.80	26.78	18.3%	2.28	2.09	8.2%	0.00	0.00	0.0%
1985	2.96	2.43	17.8%	31.04	24.57	20.9%	2.16	1.94	10.1%	0.00	0.00	0.0%
1986	2.70	2.15	20.2%	29.25	22.55	22.9%	2.05	1.81	12.0%	0.00	0.00	0.0%
1987	2.45	1.91	22.1%	27.39	20.65	24.6%	1.97	1.70	13.7%	0.00	0.00	0.0%
1988	2.23	1.70	23.8%	25.65	18.93	26.2%	1.89	1.60	15.3%	0.00	0.00	0.0%
1989	2.04	1.52	25.5%	24.16	17.45	27.8%	1.83	1.52	16.9%	0.00	0.00	0.0%
1990	1.88	1.37	27.1%	22.93	16.13	29.6%	1.78	1.45	18.3%	0.00	0.00	0.0%
1991	1.74	1.25	28.4%	21.79	14.94	31.4%	1.73	1.39	19.3%	0.00	0.00	0.0%
1992	1.61	1.14	29.6%	20.74	13.89	33.0%	1.68	1.34	20.2%	0.00	0.00	0.0%
1993	1.50	1.04	30.5%	19.82	12.93	34.8%	1.65	1.30	20.9%	0.00	0.00	0.0%
1994	1.41	0.97	31.2%	18.91	12.05	36.3%	1.61	1.27	21.5%	0.00	0.00	0.0%
1995	1.32	0.90	32.0%	18.08	11.27	37.7%	1.59	1.24	21.9%	0.00	0.00	0.0%
1996	1.25	0.84	32.6%	17.36	10.58	39.1%	1.57	1.22	22.2%	0.00	0.00	0.0%
1997	1.19	0.79	33.2%	16.73	9.99	40.3%	1.55	1.20	22.4%	0.00	0.00	0.0%
1998	1.13	0.75	33.9%	16.16	9.48	41.3%	1.54	1.19	22.6%	0.00	0.00	0.0%
1999	1.08	0.71	34.7%	15.67	9.04	42.3%	1.53	1.18	22.7%	0.00	0.00	0.0%
2000	1.04	0.68	34.0%	15.23	8.75	42.5%	1.52	1.17	22.8%	0.00	0.00	0.0%
2001	1.00	0.65	34.4%	14.86	8.54	42.6%	1.51	1.17	22.9%	0.00	0.00	0.0%
2002	0.96	0.63	34.7%	14.55	8.28	43.1%	1.51	1.16	22.9%	0.00	0.00	0.0%
2003	0.94	0.62	34.0%	14.36	8.08	43.7%	1.50	1.16	22.9%	0.00	0.00	0.0%
2004	0.92	0.61	33.4%	14.19	7.90	44.3%	1.49	1.15	22.9%	0.00	0.00	0.0%
2005	0.90	0.60	33.6%	14.04	7.75	44.8%	1.49	1.15	22.9%	0.00	0.00	0.0%
2006	0.89	0.59	33.7%	13.95	7.65	45.2%	1.48	1.14	22.9%	0.00	0.00	0.0%
2007	0.88	0.58	33.9%	13.87	7.54	45.6%	1.48	1.14	22.9%	0.00	0.00	0.0%
2008	0.88	0.58	34.0%	13.82	7.48	45.9%	1.47	1.14	22.9%	0.00	0.00	0.0%
2009	0.88	0.58	34.2%	13.79	7.43	46.1%	1.47	1.14	22.8%	0.00	0.00	0.0%
2010	0.87	0.57	34.3%	13.78	7.39	46.4%	1.47	1.14	22.7%	0.00	0.00	0.0%
2011	0.87	0.57	34.3%	13.77	7.36	46.5%	1.47	1.14	22.7%	0.00	0.00	0.0%
2012	0.87	0.57	34.4%	13.76	7.35	46.6%	1.47	1.14	22.7%	0.00	0.00	0.0%
2013	0.87	0.57	34.4%	13.76	7.33	46.7%	1.47	1.14	22.6%	0.00	0.00	0.0%
2014	0.87	0.57	34.4%	13.75	7.32	46.8%	1.47	1.14	22.6%	0.00	0.00	0.0%
2015	0.87	0.57	34.4%	13.75	7.31	46.8%	1.47	1.14	22.5%	0.00	0.00	0.0%
2016	0.87	0.57	34.4%	13.74	7.30	46.8%	1.47	1.14	22.5%	0.00	0.00	0.0%
2017	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2018	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2019	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2020	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, loaded mode for 80 & later vehicles
**
**      Output file: SENS_SB1997_80LOADED.OUT
**
** Date of this run:  1/15/  91
**                   13: 5
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDLE/SLD
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, loaded mode for 80 & later vehicles
**
** Output file: SENS_SB1997_80LOADED.OUT
**
** Date of this run: 1/15/ 91
**   13: 5
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.43	14.0%	2.01	1.87	6.9%	0.00	0.00	0.0%
1985	2.53	2.14	15.3%	26.40	22.24	15.7%	1.90	1.74	8.1%	0.00	0.00	0.0%
1986	2.29	1.92	16.1%	24.48	20.24	17.3%	1.79	1.62	9.4%	0.00	0.00	0.0%
1987	2.06	1.71	16.8%	22.65	18.44	18.6%	1.69	1.51	10.6%	0.00	0.00	0.0%
1988	1.86	1.53	17.5%	20.93	16.85	19.5%	1.60	1.41	11.9%	0.00	0.00	0.0%
1989	1.68	1.37	18.3%	19.32	15.42	20.2%	1.51	1.31	13.1%	0.00	0.00	0.0%
1990	1.52	1.23	18.7%	17.93	14.22	20.7%	1.41	1.21	14.2%	0.00	0.00	0.0%
1991	1.38	1.11	19.1%	16.68	13.15	21.1%	1.31	1.11	15.1%	0.00	0.00	0.0%
1992	1.26	1.01	19.4%	15.61	12.25	21.5%	1.21	1.02	15.7%	0.00	0.00	0.0%
1993	1.16	0.93	19.6%	14.70	11.45	22.1%	1.13	0.94	16.2%	0.00	0.00	0.0%
1994	1.06	0.85	20.0%	13.82	10.63	23.1%	1.05	0.87	16.7%	0.00	0.00	0.0%
1995	0.98	0.78	20.4%	12.92	9.77	24.4%	0.98	0.81	17.0%	0.00	0.00	0.0%
1996	0.90	0.71	20.8%	12.07	8.96	25.8%	0.92	0.76	17.3%	0.00	0.00	0.0%
1997	0.83	0.65	21.1%	11.26	8.20	27.1%	0.87	0.72	17.3%	0.00	0.00	0.0%
1998	0.76	0.60	21.4%	10.48	7.51	28.4%	0.82	0.68	17.3%	0.00	0.00	0.0%
1999	0.70	0.55	21.5%	9.77	6.89	29.4%	0.78	0.65	17.0%	0.00	0.00	0.0%
2000	0.66	0.51	22.2%	9.13	6.46	29.2%	0.74	0.62	16.8%	0.00	0.00	0.0%
2001	0.62	0.48	22.7%	8.52	5.96	30.0%	0.71	0.59	16.6%	0.00	0.00	0.0%
2002	0.59	0.46	22.9%	7.98	5.55	30.4%	0.68	0.57	16.4%	0.00	0.00	0.0%
2003	0.56	0.44	22.1%	7.45	5.16	30.7%	0.66	0.55	16.3%	0.00	0.00	0.0%
2004	0.53	0.42	21.9%	6.95	4.79	31.0%	0.64	0.54	16.1%	0.00	0.00	0.0%
2005	0.51	0.40	22.1%	6.50	4.46	31.4%	0.63	0.53	15.9%	0.00	0.00	0.0%
2006	0.49	0.38	22.2%	6.16	4.22	31.5%	0.62	0.52	15.8%	0.00	0.00	0.0%
2007	0.48	0.37	22.4%	5.87	4.01	31.7%	0.61	0.51	15.7%	0.00	0.00	0.0%
2008	0.47	0.36	22.7%	5.63	3.83	31.9%	0.60	0.51	15.6%	0.00	0.00	0.0%
2009	0.46	0.36	22.8%	5.45	3.71	32.0%	0.60	0.51	15.5%	0.00	0.00	0.0%
2010	0.46	0.35	22.9%	5.33	3.62	32.2%	0.60	0.50	15.4%	0.00	0.00	0.0%
2011	0.45	0.35	23.0%	5.24	3.55	32.3%	0.59	0.50	15.3%	0.00	0.00	0.0%
2012	0.45	0.35	23.1%	5.18	3.50	32.4%	0.59	0.50	15.3%	0.00	0.00	0.0%
2013	0.45	0.35	23.1%	5.13	3.47	32.4%	0.59	0.50	15.3%	0.00	0.00	0.0%
2014	0.45	0.34	23.1%	5.09	3.44	32.4%	0.59	0.50	15.2%	0.00	0.00	0.0%
2015	0.45	0.34	23.2%	5.06	3.41	32.5%	0.59	0.50	15.2%	0.00	0.00	0.0%
2016	0.44	0.34	23.2%	5.02	3.39	32.5%	0.59	0.50	15.2%	0.00	0.00	0.0%
2017	0.44	0.34	23.2%	4.98	3.36	32.6%	0.59	0.50	15.2%	0.00	0.00	0.0%
2018	0.44	0.34	23.3%	4.96	3.34	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%
2019	0.44	0.34	23.3%	4.95	3.33	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%
2020	0.44	0.34	23.3%	4.95	3.33	32.7%	0.59	0.50	15.2%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, loaded mode for 80 & later vehicles
**
** Output file: SENS_SB1997_80LOADED.OUT
**
** Date of this run: 1/15/ 91
**   13: 5
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.28	16.9%	2.04	1.90	7.3%	0.00	0.00	0.0%
1985	2.71	2.28	16.1%	28.51	23.38	18.0%	1.92	1.75	8.6%	0.00	0.00	0.0%
1986	2.44	1.98	18.6%	26.53	21.32	19.6%	1.79	1.61	10.0%	0.00	0.00	0.0%
1987	2.23	1.78	20.1%	25.24	19.79	21.6%	1.68	1.49	11.3%	0.00	0.00	0.0%
1988	1.98	1.57	21.1%	23.44	18.25	22.1%	1.55	1.36	12.6%	0.00	0.00	0.0%
1989	1.78	1.39	21.8%	21.74	16.90	22.2%	1.46	1.26	13.6%	0.00	0.00	0.0%
1990	1.60	1.25	22.0%	19.91	15.65	21.4%	1.36	1.16	14.6%	0.00	0.00	0.0%
1991	1.49	1.15	22.8%	19.24	15.02	21.9%	1.31	1.10	15.4%	0.00	0.00	0.0%
1992	1.35	1.04	23.1%	17.78	13.93	21.7%	1.20	1.01	15.7%	0.00	0.00	0.0%
1993	1.24	0.96	23.0%	16.65	12.95	22.2%	1.13	0.95	16.1%	0.00	0.00	0.0%
1994	1.14	0.88	23.2%	15.62	11.94	23.6%	1.07	0.90	16.6%	0.00	0.00	0.0%
1995	1.05	0.80	23.9%	14.50	10.91	24.7%	1.03	0.85	17.1%	0.00	0.00	0.0%
1996	0.97	0.73	24.5%	13.45	9.96	25.9%	0.99	0.82	17.4%	0.00	0.00	0.0%
1997	0.89	0.67	25.1%	12.44	9.03	27.5%	0.97	0.80	17.7%	0.00	0.00	0.0%
1998	0.83	0.62	25.7%	11.60	8.26	28.8%	0.95	0.78	18.0%	0.00	0.00	0.0%
1999	0.77	0.57	26.2%	10.81	7.58	29.9%	0.94	0.77	18.2%	0.00	0.00	0.0%
2000	0.72	0.54	24.9%	10.04	7.02	30.2%	0.93	0.76	18.3%	0.00	0.00	0.0%
2001	0.69	0.51	25.6%	9.51	6.65	30.1%	0.93	0.76	18.4%	0.00	0.00	0.0%
2002	0.66	0.49	26.2%	9.02	6.22	31.0%	0.92	0.75	18.5%	0.00	0.00	0.0%
2003	0.63	0.47	25.3%	8.49	5.81	31.6%	0.91	0.74	18.5%	0.00	0.00	0.0%
2004	0.61	0.45	24.9%	7.97	5.41	32.1%	0.91	0.74	18.5%	0.00	0.00	0.0%
2005	0.58	0.44	25.0%	7.54	5.09	32.4%	0.90	0.73	18.6%	0.00	0.00	0.0%
2006	0.57	0.43	25.1%	7.19	4.83	32.8%	0.89	0.73	18.6%	0.00	0.00	0.0%
2007	0.55	0.41	25.2%	6.90	4.61	33.2%	0.89	0.72	18.6%	0.00	0.00	0.0%
2008	0.55	0.41	25.4%	6.73	4.47	33.6%	0.89	0.72	18.5%	0.00	0.00	0.0%
2009	0.54	0.40	25.6%	6.62	4.37	33.9%	0.89	0.72	18.5%	0.00	0.00	0.0%
2010	0.54	0.40	25.7%	6.55	4.31	34.2%	0.89	0.72	18.5%	0.00	0.00	0.0%
2011	0.54	0.40	25.8%	6.50	4.26	34.5%	0.89	0.72	18.5%	0.00	0.00	0.0%
2012	0.54	0.40	25.9%	6.46	4.22	34.7%	0.89	0.72	18.5%	0.00	0.00	0.0%
2013	0.53	0.40	25.9%	6.42	4.18	34.9%	0.89	0.72	18.5%	0.00	0.00	0.0%
2014	0.53	0.39	26.0%	6.39	4.15	35.0%	0.89	0.72	18.5%	0.00	0.00	0.0%
2015	0.53	0.39	26.0%	6.35	4.12	35.1%	0.89	0.72	18.4%	0.00	0.00	0.0%
2016	0.53	0.39	26.0%	6.31	4.10	35.1%	0.89	0.72	18.4%	0.00	0.00	0.0%
2017	0.53	0.39	26.0%	6.28	4.07	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2018	0.53	0.39	26.1%	6.25	4.06	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2019	0.53	0.39	26.1%	6.25	4.05	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%
2020	0.53	0.39	26.1%	6.25	4.05	35.1%	0.89	0.72	18.5%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, loaded mode for 80 & later vehicles
**
** Output file: SENS_SB1997_80LOADED.OUT
**
** Date of this run: 1/15/ 91
**   13: 5
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.8%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.7%	31.04	24.65	20.6%	2.16	1.96	9.0%	0.00	0.00	0.0%
1986	2.70	2.16	20.0%	29.25	22.64	22.6%	2.05	1.84	10.6%	0.00	0.00	0.0%
1987	2.45	1.91	21.8%	27.39	20.76	24.2%	1.97	1.73	12.1%	0.00	0.00	0.0%
1988	2.23	1.71	23.5%	25.65	19.05	25.7%	1.89	1.64	13.6%	0.00	0.00	0.0%
1989	2.04	1.53	25.1%	24.16	17.60	27.2%	1.83	1.56	14.9%	0.00	0.00	0.0%
1990	1.88	1.38	26.6%	22.93	16.30	28.9%	1.78	1.49	16.1%	0.00	0.00	0.0%
1991	1.74	1.26	27.9%	21.79	15.13	30.6%	1.73	1.44	17.0%	0.00	0.00	0.0%
1992	1.61	1.15	28.9%	20.74	14.09	32.0%	1.68	1.39	17.7%	0.00	0.00	0.0%
1993	1.50	1.06	29.7%	19.82	13.15	33.7%	1.65	1.34	18.4%	0.00	0.00	0.0%
1994	1.41	0.98	30.3%	18.91	12.28	35.0%	1.61	1.31	18.8%	0.00	0.00	0.0%
1995	1.32	0.91	30.9%	18.08	11.51	36.3%	1.59	1.28	19.2%	0.00	0.00	0.0%
1996	1.25	0.86	31.5%	17.36	10.83	37.6%	1.57	1.26	19.5%	0.00	0.00	0.0%
1997	1.19	0.81	32.0%	16.73	10.25	38.7%	1.55	1.25	19.8%	0.00	0.00	0.0%
1998	1.13	0.76	32.5%	16.16	9.74	39.7%	1.54	1.23	20.0%	0.00	0.00	0.0%
1999	1.08	0.72	33.2%	15.67	9.30	40.6%	1.53	1.22	20.1%	0.00	0.00	0.0%
2000	1.04	0.70	32.4%	15.23	9.02	40.8%	1.52	1.21	20.2%	0.00	0.00	0.0%
2001	1.00	0.67	32.6%	14.86	8.81	40.7%	1.51	1.21	20.3%	0.00	0.00	0.0%
2002	0.96	0.64	32.8%	14.55	8.55	41.2%	1.51	1.20	20.4%	0.00	0.00	0.0%
2003	0.94	0.64	32.2%	14.36	8.35	41.8%	1.50	1.19	20.4%	0.00	0.00	0.0%
2004	0.92	0.63	31.5%	14.19	8.18	42.4%	1.49	1.19	20.4%	0.00	0.00	0.0%
2005	0.90	0.62	31.6%	14.04	8.03	42.9%	1.49	1.18	20.4%	0.00	0.00	0.0%
2006	0.89	0.61	31.7%	13.95	7.93	43.2%	1.48	1.18	20.4%	0.00	0.00	0.0%
2007	0.88	0.60	31.8%	13.87	7.82	43.6%	1.48	1.18	20.4%	0.00	0.00	0.0%
2008	0.88	0.60	31.9%	13.82	7.76	43.8%	1.47	1.17	20.4%	0.00	0.00	0.0%
2009	0.88	0.60	32.1%	13.79	7.71	44.1%	1.47	1.17	20.4%	0.00	0.00	0.0%
2010	0.87	0.59	32.2%	13.78	7.67	44.3%	1.47	1.17	20.3%	0.00	0.00	0.0%
2011	0.87	0.59	32.2%	13.77	7.64	44.5%	1.47	1.17	20.3%	0.00	0.00	0.0%
2012	0.87	0.59	32.2%	13.76	7.63	44.6%	1.47	1.17	20.3%	0.00	0.00	0.0%
2013	0.87	0.59	32.3%	13.76	7.62	44.6%	1.47	1.17	20.2%	0.00	0.00	0.0%
2014	0.87	0.59	32.3%	13.75	7.60	44.7%	1.47	1.17	20.2%	0.00	0.00	0.0%
2015	0.87	0.59	32.3%	13.75	7.59	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2016	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2017	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2018	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2019	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%
2020	0.87	0.59	32.3%	13.74	7.58	44.8%	1.47	1.17	20.1%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, 80 & later loaded mode, stricter standards
**
**      Output file: SENS_SB1997_80LOADED_STRICTER.OUT
**
** Date of this run:  1/15/  91
**                   13: 8
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDLE/SLD
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	STRICTER
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, 80 & later loaded mode, stricter standards
**
** Output file: SENS_SB1997_80LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 8
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.2%	28.39	24.42	14.0%	2.01	1.87	7.1%	0.00	0.00	0.0%
1985	2.53	2.14	15.3%	26.40	22.22	15.8%	1.90	1.74	8.3%	0.00	0.00	0.0%
1986	2.29	1.92	16.2%	24.48	20.21	17.5%	1.79	1.62	9.7%	0.00	0.00	0.0%
1987	2.06	1.71	16.9%	22.65	18.40	18.7%	1.69	1.51	11.0%	0.00	0.00	0.0%
1988	1.86	1.53	17.7%	20.93	16.80	19.7%	1.60	1.40	12.3%	0.00	0.00	0.0%
1989	1.68	1.37	18.5%	19.32	15.37	20.5%	1.51	1.30	13.6%	0.00	0.00	0.0%
1990	1.52	1.23	19.0%	17.93	14.16	21.1%	1.41	1.20	14.9%	0.00	0.00	0.0%
1991	1.38	1.11	19.5%	16.68	13.08	21.5%	1.31	1.10	15.9%	0.00	0.00	0.0%
1992	1.26	1.01	19.9%	15.61	12.17	22.0%	1.21	1.01	16.6%	0.00	0.00	0.0%
1993	1.16	0.92	20.2%	14.70	11.36	22.7%	1.13	0.93	17.3%	0.00	0.00	0.0%
1994	1.06	0.84	20.7%	13.82	10.54	23.8%	1.05	0.86	17.9%	0.00	0.00	0.0%
1995	0.98	0.77	21.3%	12.92	9.68	25.1%	0.98	0.80	18.4%	0.00	0.00	0.0%
1996	0.90	0.70	21.8%	12.07	8.86	26.6%	0.92	0.75	18.8%	0.00	0.00	0.0%
1997	0.83	0.64	22.3%	11.26	8.11	28.0%	0.87	0.70	18.9%	0.00	0.00	0.0%
1998	0.76	0.59	22.8%	10.48	7.41	29.3%	0.82	0.66	18.9%	0.00	0.00	0.0%
1999	0.70	0.54	23.1%	9.77	6.80	30.4%	0.78	0.63	18.8%	0.00	0.00	0.0%
2000	0.66	0.50	23.9%	9.13	6.37	30.2%	0.74	0.60	18.6%	0.00	0.00	0.0%
2001	0.62	0.47	24.5%	8.52	5.87	31.1%	0.71	0.58	18.4%	0.00	0.00	0.0%
2002	0.59	0.44	24.8%	7.98	5.46	31.6%	0.68	0.56	18.3%	0.00	0.00	0.0%
2003	0.56	0.43	24.2%	7.45	5.07	32.0%	0.66	0.54	18.2%	0.00	0.00	0.0%
2004	0.53	0.40	24.1%	6.95	4.70	32.3%	0.64	0.53	18.1%	0.00	0.00	0.0%
2005	0.51	0.39	24.3%	6.50	4.38	32.7%	0.63	0.51	17.9%	0.00	0.00	0.0%
2006	0.49	0.37	24.6%	6.16	4.13	32.9%	0.62	0.51	17.7%	0.00	0.00	0.0%
2007	0.48	0.36	24.9%	5.87	3.92	33.1%	0.61	0.50	17.6%	0.00	0.00	0.0%
2008	0.47	0.35	25.2%	5.63	3.75	33.4%	0.60	0.50	17.5%	0.00	0.00	0.0%
2009	0.46	0.34	25.4%	5.45	3.62	33.6%	0.60	0.49	17.4%	0.00	0.00	0.0%
2010	0.46	0.34	25.5%	5.33	3.53	33.8%	0.60	0.49	17.3%	0.00	0.00	0.0%
2011	0.45	0.34	25.6%	5.24	3.46	33.9%	0.59	0.49	17.2%	0.00	0.00	0.0%
2012	0.45	0.33	25.7%	5.18	3.42	34.0%	0.59	0.49	17.2%	0.00	0.00	0.0%
2013	0.45	0.33	25.7%	5.13	3.39	34.0%	0.59	0.49	17.2%	0.00	0.00	0.0%
2014	0.45	0.33	25.8%	5.09	3.36	34.1%	0.59	0.49	17.1%	0.00	0.00	0.0%
2015	0.45	0.33	25.8%	5.06	3.33	34.1%	0.59	0.49	17.1%	0.00	0.00	0.0%
2016	0.44	0.33	25.8%	5.02	3.30	34.2%	0.59	0.49	17.1%	0.00	0.00	0.0%
2017	0.44	0.33	25.9%	4.98	3.27	34.3%	0.59	0.49	17.1%	0.00	0.00	0.0%
2018	0.44	0.33	25.9%	4.96	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%
2019	0.44	0.33	25.9%	4.95	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%
2020	0.44	0.33	25.9%	4.95	3.25	34.4%	0.59	0.49	17.1%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, 80 & later loaded mode, stricter standards
**
** Output file: SENS_SB1997_80LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 8
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.27	16.9%	2.04	1.89	7.4%	0.00	0.00	0.0%
1985	2.71	2.27	16.1%	28.51	23.36	18.1%	1.92	1.75	8.9%	0.00	0.00	0.0%
1986	2.44	1.98	18.6%	26.53	21.31	19.7%	1.79	1.60	10.4%	0.00	0.00	0.0%
1987	2.23	1.78	20.1%	25.24	19.76	21.7%	1.68	1.48	11.8%	0.00	0.00	0.0%
1988	1.98	1.56	21.2%	23.44	18.22	22.3%	1.55	1.35	13.2%	0.00	0.00	0.0%
1989	1.78	1.39	22.0%	21.74	16.88	22.4%	1.46	1.25	14.4%	0.00	0.00	0.0%
1990	1.60	1.24	22.2%	19.91	15.62	21.5%	1.36	1.15	15.6%	0.00	0.00	0.0%
1991	1.49	1.15	23.0%	19.24	14.98	22.2%	1.31	1.09	16.5%	0.00	0.00	0.0%
1992	1.35	1.03	23.4%	17.78	13.87	22.0%	1.20	1.00	17.0%	0.00	0.00	0.0%
1993	1.24	0.95	23.4%	16.65	12.89	22.5%	1.13	0.93	17.6%	0.00	0.00	0.0%
1994	1.14	0.87	23.8%	15.62	11.87	24.0%	1.07	0.88	18.4%	0.00	0.00	0.0%
1995	1.05	0.79	24.5%	14.50	10.84	25.3%	1.03	0.83	19.0%	0.00	0.00	0.0%
1996	0.97	0.72	25.3%	13.45	9.88	26.5%	0.99	0.80	19.5%	0.00	0.00	0.0%
1997	0.89	0.66	26.0%	12.44	8.94	28.2%	0.97	0.78	19.8%	0.00	0.00	0.0%
1998	0.83	0.61	26.8%	11.60	8.17	29.6%	0.95	0.76	20.1%	0.00	0.00	0.0%
1999	0.77	0.56	27.5%	10.81	7.48	30.7%	0.94	0.75	20.3%	0.00	0.00	0.0%
2000	0.72	0.53	26.3%	10.04	6.92	31.1%	0.93	0.74	20.5%	0.00	0.00	0.0%
2001	0.69	0.50	27.1%	9.51	6.54	31.2%	0.93	0.73	20.6%	0.00	0.00	0.0%
2002	0.66	0.48	27.8%	9.02	6.12	32.2%	0.92	0.73	20.7%	0.00	0.00	0.0%
2003	0.63	0.46	27.0%	8.49	5.70	32.8%	0.91	0.72	20.7%	0.00	0.00	0.0%
2004	0.61	0.44	26.7%	7.97	5.31	33.3%	0.91	0.72	20.8%	0.00	0.00	0.0%
2005	0.58	0.43	26.8%	7.54	4.99	33.8%	0.90	0.71	20.8%	0.00	0.00	0.0%
2006	0.57	0.41	27.0%	7.19	4.74	34.1%	0.89	0.71	20.8%	0.00	0.00	0.0%
2007	0.55	0.40	27.1%	6.90	4.51	34.6%	0.89	0.70	20.8%	0.00	0.00	0.0%
2008	0.55	0.40	27.3%	6.73	4.38	35.0%	0.89	0.70	20.8%	0.00	0.00	0.0%
2009	0.54	0.39	27.5%	6.62	4.28	35.3%	0.89	0.70	20.7%	0.00	0.00	0.0%
2010	0.54	0.39	27.7%	6.55	4.22	35.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2011	0.54	0.39	27.8%	6.50	4.16	35.9%	0.89	0.70	20.7%	0.00	0.00	0.0%
2012	0.54	0.39	27.9%	6.46	4.12	36.2%	0.89	0.70	20.7%	0.00	0.00	0.0%
2013	0.53	0.38	27.9%	6.42	4.09	36.3%	0.89	0.70	20.7%	0.00	0.00	0.0%
2014	0.53	0.38	28.0%	6.39	4.06	36.5%	0.89	0.70	20.7%	0.00	0.00	0.0%
2015	0.53	0.38	28.0%	6.35	4.03	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2016	0.53	0.38	28.1%	6.31	4.00	36.6%	0.89	0.70	20.6%	0.00	0.00	0.0%
2017	0.53	0.38	28.1%	6.28	3.98	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2018	0.53	0.38	28.1%	6.25	3.97	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2019	0.53	0.38	28.1%	6.25	3.96	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%
2020	0.53	0.38	28.1%	6.25	3.96	36.6%	0.89	0.70	20.7%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, 80 & later loaded mode, stricter standards
**
** Output file: SENS_SB1997_80LOADED_STRICTER.OUT
**
** Date of this run: 1/15/ 91
**   13: 8
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.83	18.2%	2.28	2.11	7.4%	0.00	0.00	0.0%
1985	2.96	2.44	17.7%	31.04	24.62	20.7%	2.16	1.96	9.3%	0.00	0.00	0.0%
1986	2.70	2.15	20.1%	29.25	22.60	22.7%	2.05	1.83	11.1%	0.00	0.00	0.0%
1987	2.45	1.91	21.9%	27.39	20.70	24.4%	1.97	1.72	12.8%	0.00	0.00	0.0%
1988	2.23	1.70	23.6%	25.65	18.97	26.0%	1.89	1.62	14.4%	0.00	0.00	0.0%
1989	2.04	1.53	25.3%	24.16	17.49	27.6%	1.83	1.54	16.0%	0.00	0.00	0.0%
1990	1.88	1.38	27.0%	22.93	16.17	29.5%	1.78	1.47	17.5%	0.00	0.00	0.0%
1991	1.74	1.25	28.3%	21.79	14.97	31.3%	1.73	1.41	18.6%	0.00	0.00	0.0%
1992	1.61	1.14	29.4%	20.74	13.92	32.9%	1.68	1.36	19.6%	0.00	0.00	0.0%
1993	1.50	1.05	30.4%	19.82	12.95	34.6%	1.65	1.31	20.4%	0.00	0.00	0.0%
1994	1.41	0.97	31.1%	18.91	12.07	36.2%	1.61	1.28	21.0%	0.00	0.00	0.0%
1995	1.32	0.90	31.9%	18.08	11.28	37.6%	1.59	1.25	21.5%	0.00	0.00	0.0%
1996	1.25	0.84	32.6%	17.36	10.59	39.0%	1.57	1.23	21.8%	0.00	0.00	0.0%
1997	1.19	0.79	33.2%	16.73	10.00	40.2%	1.55	1.21	22.1%	0.00	0.00	0.0%
1998	1.13	0.75	33.9%	16.16	9.49	41.3%	1.54	1.20	22.4%	0.00	0.00	0.0%
1999	1.08	0.71	34.6%	15.67	9.04	42.3%	1.53	1.18	22.5%	0.00	0.00	0.0%
2000	1.04	0.68	33.9%	15.23	8.76	42.5%	1.52	1.18	22.6%	0.00	0.00	0.0%
2001	1.00	0.65	34.3%	14.86	8.54	42.5%	1.51	1.17	22.7%	0.00	0.00	0.0%
2002	0.96	0.63	34.6%	14.55	8.29	43.1%	1.51	1.16	22.8%	0.00	0.00	0.0%
2003	0.94	0.62	34.0%	14.36	8.08	43.7%	1.50	1.16	22.8%	0.00	0.00	0.0%
2004	0.92	0.61	33.4%	14.19	7.91	44.3%	1.49	1.15	22.8%	0.00	0.00	0.0%
2005	0.90	0.60	33.6%	14.04	7.75	44.8%	1.49	1.15	22.8%	0.00	0.00	0.0%
2006	0.89	0.59	33.7%	13.95	7.65	45.2%	1.48	1.14	22.9%	0.00	0.00	0.0%
2007	0.88	0.58	33.9%	13.87	7.55	45.6%	1.48	1.14	22.9%	0.00	0.00	0.0%
2008	0.88	0.58	34.0%	13.82	7.48	45.9%	1.47	1.14	22.9%	0.00	0.00	0.0%
2009	0.88	0.58	34.2%	13.79	7.43	46.1%	1.47	1.14	22.8%	0.00	0.00	0.0%
2010	0.87	0.57	34.3%	13.78	7.39	46.4%	1.47	1.14	22.7%	0.00	0.00	0.0%
2011	0.87	0.57	34.3%	13.77	7.36	46.5%	1.47	1.14	22.7%	0.00	0.00	0.0%
2012	0.87	0.57	34.4%	13.76	7.35	46.6%	1.47	1.14	22.7%	0.00	0.00	0.0%
2013	0.87	0.57	34.4%	13.76	7.33	46.7%	1.47	1.14	22.6%	0.00	0.00	0.0%
2014	0.87	0.57	34.4%	13.75	7.32	46.8%	1.47	1.14	22.6%	0.00	0.00	0.0%
2015	0.87	0.57	34.4%	13.75	7.31	46.8%	1.47	1.14	22.5%	0.00	0.00	0.0%
2016	0.87	0.57	34.4%	13.74	7.30	46.8%	1.47	1.14	22.5%	0.00	0.00	0.0%
2017	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2018	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2019	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%
2020	0.87	0.57	34.4%	13.74	7.30	46.9%	1.47	1.14	22.5%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no free years before first inspection
**
**      Output file: SENS_SB1997_NEW0.OUT
**
** Date of this run:  1/15/  91
**                   12:26
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	0
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no free years before first inspection
**
** Output file: SENS_SB1997_NEW0.OUT
**
** Date of this run: 1/15/ 91
**   12:26
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.38	19.8%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.1%	15.61	12.51	19.9%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	18.1%	14.70	11.74	20.1%	1.13	0.98	12.7%	0.00	0.00	0.0%
1994	1.06	0.87	18.1%	13.82	10.94	20.8%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	18.2%	12.92	10.11	21.8%	0.98	0.86	12.5%	0.00	0.00	0.0%
1996	0.90	0.74	18.2%	12.07	9.31	22.9%	0.92	0.81	12.2%	0.00	0.00	0.0%
1997	0.83	0.68	18.1%	11.26	8.57	23.9%	0.87	0.76	11.9%	0.00	0.00	0.0%
1998	0.76	0.62	18.0%	10.48	7.87	24.9%	0.82	0.73	11.4%	0.00	0.00	0.0%
1999	0.70	0.58	17.8%	9.77	7.25	25.7%	0.78	0.69	10.9%	0.00	0.00	0.0%
2000	0.66	0.54	18.1%	9.13	6.82	25.3%	0.74	0.66	10.4%	0.00	0.00	0.0%
2001	0.62	0.51	18.3%	8.52	6.31	26.0%	0.71	0.64	9.9%	0.00	0.00	0.0%
2002	0.59	0.48	18.4%	7.98	5.88	26.2%	0.68	0.62	9.6%	0.00	0.00	0.0%
2003	0.56	0.46	17.4%	7.45	5.48	26.4%	0.66	0.60	9.3%	0.00	0.00	0.0%
2004	0.53	0.44	16.9%	6.95	5.10	26.6%	0.64	0.58	9.0%	0.00	0.00	0.0%
2005	0.51	0.42	16.9%	6.50	4.76	26.8%	0.63	0.57	8.7%	0.00	0.00	0.0%
2006	0.49	0.41	16.9%	6.16	4.51	26.8%	0.62	0.56	8.5%	0.00	0.00	0.0%
2007	0.48	0.40	17.1%	5.87	4.29	26.9%	0.61	0.56	8.3%	0.00	0.00	0.0%
2008	0.47	0.39	17.2%	5.63	4.11	27.0%	0.60	0.55	8.1%	0.00	0.00	0.0%
2009	0.46	0.38	17.3%	5.45	3.98	27.1%	0.60	0.55	8.0%	0.00	0.00	0.0%
2010	0.46	0.38	17.4%	5.33	3.88	27.2%	0.60	0.55	7.9%	0.00	0.00	0.0%
2011	0.45	0.37	17.4%	5.24	3.81	27.3%	0.59	0.55	7.9%	0.00	0.00	0.0%
2012	0.45	0.37	17.5%	5.18	3.76	27.4%	0.59	0.54	7.8%	0.00	0.00	0.0%
2013	0.45	0.37	17.5%	5.13	3.73	27.4%	0.59	0.54	7.8%	0.00	0.00	0.0%
2014	0.45	0.37	17.5%	5.09	3.70	27.4%	0.59	0.54	7.8%	0.00	0.00	0.0%
2015	0.45	0.37	17.5%	5.06	3.67	27.5%	0.59	0.54	7.8%	0.00	0.00	0.0%
2016	0.44	0.37	17.6%	5.02	3.64	27.5%	0.59	0.54	7.8%	0.00	0.00	0.0%
2017	0.44	0.36	17.6%	4.98	3.61	27.6%	0.59	0.54	7.8%	0.00	0.00	0.0%
2018	0.44	0.36	17.6%	4.96	3.59	27.7%	0.59	0.54	7.8%	0.00	0.00	0.0%
2019	0.44	0.36	17.6%	4.95	3.58	27.7%	0.59	0.54	7.7%	0.00	0.00	0.0%
2020	0.44	0.36	17.6%	4.95	3.58	27.7%	0.59	0.54	7.7%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no free years before first inspection
**
** Output file: SENS_SB1997_NEW0.OUT
**
** Date of this run: 1/15/ 91
** 12:26
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.76	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.16	22.0%	19.24	15.17	21.1%	1.31	1.12	13.9%	0.00	0.00	0.0%
1992	1.35	1.05	22.1%	17.78	14.11	20.6%	1.20	1.04	13.6%	0.00	0.00	0.0%
1993	1.24	0.97	21.7%	16.65	13.17	20.9%	1.13	0.98	13.5%	0.00	0.00	0.0%
1994	1.14	0.90	21.6%	15.62	12.19	21.9%	1.07	0.93	13.4%	0.00	0.00	0.0%
1995	1.05	0.82	21.9%	14.50	11.20	22.8%	1.03	0.89	13.3%	0.00	0.00	0.0%
1996	0.97	0.75	22.2%	13.45	10.27	23.7%	0.99	0.86	13.1%	0.00	0.00	0.0%
1997	0.89	0.69	22.4%	12.44	9.36	24.8%	0.97	0.84	12.8%	0.00	0.00	0.0%
1998	0.83	0.64	22.7%	11.60	8.61	25.8%	0.95	0.83	12.6%	0.00	0.00	0.0%
1999	0.77	0.59	23.0%	10.81	7.93	26.6%	0.94	0.82	12.4%	0.00	0.00	0.0%
2000	0.72	0.57	21.3%	10.04	7.37	26.7%	0.93	0.82	12.2%	0.00	0.00	0.0%
2001	0.69	0.54	21.8%	9.51	7.00	26.4%	0.93	0.81	12.0%	0.00	0.00	0.0%
2002	0.66	0.51	22.2%	9.02	6.58	27.0%	0.92	0.81	11.8%	0.00	0.00	0.0%
2003	0.63	0.50	21.1%	8.49	6.16	27.4%	0.91	0.81	11.7%	0.00	0.00	0.0%
2004	0.61	0.48	20.6%	7.97	5.76	27.7%	0.91	0.80	11.6%	0.00	0.00	0.0%
2005	0.58	0.46	20.6%	7.54	5.43	28.0%	0.90	0.80	11.5%	0.00	0.00	0.0%
2006	0.57	0.45	20.6%	7.19	5.16	28.2%	0.89	0.79	11.4%	0.00	0.00	0.0%
2007	0.55	0.44	20.6%	6.90	4.93	28.6%	0.89	0.79	11.3%	0.00	0.00	0.0%
2008	0.55	0.43	20.8%	6.73	4.79	28.9%	0.89	0.79	11.2%	0.00	0.00	0.0%
2009	0.54	0.43	20.9%	6.62	4.69	29.1%	0.89	0.79	11.1%	0.00	0.00	0.0%
2010	0.54	0.43	21.0%	6.55	4.63	29.4%	0.89	0.79	11.1%	0.00	0.00	0.0%
2011	0.54	0.42	21.1%	6.50	4.57	29.6%	0.89	0.79	11.1%	0.00	0.00	0.0%
2012	0.54	0.42	21.2%	6.46	4.53	29.8%	0.89	0.79	11.0%	0.00	0.00	0.0%
2013	0.53	0.42	21.2%	6.42	4.50	30.0%	0.89	0.79	11.0%	0.00	0.00	0.0%
2014	0.53	0.42	21.2%	6.39	4.46	30.1%	0.89	0.79	11.0%	0.00	0.00	0.0%
2015	0.53	0.42	21.3%	6.35	4.43	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2016	0.53	0.42	21.3%	6.31	4.41	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2017	0.53	0.42	21.3%	6.28	4.38	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2018	0.53	0.42	21.3%	6.25	4.37	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2019	0.53	0.41	21.4%	6.25	4.36	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2020	0.53	0.41	21.4%	6.25	4.36	30.2%	0.89	0.79	11.0%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, no free years before first inspection
**
** Output file: SENS_SB1997_NEW0.OUT
**
** Date of this run: 1/15/ 91
**   12:26
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.67	20.5%	2.16	1.97	8.9%	0.00	0.00	0.0%
1986	2.70	2.16	19.9%	29.25	22.69	22.4%	2.05	1.84	10.4%	0.00	0.00	0.0%
1987	2.45	1.92	21.6%	27.39	20.84	23.9%	1.97	1.74	11.7%	0.00	0.00	0.0%
1988	2.23	1.71	23.1%	25.65	19.18	25.2%	1.89	1.65	12.8%	0.00	0.00	0.0%
1989	2.04	1.54	24.6%	24.16	17.77	26.5%	1.83	1.58	13.8%	0.00	0.00	0.0%
1990	1.88	1.39	26.0%	22.93	16.52	28.0%	1.78	1.52	14.7%	0.00	0.00	0.0%
1991	1.74	1.27	27.0%	21.79	15.40	29.3%	1.73	1.47	15.2%	0.00	0.00	0.0%
1992	1.61	1.17	27.8%	20.74	14.41	30.5%	1.68	1.42	15.5%	0.00	0.00	0.0%
1993	1.50	1.08	28.4%	19.82	13.51	31.8%	1.65	1.39	15.7%	0.00	0.00	0.0%
1994	1.41	1.00	28.8%	18.91	12.70	32.9%	1.61	1.36	15.7%	0.00	0.00	0.0%
1995	1.32	0.94	29.1%	18.08	11.97	33.8%	1.59	1.34	15.7%	0.00	0.00	0.0%
1996	1.25	0.88	29.4%	17.36	11.33	34.7%	1.57	1.33	15.5%	0.00	0.00	0.0%
1997	1.19	0.83	29.6%	16.73	10.78	35.5%	1.55	1.31	15.4%	0.00	0.00	0.0%
1998	1.13	0.79	30.0%	16.16	10.31	36.2%	1.54	1.30	15.3%	0.00	0.00	0.0%
1999	1.08	0.75	30.4%	15.67	9.90	36.8%	1.53	1.30	15.1%	0.00	0.00	0.0%
2000	1.04	0.73	29.4%	15.23	9.64	36.7%	1.52	1.29	15.0%	0.00	0.00	0.0%
2001	1.00	0.70	29.4%	14.86	9.45	36.4%	1.51	1.29	14.8%	0.00	0.00	0.0%
2002	0.96	0.68	29.4%	14.55	9.21	36.7%	1.51	1.29	14.6%	0.00	0.00	0.0%
2003	0.94	0.67	28.6%	14.36	9.03	37.1%	1.50	1.28	14.5%	0.00	0.00	0.0%
2004	0.92	0.66	27.8%	14.19	8.87	37.5%	1.49	1.28	14.3%	0.00	0.00	0.0%
2005	0.90	0.65	27.8%	14.04	8.72	37.9%	1.49	1.28	14.2%	0.00	0.00	0.0%
2006	0.89	0.64	27.8%	13.95	8.64	38.1%	1.48	1.27	14.1%	0.00	0.00	0.0%
2007	0.88	0.64	27.8%	13.87	8.54	38.4%	1.48	1.27	14.0%	0.00	0.00	0.0%
2008	0.88	0.63	27.9%	13.82	8.49	38.6%	1.47	1.27	13.9%	0.00	0.00	0.0%
2009	0.88	0.63	27.9%	13.79	8.44	38.8%	1.47	1.27	13.8%	0.00	0.00	0.0%
2010	0.87	0.63	28.0%	13.78	8.41	39.0%	1.47	1.27	13.6%	0.00	0.00	0.0%
2011	0.87	0.63	28.0%	13.77	8.38	39.1%	1.47	1.27	13.6%	0.00	0.00	0.0%
2012	0.87	0.63	28.1%	13.76	8.37	39.2%	1.47	1.27	13.5%	0.00	0.00	0.0%
2013	0.87	0.63	28.1%	13.76	8.36	39.2%	1.47	1.27	13.5%	0.00	0.00	0.0%
2014	0.87	0.63	28.1%	13.75	8.35	39.3%	1.47	1.27	13.4%	0.00	0.00	0.0%
2015	0.87	0.63	28.1%	13.75	8.34	39.3%	1.47	1.27	13.4%	0.00	0.00	0.0%
2016	0.87	0.63	28.1%	13.74	8.33	39.4%	1.47	1.27	13.3%	0.00	0.00	0.0%
2017	0.87	0.63	28.1%	13.74	8.33	39.4%	1.47	1.27	13.3%	0.00	0.00	0.0%
2018	0.87	0.63	28.1%	13.74	8.33	39.4%	1.47	1.27	13.3%	0.00	0.00	0.0%
2019	0.87	0.63	28.1%	13.74	8.33	39.4%	1.47	1.27	13.3%	0.00	0.00	0.0%
2020	0.87	0.63	28.1%	13.74	8.33	39.4%	1.47	1.27	13.3%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, two free years before first inspection
**
**      Output file: SENS_SB1997_NEW2.OUT
**
** Date of this run:  1/15/  91
**                   12:29
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	2
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, two free years before first inspection
**
** Output file: SENS_SB1997_NEW2.OUT
**
** Date of this run: 1/15/ 91
** 12:29
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.38	19.8%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.1%	15.61	12.51	19.8%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	18.0%	14.70	11.74	20.1%	1.13	0.98	12.7%	0.00	0.00	0.0%
1994	1.06	0.87	18.0%	13.82	10.95	20.8%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	18.1%	12.92	10.11	21.7%	0.98	0.86	12.5%	0.00	0.00	0.0%
1996	0.90	0.74	18.1%	12.07	9.32	22.8%	0.92	0.81	12.3%	0.00	0.00	0.0%
1997	0.83	0.68	18.1%	11.26	8.57	23.9%	0.87	0.76	11.9%	0.00	0.00	0.0%
1998	0.76	0.62	17.9%	10.48	7.88	24.8%	0.82	0.73	11.5%	0.00	0.00	0.0%
1999	0.70	0.58	17.7%	9.77	7.26	25.7%	0.78	0.69	10.9%	0.00	0.00	0.0%
2000	0.66	0.54	18.0%	9.13	6.82	25.3%	0.74	0.66	10.5%	0.00	0.00	0.0%
2001	0.62	0.51	18.2%	8.52	6.31	25.9%	0.71	0.64	10.0%	0.00	0.00	0.0%
2002	0.59	0.48	18.2%	7.98	5.89	26.2%	0.68	0.62	9.7%	0.00	0.00	0.0%
2003	0.56	0.46	17.2%	7.45	5.49	26.4%	0.66	0.60	9.4%	0.00	0.00	0.0%
2004	0.53	0.44	16.8%	6.95	5.11	26.5%	0.64	0.58	9.2%	0.00	0.00	0.0%
2005	0.51	0.42	16.7%	6.50	4.77	26.7%	0.63	0.57	8.8%	0.00	0.00	0.0%
2006	0.49	0.41	16.7%	6.16	4.51	26.7%	0.62	0.56	8.7%	0.00	0.00	0.0%
2007	0.48	0.40	16.9%	5.87	4.29	26.8%	0.61	0.56	8.5%	0.00	0.00	0.0%
2008	0.47	0.39	17.0%	5.63	4.11	27.0%	0.60	0.55	8.3%	0.00	0.00	0.0%
2009	0.46	0.38	17.1%	5.45	3.98	27.0%	0.60	0.55	8.2%	0.00	0.00	0.0%
2010	0.46	0.38	17.2%	5.33	3.88	27.2%	0.60	0.55	8.1%	0.00	0.00	0.0%
2011	0.45	0.38	17.2%	5.24	3.81	27.3%	0.59	0.55	8.1%	0.00	0.00	0.0%
2012	0.45	0.37	17.3%	5.18	3.76	27.3%	0.59	0.54	8.0%	0.00	0.00	0.0%
2013	0.45	0.37	17.3%	5.13	3.73	27.4%	0.59	0.54	8.0%	0.00	0.00	0.0%
2014	0.45	0.37	17.3%	5.09	3.70	27.4%	0.59	0.54	8.0%	0.00	0.00	0.0%
2015	0.45	0.37	17.3%	5.06	3.67	27.5%	0.59	0.54	8.0%	0.00	0.00	0.0%
2016	0.44	0.37	17.4%	5.02	3.64	27.5%	0.59	0.54	8.0%	0.00	0.00	0.0%
2017	0.44	0.37	17.4%	4.98	3.61	27.6%	0.59	0.54	8.0%	0.00	0.00	0.0%
2018	0.44	0.36	17.4%	4.96	3.59	27.6%	0.59	0.54	8.0%	0.00	0.00	0.0%
2019	0.44	0.36	17.4%	4.95	3.58	27.7%	0.59	0.54	7.9%	0.00	0.00	0.0%
2020	0.44	0.36	17.4%	4.95	3.58	27.7%	0.59	0.54	7.9%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, two free years before first inspection
**
** Output file: SENS_SB1997_NEW2.OUT
**
** Date of this run: 1/15/ 91
**   12:29
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.76	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.16	22.0%	19.24	15.17	21.1%	1.31	1.12	13.9%	0.00	0.00	0.0%
1992	1.35	1.05	22.0%	17.78	14.11	20.6%	1.20	1.04	13.6%	0.00	0.00	0.0%
1993	1.24	0.97	21.7%	16.65	13.18	20.8%	1.13	0.98	13.5%	0.00	0.00	0.0%
1994	1.14	0.90	21.6%	15.62	12.20	21.9%	1.07	0.93	13.5%	0.00	0.00	0.0%
1995	1.05	0.82	21.8%	14.50	11.21	22.7%	1.03	0.89	13.3%	0.00	0.00	0.0%
1996	0.97	0.75	22.1%	13.45	10.28	23.6%	0.99	0.86	13.1%	0.00	0.00	0.0%
1997	0.89	0.69	22.3%	12.44	9.37	24.7%	0.97	0.84	12.9%	0.00	0.00	0.0%
1998	0.83	0.64	22.6%	11.60	8.62	25.7%	0.95	0.83	12.7%	0.00	0.00	0.0%
1999	0.77	0.59	22.8%	10.81	7.94	26.5%	0.94	0.82	12.5%	0.00	0.00	0.0%
2000	0.72	0.57	21.2%	10.04	7.38	26.5%	0.93	0.82	12.3%	0.00	0.00	0.0%
2001	0.69	0.54	21.6%	9.51	7.02	26.2%	0.93	0.81	12.1%	0.00	0.00	0.0%
2002	0.66	0.52	22.0%	9.02	6.60	26.8%	0.92	0.81	11.9%	0.00	0.00	0.0%
2003	0.63	0.50	20.9%	8.49	6.18	27.2%	0.91	0.81	11.7%	0.00	0.00	0.0%
2004	0.61	0.48	20.4%	7.97	5.78	27.5%	0.91	0.80	11.7%	0.00	0.00	0.0%
2005	0.58	0.47	20.4%	7.54	5.45	27.7%	0.90	0.79	11.6%	0.00	0.00	0.0%
2006	0.57	0.45	20.4%	7.19	5.18	28.0%	0.89	0.79	11.5%	0.00	0.00	0.0%
2007	0.55	0.44	20.4%	6.90	4.95	28.4%	0.89	0.79	11.4%	0.00	0.00	0.0%
2008	0.55	0.43	20.6%	6.73	4.80	28.6%	0.89	0.79	11.3%	0.00	0.00	0.0%
2009	0.54	0.43	20.7%	6.62	4.70	28.9%	0.89	0.79	11.2%	0.00	0.00	0.0%
2010	0.54	0.43	20.8%	6.55	4.64	29.2%	0.89	0.79	11.2%	0.00	0.00	0.0%
2011	0.54	0.42	20.9%	6.50	4.59	29.4%	0.89	0.79	11.2%	0.00	0.00	0.0%
2012	0.54	0.42	20.9%	6.46	4.55	29.6%	0.89	0.79	11.1%	0.00	0.00	0.0%
2013	0.53	0.42	21.0%	6.42	4.51	29.7%	0.89	0.79	11.1%	0.00	0.00	0.0%
2014	0.53	0.42	21.0%	6.39	4.48	29.9%	0.89	0.79	11.1%	0.00	0.00	0.0%
2015	0.53	0.42	21.0%	6.35	4.45	29.9%	0.89	0.79	11.1%	0.00	0.00	0.0%
2016	0.53	0.42	21.1%	6.31	4.42	30.0%	0.89	0.79	11.1%	0.00	0.00	0.0%
2017	0.53	0.42	21.1%	6.28	4.40	30.0%	0.89	0.79	11.1%	0.00	0.00	0.0%
2018	0.53	0.42	21.1%	6.25	4.38	30.0%	0.89	0.79	11.1%	0.00	0.00	0.0%
2019	0.53	0.42	21.1%	6.25	4.37	30.0%	0.89	0.79	11.1%	0.00	0.00	0.0%
2020	0.53	0.42	21.1%	6.25	4.37	30.0%	0.89	0.79	11.1%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, two free years before first inspection
**
** Output file: SENS_SB1997_NEW2.OUT
**
** Date of this run: 1/15/ 91
** 12:29
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.67	20.5%	2.16	1.97	8.9%	0.00	0.00	0.0%
1986	2.70	2.16	19.9%	29.25	22.69	22.4%	2.05	1.84	10.4%	0.00	0.00	0.0%
1987	2.45	1.92	21.6%	27.39	20.84	23.9%	1.97	1.74	11.7%	0.00	0.00	0.0%
1988	2.23	1.71	23.1%	25.65	19.18	25.2%	1.89	1.65	12.8%	0.00	0.00	0.0%
1989	2.04	1.54	24.6%	24.16	17.77	26.5%	1.83	1.58	13.8%	0.00	0.00	0.0%
1990	1.88	1.39	26.0%	22.93	16.52	27.9%	1.78	1.52	14.7%	0.00	0.00	0.0%
1991	1.74	1.27	27.0%	21.79	15.40	29.3%	1.73	1.47	15.2%	0.00	0.00	0.0%
1992	1.61	1.17	27.8%	20.74	14.43	30.4%	1.68	1.42	15.5%	0.00	0.00	0.0%
1993	1.50	1.08	28.3%	19.82	13.54	31.7%	1.65	1.39	15.7%	0.00	0.00	0.0%
1994	1.41	1.00	28.6%	18.91	12.74	32.7%	1.61	1.36	15.7%	0.00	0.00	0.0%
1995	1.32	0.94	29.0%	18.08	12.02	33.5%	1.59	1.34	15.6%	0.00	0.00	0.0%
1996	1.25	0.88	29.2%	17.36	11.39	34.4%	1.57	1.33	15.5%	0.00	0.00	0.0%
1997	1.19	0.84	29.4%	16.73	10.85	35.1%	1.55	1.31	15.4%	0.00	0.00	0.0%
1998	1.13	0.79	29.7%	16.16	10.38	35.8%	1.54	1.31	15.2%	0.00	0.00	0.0%
1999	1.08	0.76	30.1%	15.67	9.98	36.3%	1.53	1.30	15.1%	0.00	0.00	0.0%
2000	1.04	0.74	29.0%	15.23	9.73	36.1%	1.52	1.29	14.9%	0.00	0.00	0.0%
2001	1.00	0.71	29.1%	14.86	9.54	35.8%	1.51	1.29	14.8%	0.00	0.00	0.0%
2002	0.96	0.68	29.0%	14.55	9.30	36.1%	1.51	1.29	14.6%	0.00	0.00	0.0%
2003	0.94	0.67	28.2%	14.36	9.12	36.5%	1.50	1.28	14.4%	0.00	0.00	0.0%
2004	0.92	0.67	27.4%	14.19	8.96	36.8%	1.49	1.28	14.3%	0.00	0.00	0.0%
2005	0.90	0.65	27.3%	14.04	8.82	37.2%	1.49	1.28	14.2%	0.00	0.00	0.0%
2006	0.89	0.65	27.3%	13.95	8.74	37.4%	1.48	1.27	14.1%	0.00	0.00	0.0%
2007	0.88	0.64	27.3%	13.87	8.64	37.7%	1.48	1.27	14.0%	0.00	0.00	0.0%
2008	0.88	0.64	27.4%	13.82	8.59	37.9%	1.47	1.27	13.8%	0.00	0.00	0.0%
2009	0.88	0.64	27.4%	13.79	8.54	38.1%	1.47	1.27	13.7%	0.00	0.00	0.0%
2010	0.87	0.63	27.5%	13.78	8.51	38.2%	1.47	1.27	13.6%	0.00	0.00	0.0%
2011	0.87	0.63	27.5%	13.77	8.49	38.3%	1.47	1.27	13.5%	0.00	0.00	0.0%
2012	0.87	0.63	27.6%	13.76	8.48	38.4%	1.47	1.27	13.5%	0.00	0.00	0.0%
2013	0.87	0.63	27.6%	13.76	8.47	38.5%	1.47	1.27	13.4%	0.00	0.00	0.0%
2014	0.87	0.63	27.6%	13.75	8.45	38.5%	1.47	1.27	13.4%	0.00	0.00	0.0%
2015	0.87	0.63	27.6%	13.75	8.45	38.5%	1.47	1.27	13.3%	0.00	0.00	0.0%
2016	0.87	0.63	27.6%	13.74	8.44	38.6%	1.47	1.27	13.3%	0.00	0.00	0.0%
2017	0.87	0.63	27.6%	13.74	8.43	38.6%	1.47	1.27	13.2%	0.00	0.00	0.0%
2018	0.87	0.63	27.6%	13.74	8.43	38.6%	1.47	1.27	13.2%	0.00	0.00	0.0%
2019	0.87	0.63	27.6%	13.74	8.43	38.6%	1.47	1.27	13.2%	0.00	0.00	0.0%
2020	0.87	0.63	27.6%	13.74	8.43	38.6%	1.47	1.27	13.2%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, three years before first inspection
**
**      Output file: SENS_SB1997_NEW3.OUT
**
** Date of this run:  1/15/  91
**                   12:32
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	3
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, three years before first inspection
**
** Output file: SENS_SB1997_NEW3.OUT
**
** Date of this run: 1/15/ 91
**   12:32
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.38	19.8%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.1%	15.61	12.51	19.8%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	18.0%	14.70	11.75	20.1%	1.13	0.98	12.7%	0.00	0.00	0.0%
1994	1.06	0.87	18.0%	13.82	10.96	20.7%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	18.0%	12.92	10.13	21.6%	0.98	0.86	12.5%	0.00	0.00	0.0%
1996	0.90	0.74	18.0%	12.07	9.33	22.7%	0.92	0.81	12.3%	0.00	0.00	0.0%
1997	0.83	0.68	17.9%	11.26	8.59	23.7%	0.87	0.76	11.9%	0.00	0.00	0.0%
1998	0.76	0.63	17.8%	10.48	7.90	24.7%	0.82	0.73	11.5%	0.00	0.00	0.0%
1999	0.70	0.58	17.5%	9.77	7.28	25.5%	0.78	0.69	10.9%	0.00	0.00	0.0%
2000	0.66	0.54	17.8%	9.13	6.84	25.0%	0.74	0.66	10.5%	0.00	0.00	0.0%
2001	0.62	0.51	18.0%	8.52	6.33	25.7%	0.71	0.64	10.0%	0.00	0.00	0.0%
2002	0.59	0.48	18.0%	7.98	5.91	25.9%	0.68	0.62	9.7%	0.00	0.00	0.0%
2003	0.56	0.47	17.0%	7.45	5.51	26.1%	0.66	0.60	9.4%	0.00	0.00	0.0%
2004	0.53	0.44	16.5%	6.95	5.12	26.3%	0.64	0.58	9.2%	0.00	0.00	0.0%
2005	0.51	0.43	16.5%	6.50	4.78	26.5%	0.63	0.57	8.8%	0.00	0.00	0.0%
2006	0.49	0.41	16.5%	6.16	4.53	26.5%	0.62	0.56	8.6%	0.00	0.00	0.0%
2007	0.48	0.40	16.6%	5.87	4.31	26.6%	0.61	0.56	8.5%	0.00	0.00	0.0%
2008	0.47	0.39	16.8%	5.63	4.12	26.7%	0.60	0.55	8.3%	0.00	0.00	0.0%
2009	0.46	0.38	16.9%	5.45	3.99	26.8%	0.60	0.55	8.2%	0.00	0.00	0.0%
2010	0.46	0.38	16.9%	5.33	3.89	27.0%	0.60	0.55	8.1%	0.00	0.00	0.0%
2011	0.45	0.38	17.0%	5.24	3.82	27.1%	0.59	0.55	8.1%	0.00	0.00	0.0%
2012	0.45	0.37	17.0%	5.18	3.77	27.1%	0.59	0.54	8.0%	0.00	0.00	0.0%
2013	0.45	0.37	17.1%	5.13	3.74	27.2%	0.59	0.54	8.0%	0.00	0.00	0.0%
2014	0.45	0.37	17.1%	5.09	3.71	27.2%	0.59	0.54	8.0%	0.00	0.00	0.0%
2015	0.45	0.37	17.1%	5.06	3.68	27.3%	0.59	0.54	8.0%	0.00	0.00	0.0%
2016	0.44	0.37	17.1%	5.02	3.65	27.3%	0.59	0.54	8.0%	0.00	0.00	0.0%
2017	0.44	0.37	17.2%	4.98	3.62	27.4%	0.59	0.54	8.0%	0.00	0.00	0.0%
2018	0.44	0.37	17.2%	4.96	3.60	27.5%	0.59	0.54	8.0%	0.00	0.00	0.0%
2019	0.44	0.37	17.2%	4.95	3.59	27.5%	0.59	0.54	7.9%	0.00	0.00	0.0%
2020	0.44	0.37	17.2%	4.95	3.59	27.5%	0.59	0.54	7.9%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, three years before first inspection
**
** Output file: SENS_SB1997_NEW3.OUT
**
** Date of this run: 1/15/ 91
**   12:32
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.76	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.16	22.0%	19.24	15.18	21.1%	1.31	1.12	13.9%	0.00	0.00	0.0%
1992	1.35	1.05	22.0%	17.78	14.12	20.6%	1.20	1.04	13.6%	0.00	0.00	0.0%
1993	1.24	0.98	21.6%	16.65	13.19	20.8%	1.13	0.98	13.5%	0.00	0.00	0.0%
1994	1.14	0.90	21.5%	15.62	12.22	21.7%	1.07	0.93	13.4%	0.00	0.00	0.0%
1995	1.05	0.82	21.7%	14.50	11.23	22.5%	1.03	0.89	13.3%	0.00	0.00	0.0%
1996	0.97	0.76	22.0%	13.45	10.31	23.4%	0.99	0.86	13.1%	0.00	0.00	0.0%
1997	0.89	0.69	22.1%	12.44	9.41	24.4%	0.97	0.84	12.8%	0.00	0.00	0.0%
1998	0.83	0.64	22.4%	11.60	8.65	25.4%	0.95	0.83	12.6%	0.00	0.00	0.0%
1999	0.77	0.60	22.6%	10.81	7.98	26.1%	0.94	0.82	12.4%	0.00	0.00	0.0%
2000	0.72	0.57	20.9%	10.04	7.42	26.1%	0.93	0.82	12.2%	0.00	0.00	0.0%
2001	0.69	0.54	21.2%	9.51	7.06	25.7%	0.93	0.81	12.0%	0.00	0.00	0.0%
2002	0.66	0.52	21.6%	9.02	6.64	26.3%	0.92	0.81	11.8%	0.00	0.00	0.0%
2003	0.63	0.50	20.5%	8.49	6.23	26.7%	0.91	0.81	11.6%	0.00	0.00	0.0%
2004	0.61	0.48	19.9%	7.97	5.82	26.9%	0.91	0.80	11.5%	0.00	0.00	0.0%
2005	0.58	0.47	19.9%	7.54	5.49	27.2%	0.90	0.80	11.5%	0.00	0.00	0.0%
2006	0.57	0.45	19.9%	7.19	5.22	27.5%	0.89	0.79	11.4%	0.00	0.00	0.0%
2007	0.55	0.44	20.0%	6.90	4.98	27.8%	0.89	0.79	11.3%	0.00	0.00	0.0%
2008	0.55	0.44	20.1%	6.73	4.84	28.1%	0.89	0.79	11.2%	0.00	0.00	0.0%
2009	0.54	0.43	20.3%	6.62	4.74	28.3%	0.89	0.79	11.1%	0.00	0.00	0.0%
2010	0.54	0.43	20.3%	6.55	4.68	28.6%	0.89	0.79	11.1%	0.00	0.00	0.0%
2011	0.54	0.43	20.4%	6.50	4.62	28.8%	0.89	0.79	11.0%	0.00	0.00	0.0%
2012	0.54	0.43	20.5%	6.46	4.58	29.0%	0.89	0.79	11.0%	0.00	0.00	0.0%
2013	0.53	0.42	20.5%	6.42	4.55	29.2%	0.89	0.79	11.0%	0.00	0.00	0.0%
2014	0.53	0.42	20.5%	6.39	4.52	29.3%	0.89	0.79	11.0%	0.00	0.00	0.0%
2015	0.53	0.42	20.6%	6.35	4.49	29.4%	0.89	0.79	10.9%	0.00	0.00	0.0%
2016	0.53	0.42	20.6%	6.31	4.46	29.4%	0.89	0.79	10.9%	0.00	0.00	0.0%
2017	0.53	0.42	20.6%	6.28	4.43	29.4%	0.89	0.79	10.9%	0.00	0.00	0.0%
2018	0.53	0.42	20.7%	6.25	4.42	29.4%	0.89	0.79	11.0%	0.00	0.00	0.0%
2019	0.53	0.42	20.7%	6.25	4.41	29.4%	0.89	0.79	11.0%	0.00	0.00	0.0%
2020	0.53	0.42	20.7%	6.25	4.41	29.4%	0.89	0.79	11.0%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, three years before first inspection
**
** Output file: SENS_SB1997_NEW3.OUT
**
** Date of this run: 1/15/ 91
**   12:32
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.67	20.5%	2.16	1.97	8.9%	0.00	0.00	0.0%
1986	2.70	2.16	19.9%	29.25	22.69	22.4%	2.05	1.84	10.4%	0.00	0.00	0.0%
1987	2.45	1.92	21.6%	27.39	20.84	23.9%	1.97	1.74	11.7%	0.00	0.00	0.0%
1988	2.23	1.71	23.1%	25.65	19.18	25.2%	1.89	1.65	12.8%	0.00	0.00	0.0%
1989	2.04	1.54	24.6%	24.16	17.77	26.5%	1.83	1.58	13.8%	0.00	0.00	0.0%
1990	1.88	1.39	26.0%	22.93	16.52	27.9%	1.78	1.52	14.7%	0.00	0.00	0.0%
1991	1.74	1.27	27.0%	21.79	15.42	29.2%	1.73	1.47	15.2%	0.00	0.00	0.0%
1992	1.61	1.17	27.7%	20.74	14.46	30.3%	1.68	1.42	15.4%	0.00	0.00	0.0%
1993	1.50	1.08	28.2%	19.82	13.59	31.4%	1.65	1.39	15.6%	0.00	0.00	0.0%
1994	1.41	1.01	28.4%	18.91	12.80	32.3%	1.61	1.36	15.6%	0.00	0.00	0.0%
1995	1.32	0.94	28.7%	18.08	12.10	33.1%	1.59	1.34	15.5%	0.00	0.00	0.0%
1996	1.25	0.89	28.9%	17.36	11.48	33.8%	1.57	1.33	15.3%	0.00	0.00	0.0%
1997	1.19	0.84	29.0%	16.73	10.96	34.5%	1.55	1.32	15.2%	0.00	0.00	0.0%
1998	1.13	0.80	29.2%	16.16	10.51	35.0%	1.54	1.31	15.0%	0.00	0.00	0.0%
1999	1.08	0.76	29.5%	15.67	10.11	35.5%	1.53	1.30	14.8%	0.00	0.00	0.0%
2000	1.04	0.74	28.4%	15.23	9.87	35.2%	1.52	1.30	14.7%	0.00	0.00	0.0%
2001	1.00	0.71	28.3%	14.86	9.69	34.8%	1.51	1.29	14.5%	0.00	0.00	0.0%
2002	0.96	0.69	28.2%	14.55	9.46	35.0%	1.51	1.29	14.3%	0.00	0.00	0.0%
2003	0.94	0.68	27.4%	14.36	9.28	35.3%	1.50	1.29	14.2%	0.00	0.00	0.0%
2004	0.92	0.68	26.5%	14.19	9.13	35.7%	1.49	1.28	14.0%	0.00	0.00	0.0%
2005	0.90	0.66	26.4%	14.04	8.99	36.0%	1.49	1.28	13.9%	0.00	0.00	0.0%
2006	0.89	0.66	26.4%	13.95	8.91	36.2%	1.48	1.28	13.8%	0.00	0.00	0.0%
2007	0.88	0.65	26.4%	13.87	8.82	36.4%	1.48	1.27	13.6%	0.00	0.00	0.0%
2008	0.88	0.65	26.4%	13.82	8.76	36.6%	1.47	1.27	13.5%	0.00	0.00	0.0%
2009	0.88	0.64	26.5%	13.79	8.72	36.8%	1.47	1.27	13.4%	0.00	0.00	0.0%
2010	0.87	0.64	26.5%	13.78	8.69	36.9%	1.47	1.27	13.3%	0.00	0.00	0.0%
2011	0.87	0.64	26.6%	13.77	8.67	37.0%	1.47	1.27	13.2%	0.00	0.00	0.0%
2012	0.87	0.64	26.6%	13.76	8.66	37.1%	1.47	1.27	13.2%	0.00	0.00	0.0%
2013	0.87	0.64	26.6%	13.76	8.65	37.1%	1.47	1.28	13.1%	0.00	0.00	0.0%
2014	0.87	0.64	26.6%	13.75	8.64	37.2%	1.47	1.28	13.0%	0.00	0.00	0.0%
2015	0.87	0.64	26.6%	13.75	8.63	37.2%	1.47	1.28	13.0%	0.00	0.00	0.0%
2016	0.87	0.64	26.6%	13.74	8.63	37.2%	1.47	1.28	12.9%	0.00	0.00	0.0%
2017	0.87	0.64	26.6%	13.74	8.62	37.3%	1.47	1.28	12.9%	0.00	0.00	0.0%
2018	0.87	0.64	26.6%	13.74	8.62	37.3%	1.47	1.28	12.9%	0.00	0.00	0.0%
2019	0.87	0.64	26.6%	13.74	8.62	37.3%	1.47	1.28	12.9%	0.00	0.00	0.0%
2020	0.87	0.64	26.6%	13.74	8.62	37.3%	1.47	1.28	12.9%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, four years before first inspection
**
**      Output file: SENS_SB1997_NEW4.OUT
**
** Date of this run:  1/15/  91
**                   12:35
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	4
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, four years before first inspection
**
** Output file: SENS_SB1997_NEW4.OUT
**
** Date of this run: 1/15/ 91
**   12:35
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.38	19.7%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.1%	15.61	12.52	19.8%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	17.9%	14.70	11.76	20.0%	1.13	0.98	12.7%	0.00	0.00	0.0%
1994	1.06	0.87	17.9%	13.82	10.98	20.6%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	17.9%	12.92	10.15	21.4%	0.98	0.86	12.5%	0.00	0.00	0.0%
1996	0.90	0.74	17.8%	12.07	9.36	22.4%	0.92	0.81	12.2%	0.00	0.00	0.0%
1997	0.83	0.68	17.7%	11.26	8.62	23.4%	0.87	0.76	11.9%	0.00	0.00	0.0%
1998	0.76	0.63	17.5%	10.48	7.93	24.3%	0.82	0.73	11.4%	0.00	0.00	0.0%
1999	0.70	0.58	17.2%	9.77	7.31	25.1%	0.78	0.69	10.8%	0.00	0.00	0.0%
2000	0.66	0.54	17.5%	9.13	6.88	24.7%	0.74	0.66	10.4%	0.00	0.00	0.0%
2001	0.62	0.51	17.6%	8.52	6.37	25.2%	0.71	0.64	9.9%	0.00	0.00	0.0%
2002	0.59	0.49	17.6%	7.98	5.94	25.5%	0.68	0.62	9.6%	0.00	0.00	0.0%
2003	0.56	0.47	16.6%	7.45	5.54	25.6%	0.66	0.60	9.3%	0.00	0.00	0.0%
2004	0.53	0.45	16.1%	6.95	5.16	25.8%	0.64	0.58	9.0%	0.00	0.00	0.0%
2005	0.51	0.43	16.0%	6.50	4.81	26.0%	0.63	0.57	8.7%	0.00	0.00	0.0%
2006	0.49	0.41	16.1%	6.16	4.56	26.0%	0.62	0.56	8.5%	0.00	0.00	0.0%
2007	0.48	0.40	16.2%	5.87	4.33	26.1%	0.61	0.56	8.4%	0.00	0.00	0.0%
2008	0.47	0.39	16.3%	5.63	4.15	26.3%	0.60	0.55	8.2%	0.00	0.00	0.0%
2009	0.46	0.39	16.4%	5.45	4.01	26.4%	0.60	0.55	8.1%	0.00	0.00	0.0%
2010	0.46	0.38	16.5%	5.33	3.92	26.5%	0.60	0.55	8.0%	0.00	0.00	0.0%
2011	0.45	0.38	16.6%	5.24	3.85	26.6%	0.59	0.55	8.0%	0.00	0.00	0.0%
2012	0.45	0.38	16.6%	5.18	3.80	26.7%	0.59	0.54	7.9%	0.00	0.00	0.0%
2013	0.45	0.37	16.6%	5.13	3.76	26.8%	0.59	0.54	7.9%	0.00	0.00	0.0%
2014	0.45	0.37	16.6%	5.09	3.73	26.8%	0.59	0.54	7.9%	0.00	0.00	0.0%
2015	0.45	0.37	16.7%	5.06	3.70	26.8%	0.59	0.54	7.9%	0.00	0.00	0.0%
2016	0.44	0.37	16.7%	5.02	3.67	26.9%	0.59	0.54	7.9%	0.00	0.00	0.0%
2017	0.44	0.37	16.8%	4.98	3.64	27.0%	0.59	0.54	7.9%	0.00	0.00	0.0%
2018	0.44	0.37	16.8%	4.96	3.62	27.1%	0.59	0.54	7.8%	0.00	0.00	0.0%
2019	0.44	0.37	16.8%	4.95	3.61	27.1%	0.59	0.54	7.8%	0.00	0.00	0.0%
2020	0.44	0.37	16.8%	4.95	3.61	27.1%	0.59	0.54	7.8%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
* SB 1997 program, four years before first inspection
**
** Output file: SENS_SB1997_NEW4.OUT
**
** Date of this run: 1/15/ 91
**   12:35
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.76	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.16	22.0%	19.24	15.18	21.1%	1.31	1.12	13.8%	0.00	0.00	0.0%
1992	1.35	1.05	22.0%	17.78	14.13	20.5%	1.20	1.04	13.6%	0.00	0.00	0.0%
1993	1.24	0.98	21.5%	16.65	13.21	20.6%	1.13	0.98	13.4%	0.00	0.00	0.0%
1994	1.14	0.90	21.3%	15.62	12.25	21.6%	1.07	0.93	13.4%	0.00	0.00	0.0%
1995	1.05	0.83	21.5%	14.50	11.27	22.2%	1.03	0.89	13.2%	0.00	0.00	0.0%
1996	0.97	0.76	21.7%	13.45	10.36	23.0%	0.99	0.86	12.9%	0.00	0.00	0.0%
1997	0.89	0.70	21.8%	12.44	9.46	23.9%	0.97	0.84	12.6%	0.00	0.00	0.0%
1998	0.83	0.65	22.0%	11.60	8.71	25.0%	0.95	0.83	12.4%	0.00	0.00	0.0%
1999	0.77	0.60	22.1%	10.81	8.04	25.6%	0.94	0.83	12.2%	0.00	0.00	0.0%
2000	0.72	0.57	20.3%	10.04	7.49	25.4%	0.93	0.82	11.9%	0.00	0.00	0.0%
2001	0.69	0.55	20.6%	9.51	7.14	25.0%	0.93	0.82	11.7%	0.00	0.00	0.0%
2002	0.66	0.52	20.9%	9.02	6.72	25.5%	0.92	0.81	11.5%	0.00	0.00	0.0%
2003	0.63	0.51	19.8%	8.49	6.30	25.8%	0.91	0.81	11.3%	0.00	0.00	0.0%
2004	0.61	0.49	19.2%	7.97	5.90	26.0%	0.91	0.80	11.2%	0.00	0.00	0.0%
2005	0.58	0.47	19.2%	7.54	5.56	26.2%	0.90	0.80	11.2%	0.00	0.00	0.0%
2006	0.57	0.46	19.1%	7.19	5.29	26.5%	0.89	0.79	11.1%	0.00	0.00	0.0%
2007	0.55	0.45	19.2%	6.90	5.05	26.8%	0.89	0.79	10.9%	0.00	0.00	0.0%
2008	0.55	0.44	19.3%	6.73	4.91	27.1%	0.89	0.79	10.9%	0.00	0.00	0.0%
2009	0.54	0.44	19.5%	6.62	4.81	27.3%	0.89	0.79	10.8%	0.00	0.00	0.0%
2010	0.54	0.43	19.5%	6.55	4.74	27.6%	0.89	0.79	10.7%	0.00	0.00	0.0%
2011	0.54	0.43	19.6%	6.50	4.69	27.8%	0.89	0.79	10.7%	0.00	0.00	0.0%
2012	0.54	0.43	19.6%	6.46	4.65	28.0%	0.89	0.79	10.7%	0.00	0.00	0.0%
2013	0.53	0.43	19.7%	6.42	4.62	28.1%	0.89	0.79	10.6%	0.00	0.00	0.0%
2014	0.53	0.43	19.7%	6.39	4.58	28.2%	0.89	0.79	10.6%	0.00	0.00	0.0%
2015	0.53	0.43	19.7%	6.35	4.55	28.3%	0.89	0.79	10.6%	0.00	0.00	0.0%
2016	0.53	0.42	19.8%	6.31	4.52	28.3%	0.89	0.79	10.6%	0.00	0.00	0.0%
2017	0.53	0.42	19.8%	6.28	4.50	28.3%	0.89	0.79	10.6%	0.00	0.00	0.0%
2018	0.53	0.42	19.8%	6.25	4.48	28.4%	0.89	0.79	10.6%	0.00	0.00	0.0%
2019	0.53	0.42	19.8%	6.25	4.48	28.4%	0.89	0.79	10.6%	0.00	0.00	0.0%
2020	0.53	0.42	19.8%	6.25	4.48	28.4%	0.89	0.79	10.6%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, four years before first inspection
**
** Output file: SENS_SB1997_NEW4.OUT
**
** Date of this run: 1/15/ 91
**   12:35
** Calendar Year I/M Benefits Medium Duty Vehicles
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	4.33	4.33	0.0%	41.94	41.94	0.0%	2.64	2.64	0.0%	0.00	0.00	0.0%
1981	4.05	4.05	0.0%	39.27	39.27	0.0%	2.57	2.57	0.0%	0.00	0.00	0.0%
1982	3.77	3.77	0.0%	36.77	36.77	0.0%	2.48	2.48	0.0%	0.00	0.00	0.0%
1983	3.52	3.52	0.0%	34.63	34.63	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1984	3.24	2.76	14.7%	32.80	26.85	18.1%	2.28	2.12	7.3%	0.00	0.00	0.0%
1985	2.96	2.44	17.6%	31.04	24.67	20.5%	2.16	1.97	8.9%	0.00	0.00	0.0%
1986	2.70	2.16	19.9%	29.25	22.69	22.4%	2.05	1.84	10.4%	0.00	0.00	0.0%
1987	2.45	1.92	21.6%	27.39	20.84	23.9%	1.97	1.74	11.7%	0.00	0.00	0.0%
1988	2.23	1.71	23.1%	25.65	19.18	25.2%	1.89	1.65	12.8%	0.00	0.00	0.0%
1989	2.04	1.54	24.6%	24.16	17.77	26.5%	1.83	1.58	13.8%	0.00	0.00	0.0%
1990	1.88	1.39	26.0%	22.93	16.52	27.9%	1.78	1.52	14.7%	0.00	0.00	0.0%
1991	1.74	1.27	26.9%	21.79	15.44	29.1%	1.73	1.47	15.1%	0.00	0.00	0.0%
1992	1.61	1.17	27.5%	20.74	14.51	30.0%	1.68	1.43	15.3%	0.00	0.00	0.0%
1993	1.50	1.08	27.9%	19.82	13.67	31.0%	1.65	1.39	15.4%	0.00	0.00	0.0%
1994	1.41	1.01	28.1%	18.91	12.90	31.8%	1.61	1.37	15.4%	0.00	0.00	0.0%
1995	1.32	0.95	28.3%	18.08	12.22	32.4%	1.59	1.35	15.2%	0.00	0.00	0.0%
1996	1.25	0.89	28.3%	17.36	11.63	33.0%	1.57	1.33	15.0%	0.00	0.00	0.0%
1997	1.19	0.85	28.3%	16.73	11.13	33.5%	1.55	1.32	14.8%	0.00	0.00	0.0%
1998	1.13	0.81	28.4%	16.16	10.69	33.8%	1.54	1.31	14.6%	0.00	0.00	0.0%
1999	1.08	0.77	28.7%	15.67	10.31	34.2%	1.53	1.31	14.4%	0.00	0.00	0.0%
2000	1.04	0.75	27.4%	15.23	10.09	33.8%	1.52	1.30	14.2%	0.00	0.00	0.0%
2001	1.00	0.72	27.3%	14.86	9.91	33.3%	1.51	1.30	14.0%	0.00	0.00	0.0%
2002	0.96	0.70	27.1%	14.55	9.70	33.4%	1.51	1.30	13.8%	0.00	0.00	0.0%
2003	0.94	0.69	26.2%	14.36	9.52	33.7%	1.50	1.29	13.7%	0.00	0.00	0.0%
2004	0.92	0.69	25.3%	14.19	9.37	33.9%	1.49	1.29	13.5%	0.00	0.00	0.0%
2005	0.90	0.67	25.1%	14.04	9.24	34.2%	1.49	1.29	13.3%	0.00	0.00	0.0%
2006	0.89	0.67	25.1%	13.95	9.16	34.3%	1.48	1.29	13.2%	0.00	0.00	0.0%
2007	0.88	0.66	25.0%	13.87	9.08	34.5%	1.48	1.28	13.1%	0.00	0.00	0.0%
2008	0.88	0.66	25.0%	13.82	9.03	34.7%	1.47	1.28	13.0%	0.00	0.00	0.0%
2009	0.88	0.66	25.1%	13.79	8.99	34.8%	1.47	1.28	12.9%	0.00	0.00	0.0%
2010	0.87	0.65	25.1%	13.78	8.96	35.0%	1.47	1.28	12.7%	0.00	0.00	0.0%
2011	0.87	0.65	25.1%	13.77	8.94	35.1%	1.47	1.28	12.6%	0.00	0.00	0.0%
2012	0.87	0.65	25.1%	13.76	8.94	35.1%	1.47	1.28	12.6%	0.00	0.00	0.0%
2013	0.87	0.65	25.1%	13.76	8.93	35.1%	1.47	1.28	12.5%	0.00	0.00	0.0%
2014	0.87	0.65	25.1%	13.75	8.92	35.1%	1.47	1.28	12.5%	0.00	0.00	0.0%
2015	0.87	0.65	25.1%	13.75	8.91	35.2%	1.47	1.28	12.4%	0.00	0.00	0.0%
2016	0.87	0.65	25.1%	13.74	8.90	35.2%	1.47	1.29	12.4%	0.00	0.00	0.0%
2017	0.87	0.65	25.1%	13.74	8.90	35.2%	1.47	1.29	12.3%	0.00	0.00	0.0%
2018	0.87	0.65	25.1%	13.74	8.90	35.2%	1.47	1.29	12.3%	0.00	0.00	0.0%
2019	0.87	0.65	25.1%	13.74	8.90	35.2%	1.47	1.29	12.3%	0.00	0.00	0.0%
2020	0.87	0.65	25.1%	13.74	8.90	35.2%	1.47	1.29	12.3%	0.00	0.00	0.0%

```
** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, five years before first inspection
**
**      Output file: SENS_SB1997_NEW5.OUT
**
** Date of this run:  1/15/  91
**                   12:39
**
```

THIS RUN REFLECTS THE FOLLOWING PROGRAM OPTIONS:

Program start year:	1984
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	88 LEVEL
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	$50
Mechanic Performance:	88 LEVEL
Model Years Included:	
Max. Age for Inspected Vehicles:	20
Earliest Model Year in Program:	1965
Vehicle Exemptions:	
Years Before Inspection for New Cars:	1
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

Program start year:	1990
Inspection Frequency:	BIENNIAL
Change of Ownership Rate:	17.00 %
Inspection Test Type:	IDL/2500
Visual/Functional Checks:	BETTER
Emission Standard Stringency:	88 LEVEL
Repair Cost Limits:	SB 1997
Mechanic Performance:	ENHANCED
Model Years Included:	
Max. Age for Inspected Vehicles:	25
Earliest Model Year in Program:	1966
Vehicle Exemptions:	
Years Before Inspection for New Cars:	5
Inspection-free Year After Pass?	NO
Fraction of hard-to-repair vehicles:	0.24

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, five years before first inspection
**
** Output file: SENS_SB1997_NEW5.OUT
**
** Date of this run: 1/15/ 91
** 12:39
** Calendar Year I/M Benefits Passenger Cars
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.75	3.75	0.0%	36.30	36.30	0.0%	2.44	2.44	0.0%	0.00	0.00	0.0%
1981	3.50	3.50	0.0%	34.22	34.22	0.0%	2.33	2.33	0.0%	0.00	0.00	0.0%
1982	3.26	3.26	0.0%	32.23	32.23	0.0%	2.23	2.23	0.0%	0.00	0.00	0.0%
1983	3.02	3.02	0.0%	30.32	30.32	0.0%	2.12	2.12	0.0%	0.00	0.00	0.0%
1984	2.78	2.39	14.1%	28.39	24.46	13.9%	2.01	1.87	6.7%	0.00	0.00	0.0%
1985	2.53	2.14	15.2%	26.40	22.28	15.6%	1.90	1.75	7.7%	0.00	0.00	0.0%
1986	2.29	1.92	16.0%	24.48	20.30	17.1%	1.79	1.63	8.8%	0.00	0.00	0.0%
1987	2.06	1.72	16.6%	22.65	18.53	18.2%	1.69	1.53	9.8%	0.00	0.00	0.0%
1988	1.86	1.54	17.2%	20.93	16.97	19.0%	1.60	1.43	10.7%	0.00	0.00	0.0%
1989	1.68	1.38	17.8%	19.32	15.57	19.4%	1.51	1.33	11.5%	0.00	0.00	0.0%
1990	1.52	1.24	18.0%	17.93	14.41	19.7%	1.41	1.24	12.2%	0.00	0.00	0.0%
1991	1.38	1.13	18.1%	16.68	13.39	19.7%	1.31	1.14	12.6%	0.00	0.00	0.0%
1992	1.26	1.03	18.0%	15.61	12.53	19.7%	1.21	1.06	12.7%	0.00	0.00	0.0%
1993	1.16	0.95	17.9%	14.70	11.78	19.9%	1.13	0.99	12.6%	0.00	0.00	0.0%
1994	1.06	0.87	17.8%	13.82	11.00	20.4%	1.05	0.92	12.6%	0.00	0.00	0.0%
1995	0.98	0.80	17.7%	12.92	10.19	21.2%	0.98	0.86	12.4%	0.00	0.00	0.0%
1996	0.90	0.74	17.6%	12.07	9.40	22.1%	0.92	0.81	12.1%	0.00	0.00	0.0%
1997	0.83	0.68	17.4%	11.26	8.67	23.0%	0.87	0.76	11.7%	0.00	0.00	0.0%
1998	0.76	0.63	17.1%	10.48	7.98	23.9%	0.82	0.73	11.2%	0.00	0.00	0.0%
1999	0.70	0.58	16.7%	9.77	7.37	24.5%	0.78	0.69	10.7%	0.00	0.00	0.0%
2000	0.66	0.55	17.0%	9.13	6.94	24.0%	0.74	0.67	10.2%	0.00	0.00	0.0%
2001	0.62	0.51	17.0%	8.52	6.43	24.5%	0.71	0.64	9.7%	0.00	0.00	0.0%
2002	0.59	0.49	17.0%	7.98	6.00	24.7%	0.68	0.62	9.4%	0.00	0.00	0.0%
2003	0.56	0.47	15.9%	7.45	5.60	24.8%	0.66	0.60	9.1%	0.00	0.00	0.0%
2004	0.53	0.45	15.4%	6.95	5.21	25.0%	0.64	0.58	8.8%	0.00	0.00	0.0%
2005	0.51	0.43	15.3%	6.50	4.87	25.1%	0.63	0.57	8.5%	0.00	0.00	0.0%
2006	0.49	0.42	15.4%	6.16	4.61	25.1%	0.62	0.57	8.3%	0.00	0.00	0.0%
2007	0.48	0.41	15.5%	5.87	4.39	25.2%	0.61	0.56	8.1%	0.00	0.00	0.0%
2008	0.47	0.40	15.6%	5.63	4.20	25.4%	0.60	0.56	7.9%	0.00	0.00	0.0%
2009	0.46	0.39	15.8%	5.45	4.06	25.5%	0.60	0.55	7.8%	0.00	0.00	0.0%
2010	0.46	0.38	15.8%	5.33	3.96	25.6%	0.60	0.55	7.7%	0.00	0.00	0.0%
2011	0.45	0.38	15.9%	5.24	3.89	25.8%	0.59	0.55	7.7%	0.00	0.00	0.0%
2012	0.45	0.38	15.9%	5.18	3.84	25.8%	0.59	0.55	7.6%	0.00	0.00	0.0%
2013	0.45	0.38	16.0%	5.13	3.81	25.8%	0.59	0.54	7.6%	0.00	0.00	0.0%
2014	0.45	0.38	15.9%	5.09	3.78	25.9%	0.59	0.54	7.6%	0.00	0.00	0.0%
2015	0.45	0.37	16.0%	5.06	3.75	25.9%	0.59	0.54	7.6%	0.00	0.00	0.0%
2016	0.44	0.37	16.0%	5.02	3.71	26.0%	0.59	0.54	7.6%	0.00	0.00	0.0%
2017	0.44	0.37	16.1%	4.98	3.68	26.1%	0.59	0.54	7.6%	0.00	0.00	0.0%
2018	0.44	0.37	16.1%	4.96	3.66	26.2%	0.59	0.54	7.6%	0.00	0.00	0.0%
2019	0.44	0.37	16.1%	4.95	3.65	26.2%	0.59	0.54	7.6%	0.00	0.00	0.0%
2020	0.44	0.37	16.1%	4.95	3.65	26.2%	0.59	0.54	7.6%	0.00	0.00	0.0%

** CALIMFAC v 1.10
** California Motor Vehicle Emissions Factor Model
**
** SB 1997 program, five years before first inspection
**
** Output file: SENS_SB1997_NEW5.OUT
**
** Date of this run: 1/15/ 91
**   12:39
** Calendar Year I/M Benefits Light Duty Trucks
**
**

Cal	HC			CO			NOx			EVAP		
Year	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED	NO IM	IM	RED
1980	3.85	3.85	0.0%	36.95	36.95	0.0%	2.40	2.40	0.0%	0.00	0.00	0.0%
1981	3.62	3.62	0.0%	35.02	35.02	0.0%	2.34	2.34	0.0%	0.00	0.00	0.0%
1982	3.38	3.38	0.0%	33.25	33.25	0.0%	2.28	2.28	0.0%	0.00	0.00	0.0%
1983	3.20	3.20	0.0%	31.96	31.96	0.0%	2.17	2.17	0.0%	0.00	0.00	0.0%
1984	3.00	2.59	13.6%	30.42	25.30	16.8%	2.04	1.90	7.2%	0.00	0.00	0.0%
1985	2.71	2.28	16.0%	28.51	23.40	17.9%	1.92	1.75	8.5%	0.00	0.00	0.0%
1986	2.44	1.99	18.5%	26.53	21.36	19.5%	1.79	1.61	9.8%	0.00	0.00	0.0%
1987	2.23	1.79	19.9%	25.24	19.83	21.4%	1.68	1.49	10.9%	0.00	0.00	0.0%
1988	1.98	1.57	20.8%	23.44	18.32	21.9%	1.55	1.37	12.0%	0.00	0.00	0.0%
1989	1.78	1.40	21.5%	21.74	16.99	21.8%	1.46	1.27	12.8%	0.00	0.00	0.0%
1990	1.60	1.26	21.4%	19.91	15.77	20.8%	1.36	1.17	13.5%	0.00	0.00	0.0%
1991	1.49	1.17	22.0%	19.24	15.19	21.1%	1.31	1.12	13.8%	0.00	0.00	0.0%
1992	1.35	1.05	21.9%	17.78	14.15	20.4%	1.20	1.04	13.5%	0.00	0.00	0.0%
1993	1.24	0.98	21.4%	16.65	13.24	20.4%	1.13	0.98	13.3%	0.00	0.00	0.0%
1994	1.14	0.90	21.1%	15.62	12.29	21.3%	1.07	0.93	13.2%	0.00	0.00	0.0%
1995	1.05	0.83	21.2%	14.50	11.33	21.9%	1.03	0.90	13.0%	0.00	0.00	0.0%
1996	0.97	0.76	21.3%	13.45	10.43	22.5%	0.99	0.86	12.7%	0.00	0.00	0.0%
1997	0.89	0.70	21.3%	12.44	9.55	23.3%	0.97	0.85	12.3%	0.00	0.00	0.0%
1998	0.83	0.65	21.5%	11.60	8.78	24.3%	0.95	0.84	12.1%	0.00	0.00	0.0%
1999	0.77	0.60	21.5%	10.81	8.13	24.8%	0.94	0.83	11.8%	0.00	0.00	0.0%
2000	0.72	0.58	19.6%	10.04	7.59	24.5%	0.93	0.82	11.5%	0.00	0.00	0.0%
2001	0.69	0.55	19.7%	9.51	7.24	23.9%	0.93	0.82	11.3%	0.00	0.00	0.0%
2002	0.66	0.53	20.0%	9.02	6.83	24.3%	0.92	0.82	11.1%	0.00	0.00	0.0%
2003	0.63	0.51	18.8%	8.49	6.41	24.5%	0.91	0.81	10.8%	0.00	0.00	0.0%
2004	0.61	0.50	18.1%	7.97	6.01	24.6%	0.91	0.81	10.7%	0.00	0.00	0.0%
2005	0.58	0.48	18.0%	7.54	5.67	24.8%	0.90	0.80	10.6%	0.00	0.00	0.0%
2006	0.57	0.47	18.0%	7.19	5.39	25.0%	0.89	0.80	10.5%	0.00	0.00	0.0%
2007	0.55	0.45	18.0%	6.90	5.15	25.4%	0.89	0.80	10.4%	0.00	0.00	0.0%
2008	0.55	0.45	18.2%	6.73	5.01	25.6%	0.89	0.80	10.3%	0.00	0.00	0.0%
2009	0.54	0.44	18.3%	6.62	4.91	25.9%	0.89	0.80	10.3%	0.00	0.00	0.0%
2010	0.54	0.44	18.4%	6.55	4.84	26.1%	0.89	0.80	10.2%	0.00	0.00	0.0%
2011	0.54	0.44	18.4%	6.50	4.79	26.3%	0.89	0.80	10.2%	0.00	0.00	0.0%
2012	0.54	0.44	18.5%	6.46	4.75	26.5%	0.89	0.80	10.1%	0.00	0.00	0.0%
2013	0.53	0.44	18.5%	6.42	4.72	26.5%	0.89	0.80	10.1%	0.00	0.00	0.0%
2014	0.53	0.43	18.5%	6.39	4.69	26.6%	0.89	0.80	10.0%	0.00	0.00	0.0%
2015	0.53	0.43	18.5%	6.35	4.65	26.7%	0.89	0.80	10.0%	0.00	0.00	0.0%
2016	0.53	0.43	18.6%	6.31	4.63	26.7%	0.89	0.80	10.0%	0.00	0.00	0.0%
2017	0.53	0.43	18.6%	6.28	4.60	26.8%	0.89	0.80	10.0%	0.00	0.00	0.0%
2018	0.53	0.43	18.6%	6.25	4.58	26.8%	0.89	0.80	10.1%	0.00	0.00	0.0%
2019	0.53	0.43	18.6%	6.25	4.57	26.8%	0.89	0.80	10.1%	0.00	0.00	0.0%
2020	0.53	0.43	18.6%	6.25	4.57	26.8%	0.89	0.80	10.1%	0.00	0.00	0.0%