CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
AIR RESOURCES BOARD

ADDENDUM PRESENTING AND DESCRIBING REVISIONS TO:

INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING, PUBLIC HEARING TO CONSIDER ADOPTION OF REGULATIONS TO CONTROL GREENHOUSE GAS EMISSIONS FROM MOTOR VEHICLES

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1 INTRODUCTION

The ARB staff has received comment concerning some aspects of the cost analysis contained in the August 6th release of the ISOR for the proposed California regulation of greenhouse gas emissions from motor vehicles. In response to these comments, staff has reexamined and revised its analysis that pertains to deployment of the climate change emission reduction technologies in the vehicle fleet from 2009 to 2016. These changes yielded an increase in average PC/LDT1 cost across all manufacturers such that the average PC/LDT1 costs are now similar to those for LDT2 vehicles.

In addition, staff elected to further review the individual technology package costs in conjunction with NESCCAF. This was deemed worthwhile due to the complexity of the individual package specifications that were modeled and to ensure reliability of the cost estimates. This resulted in relatively minor changes to the estimated cost of various technology packages.

The updated cost estimates in turn affected some aspects of the staff analysis of economic impacts, cost effectiveness and other considerations, which have been updated where appropriate.

Staff also updated its estimates of the emission reductions resulting from the staff proposal. The greenhouse gas reduction estimate now explicitly accounts for the fact that some manufacturers will need to trade emission reductions from the LDT2 category to the PC/LDT1 category. This change resulted in very minor adjustments to the EMFAC emission reduction totals. In addition, the estimated reduction in upstream criteria pollutant emissions has increased, due to correctly reporting the reductions on a tons per day rather than tons per year basis and to the use of updated emission factors.

In summary, the effect of these revisions is as follows:

- The estimated average cost of compliance with the near term standard has increased for PC/LDT1 vehicles ($367 as compared to $292 in the ISOR) and decreased for LDT2 vehicles ($277 as compared to $308 in the ISOR).

- The estimated average cost of compliance with the mid term standard has increased, particularly for PC/LDT1 vehicles. Staff now estimates that the fully phased in PC/LDT1 mid term standard will result in an average cost of $1,064, as compared to the $626 estimated in the ISOR. The estimated average cost for compliance for LDT2 vehicles has also increased, but to a lesser extent ($1029 as compared to $955 in the ISOR).

- Although these cost changes and conforming changes to the economic analysis have resulted in revisions to many of the ISOR tables, the revisions do not alter the fundamental conclusions presented in the ISOR as to the effect of the proposed standards on vehicle owners or the California economy. The proposal still results in a monthly savings for the average vehicle purchaser, and in increased jobs and personal income for the California economy.

- The staff proposal is estimated to result in a criteria pollutant benefit, even taking into account possible criteria pollutant increases due to consumer response.

Please note that this document is an addendum to, rather than a replacement of, the August 6, 2004 ISOR. This supplemental discussion uses as a starting point the proposed regulatory text and supporting analysis thereof contained in the ISOR. Thus the updated information here only supplements the analysis supporting the August 6 proposal and regulatory text.

This document primarily updates the tables provided in the ISOR, and provides an explanation for each change. Table entries that have been changed are shown in *italics*. In general, text in the ISOR that refers to or describes results from the various tables is not reproduced here. The reader should treat the values provided in all such descriptive text entries as superceded by the values provided in the updated tables in this Addendum.

In some cases, the ISOR text itself also needs to be updated. In those instances, which are clearly identified, this document provides updated sections of text from the ISOR.

2 REVISIONS TO SECTION 5

Tables 5.2-5 through 5.2-9, pages 63-68

Relatively minor revisions were made to some of the incremental costs of the technology packages in Sections 5.2 and 5.3. These changes are a result of consultation by staff with NESCCAF on the revised costs to be included in their final report. The updated information from this consultation was received too late to be published in the August 6 ISOR. In order to provide the Board and the public with the most accurate and up-to-date information, staff is providing updated cost estimates in this Addendum.

By and large, these changes are of an accounting nature – primarily changes due to rounding, carefully avoiding both the undercounting of additional indirect costs and the double-counting of various technology costs, as well as improved cost estimates for some components. In addition, the hybrid-electric vehicle costs were modified to reflect the final NESCCAF study cost results, in lieu of the ARB's own staff analysis.

All of the incremental cost revisions for the various technology packages on the five vehicle types are shown in Tables 5.2-5 through 5.2-9. These changes also affected Tables 5.3-2 through 5.3-6, and Table 5.3-8, which are contained in the Appendix. Here and throughout this Addendum changes in table values are shown in *italics*.

Revised Table 5.2-5. Potential Carbon Dioxide Emissions Reductions from Small Car (NESCCAF, 2004)

Small Car	Combined Technology Packages	CO_2 (g/mi)	Potential CO_2 reduction from 2002 baseline	Retail Price Equivalent 2002	Potential CO_2 reduction from 2009 baseline	Retail Price Equivalent 2009
Near Term 2009-2012	DVVL,DCP,A5 (2009 baseline)	*285*	*-2.6%*	$308	0%	$0
	DCP,CVT,EPS,ImpAlt	*269*	*-7.8%*	$561	-5.4%	$253
	DCP,A4,EPS,ImpAlt	269	*-7.8%*	$351	*-5.4%*	$43
	DCP,A5,EPS,ImpAlt	260	*-10.9%*	$486	*-8.5%*	$178
	DCP,A6	260	*-11.0%*	$346	*-8.6%*	$38
	DVVL,DCP,AMT,EPS,ImpAlt	233	*-20.1%*	*$456*	*-18.0%*	*$148*
	GDI-S,DCP,Turbo,AMT,EPS, ImpAlt	215	*-26.5%*	$1120	*-24.6%*	$812
Mid Term 2013-2015	gHCCI,DVVL,ICP,AMT,EPS,ImpAlt	229	*-21.8%*	*$665*	*-19.7%*	*$357*
	CVVL,DCP,AMT,ISG-SS,EPS, ImpAlt	216	*-25.9%*	*$1022*	*-24.0%*	*$714*
	gHCCI,DVVL,ICP,AMT,ISG, EPS,eACC	204	*-30.1%*	$1767	*-28.3%*	$1459
Long Term 2015-	dHCCI,AMT,ISG,EPS,eACC	*224*	*-23.4%*	*$3055*	*-21.4%*	*$2747*
	ModHEV	*159*	*-45.6%*	$2546	*-44.2%*	$2238
	HSDI,AdvHEV	*133*	*-54.4%*	$6060	*-53.2%*	$5752
	AdvHEV	*136*	*-53.4%*	$4009	*-52.2%*	$3701

Notes: Costs are included here to place the technology benefits in context. Costs and their derivation are discussed in greater detail in Section 5.3; Reductions and costs for all scenarios except the baseline include benefits and costs listed in Table 5.2-4 and benefits and costs from improved air conditioning systems from NESCCAF (2004).

Revised Table 5.2-6. Potential Carbon Dioxide Emissions Reductions from Large Car (NESCCAF, 2004)

Large Car	Combined Technology Packages	CO_2 (g/mi)	Potential CO_2 reduction from 2002 baseline	Retail Price Equivalent 2002	Potential CO_2 reduction from 2009 baseline	Retail Price Equivalent 2009
Near Term 2009-2012	DVVL,DCP,A6 (2009 baseline)	*323*	-6.6%	$427	0%	$0
	DCP,A6	304	*-12.1%*	$479	*5.9%*	$52
	DCP,CVT,EPS,ImpAlt	303	*-12.3%*	$709	*-6.2%*	$282
	CVVL,DCP,A6	290	*-16.1%*	$864	*-10.2%*	$437
	DCP,DeAct,A6	286	*-17.1%*	$662	*-11.2%*	$235
	DCP,Turbo,A6,EPS,ImpAlt	279	*-19.3%*	$266	*-13.7%*	-$161
	CVVL,DCP,AMT,EPS,ImpAlt	265	*-23.4%*	$874	*-18.0%*	$447
	GDI-S,DeAct,DCP,AMT,EPS, ImpAlt	265	*-23.4%*	*$931*	*-18.0%*	*$504*
	GDI-S,DCP,Turbo,AMT,EPS, ImpAlt	251	*-27.4%*	*$370*	*-22.3%*	*-$57*
Mid Term 2013-2015	gHCCI,DVVL,ICP,AMT,EPS,ImpAlt	272	*-21.2%*	$881	*-15.7%*	$454
	DeAct,DVVL,CCP,A6,ISG,EPS, eACC	259	*-24.9%*	$1879	*-19.6%*	$1452
	ehCVA,AMT,EPS,ImpAlt	250	*-27.5%*	$930	*-22.4%*	$503
	ehCVA,GDI-S,AMT,EPS,ImpAlt	242	*-30.0%*	*$1189*	*-25.1%*	*$762*
	gHCCI,DVVL,ICP,AMT,ISG,EPS, eACC	231	*-33.1%*	$2002	*-28.4%*	$1575
	GDI-S,Turbo,DCP,A6,ISG,EPS, eACC	224	*-35.3%*	*$1576*	*-30.7%*	*$1149*
Long Term 2015-	dHCCI,AMT,ISG,EPS,eACC	*247*	*-28.6%*	*$2163*	*-23.5%*	*$1736*
	ModHEV	*188*	*-45.5%*	*$1758*	*-41.7%*	*$1331*
	AdvHEV	*161*	*-53.4%*	*$3539*	*-50.1%*	*$3112*
	HSDI,AdvHEV	*161*	*-53.4%*	$5695	*-50.1%*	$5268

Notes: Costs are included here to place the technology benefits in context. Costs and their derivation are discussed in greater detail in Section 5.3; Reductions and costs for all scenarios except the baseline include benefits and costs listed in Table 5.2-4 and benefits and costs from improved air conditioning systems from NESCCAF (2004).

Revised Table 5.2-7. Potential Carbon Dioxide Emissions Reductions from Minivan (NESCCAF, 2004)

Minivan	Combined Technology Packages	CO_2 (g/mi)	Potential CO_2 reduction from 2002 baseline	Retail Price Equivalent 2002	Potential CO_2 reduction from 2009 baseline	Retail Price Equivalent 2009
Near Term 2009-2012	DVVL,CCP,A5 (2009 baseline)	*371*	-6.4%	$315	0%	$0
	DCP,A6	348	*-12.2%*	$670	*-6.2%*	$355
	GDI-S,CCP,DeAct,AMT,EPS, ImpAlt	*319*	*-19.6%*	*$764*	*-14.1%*	*$449*
	DVVL,CCP,AMT,EPS,ImpAlt	*315*	*-20.4%*	$478	*-15.0%*	$163
	CCP,AMT,Turbo,EPS,ImpAlt,	*315*	*-20.5%*	*$325*	*-15.0%*	*$10*
	DeAct,DVVL,CCP,AMT,EPS, ImpAlt	*307*	*-22.6%*	*$594*	*-17.3%*	*$279*
	CVVL,CCP,AMT,EPS,ImpAlt	*306*	*-22.9%*	$1011	*-17.6%*	$696
	GDI-S,DCP,Turbo,AMT,EPS, ImpAlt	*297*	*-25.0%*	*$561*	*-19.9%*	*$246*
Mid Term 2013-2015	ehCVA,GDI-S,AMT,EPS,ImpAlt	*290*	*-26.8%*	$1414	*-21.8%*	$1099
	GDI-S,CCP,AMT,ISG,DeAct,EPS, eACC	*287*	*-27.6%*	*$1905*	*-22.7%*	*$1590*
Long Term 2015-	dHCCI,AMT,EPS,ImpAlt	*311*	*-21.5%*	*$1550*	*-16.1%*	*$1235*
	Mod HEV	*216*	*-45.6%*	$2300	*-41.8%*	$1985
	Adv HEV	*185*	*-53.4%*	$4204	*-50.2%*	$3889

Notes: Costs are included here to place the technology benefits in context. Costs and their derivation are discussed in greater detail in Section 5.3; Reductions and costs for all scenarios except the baseline include benefits and costs listed in Table 5.2-4 and benefits and costs from improved air conditioning systems from NESCCAF (2004).

Revised Table 5.2-8. Potential Carbon Dioxide Emissions Reductions from Small Truck (NESCCAF, 2004)

Small Truck	Combined Technology Packages	CO_2 (g/mi)	Potential CO_2 reduction from 2002 baseline	Retail Price Equivalent 2002	Potential CO_2 reduction from 2009 baseline	Retail Price Equivalent 2009
Near Term 2009-2012	DVVL,DCP,A6 (2009 baseline)	*405*	-9.0%	$427	0%	$0
	DCP,A6	379	*-14.9%*	$479	*-6.5%*	$52
	DCP,A6,Turbo,EPS,ImpAlt	371	*-16.8%*	$266	*-8.6%*	-$161
	DCP,A6,DeAct	366	*-17.8%*	*$657*	*-9.7%*	*$230*
	GDI-S,DCP,DeAct,AMT,EPS, ImpAlt	334	*-25.1%*	*$911*	*-17.6%*	*$484*
	DeAct,DVVL,CCP,AMT,EPS, ImpAlt	*328*	*-26.4%*	*$672*	*-19.1%*	*$245*
	GDI-S,DCP,Turbo,AMT,EPS, ImpAlt,DCP-DS	318	*-28.6%*	$350	*-21.5%*	-$77
Mid Term 2013-2015	DeAct,DVVL,CCP,A6,ISG,EPS, eACC	316	*-29.2%*	*$1898*	*-22.1%*	*$1471*
	ehCVA,GDI-S,AMT,EPS,ImpAlt	309	*-30.7%*	$1169	*-23.8%*	$742
	HSDI,AMT,EPS,ImpAlt	*316*	*-29.1%*	$1568	*-22.1%*	$1141
Long Term 2015-	dHCCI,AMT,EPS,ImpAlt	*341*	*-23.6%*	*$1022*	*-16.0%*	*$595*
	Mod HEV	*247*	*-44.7%*	*$1758*	*-39.2%*	*$1331*
	Adv HEV	*212*	*-52.5%*	*$3613*	*-47.8%*	*$3186*

Notes: Costs are included here to place the technology benefits in context. Costs and their derivation are discussed in greater detail in Section 5.3; Reductions and costs for all scenarios except the baseline include benefits and costs listed in Table 5.2-4 and benefits and costs from improved air conditioning systems from NESCCAF (2004).

Revised Table 5.2-9. Potential Carbon Dioxide Emissions Reductions from Large Truck (NESCCAF, 2004)

Large Truck	Combined Technology Packages	CO_2 (g/mi)	Potential CO_2 reduction from 2002 baseline	Retail Price Equivalent 2002	Potential CO_2 reduction from 2009 baseline	Retail Price Equivalent 2009
Near Term 2009-2012	CCP,A6 (2009 baseline)	*484*	-5.5%	$126	0%	$0
	DVVL,DCP,A6	442	*-13.7%*	$549	*-8.7%*	$423
	CCP,DeAct,A6	433	*-15.6%*	*$550*	*-10.7%*	*$424*
	DCP,DeAct,A6	430	*-16.0%*	*$915*	*-11.2%*	*$789*
	DeAct,DVVL,CCP,A6,EHPS,ImpAlt	418	*-18.5%*	$789	*-13.8%*	$663
	DeAct,DVVL,CCP,AMT,EHPS, ImpAlt	396	*-22.7%*	$677	*-18.3%*	$551
Mid Term 2013-2015	CCP,DeAct,GDI-S, AMT,EHPS,ImpAlt	416	*-18.8%*	*$897*	*-14.1%*	*$771*
	DeAct,DVVL,CCP,A6,ISG, EHPS,eACC	378	*-26.3%*	*$1886*	*-22.1%*	*$1760*
	ehCVA,GDI-S,AMT,EHPS,ImpAlt	381	*-25.6%*	*$1709*	*-21.3%*	*$1583*
Long Term 2015-	GDI-L,AMT,EHPS,ImpAlt	*399*	*-22.3%*	$1460	*-17.8%*	$1334
	Mod HEV	*284*	*-44.6%*	$2630	*-41.4%*	$2504
	dHCCI,AMT,ISG,EPS,eACC	*373*	*-27.3%*	*$3041*	*-23.1%*	*$2915*
	GDI-L,AMT,ISG,EPS,ImpAlt	*365*	*-28.8%*	$2537	*-24.7%*	$2411
	HSDI,AdvHEV	*237*	*-53.9%*	$8363	*-51.2%*	$8237
	AdvHEV	*243*	*-52.6%*	$5311	-49.9%	$5185

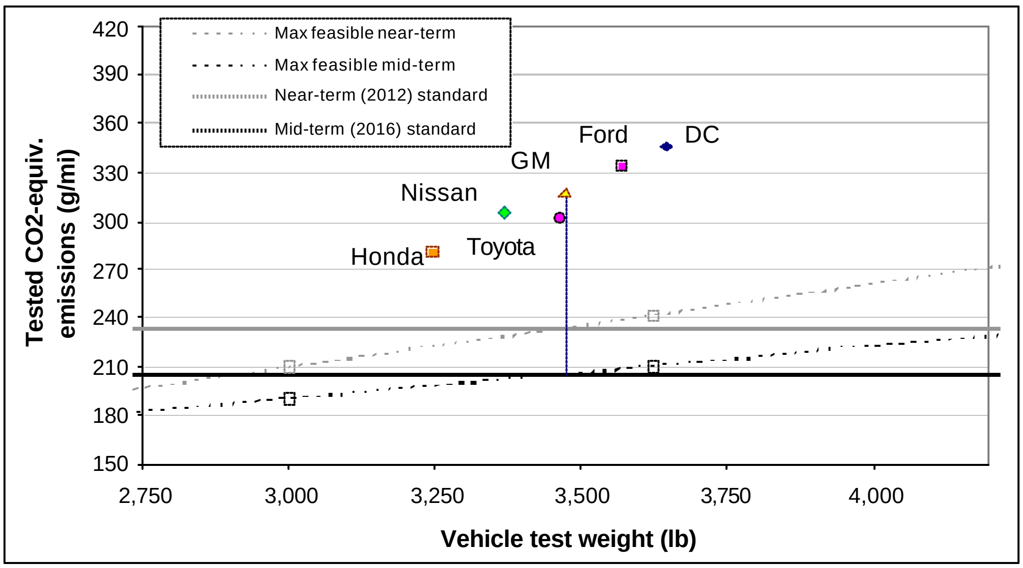
Notes: Costs are included here to place the technology benefits in context. Costs and their derivation are discussed in greater detail in Section 5.3; Reductions and costs for all scenarios except the baseline include benefits and costs listed in Table 5.2-4 and benefits and costs from improved air conditioning systems from NESCCAF (2004).

3 REVISIONS TO SECTION 6

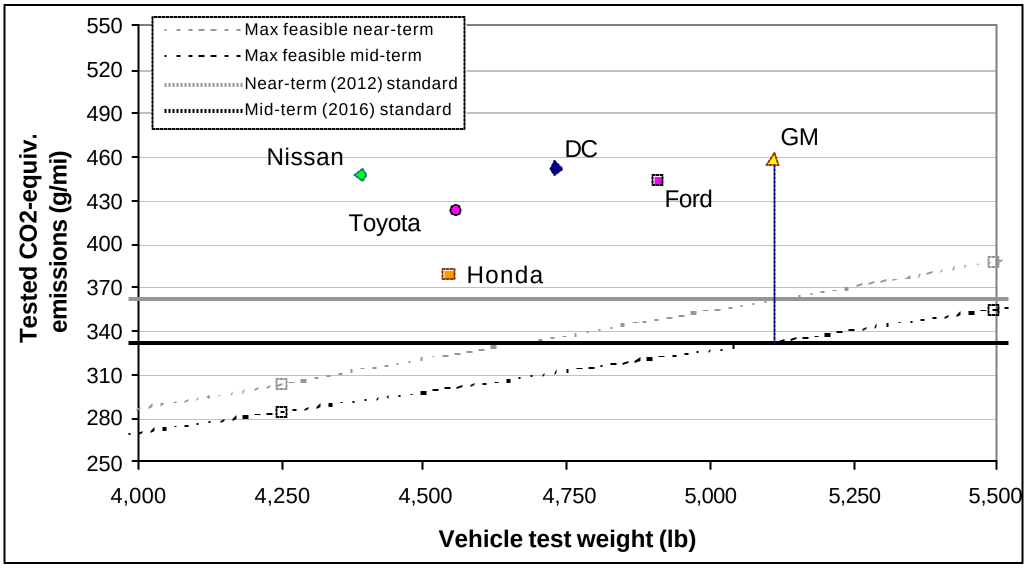
In Chapter 6, several calculations were reexamined and correspondingly some of the tables and figures have been modified.

Figures 6-1 and 6-2, pages 113-114

Figures 6-1 and 6-2 have been revised to correctly show the manufacturer baselines and the near- and mid-term standards at their proper points. The standard emission levels have not changed, but these graphical representations of the standards have been corrected. The revised figures are shown below.



Revised Figure 6-1. Manufacturer Baseline CO_2 and Maximum Feasible Regression Lines for PC/LDT1 Vehicle Category



Revised Figure 6-2. Manufacturer Baseline CO_2 and Maximum Feasible Regression Lines for LDT2 Vehicle Category

Sections 6.2.B and 6.2.C, pages 116-120

The ARB staff looked at several different ways to estimate the number of vehicles each manufacturer must deploy with the near-term and mid-term technology packages in order to comply with the standard. Because technology, weight, and other unaccounted for baseline attributes (e.g., manufacturer-specific acceleration capability, towing ability, or other unique vehicle characteristics) independently affect each manufacturer's baseline position of CO_2-equivalent emissions, determining the needed level of technology deployment is complex.

Originally, for the August 6th ISOR, the ARB staff chose a methodology that had the effect of overestimating the emission reduction benefit of the technologies and did not properly reflect that General Motors, as the highest-weight standard-setting manufacturer, would need full levels of deployment throughout the standard phase-in. After reviewing this issue in response to comments received, staff has developed a revised, relatively straightforward and conservative approach to determine the extent to which each manufacturer will need to deploy the near term and mid term technology packages to meet the 2009-2016 standards. The estimation of needed technology deployment now uses as a starting point the fact that the standard-setting manufacturer, General Motors, must deploy the maximum feasible emission reduction technology across its entire fleet--100% deployment of near-term technology in 2012, and 100% deployment of mid-term technology in 2016. Fundamentally this approach assumes that 100% deployment of near-term technology reduces the emissions of any manufacturer from their baseline emission level straight down to the near-term regression line (for that manufacturer's weight) in Figures 6-1 and 6-2. The result of this revised approach is that the percentage of vehicles needing to use the near term and mid term technology packages increased significantly.

As before, the calculations include trading. This affects Daimler Chrysler and Ford, each of which could not comply with the PC/LDT1 standard strictly with technology deployment without trading from the LDT2 category.

This approach is more conservative in that it calls for greater use of the technology packages than our previous method and others we examined. Given the uncertainties associated with the different manufacturer baseline technologies and vehicle performance attributes and their differential effect on CO_2-equivalent emissions, the ARB staff deemed this straightforward and conservative methodology to be the most appropriate approach.

The following provides revised text and tables for Sections 6.2.B and 6.2.C:

6.2.B Percent of Vehicles Controlled by Model Year

In order to achieve the CO_2-equivalent emission reduction levels shown in Table 6.2-2 [not included in this Addendum], each manufacturer would need to deploy technology packages in their new vehicle fleet for years 2009 through 2016. To estimate the impact on manufacturers, it is assumed that the maximum feasible "near-term" technologies would first be used only on those vehicles necessary to comply with the proposed emission standards. The following scenarios assume that manufacturers will apply the lowest cost approaches to complying with the proposed emission standards. The technology deployment percentages are shown in Tables 6.2-3 (for near-term technologies) and 6.2-4 (for mid-term technologies).

The percent of technologies (near- or mid-term) that any manufacturer deploys corresponds to the ratio of the required emission reduction (from baseline to standard) to the difference in its baseline emission rate and the maximum feasible regression emission rate for its particular weight (the vertical difference between the manufacturer points and the maximum feasible regression line in Figures 6-1 and 6-2). By definition, the standard-setting automaker, General Motors, has full deployment of near- and mid-term technologies from 2009 to 2016. This corresponds to having the deployment of maximum feasible near-term emission reduction technology on 20 percent, 40 percent, 70 percent, and 100 percent of its vehicles from 2009 to 2012. Likewise, General Motors has the same 20-40-70-100 percent deployment of mid-term technologies from 2013-2016. Manufacturers with baseline weights greater than that of General Motors for certain categories (i.e. Daimler Chrysler and Ford for the PC/LDT1 category) also have full deployment for those categories. Because these manufacturers cannot fully meet the emission standards with full deployment in the PC/LDT1 category, each one makes up the compliance deficit by over-complying with the LDT2 standard and trading the emission credits to be net even for both categories together.

All of the manufacturers with average vehicle weights for either category that are less than General Motors have less than the full technology deployment for that category. Again, the percent deployment is proportional to the required emission reduction and the difference between the manufacturer baseline and the maximum feasible emission reduction (from the regression line) for that weight. For example, for the 2012 near-term standard, Toyota in the LDT2 category has a baseline emission rate of 422 g CO_2 per mile, and its maximum feasible regression line for its weight is 324 g CO_2 per mile. With the 2012 LDT2 standard of 361 g CO_2 per mile, the percent deployment of near-term technology for Toyota is (422-361) / (422-324) = 62 percent.

For the mid-term 2013-2016 phase-in, some manufacturers could not achieve the emission standards using only the near-term technology packages. Those manufacturers that can meet the mid-term emission standards (2013-2016) with only the use of near-term technologies) do so. This is the case for manufacturers for which the maximum feasible near-term regression line (for their average vehicle weight) is below the mid-term standard line in Figures 6-1 and 6-2 above. Once a manufacturer's entire fleet has the near-term technology package installed and further reductions are needed, the mid-term technology packages are utilized to the extent necessary to comply with the 2013-2016 standards. Table 6.2-5 sums the values of Table 6.2-3 and Table 6.2-4 to show the total percent of vehicles that have some CO_2-reduction control technology.

Revised Table 6.2-3. Percent of Vehicles Equipped with Near-Term Technology Package by Vehicle Model Year

Year			DC	Ford	GM	Honda	Nissan	Toyota	All major 6
2009	Near-term phase-in	PC/LDT1	20%	*11%*	0%	0%	0%	0%	4%
		LDT2	*18%*	6%	20%	0%	*6%*	0%	*11%*
2010		PC/LDT1	40%	*34%*	*20%*	0%	*5%*	1%	*15%*
		LDT2	*36%*	*26%*	40%	0%	*21%*	3%	*26%*
2011		PC/LDT1	70%	*70%*	*60%*	*24%*	*49%*	*50%*	*53%*
		LDT2	63%	*56%*	70%	0%	*42%*	*32%*	*54%*
2012		PC/LDT1	100%	*100%*	*100%*	*81%*	*93%*	*99%*	*96%*
		LDT2	*90%*	*93%*	100%	*32%*	*64%*	*62%*	*85%*
2013	Mid-term phase-in	PC/LDT1	80%	*80%*	*80%*	*90%*	*98%*	*81%*	*83%*
		LDT2	*82%*	*81%*	80%	*42%*	*68%*	*68%*	*76%*
2014		PC/LDT1	60%	*60%*	*60%*	*100%*	*77%*	*61%*	*69%*
		LDT2	*63%*	*62%*	60%	*52%*	*73%*	*74%*	*64%*
2015		PC/LDT1	30%	*30%*	*30%*	*65%*	*45%*	*31%*	*38%*
		LDT2	*35%*	*33%*	30%	*68%*	*79%*	*82%*	*45%*
2016		PC/LDT1	0%	*0%*	*0%*	*30%*	*12%*	*1%*	*7%*
		LDT2	*5%*	*3%*	0%	*83%*	*85%*	*91%*	*27%*

Revised Table 6.2-4. Percent of Vehicles Equipped with Mid-Term Technology Package by Vehicle Model Year

Year			DC	Ford	GM	Honda	Nissan	Toyota	All major 6
2009	Near-term phase-in	PC/LDT1	0%	0%	0%	0%	0%	0%	0%
		LDT2	0%	0%	0%	0%	0%	0%	0%
2010		PC/LDT1	0%	0%	0%	0%	0%	0%	0%
		LDT2	0%	0%	0%	0%	0%	0%	0%
2011		PC/LDT1	0%	0%	0%	0%	0%	0%	0%
		LDT2	0%	0%	0%	0%	0%	0%	0%
2012		PC/LDT1	0%	0%	0%	0%	0%	0%	0%
		LDT2	0%	0%	0%	0%	0%	0%	0%
2013	Mid-term phase-in	PC/LDT1	20%	*20%*	*20%*	10%	*2%*	*19%*	*17%*
		LDT2	*18%*	*19%*	20%	0%	0%	0%	*14%*
2014		PC/LDT1	40%	*40%*	*40%*	0%	*23%*	*39%*	*31%*
		LDT2	*37%*	*38%*	40%	0%	0%	0%	*28%*
2015		PC/LDT1	70%	*70%*	*70%*	*35%*	*55%*	*69%*	*62%*
		LDT2	*65%*	*67%*	70%	0%	0%	0%	*49%*
2016		PC/LDT1	100%	*100%*	*100%*	*70%*	*88%*	*99%*	*93%*
		LDT2	*95%*	*97%*	100%	0%	0%	0%	*70%*

Revised Table 6.2-5. Total Percent of Vehicles Equipped with Near- and Mid-Term Technology Packages by Vehicle Model Year

Year			DC	Ford	GM	Honda	Nissan	Toyota	All major 6
2009	Near-term phase-in	PC/LDT1	20%	*11%*	0%	0%	0%	0%	4%
		LDT2	*18%*	6%	20%	0%	*6%*	0%	*11%*
2010		PC/LDT1	40%	*34%*	*20%*	0%	*5%*	1%	*15%*
		LDT2	*36%*	*26%*	40%	0%	*21%*	3%	*26%*
2011		PC/LDT1	70%	*70%*	*60%*	*24%*	*49%*	*50%*	*60%*
		LDT2	63%	*56%*	70%	0%	*42%*	*32%*	*54%*
2012		PC/LDT1	100%	*100%*	*100%*	*81%*	*93%*	*99%*	*96%*
		LDT2	*90%*	*93%*	100%	*32%*	*64%*	*62%*	*85%*
2013	Mid-term phase-in	PC/LDT1	100%	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*
		LDT2	*100%*	*100%*	100%	*42%*	*68%*	*68%*	*90%*
2014		PC/LDT1	100%	100%	*100%*	*100%*	*100%*	*100%*	*100%*
		LDT2	100%	100%	100%	*52%*	*73%*	*74%*	*92%*
2015		PC/LDT1	100%	100%	100%	*100%*	*100%*	*100%*	*100%*
		LDT2	100%	100%	100%	*68%*	*79%*	*82%*	*94%*
2016		PC/LDT1	100%	100%	100%	*100%*	100%	100%	*100%*
		LDT2	100%	100%	100%	*83%*	*85%*	*91%*	*97%*

6.2.C Cost of Control by Model Year

To translate the percent of vehicle fleet utilizing the near- and mid- term technology packages (from Table 6.2-3 and Table 6.2-4) into average cost of compliance estimations, the costs associated with the maximum feasible CO_2 reduction technologies are applied. These costs, directly associated with the technology packages of Table 6.1-2 and Table 6.1-3 above [not included in this Addendum], are shown below in Table 6.2-6 and Table 6.2-7. The costs are shown as the incremental cost with respect to the 2009 baseline vehicle cost within each of the five vehicle classes. The costs are then aggregated into a sales-averaged cost for each of the two vehicle categories, PC/LDT1 and LDT2, according to the estimated percentage of the 2002 California fleet that each vehicle class represents. The average cost of control for maximum feasible climate change emission reductions for near-term technology packages on a vehicle in the PC/LDT1 category is estimated to be *$383*. The average cost of control for maximum feasible reductions for near-term technology packages on a vehicle in the LDT2 category is estimated to be *$327*. These costs do not include any operating cost savings, which staff has determined to be more than sufficient to offset the upfront incremental cost thus resulting in a net savings to the purchaser.

Revised Table 6.2-6. Technology Cost for Maximum Feasible Near-Term CO_2 Reduction by Vehicle Category

Vehicle Class	Combined Technology Packages	Cost incremental from 2009 baseline (2004$)	Average cost incremental from 2009 baseline (2004$)	Estimated percentage of CA 2002 fleet	Average cost for near-term control technology for vehicle category ($)
Small car	DVVL,DCP, AMT,EPS,ImpAlt	*148*	*480*	34%	*383*
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	812			
Large car	GDI-S,DeAct,DCP, AMT,EPS,ImpAlt	504	*224*	20%	
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	*-57*			
Minivan	CVVL,CCP,AMT, EPS,ImpAlt	696	*471*	9%	*327*
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	*246*			
Small truck	DeAct,DVVL,CCP, AMT,EPS,ImpAlt	*245*	84	22%	
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	-77			
Large truck	DeAct,DVVL,CCP, A6,EHPS,ImpAlt	663	607	15%	
	DeAct,DVVL,CCP, AMT,EHPS,ImpAlt	551			

Similar calculations were performed for the maximum feasible emission reductions for mid-term technology packages. The average cost of control to achieve the maximum feasible reduction for a vehicle in the PC/LDT1 category is estimated to be *$1,115*. The average cost of control to achieve the maximum feasible reduction for vehicles in the LDT2 category is estimated to be *$1,341*. Again, these costs do not include operating cost savings.

Revised Table 6.2-7. Technology Package Cost for Maximum Feasible Mid-Term CO_2 Reduction by Vehicle Category

Vehicle Class	Combined Technology Packages	Cost incremental from 2009 baseline (2004$)	Average cost incremental from 2009 baseline (2004$)	Estimated percentage of CA 2002 fleet	Average cost for mid-term control technology for vehicle category ($)
Small car	CVVL,DCP,AMT, ISG-SS,EPS,ImpAlt	*714*	*1,087*	34%	*1,115*
	gHCCI,DVVL,ICP, AMT,ISG,EPS,eACC	1459			
Large car	CVAeh,GDI-S, AMT,EPS,ImpAlt	*762*	*1,162*	20%	
	gHCCI,DVVL,ICP, AMT,ISG,EPS,eACC	1575			
	GDI-S,Turbo,DCP, A6,ISG,EPS,eACC	*1149*			
Minivan	CVAeh,GDI-S, AMT,EPS,ImpAlt	1099	*1,345*	9%	*1,341*
	GDI-S,CCP,AMT,ISG, DeAct,EPS,eACC	*1590*			
Small truck	DeAct,DVVL,CCP, A6,ISG,EPS,eACC	*1471*	1,118	22%	
	CVAeh,GDI-S, AMT,EPS,ImpAlt	742			
	HSDI,AMT, EPS,ImpAlt	1141			
Large truck	CVAeh,GDI-S, AMT,EHPS,ImpAlt	*1583*	*1,672*	15%	
	DeAct,DVVL,CCP, A6,ISG,EPS,eACC	*1760*			

Multiplying the cost-of-control estimates (Table 6.2-6 and Table 6.2-7) with the corresponding percentages of the each manufacturer's fleet that will need to use these packages to achieve compliance (Table 6.2-3 and Table 6.2-4) results in the average cost increase per vehicle manufacturer per model year under the proposed climate change regulation. These average costs per vehicle for each manufacturer for each model year are shown in Table 6.2-8. The final column "All major 6" shows the estimated cost increase averaged across all vehicle sales of the six manufacturers.

Revised Table 6.2-8. Average Cost of Control by Vehicle Model Year ($)

Year			DC	Ford	GM	Honda	Nissan	Toyota	All major 6
2009		PC/LDT1	*77*	*41*	0	0	0	0	*17*
		LDT2	*59*	*19*	*65*	0	*20*	0	36
2010	Near-term phase-in	PC/LDT1	*153*	*132*	*76*	0	*21*	*3*	*58*
		LDT2	*118*	*85*	*131*	0	*67*	*8*	*85*
2011		PC/LDT1	*268*	*268*	*230*	*94*	*189*	*192*	*230*
		LDT2	*206*	*183*	*229*	0	*138*	*106*	*176*
2012		PC/LDT1	*383*	*383*	*383*	*311*	*358*	*381*	*367*
		LDT2	*294*	*306*	*327*	*105*	*210*	*203*	*277*
2013		PC/LDT1	*530*	*530*	*530*	*454*	*396*	*520*	*504*
		LDT2	*512*	*519*	*530*	*139*	*224*	*222*	*434*
2014		PC/LDT1	*676*	*676*	*676*	*386*	*553*	*667*	*609*
	Mid-term phase-in	LDT2	*701*	*713*	*733*	*172*	*238*	*241*	*581*
2015		PC/LDT1	*895*	*895*	*895*	*637*	*789*	*888*	*836*
		LDT2	*991*	*1008*	*1037*	*222*	*259*	*270*	*804*
2016		PC/LDT1	*1115*	*1115*	*1115*	*896*	*1024*	*1108*	*1064*
		LDT2	*1288*	*1308*	*1341*	*272*	*279*	*298*	*1029*

4 REVISIONS TO SECTION 8

Table 8.2-1, page 143

The following table is a revision to Table 8.2-1. This table reflects updated projections of the percent reduction in CO_2 emission rates by model year and category, in keeping with the changes outlined in section 5 and section 6. The PC/T1 and T2 CO_2 percent reductions have changed due to the expected use of trading across the PC/T1 and T2 categories.

Revised Table 8.2-1: Light Duty Fleet CO_2 Equivalent Emissions and Reductions

Baseline Inventory without Proposed Regulation		
	2020 (tons per day)	**2030 (tons per day)**
PC/T1 *(Passenger Cars and Trucks 0-3750 lb. LVW)*	350,500	400,000
T2 *(Trucks 3751 lb. LVW – 8500 lb. GVWR)*	146,900	175,500
Total Light Duty	**497,400**	**575,500**
Adjusted Inventory with Proposed Regulation		
	2020 (tons per day)	**2030 (tons per day)**
PC/T1 *(Passenger Cars and Trucks 0-3750 lb. LVW)*	*283,400*	*282,800*
T2 *(Trucks 3751 lb. LVW – 8500 lb. GVWR)*	*126,200*	*137,400*
Total Light Duty	***409,600***	***420,300***
Emissions Reductions for Proposed Regulation		
	2020 (tons per day)	**2030 (tons per day)**
PC/T1 *(Passenger Cars and Trucks 0-3750 lb. LVW)*	*67,100*	*117,200*
T2 *(Trucks 3751 lb. LVW – 8500 lb. GVWR)*	*20,700*	*38,000*
Total Light Duty	***87,700***	***155,200***

The revisions translate into additional reductions of 300 CO_2 equivalent tons per day statewide in 2020 and 700 CO_2 equivalent tons per day in 2030.

Table 8.4-2, page 147

The results shown in Table 8.4-2 have been revised to account for the fact that the estimated fuel cycle emission reductions were incorrectly reported in terms of tons per year. In addition the estimates have been adjusted to account for updated emission factors.

Revised Table 8.4-2: Criteria Pollutant Fuel Cycle Emission Reductions (tons per *day*)

	2020	2030
Non-Methane Organic Gases	*4.6*	*7.9*
Oxides of Nitrogen	*1.4*	*2.3*
Carbon Monoxide	*0.2*	*0.4*

5 REVISIONS TO SECTION 9

Table 9.2-1, page 149

Table 9.2-1 in the August 6, 2004 ISOR presented the cost effectiveness, in terms of dollars per ton of CO_2 equivalent emissions reduced, of the regulation based on estimates of net annualized costs and emissions benefit.

The following table is a revision to Table 9.2-1. This table reflects updated data on the net annualized cost savings, conforming to the updated estimates provided in section 6. The savings have decreased from $4,386 million to $4,042 million in 2020 and from $7,606 million to $6,799 million in 2030. The net decrease in cost savings for 2020 and 2030 are the result of increased vehicle costs, partially offset by additional savings in operating costs. The emissions reductions have also been revised upward to reflect changes in the percent reduction in CO_2 emission rates by model year and category.

Revised Table 9.2-1: Cost Effectiveness of Proposed Regulation (2004 dollars)

	2020	**2030**
Net Annualized Costs (Savings)	*$4,042 million*	*$6,799 million*
Emissions Reduction (tons/year)	*32.0 million*	*56.7 million*
Cost effectiveness ($/ton)	***-126***	***-120***

The revisions to net annualized cost savings and emission reductions translate into a change in the cost effectiveness from -$138 to -$126 per ton in 2020 and from -$135 to -$120 per ton in 2030.

6 REVISIONS TO SECTION 10

The revisions to the average cost of control reported in previous sections of this Addendum also affect the staff analysis of the economic effects of the staff proposal. This section provides updated figures and tables, and text as needed, to describe the conforming revisions to Section 10 of the ISOR.

Table 10.2-1, page 154

This table has changed to update estimates of annualized costs based on the most recent estimates of average per vehicle cost of compliance presented above. In addition, the baseline prices changed from 2003 dollars to 2004 dollars.

Revised Table 10.2-1. Estimates of Total Annual Costs of the Proposed Climate Change Regulations for 2009 through 2030 (millions of 2004 Dollars)

Model Year	Annualized Costs to Consumers of PC/T1	Annualized Costs to Consumers of T2	Incremental Annualized Costs to consumers of 2009+ Vehicles	Cumulative Annualized Cost
2009	$ 2	$ 1	$ 3	$ 3
2010	*$ 7*	*$ 2*	$ 9	$ 12
2011	*$ 27*	*$ 5*	*$ 32*	*$ 45*
2012	*$ 44*	*$ 8*	*$ 52*	*$ 96*
2013	*$ 60*	*$ 13*	*$ 73*	*$ 169*
2014	*$ 74*	*$ 18*	*$ 92*	*$ 261*
2015	*$103*	*$ 25*	*$ 128*	*$ 389*
2016	*$130*	*$ 33*	*$ 163*	*$ 552*
2017	*$133*	*$ 34*	*$ 166*	*$ 719*
2018	*$135*	*$ 34*	*$ 170*	*$ 888*
2019	*$138*	*$ 35*	*$ 172*	*$ 1,061*
2020	*$140*	*$ 35*	*$ 175*	*$ 1,236*
2021	*$137*	*$ 34*	*$ 171*	*$ 1,407*
2022	*$140*	*$ 35*	*$ 175*	*$ 1,581*
2023	*$142*	*$ 36*	*$ 177*	*$1,759*
2024	*$144*	*$ 36*	*$ 180*	*$ 1,939*
2025	*$145*	*$ 36*	*$ 182*	*$ 2,118*
2026	*$148*	*$ 38*	*$ 185*	*$ 2,294*
2027	*$151*	*$ 39*	*$ 190*	*$ 2,448*
2028	*$153*	*$ 41*	*$ 194*	*$ 2,562*
2029	*$156*	*$ 42*	*$ 198*	*$ 2,616*
2030	*$158*	*$ 43*	*$ 201*	*$ 2,595*

Table 10.2-2, page 156

This table has changed to update estimates of annualized operating cost savings, in keeping with the changes reported for section 5 and section 6.

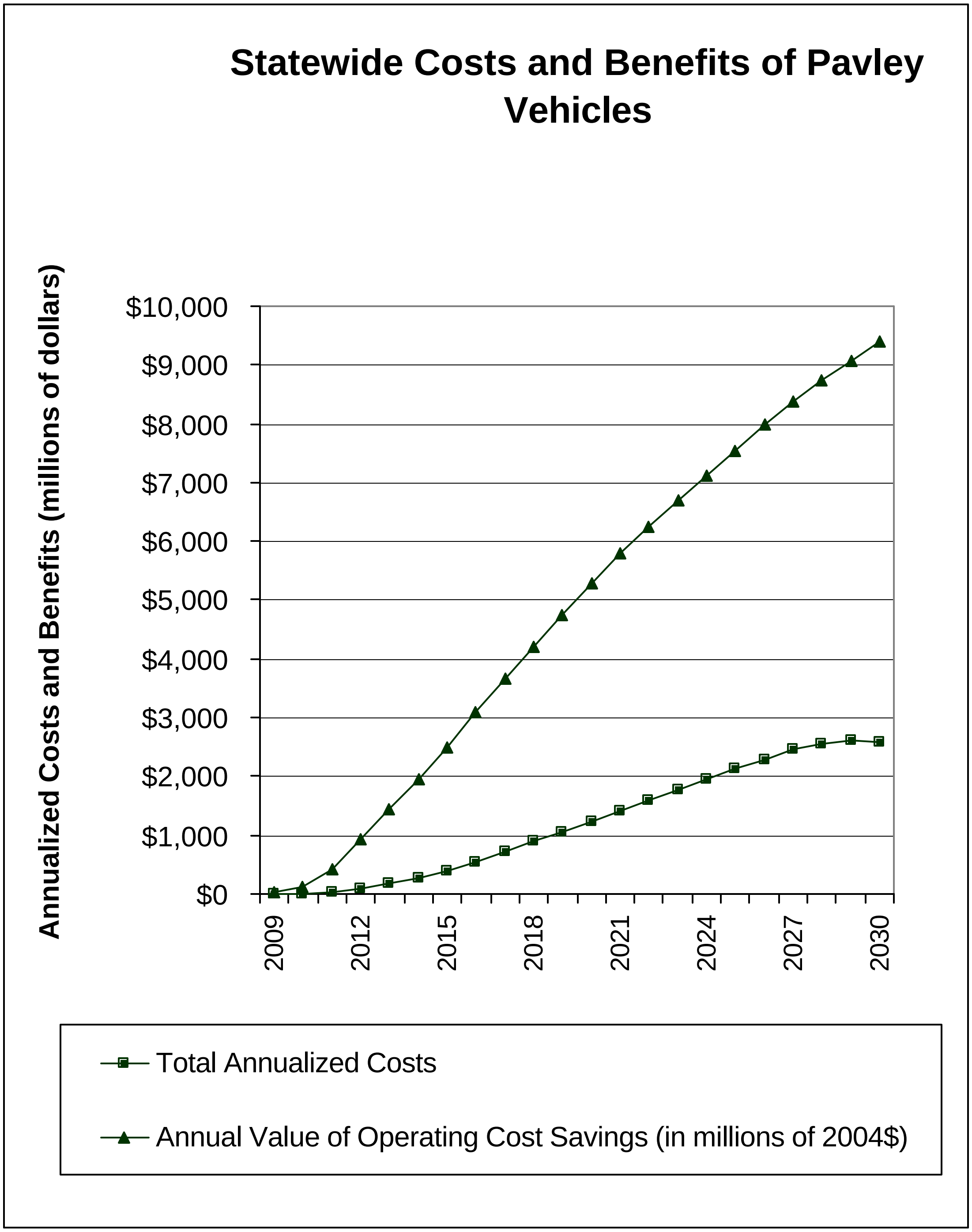
Revised Table 10.2-2. Estimates of Total Annual Value of New Vehicle Operating Cost Savings (millions of 2004 Dollars)

Model Year	Operating Cost Savings (millions of 2004$)	Saving to Cost Ratio
2009	*$ 31*	*10.3*
2010	*$ 131*	*10.6*
2011	*$ 423*	*9.5*
2012	*$ 927*	*9.6*
2013	*$1,427*	*8.4*
2014	*$1,938*	*7.4*
2015	*$2,493*	*6.4*
2016	*$3,084*	*5.6*
2017	*$3,660*	*5.1*
2018	*$4,217*	*4.7*
2019	*$4,756*	*4.5*
2020	*$5,278*	*4.3*
2021	*$5,795*	*4.1*
2022	*$6,259*	*4.0*
2023	*$6,705*	*3.8*
2024	*$7,129*	*3.7*
2025	*$7,529*	*3.6*
2026	*$7,996*	*3.5*
2027	*$8,374*	*3.4*
2028	*$8,733*	*3.4*
2029	*$9,073*	*3.5*
2030	*$9,394*	*3.6*

Figure 10-1, page 157

Figure 10-1 has changed to reflect new estimates of total annual statewide costs and benefits associated with the proposed climate change regulations. This figure reports the updated values provided above.

Revised Figure 10-1: Statewide Costs and Benefits of the Proposed Climate Change Regulations



Tables 10.2-3, 4 and 5 on pages 158-159

These tables have changed to reflect new estimates of economic impacts caused by changes in annual statewide cost and benefit estimates. In addition, the baseline prices were changed from 2003 dollars to 2004 dollars.

Revised Table 10.2-4. Economic Impacts of the Proposed Climate Change Regulations on the California Economy in Fiscal Year 2010 (2004$)

California Economy	Without Climate Change Regulations	With Climate Change Regulations	Difference	% of Total
Output (Billions)	$2,228.06	$2,228.02	- $0.04	- 0.002
Personal Income (Billions)	$1,451.01	*$1,451.18*	*+ $0.17*	+ 0.01
Employment (thousands)	16,354	16,357	+ 3	+ 0.02

Revised Table 10.2-4. Economic Impacts of the Proposed Climate Change Regulations on the California Economy in Fiscal Year 2020 (2004$)

California Economy	Without Climate Change Regulations	With Climate Change Regulations	Difference	% Total
Output (Billions)	$3,078.02	*$3,075.18*	*- $2.84*	*- 0.09*
Personal Income (Billions)	$2,009.54	*$2,014.30*	*+ $4.76*	*+ 0.2*
Employment (thousands)	18,661	*18,714*	*+ 53*	+ 0.3

Revised Table 10.2-5. Economic Impacts of the Proposed Climate Change Regulations on the California Economy in Fiscal Year 2030 (2004$)

California Economy	Without Climate Change Regulations	With Climate Change Regulations	Difference	% Total
Output (Billions)	$4,241.54	*$4,236.05*	*- $5.49*	- 0.1
Personal Income (Billions)	$2,781.44	*$2,788.76*	*+ $7.32*	+ 0.3
Employment (thousands)	21,763	*21,840*	*+ 77*	+ 0.4

Page 160, 2nd paragraph

Lower fuel consumption by the new complying vehicles would affect gasoline and vehicle sales tax revenues. Gasoline taxes include fixed state and federal excise taxes, and the state sales tax. If tax rates remain the same, staff estimates that gasoline excise and sales tax revenues will decline by about $36 million in 2010 compared to the no regulation scenario, of which about $8 million will be offset by increased sales taxes from higher priced vehicles. In 2020, fuel taxes would decline by $1.3 billion compared to a no regulation scenario, of which about *$200* million will be offset by increased vehicle sales tax revenues. Though not quantified, it is expected that a considerable percentage of the increase in personal income due to the proposed regulations would be expended on goods subject to local sales tax

Table 10.5-1, page 161

This table has changed to reflect changes associated with changes in average per vehicle cost of compliance and average operating cost benefits, as noted in section 5 and section 6.

Revised Table 10.5-1. Potential Impact on Monthly Loan Payment and Operating Savings for New Vehicles

Description	PC/LDT1	LDT2
Average Increase in New Car Price	*$1,064*	*$1,029*
Increase in Monthly Loan Payment	*$20.08*	*$19.42*
Monthly Operating Savings	*$23.46*	*$26.16*
Net Monthly Savings	***$3.38***	***$6.74***

7 REVISIONS TO SECTION 11

The revisions to the average cost of control reported in previous sections of this Addendum also affect the staff analysis of the impact of the staff proposal on minority and low income communities. This section provides updated text and tables as needed to describe the conforming revisions to Section 11 of the ISOR.

Table 11.4-1, page 169

This table has changed to reflect the noted changes in average per vehicle cost of compliance.

Revised Table 11.4-1. Potential Impacts of Proposed Regulation on Low-Income Households

Description	**PC/LDT1**	**LDT2**
Increase in New Vehicle Prices	*$1,064*	*$1,029*
Increase in Used Vehicle Prices	*$245*	*$329*
Median Remaining useful life (years)	8	11
Annualized Cost of Used Vehicle	*$46*	*$51*
Poverty Income Level	$15,000	$15,000
% Change	***0.3***	**0.3**

Table 11.4-2, page 170

This table has changed to reflect the noted changes in average per vehicle cost of compliance and operating cost benefits.

Revised Table11.4-2. Potential Impact on Monthly Loan Payment and Operating Cost Savings for Used Vehicles

Description	**PC/LDT1**	**LDT2**
Average Increase in Used Vehicle Price	*$245*	*$329*
Increase in Monthly Loan Payment	*$7.91*	*$10.62*
Monthly Operating Cost Savings	*$14.02*	*$15.21*
Net Monthly Savings	***$6.11***	***$4.59***

- Example baseline consumption based on 0.0348 gallons/mile for PC/LDT1 and 0.0495 gallons/mile for LTD2.

8 REVISIONS TO SECTION 12

The revisions to the average cost of control reported in previous sections of this Addendum also affect the staff discussion of other considerations. This section provides updated figures and tables, and text as needed, to describe conforming revisions to Section 12 of the ISOR and other minor cleanup revisions.

Table 12.1-1, page 173

This table has changed to report prices in year 2004 dollars, in order to be consistent with other tables in the ISOR. The calculation also uses a new deflator that is more accurate than the one used in the August 6, 2004 ISOR. The new deflator, 0.900, is the ratio of the year 2000 Consumer Price Index (CPI) from the California Department of Industrial Relations and the year 2004 CPI from the California Department of Finance. The old deflator was 0.896.

Revised-Table 12.1-1. Baseline Vehicle Prices Used for CARBITS Classes ($2004)

Cars:	Mini	Sub-compact	Compact	Midsize	Large	Luxury	Sport
2009	*$15,251*	*$17,133*	*$17,359*	*$22,620*	*$25,987*	*$49,261*	*$22,824*
2010	*$15,317*	*$17,133*	*$17,441*	*$22,701*	*$26,068*	*$49,342*	*$22,890*
2011	*$15,367*	*$17,133*	*$17,508*	*$22,762*	*$26,129*	*$49,403*	*$22,940*
2012	*$15,400*	*$17,133*	*$17,557*	*$22,802*	*$26,169*	*$49,443*	*$22,973*
2013	*$15,417*	*$17,133*	*$17,590*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2014	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2015	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2016	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2017	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2018	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2019	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*
2020	*$15,417*	*$17,133*	*$17,607*	*$22,822*	*$26,190*	*$49,464*	*$22,990*

Revised-Table 12.1-1. (Continued) Baseline Vehicle Prices Used for CARBITS Classes ($2004)

Trucks:	Small pickups	Large pickups	Minivans	Standard vans	Mid SUVs	Large SUVs	Mini SUVs
2009	*$14,940*	*$20,439*	*$27,072*	*$24,566*	*$29,481*	*$38,218*	*$19,961*
2010	*$15,021*	*$20,482*	*$27,139*	*$24,609*	*$29,563*	*$38,261*	*$20,043*
2011	*$15,082*	*$20,514*	*$27,189*	*$24,641*	*$29,623*	*$38,293*	*$20,103*
2012	*$15,123*	*$20,537*	*$27,223*	*$24,663*	*$29,664*	*$38,316*	*$20,144*
2013	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2014	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2015	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2016	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2017	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2018	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2019	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*
2020	*$15,143*	*$20,547*	*$27,240*	*$24,673*	*$29,684*	*$38,326*	*$20,164*

Table 12.1-2, page 174

This table has changed to report revised price increases calculated from the new values for technology cost and percent of vehicles equipped with near-term and mid-term technology packages, as outlined in section 6. The formula is still the same:

(Price increase) = (Percent of vehicles equipped with near-term) * (Near-term cost) + (Percent of vehicles equipped with mid-term) * (Mid-term cost).

The price increases have changed because the numbers on the right-hand side of the equation have changed. For the most part, the new price increases are larger than the ones in the ISOR. These changes affect the inputs to the CARBITS regulation scenario noticeably. Likewise, these changes drive the changes to the CARBITS output.

Revised-Table 12.1-2. Climate Change Regulation Scenario, Vehicle Price Changes 2009 – 2020 ($2004)

Cars:	Mini	Sub-compact	Compact	Midsize	Large	Luxury	Sport
2009	*$21*	*$21*	*$21*	*$10*	*$10*	*$10*	*$21*
2010	*$72*	*$72*	*$72*	*$33*	*$33*	*$33*	*$72*
2011	*$253*	*$253*	*$253*	*$118*	*$118*	*$118*	*$253*
2012	*$459*	*$459*	*$459*	*$214*	*$214*	*$214*	*$459*
2013	*$580*	*$580*	*$580*	*$379*	*$379*	*$379*	*$580*
2014	*$667*	*$667*	*$667*	*$513*	*$513*	*$513*	*$667*
2015	*$856*	*$856*	*$856*	*$804*	*$804*	*$804*	*$856*
2016	*$1,046*	*$1,046*	*$1,046*	*$1,098*	*$1,098*	*$1,098*	*$1,046*
2017	*$1,046*	*$1,046*	*$1,046*	*$1,098*	*$1,098*	*$1,098*	*$1,046*
2018	*$1,046*	*$1,046*	*$1,046*	*$1,098*	*$1,098*	*$1,098*	*$1,046*
2019	*$1,046*	*$1,046*	*$1,046*	*$1,098*	*$1,098*	*$1,098*	*$1,046*
2020	*$1,046*	*$1,046*	*$1,046*	*$1,098*	*$1,098*	*$1,098*	*$1,046*

Revised-Table 12.1-2. (Continued) Climate Change Regulation Scenario, Vehicle Price Changes 2009 – 2020 ($2004)

Trucks:	Small pickups	Large pickups	Minivans	Standard vans	Mid SUVs	Large SUVs	Mini SUVs
2009	*$9*	*$66*	*$51*	*$66*	*$9*	*$66*	*$52*
2010	*$22*	*$158*	*$122*	*$158*	*$22*	*$158*	*$124*
2011	*$46*	*$326*	*$253*	*$326*	*$46*	*$326*	*$258*
2012	*$71*	*$514*	*$399*	*$514*	*$71*	*$514*	*$407*
2013	*$218*	*$692*	*$543*	*$692*	*$218*	*$692*	*$514*
2014	*$363*	*$851*	*$673*	*$851*	*$363*	*$851*	*$608*
2015	*$584*	*$1,092*	*$871*	*$1,092*	*$584*	*$1,092*	*$749*
2016	*$808*	*$1,336*	*$1,070*	*$1,336*	*$808*	*$1,336*	*$891*
2017	*$808*	*$1,336*	*$1,070*	*$1,336*	*$808*	*$1,336*	*$891*
2018	*$808*	*$1,336*	*$1,070*	*$1,336*	*$808*	*$1,336*	*$891*
2019	*$808*	*$1,336*	*$1,070*	*$1,336*	*$808*	*$1,336*	*$891*
2020	*$808*	*$1,336*	*$1,070*	*$1,336*	*$808*	*$1,336*	*$891*

Table 12.1-3, page 175

This table has changed to report revised percentage changes in new vehicle price. These changes reflect the changes to new vehicle prices and price increases outlined in section 6.

Revised-Table 12.1-3. Climate Change Regulation Scenario, Percentage Change in Vehicle Price 2009 - 2020

Cars:	Mini	Sub-compact	Compact	Midsize	Large	Luxury	Sport
2009	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%
2010	*0.5%*	0.4%	0.4%	0.1%	0.1%	0.1%	0.3%
2011	1.6%	*1.5%*	1.4%	0.5%	*0.5%*	0.2%	1.1%
2012	*3.0%*	*2.7%*	*2.6%*	*0.9%*	*0.8%*	*0.4%*	*2.0%*
2013	*3.8%*	*3.4%*	*3.3%*	*1.7%*	*1.4%*	*0.8%*	*2.5%*
2014	*4.3%*	*3.9%*	*3.8%*	*2.2%*	*2.0%*	*1.0%*	*2.9%*
2015	*5.5%*	*5.0%*	*4.9%*	*3.5%*	*3.1%*	*1.6%*	*3.7%*
2016	*6.8%*	*6.1%*	*5.9%*	*4.8%*	*4.2%*	*2.2%*	*4.5%*
2017	*6.8%*	*6.1%*	*5.9%*	*4.8%*	*4.2%*	*2.2%*	*4.5%*
2018	*6.8%*	*6.1%*	*5.9%*	*4.8%*	*4.2%*	*2.2%*	*4.5%*
2019	*6.8%*	*6.1%*	*5.9%*	*4.8%*	*4.2%*	*2.2%*	*4.5%*
2020	*6.8%*	*6.1%*	*5.9%*	*4.8%*	*4.2%*	*2.2%*	*4.5%*

Revised-Table 12.1-3. (Continued) Climate Change Regulation Scenario, Percentage Change in Vehicle Price 2009 - 2020

Trucks:	Small pickups	Large pickups	Minivans	Standard vans	Mid SUVs	Large SUVs	Mini SUVs
2009	0.1%	0.3%	0.2%	*0.3%*	0.0%	0.2%	*0.3%*
2010	0.1%	0.8%	*0.5%*	0.6%	0.1%	0.4%	*0.6%*
2011	0.3%	1.6%	*0.9%*	*1.3%*	0.2%	0.9%	*1.3%*
2012	0.5%	2.5%	*1.5%*	2.1%	0.2%	*1.3%*	*2.0%*
2013	*1.4%*	*3.4%*	*2.0%*	*2.8%*	*0.7%*	*1.8%*	*2.6%*
2014	*2.4%*	*4.1%*	*2.5%*	*3.4%*	*1.2%*	*2.2%*	*3.0%*
2015	*3.9%*	*5.3%*	3.2%	*4.4%*	*2.0%*	*2.8%*	*3.7%*
2016	*5.3%*	*6.5%*	3.9%	*5.4%*	*2.7%*	*3.5%*	*4.4%*
2017	*5.3%*	*6.5%*	3.9%	*5.4%*	*2.7%*	*3.5%*	*4.4%*
2018	*5.3%*	*6.5%*	3.9%	*5.4%*	*2.7%*	*3.5%*	*4.4%*
2019	*5.3%*	*6.5%*	3.9%	*5.4%*	*2.7%*	*3.5%*	*4.4%*
2020	*5.3%*	*6.5%*	3.9%	*5.4%*	*2.7%*	*3.5%*	*4.4%*

Table 12.1-4 on page 176

This table has changed to report revised percentage reduction in fuel-related operating cost. The numbers change for two reasons. The main reason is the changes to the percentage of vehicles equipped with near-term and mid-term technology packages, as outlined in section 6. Secondly, the revision assumes that Mini SUVs resemble small cars rather than small trucks. For the most part, the revised reductions are greater than in the August 6, 2004 ISOR. These reductions have a modest effect on the vehicle attributes in the CARBITS regulation scenario. This mitigates, to some extent, the consumer response to the price increase, as seen in the CARBITS regulation scenario results.

Revised-Table 12.1-4. Climate Change Regulation Scenario, Percentage Reduction in Fuel-related Operating Cost 2009 - 2020

Cars:	Mini	Sub-compact	Compact	Midsize	Large	Luxury	Sport
2009	*1.1%*	*1.1%*	*1.1%*	*0.9%*	*0.9%*	*1.0%*	*1.1%*
2010	*3.6%*	*3.6%*	*3.6%*	*3.2%*	*3.2%*	*3.2%*	*3.6%*
2011	*11.6%*	*11.6%*	*11.6%*	*10.4%*	*10.4%*	*10.4%*	*11.7%*
2012	*19.3%*	*19.3%*	*19.3%*	*17.4%*	*17.4%*	*17.4%*	*19.3%*
2013	*20.8%*	*20.8%*	*20.8%*	*19.7%*	*19.7%*	*19.7%*	*20.8%*
2014	*21.6%*	*21.5%*	*21.6%*	*21.0%*	*21.0%*	*21.0%*	*21.6%*
2015	*23.1%*	*23.0%*	*23.1%*	*23.8%*	*23.8%*	*23.8%*	*23.0%*
2016	*24.5%*	*24.5%*	*24.5%*	*26.5%*	*26.5%*	*26.4%*	*24.5%*
2017	*24.5%*	*24.5%*	*24.5%*	*26.5%*	*26.5%*	*26.4%*	*24.5%*
2018	*24.5%*	*24.5%*	*24.5%*	*26.5%*	*26.5%*	*26.4%*	*24.5%*
2019	*24.5%*	*24.5%*	*24.5%*	*26.5%*	*26.5%*	*26.4%*	*24.5%*
2020	*24.5%*	*24.5%*	*24.5%*	*26.5%*	*26.5%*	*26.4%*	*24.5%*

Revised-Table 12.1-4 (Continued) Climate Change Regulation Scenario, Percentage Reduction in Fuel-related Operating Cost 2009 - 2020

Trucks:	Small pickups	Large pickups	Minivans	Standard vans	Mid SUVs	Large SUVs	Mini SUVs
2009	*2.4%*	*1.7%*	*2.1%*	*1.7%*	*2.4%*	*1.7%*	*2.6%*
2010	*5.6%*	*4.0%*	*4.9%*	*4.0%*	*5.6%*	*4.0%*	*6.1%*
2011	*11.0%*	*7.9%*	*9.7%*	*7.9%*	*11.0%*	*7.9%*	*11.8%*
2012	*16.3%*	*11.9%*	*14.5%*	*11.9%*	*16.3%*	*11.9%*	*17.5%*
2013	*17.6%*	*13.5%*	*15.7%*	*13.5%*	*17.6%*	*13.5%*	*19.1%*
2014	*18.3%*	*14.7%*	*16.5%*	*14.7%*	*18.3%*	*14.6%*	*20.1%*
2015	*19.4%*	*16.3%*	*17.5%*	*16.3%*	*19.4%*	*16.3%*	*21.5%*
2016	*20.5%*	*17.9%*	*18.6%*	*17.9%*	*20.5%*	*17.9%*	*23.0%*
2017	*20.5%*	*17.9%*	*18.6%*	*17.9%*	*20.5%*	*17.9%*	*23.0%*
2018	*20.5%*	*17.9%*	*18.6%*	*17.9%*	*20.5%*	*17.9%*	*23.0%*
2019	*20.5%*	*17.9%*	*18.6%*	*17.9%*	*20.5%*	*17.9%*	*23.0%*
2020	*20.5%*	*17.9%*	*18.6%*	*17.9%*	*20.5%*	*17.9%*	*23.0%*

Table 12.1-5, page 177

This table has changed to report revised operating cost savings. The numbers change for two reasons. The main reason is that they are based on a price of $1.74 per gallon of gasoline, which is a price in year 2004 dollars. The previous calculation used the same price in year 2003 dollars. The second reason is that the percentage reductions in fuel-related cost have changed modestly, in keeping with the revisions shown in section 5 and section 6. These revisions show an increase in the operating cost savings.

Revised-12.1-5. Operating Cost Savings, Cents Per Mile

Cars:	Mini	Sub-compact	Compact	Midsize	Large	Luxury	Sport
2009	*0.1*	*0.1*	0.1	0.1	0.1	0.1	0.1
2010	0.2	0.2	0.2	0.2	0.2	0.2	*0.3*
2011	*0.6*	*0.6*	0.6	*0.7*	0.7	0.7	0.8
2012	*1.0*	*1.0*	*1.1*	*1.1*	*1.2*	*1.2*	*1.4*
2013	*1.0*	*1.0*	*1.2*	*1.2*	*1.4*	*1.4*	*1.5*
2014	*1.1*	*1.1*	*1.2*	*1.3*	*1.5*	*1.5*	*1.5*
2015	*1.1*	*1.1*	*1.3*	*1.5*	*1.7*	*1.7*	*1.6*
2016	*1.2*	*1.2*	*1.4*	*1.7*	*1.9*	*1.9*	*1.7*
2017	*1.2*	*1.2*	*1.4*	*1.7*	*1.9*	*1.9*	*1.7*
2018	*1.2*	*1.2*	*1.4*	*1.7*	*1.9*	*1.9*	*1.7*
2019	*1.2*	*1.2*	*1.4*	*1.7*	*1.9*	*1.9*	*1.7*
2020	*1.2*	*1.2*	*1.4*	*1.7*	*1.9*	*1.9*	*1.7*

Revised-Table 12.1-5. (Continued) Operating Cost Savings, Cents Per Mile

Trucks:	Small pickups	Large pickups	Minivans	Standard vans	Mid SUVs	Large SUVs	Mini SUVs
2009	*0.2*	*0.2*	0.2	0.2	0.2	0.2	*0.2*
2010	*0.4*	0.3	0.4	0.4	0.5	0.4	0.4
2011	0.7	0.7	0.8	0.8	0.9	0.8	*0.8*
2012	1.0	1.0	1.1	1.2	1.3	1.2	*1.1*
2013	1.1	*1.2*	1.2	*1.4*	1.4	*1.4*	*1.2*
2014	*1.2*	*1.3*	*1.3*	*1.5*	*1.5*	*1.5*	*1.3*
2015	1.2	*1.4*	*1.4*	*1.6*	*1.6*	*1.7*	*1.4*
2016	*1.3*	*1.6*	*1.5*	*1.8*	*1.7*	*1.8*	*1.5*
2017	*1.3*	*1.6*	*1.5*	*1.8*	*1.7*	*1.8*	*1.5*
2018	*1.3*	*1.6*	*1.5*	*1.8*	*1.7*	*1.8*	*1.5*
2019	*1.3*	*1.6*	*1.5*	*1.8*	*1.7*	*1.8*	*1.5*
2020	*1.3*	*1.6*	*1.5*	*1.8*	*1.7*	*1.8*	*1.5*

Table 12.1-6, page 178

This table has changed to report revised CARBITS results. They have changed because the CARBITS scenario has changed. The scenario output is different because the input is different, specifically the price increases and the reductions to fuel operating cost, in keeping with the revised results reported in section 5 and section 6. Compared to the August 6, 2004 ISOR, the revision shows the regulation fleet as slightly smaller and older, with fewer sales. This is due mainly to the higher price increases for the mid-term technologies.

Revised-Table 12.1-6. Results of Baseline and Climate Change Regulation Scenarios

Year	Baseline Scenario			Regulation Scenario		
	Vehicle Sales (x1000)	Fleet Size (x1000)	Average Age (years)	Vehicle Sales (x1000)	Fleet Size (x1000)	Average Age (years)
2009	*1,685*	*26,845*	9.17	1,689	26,845	9.17
2010	*1,709*	*27,582*	*9.27*	1,717	27,582	9.27
2011	1,728	*28,280*	*9.37*	1,745	*28,280*	9.36
2012	*1,755*	*29,134*	*9.47*	*1,777*	*29,128*	9.45
2013	1,775	*29,827*	*9.58*	*1,778*	*29,813*	9.56
2014	*1,803*	*30,719*	9.71	*1,791*	*30,703*	9.68
2015	*1,848*	*31,783*	9.84	*1,809*	*31,762*	*9.82*
2016	*1,876*	*32,635*	9.95	*1,808*	*32,612*	*9.96*
2017	*1,924*	*33,644*	*10.06*	*1,847*	*33,616*	*10.08*
2018	*1,964*	*34,729*	10.16	*1,879*	*34,687*	*10.21*
2019	*2,001*	*35,603*	10.25	*1,912*	*35,543*	*10.32*
2020	2,049	*36,686*	10.34	*1,952*	*36,613*	*10.43*

Table 12.1-7 on page 178

This table has changed to report revised CARBITS results. They have changed because the CARBITS scenario has changed, in keeping with the revised results reported in section 5 and section 6. Compared to the August 6, 2004 ISOR, the revision shows the regulation fleet as slightly smaller and older, with fewer sales.

Revised-Table 12.1-7. Climate Change Regulation Impacts on Vehicle Sales, Fleet Size, and Fleet Age

Years	Changes in Sales		Changes in Fleet Size		Changes in Average Age (years)
	In Thousands	Percent Change	In Thousands	Percent Change	
2009	4	0.2%	0	0.0%	0.00
2010	8	0.5%	0	0.0%	0.00
2011	17	1.0%	0	0.0%	-0.01
2012	22	1.3%	-7	0.0%	-0.02
2013	3	0.2%	-14	0.0%	-0.02
2014	-12	-0.7%	-16	-0.1%	-0.03
2015	-39	-2.1%	-21	-0.1%	-0.02
2016	-68	-3.6%	-23	-0.1%	0.00
2017	-77	-4.0%	-28	-0.1%	0.02
2018	-86	-4.4%	-43	-0.1%	0.05
2019	-89	-4.4%	-61	-0.2%	0.07
2020	-97	-4.7%	-73	-0.2%	0.09

Table 12.1-8, page 180

This table has changed to report revised EMFAC results for ROG. They changed because the CARBITS scenario changed, in keeping with the revised results reported in section 5 and section 6. The changes result in slightly higher estimated criteria pollutant emissions. This is due to the increased consumer response to the higher-priced mid-term technology, which reduces scrappage of old vehicles. The net change in ROG indicates a slight increase. This supplemental analysis now estimates a ROG increase of 1.52 tons per day in 2020. This is less than 1 percent of the total ROG emissions from passenger vehicles.

Revised-Table 12.1-8. Climate Change Regulation Consumer Response, Changes in ROG Emissions (tons/day)

Year	Vintages	Baseline ROG (tpd)	Regulation ROG (tpd)	Difference (tpd)
2020	1975-2008	197.70	199.15	1.45
2020	2009-2020	33.26	33.33	0.07
2020	Total	230.96	232.48	1.52

Table 12.1-9, page 180

This table has changed to report revised EMFAC results for NOx. They changed for the same reason that the ROG emissions changed. This supplemental analysis now estimates a NOx increase of 0.95 tons per day in 2020. This is half of one percent of the total NOx emissions from passenger vehicles.

Revised-Table 12.1-9. Climate Change Regulation Consumer Response, Changes in NOx Emissions (tons/day)

Year	Vintages	Baseline NOx (tpd)	Regulation NOx (tpd)	Difference (tpd)
2020	1975-2008	157.24	*158.33*	*1.09*
2020	2009-2020	32.96	*32.82*	*-0.14*
2020	Total	190.20	*191.15*	*0.95*

Table 12.1-10, page 180

This table has changed to report revised EMFAC results for PM10. They changed for the same reason that the ROG and NOx emissions changed. For 2009-2020 vehicles, this supplemental analysis predicts a reduction in PM10, because there are fewer of these vehicles in the regulation scenario, due to consumer response. Likewise, there are a greater number of pre-2009 vehicles, so the impact of the regulation is an increase in PM10. Per-vehicle PM10 emissions are about the same for all model years. This supplemental analysis now estimates a PM10 decrease of 0.04 tons per day.

Revised-Table 12.1-10. Climate Change Regulation Consumer Response, Changes in PM10 Emissions (tons/day)

Year	Vintages	Baseline PM10 (tpd)	Regulation PM10 (tpd)	Difference (tpd)
2020	1975-2008	17.23	*17.31*	*0.08*
2020	2009-2020	25.52	*25.40*	*-0.12*
2020	Total	42.75	*42.71*	*-0.04*

Page 180, paragraph 1

As can be seen from the tables, the regulation is predicted to slightly increase criteria pollutant emissions in 2020, but only by a very small amount. In considering and interpreting these results, staff believes that the increase in vehicle sales in the early years of the regulation results in a small increase in ROG from vintage 2009-2020 vehicles, because ROG emissions per vehicle are declining during this period. That is, the reduction in ROG from decreased sales of clean vintage 2014-2020 vehicles is more than offset by the increase in ROG from increased sales of vintage 2009-2013 vehicles. The per-vehicle NOx and PM10 emissions stay about the same over the period 2009-2020, so the net decrease in sales results in a net decrease in NOx and PM10 emissions for vintages 2009-2020. In addition, by 2020 consumer response has resulted in reduced scrappage of pre-2009 vehicles, which are less clean than the 2009-2020 vehicles, so emissions of all pollutants goes up for the older vehicles. This results in slightly higher fleet emissions for ROG and NOx. The fleet PM10 emissions drop slightly because per-vehicle PM10 emissions are approximately the same for all vintages, but the fleet size as a whole shrinks slightly. The net effect is a very small effect on emissions and air quality.

Table 12.2-1, page 181

This table has changed to report revised elasticity for CARBITS. The revised elasticity is based on a 5 percent price increase starting in 2009 rather than in 2000.

Revised Table 12.2-1. Estimated Price Elasticity of Demand for Automobiles

Estimator	Price Elasticity of Demand	Source
CARBITS	*-1.8*	ITS, UCD
NERA/Sierra	-1.0	GM Study of ZEV Mandate, Volume II
Mackinac	-1.2 to -1.5 (short-run) -0.2 (Long-run)	The Mackinac Center for Public Policy, Michigan
Patrick McCarty	-0.87	MIT Press, 1996
David Greene	-1.0	Kleit, Andrew 1990
Range	-0.2 to -1.5	

Table 12.2-2, page 181

This table has changed to report revised percentage changes in new vehicle price, in keeping with the changes reported in section 5 and section 6.

Revised-Table 12.2-2. Percentage Price and Sales Changes by Vehicle Class

Vehicle Type	Change in Price	Change in Sales
Passenger Cars (All)	*5.6*	*-5.6*
Trucks (0-3750 lb. Loaded Vehicle Weight)	*5.1*	*-5.1*
Trucks (3751-5750 lb. Loaded Vehicle Weight)	*4.3*	*-4.3*
Trucks (5751 lb. Loaded Vehicle Weight-8500 lb. GVWR	*5.1*	*-5.1*

Table 12.4-1, page 189

Table 12.4-1 and the paragraph of text that precedes it have been changed to conform to revised results reported in other sections, as follows:

The combined impact is primarily driven by the reduction in fuel cycle emissions. Table 12.4-1 below shows the combined changes in terms of tons per day, and also in terms of the percent change from baseline emissions from the regulated light duty fleet. As the table shows, looking at the combined effect of all possible mechanisms that would impact fleetwide emissions, ROG plus NOx emissions are expected to decrease by a combined total of approximately *3.2* tons per day. PM 10 emissions would *decrease* by approximately *0.6* tons per day.

Revised Table 12.4-1. Estimated Emissions Impact of Rebound Effect, Fleet Turnover and Fuel Cycle Benefits, Calendar Year 2020 Criteria Pollutant tons Per Day

	ROG	NOx	PM10
Baseline Emissions	231	187	43
Combined Impact, Method 1			
Rebound Effect	-0.25	0.58	0.27
(July EMFAC Analysis with UC Irvine methodology)			
Fleet Turnover Changes	*1.52*	*0.95*	*-0.04*
(September EMFAC Analysis with CARBITS inputs)			
Fuel Cycle Changes	*-4.6*	*-1.4*	*-0.8*
(TIAX estimates)			
Combined Impacts (additive)	*-3.33*	*0.13*	*-0.57*
Percent change (additive)	*-1.44%*	*0.07%*	*-1.33%*
Combined Impact, Method 2			
Fleet Turnover and Rebound Changes	*1.61*	*1.17*	*0.2*
(One EMFAC run)			
Fuel Cycle Changes	*-4.6*	*-1.4*	*-0.8*
Combined Impact (using EMFAC run)	*-3.0*	*-0.2*	*-0.6*
Percent change (using EMFAC run)	*-1.30%*	*-0.12%*	*-1.40%*

Page 193, 3rd paragraph

The affiliated business may experience some sales reduction because of vehicle price increases due to the proposed regulation. For purposes of this analysis staff used a price increase of *$1000* for 2016 and thereafter. This corresponds to roughly the average of the fully phased in estimated cost increases for PC/LDT1 and LDT 2 vehicles. This increase represents about *4* percent increase on an average new vehicle price of $25,000, which would reduce sales by *4* percent assuming a price elasticity of -1.0. Staff chose the elasticity from literature reviews. Further assumptions were made that new vehicles have 6 percent market penetration rate per year based on vehicle expected life of 16 years, and their operating cost declines by 25 percent. Because vehicle prices would increase, and people tend to maintain their cars more often in an attempt to retain the value of their car, staff assumed that the revenues of some of the affiliated business would increase such that the demand for automotive services and repairs increases by one percent.

Page 195, 2nd paragraph

Staff believes that the numbers of jobs created by these unaffiliated businesses will significantly exceed the number of new jobs foregone at service stations. San Diego County has a population of 3,017,200 (8.3 percent of the state) according to California Department of Finance. To estimate the job gains in communities in San Diego, the *53,000* increase in statewide jobs from the regulation in 2020, as estimated in section 10, can be apportioned to San Diego based on population. The communities have a population of about 2 million, or two-thirds of the total. Apportioning the total to these communities would mean a gain of about *2,950* jobs. This more than outweighs the reduction of 460 in these communities and results in a net increase of *slightly less* than 2,500 new jobs because of the proposed climate change regulation.

Table 12.6-4, page 196

This table has changed to reflect changes in the estimated number of jobs created and reduced, in keeping with the revised estimates presented in section 5 and section 6.

Revised Table 12.6-4. Net Impact of the Proposed Regulations on Jobs and Affiliated Businesses In San Diego Communities

Industry	Number of Jobs Relative to No Regulation)	Business Creation (Elimination) Relative to No Regulation
Service stations	(491)	(72)
Automotive dealers	0	0
Automobile transmission repair shops	3	1
Automotive repair shops	14	3
Automotive services	14	3
Impact on affiliated businesses	(460)	(65)
Impact on other businesses	*2,950*	*562*
Net Impact	***2,490***	***497***

Table 12.7-1, page 198

This table has been modified to reflect changes due to the revised average cost of control, as reported in section 6.

Revised Table 12.7-1. Effect of Increased Fuel Price on Economic Impacts

Variable		Value	
		@ $1.74 per gallon	@$2.30 per gallon
Individual Consumer:			
	Net Monthly Savings, New Vehicle*	$3.38 to $6.74	$10.93 to $15.16
	Net Monthly Savings, Used Vehicle**	$4.59 to $6.11	$9.49 to $10.62
California Economy, 2020			
	Annualized Savings	$5.3 billion	$7.0 billion
	Change in Output	-$2.8 billion	-$3.7 billion
	Change in Personal Income	+$4.8 billion	+$6.5 billion
	Change in Jobs	+53,000	+72,000

*Loan Payment (5 year loan) minus Operating Cost Savings
**Loan Payment (3 year loan) minus Operating Cost Savings

APPENDIX A: ADDITIONAL REVISED COST TABLES AND FIGURES

Revised Table 5.3-2. Estimated Incremental Costs for Carbon Dioxide Reduction Technologies for Small Car Relative to 2009 Baseline

Small Car	Combined Technology Packages	Technology cost ($)	Retail Price Equivalent ($)
Near Term 2009-2012	DCP,EPS,A4,ImpAlt	31	43
	DCP,CVT,EPS,ImpAlt	181	253
	DVVLd,A5 (2009 baseline)	0	0
	DCP,A6	27	38
	DCP,A5,EPS,ImpAlt	127	178
	DVVL,DCP,AMT,EPS,ImpAlt	106	*148*
	GDI-S,DCP,Turbo,AMT,EPS,ImpAlt	580	812
Mid Term 2013-2015	gHCCI,DVVLi,AMT,EPS,ImpAlt	255	357
	gHCCI,DVVL,ICP,AMT,ISG,EPS,eACC	1042	1459
	CVVL,DCP,AMT,ISG-SS,EPS,ImpAlt	*510*	*714*
Long Term 2015-	ModHEV	1599	2238
	dHCCI,AMT,ISG,EPS,eACC	*1962*	*2747*
	AdvHEV	2644	3701
	HSDI,AdvHEV	4109	5752

Revised Table 5.3-3. Estimated Incremental Costs for Carbon Dioxide Reduction Technologies for Large Car Relative to 2009 Baseline

Large Car	Combined Technology Packages	Technology cost ($)	Retail Price Equivalent ($)
Near Term 2009-2012	DCP,A6	37	52
	DCP,CVT,EPS,ImpAlt	201	282
	DVVL,DCP,A6 (2009 baseline)	0	0
	CVVL,DCP,A6	*312*	*437*
	DCP,DeAct,A6	168	235
	DCP,Turbo,A6,EPS,ImpAlt	(115)	(161)
	CVVL,DCP,AMT,EPS,ImpAlt	319	447
	GDI-S,DeAct,DCP,AMT,EPS,ImpAlt	*360*	*504*
	GDI-S,DCP,Turbo,AMT,EPS,ImpAlt	*(41)*	*(57)*
Mid Term 2013-2015	gHCCI,DVVL,ICP,AMT,EPS,ImpAlt	324	454
	DeAct,DVVL,CCP,A6,ISG,EPS,eACC	1037	1452
	ehCVA,AMT,EPS,ImpAlt	359	503
	ehCVA,GDI-S,AMT,EPS,ImpAlt	*544*	*762*
	gHCCI,DVVL,ICP,AMT,ISG,EPS,eACC	1125	1575
	GDI-S,Turbo,DCP,A6,ISG,EPS,eACC	*821*	*1149*
Long Term 2015-	dHCCI,AMT,42V,EPS,eACC	*1240*	*1736*
	ModHEV	*951*	*1331*
	AdvHEV	*2223*	*3112*
	HSDI,AdvHEV	3763	5268

Revised Table 5.3-4. Estimated Incremental Costs for Carbon Dioxide Reduction Technologies for Minivan Relative to 2009 Baseline

Minivan	Combined Technology Packages	Technology cost ($)	Retail Price Equivalent ($)
Near Term 2009-2012	DVVL,CCP,A5 (2009 baseline)	0	0
	DCP,A6	254	355
	GDI-S,CCP,DeAct,AMT,EPS,ImpAlt	*321*	*449*
	DVVL,CCP,AMT,EPS,ImpAlt	116	163
	CCP,AMT,Turbo,EPS,ImpAlt	7	10
	DeAct,DVVL,CCP,AMT,EPS,ImpAlt	*199*	*279*
	CVVL,CCP,AMT,EPS,ImpAlt	497	696
	GDI-S,DCP,Turbo,AMT,EPS,ImpAlt	*176*	*246*
Mid Term 2013-2015	GDI-S,CCP,AMT,ISG,DeAct,EPS,eACC	*1136*	*1590*
	ehCVA,GDI-S,AMT,EPS,ImpAlt	785	1099
Long Term 2015-	ModHEV	1418	1985
	AdvHEV	2778	3889
	dHCCI,AMT,EPS,ImpAlt	*882*	*1235*

Revised Table 5.3-5. Estimated Incremental Costs for Carbon Dioxide Reduction Technologies for Small Truck Relative to 2009 Baseline

Small Truck	Combined Technology Packages	Technology cost ($)	Retail Price Equivalent ($)
Near Term 2009-2012	DCP,A6	37	52
	DVVL,DCP,A6 (2009 baseline)	0	0
	DCP,A6,Turbo,EPS,ImpAlt	(115)	(161)
	DCP,A6,DeAct	*164*	*230*
	GDI-S,DCP,Turbo,AMT,EPS,ImpAlt, DCP-DS	(55)	(77)
	DeAct,DVVL,CCP,AMT,EPS,ImpAlt	*175*	*245*
	GDI-S,DCP,DeAct,AMT,EPS,ImpAlt	296	*484*
Mid Term 2013-2015	DeAct,DVVL,CCP,A6,ISG,EPS, eACC	*1051*	*1471*
	ehCVA,GDI-S,AMT,EPS,ImpAlt	530	742
	HSDI,AMT,EPS,ImpAlt	815	1141
Long Term 2015-	ModHEV	*951*	*1331*
	AdvHEV	*2276*	*3186*
	dHCCI,AMT,EPS,ImpAlt	*425*	*595*

Revised Table 5.3-6. Estimated Incremental Costs for Carbon Dioxide Reduction Technologies for Large Truck Relative to 2009 Baseline

Large Truck	Combined Technology Packages	Technology cost ($)	Retail Price Equivalent ($)
Near Term 2009-2012	CCP,A6 (2009 baseline)	0	0
	DVVL,DCP,A6	302	423
	CCP,DeAct,A6	*303*	*424*
	DCP,DeAct,A6	*564*	*789*
	DeAct,DVVL,CCP,A6,EHPS,ImpAlt	474	663
	DeAct,DVVL,CCP,AMT,EHPS,ImpAlt	394	551
Mid Term 2013-2015	CCP,DeAct,GDI-S, AMT,EHPS,ImpAlt	*551*	*771*
	DeAct,DVVL,CCP,A6,ISG,EPS, eACC	*1257*	*1760*
	ehCVA,GDI-S,AMT,EHPS,ImpAlt	*1131*	*1583*
Long Term 2015-	GDI-L,AMT,EHPS,ImpAlt	953	1334
	dHCCI,AMT,ISG,EPS,eACC	*2082*	*2915*
	ModHEV	1789	2504
	AdvHEV	*3704*	*5185*
	HSDI,AdvHEV	5884	8237
	GDI-L,AMT,42V,EPS,ImpAlt	1722	2411

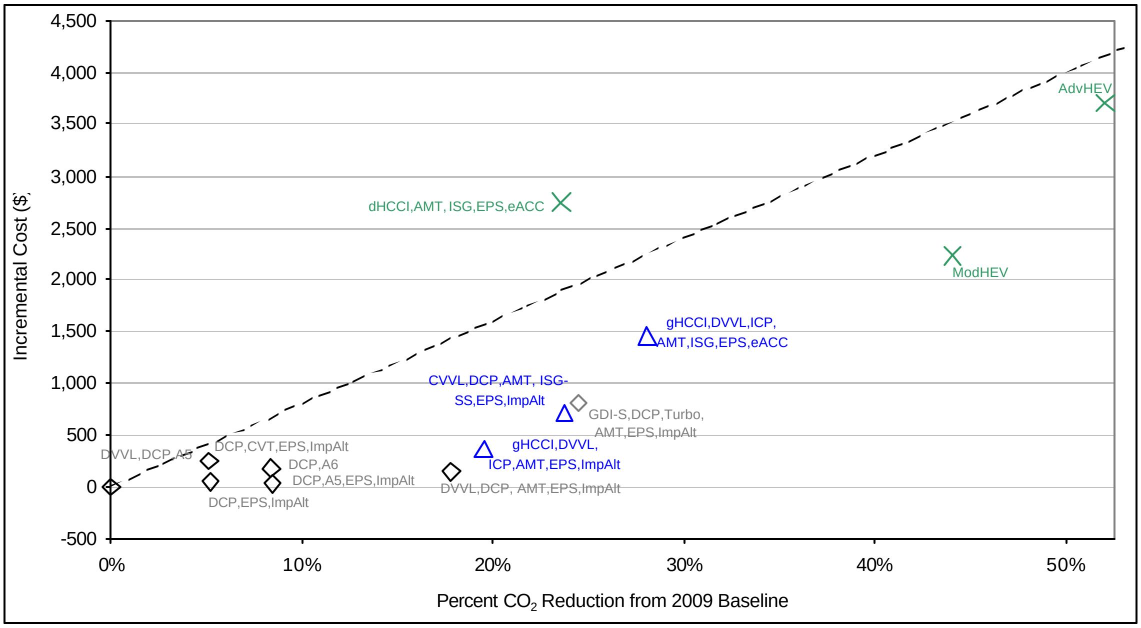
Revised Table 5.3-8 Summary of Incremental Cost Parameters for Climate Change Emission Reduction Engine, Drivetrain, and Hybrid-Electric Vehicle Technologies

Vehicle Class	Combined Technology Packages	Technology readiness	CO2 emissions (g/mi)	CO2 change from 2002 baseline	Lifetime CO2 reduced from 2002 baseline (ton)	CO2 change from 2009 baseline	Lifetime CO2 reduced from 2009 baseline (ton)	Retail cost incremental (2004$)	Cost incremental from 2009 baseline (2004$)	Lifetime Net Present Value (2004$)	Payback period (yr)
Small car	DVVL,DCP,A5	Near-term	285	-2.6%	1.7	0.0%	0.0	308	0	0	0
	DCP,A6	Near-term	260	-11.0%	7.1	-8.6%	5.5	346	38	641	1
	DCP,EPS,ImpAlt	Near-term	269	-7.8%	5.1	-5.4%	3.4	351	43	383	1
	DCP,A5,EPS,ImpAlt	Near-term	260	-10.9%	7.1	-8.5%	5.4	486	178	494	3
	DCP,CVT,EPS,ImpAlt	Near-term	269	-7.8%	5.1	-5.4%	3.4	561	253	169	8
	DVVL,DCP, AMT,EPS,ImpAlt	Near-term	233	-20.1%	13.1	-18.0%	11.4	456	148	1,269	1
	gHCCI,DVVL, ICP,AMT,EPS,ImpAlt	Mid-term	229	-21.8%	14.1	-19.7%	12.5	665	357	1,193	3
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	Near-term	215	-26.5%	17.3	-24.6%	15.6	1,120	812	1,125	5
	gHCCI,DVVL,ICP, AMT,ISG,EPS,eACC	Mid-term	204	-30.1%	19.6	-28.3%	17.9	1,767	1,459	765	8
	ModHEV	Long-term	159	-45.6%	29.6	-44.2%	28.0	2,546	2,238	1,238	8
	dHCCI,AMT, ISG,EPS,eACC	Long-term	224	-23.4%	15.2	-21.4%	13.6	3,055	2,747	-320	>16
	AdvHEV	Long-term	136	-53.4%	34.7	-52.2%	33.0	4,009	3,701	405	14
	HSDI,AdvHEV	Long-term	133	-54.4%	35.4	-53.2%	33.7	6,060	5,752	-1,122	>16
	CVVL,DCP,AMT, ISG-SS,EPS,ImpAlt	Mid-term	216	-25.9%	16.8	-24.0%	15.2	1,022	714	1,171	4
Large car	DVVL,DCP,A6	Near-term	323	-6.6%	5.1	0.0%	0.0	427	0	0	0
	DCP,DeAct,A6	Near-term	286	-17.1%	13.1	-11.2%	8.1	662	235	768	3
	CVVL,DCP,A6	Near-term	290	-16.1%	12.4	-10.2%	7.3	864	437	474	6
	DCP,A6	Near-term	304	-12.1%	9.3	-5.9%	4.2	479	52	471	1
	DCP,Turbo,A6,EPS,ImpAlt	Near-term	279	-19.3%	14.9	-13.7%	9.8	266	-161	1,380	0
	CVVL,DCP,AMT,EPS,ImpAlt	Near-term	265	-23.4%	18.0	-18.0%	12.9	874	447	1,157	3
	gHCCI,DVVL, ICP,AMT,EPS,ImpAlt	Mid-term	272	-21.2%	16.3	-15.7%	11.3	881	454	944	4
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	Near-term	251	-27.4%	21.0	-22.3%	16.0	370	-57	2,044	0
	DCP,CVT,EPS,ImpAlt	Near-term	303	-12.3%	9.5	-6.2%	4.4	709	282	269	6
	GDI-S,Turbo,DCP, A6,ISG,EPS,eACC	Mid-term	224	-35.3%	27.1	-30.7%	22.0	1,576	1,149	1,591	5
	DeAct,DVVL,CCP, A6,ISG,EPS,eACC	Mid-term	259	-24.9%	19.1	-19.6%	14.1	1,879	1,452	297	12
	gHCCI,DVVL,ICP, AMT,ISG,EPS,eACC	Mid-term	231	-33.1%	25.4	-28.4%	20.4	2,002	1,575	956	8
	dHCCI,AMT,ISG, EPS,eACC	Long-term	247	-28.6%	22.0	-23.5%	16.9	2,163	1,736	1,182	7
	ModHEV	Long-term	188	-45.5%	35.0	-41.7%	29.9	1,758	1,331	2,386	4
	AdvHEV	Long-term	161	-53.4%	41.0	-50.1%	36.0	3,539	3,112	1,358	9
	HSDI,AdvHEV	Long-term	161	-53.4%	41.0	-50.1%	36.0	5,695	5,268	-266	>16
	GDI-S,DeAct,DCP, AMT,EPS,ImpAlt	Near-term	265	-23.4%	18.0	-18.0%	12.9	931	504	1,103	4
	CVAeh,AMT,EPS,ImpAlt	Mid-term	250	-27.5%	21.2	-22.4%	16.1	930	503	1,498	3
	CVAeh,GDI-S, AMT,EPS,ImpAlt	Mid-term	242	-30.0%	23.1	-25.1%	18.0	1,189	762	1,477	4

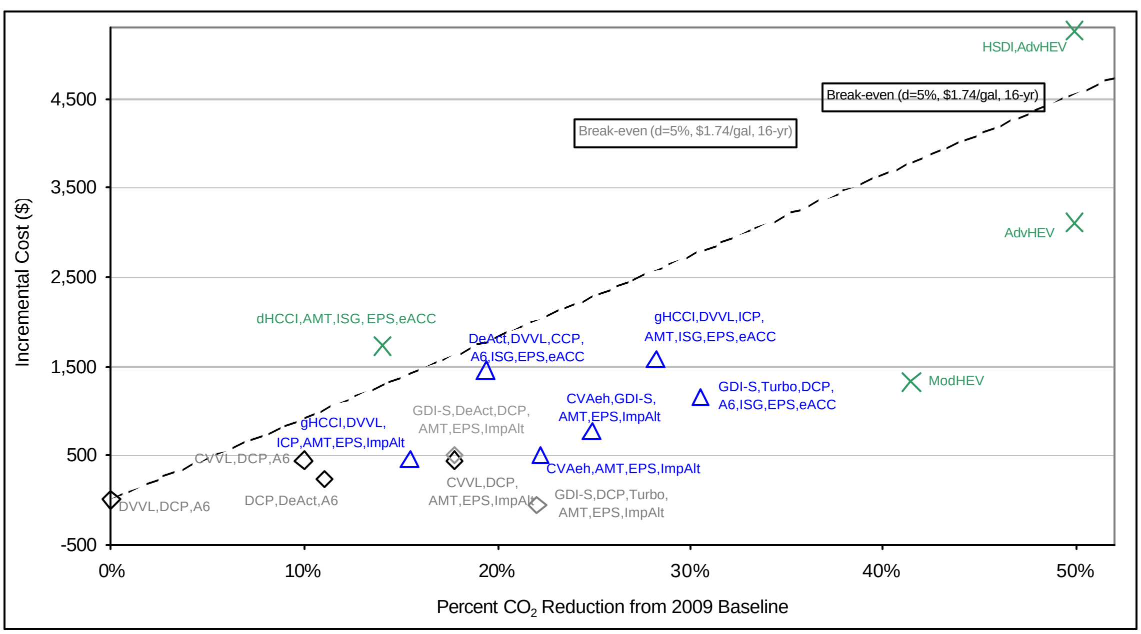
Revised Table 5.3-8 (cont.) Summary of Incremental Cost Parameters for Climate Change Emission Reduction Engine, Drivetrain, and Hybrid-Electric Vehicle Technologies

Vehicle Class	Combined Technology Packages	Technology readiness	CO2 emissions (g/mi)	CO2 change from 2002 baseline	Lifetime CO2 reduced from 2002 baseline (ton)	CO2 change from 2009 baseline	Lifetime CO2 reduced from 2009 baseline (ton)	Retail cost incremental (2004$)	Cost incremental from 2009 baseline (2004$)	Lifetime Net Present Value (2004$)	Payback period (yr)
Minivan	DVVL,CCP,A5	Near-term	371	-6.4%	6.3	0.0%	0.0	315	0	0	0
	DCP,A6	Near-term	348	-12.2%	11.9	-6.2%	5.6	670	355	324	7
	DVVL,CCP,AMT, EPS,ImpAlt	Near-term	315	-20.4%	19.9	-15.0%	13.7	478	163	1,485	1
	CVVL,CCP,AMT, EPS,ImpAlt	Near-term	306	-22.9%	22.3	-17.6%	16.1	1,011	696	1,240	4
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	Near-term	297	-25.0%	24.4	-19.9%	18.2	561	246	1,941	2
	DeAct,DVVL,CCP, AMT,EPS,ImpAlt	Near-term	307	-22.6%	22.1	-17.3%	15.8	594	279	1,625	2
	GDI-S,CCP,DeAct, AMT,EPS,ImpAlt	Near-term	319	-19.6%	19.2	-14.1%	12.9	764	449	1,105	4
	CCP,AMT,Turbo, EPS,ImpAlt	Near-term	315	-20.5%	20.0	-15.0%	13.7	325	10	1,645	1
	dHCCI,AMT, EPS,ImpAlt	Long-term	311	-21.5%	21.0	-16.1%	14.7	1,550	1,235	1,646	5
	GDI-S,CCP,AMT,ISG, DeAct,EPS,eACC	Mid-term	287	-27.6%	27.0	-22.7%	20.7	1,905	1,590	907	9
	CVAeh,GDI-S, AMT,EPS,ImpAlt	Mid-term	290	-26.8%	26.2	-21.8%	19.9	1,414	1,099	1,297	6
	AdvHEV	Long-term	185	-53.4%	52.1	-50.2%	45.9	4,204	3,889	1,637	10
	ModHEV	Long-term	216	-45.6%	44.5	-41.8%	38.2	2,300	1,985	2,619	5
Small truck	DVVL,DCP,A6	Near-term	405	-9.0%	9.9	0.0%	0.0	427	0	0	0
	DCP,A6	Near-term	379	-14.9%	16.4	-6.5%	6.5	479	52	728	1
	DCP,A6,Turbo, EPS,ImpAlt	Near-term	371	-16.8%	18.5	-8.6%	8.6	266	-161	1,196	0
	DCP,A6,DeAct	Near-term	366	-17.8%	19.6	-9.7%	9.7	657	230	935	2
	GDI-S,DCP,Turbo, AMT,EPS,ImpAlt	Near-term	318	-28.6%	31.4	-21.5%	21.5	350	-77	2,661	0
	DeAct,DVVL,CCP, AMT,EPS,ImpAlt	Near-term	328	-26.4%	28.9	-19.1%	19.0	672	245	2,048	2
	DeAct,DVVL,CCP, A6,ISG,EPS,eACC	Mid-term	316	-29.2%	32.0	-22.1%	22.1	1,898	1,471	1,193	7
	GDI-S,DCP,DeAct, AMT,EPS,ImpAlt	Near-term	334	-25.1%	27.5	-17.6%	17.6	911	484	1,640	3
	dHCCI,AMT, EPS,ImpAlt	Long-term	341	-23.6%	25.9	-16.0%	16.0	1,022	595	2,539	2
	HSDI,AMT, EPS,ImpAlt	Mid-term	316	-29.1%	32.0	-22.1%	22.1	1,568	1,141	2,639	4
	CVAeh,GDI-S, AMT,EPS,ImpAlt	Mid-term	309	-30.7%	33.7	-23.8%	23.8	1,169	742	2,123	3
	AdvHEV	Long-term	212	-52.5%	57.7	-47.8%	47.8	3,613	3,186	2,568	7
	ModHEV	Long-term	247	-44.7%	49.0	-39.2%	39.1	1,758	1,331	3,382	3
Large truck	CCP,A6	Near-term	485	-5.5%	6.9	0.0%	0.0	126	0	0	0
	DVVL,CCP,A6	Near-term	442	-13.7%	17.3	-8.7%	10.4	549	423	835	4
	DCP,DeAct,A6	Near-term	430	-16.0%	20.2	-11.2%	13.3	915	789	816	6
	CCP,DeAct,A6	Near-term	433	-15.6%	19.7	-10.7%	12.8	550	424	1,112	3
	DeAct,DVVL,CCP, A6,EHPS,ImpAlt	Near-term	418	-18.5%	23.4	-13.8%	16.5	789	663	1,322	4
	DeAct,DVVL,CCP, AMT,EHPS,ImpAlt	Near-term	396	-22.7%	28.7	-18.3%	21.8	677	551	2,077	3
	GDI-L,AMT, EHPS,ImpAlt	Long-term	399	-22.3%	28.1	-17.8%	21.2	1,460	1,334	1,220	7
	DeAct,DVVL,CCP, A6,ISG,EPS,eACC	Mid-term	378	-26.3%	33.3	-22.1%	26.4	1,886	1,760	1,415	7
	dHCCI,AMT,ISG, EPS,eACC	Long-term	373	-27.3%	34.5	-23.1%	27.6	3,041	2,915	411	15
	AdvHEV	Long-term	243	-52.6%	66.4	-49.9%	59.5	5,311	5,185	1,987	11
	HSDI,AdvHEV	Long-term	237	-53.9%	68.0	-51.2%	61.1	8,363	8,237	-35	>19
	GDI-L,AMT,ISG, EPS,ImpAlt	Long-term	365	-28.8%	36.3	-24.7%	29.4	2,537	2,411	1,135	10
	CVAeh,GDI-S, AMT,EHPS,ImpAlt	Mid-term	381	-25.6%	32.4	-21.3%	25.5	1,709	1,583	2,840	4
	CCP,DeAct,GDI-S, AMT,EHPS,ImpAlt	Mid-term	416	-18.8%	23.7	-14.1%	16.8	897	771	1,254	5
	ModHEV	Mid-term	284	-44.6%	56.3	-41.4%	49.4	2,630	2,504	3,254	7

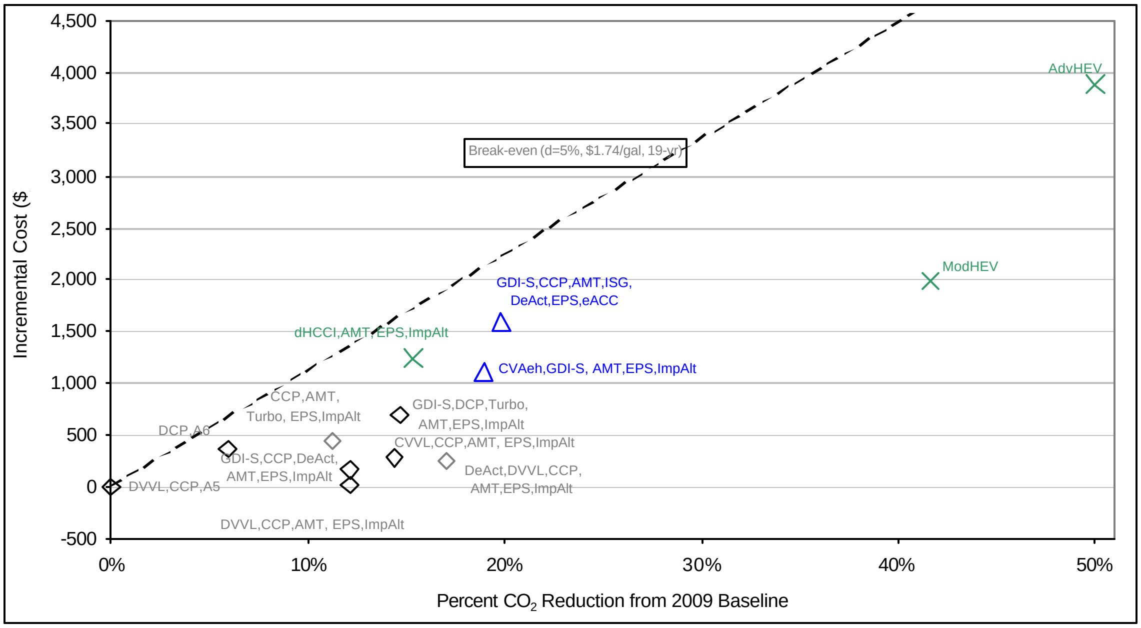
The following figures correct errors with HEV runs (both g/mi and $) that resulted from the use of both ARB HEV estimates and NESCCAF/AVL HEV estimates. Now all HEV data correspond only to the NESCCAF data. Also a change in the discounting of dHCCI costs is incorporated (staff is now discounting only the aftertreatment hardware for dHCCI).



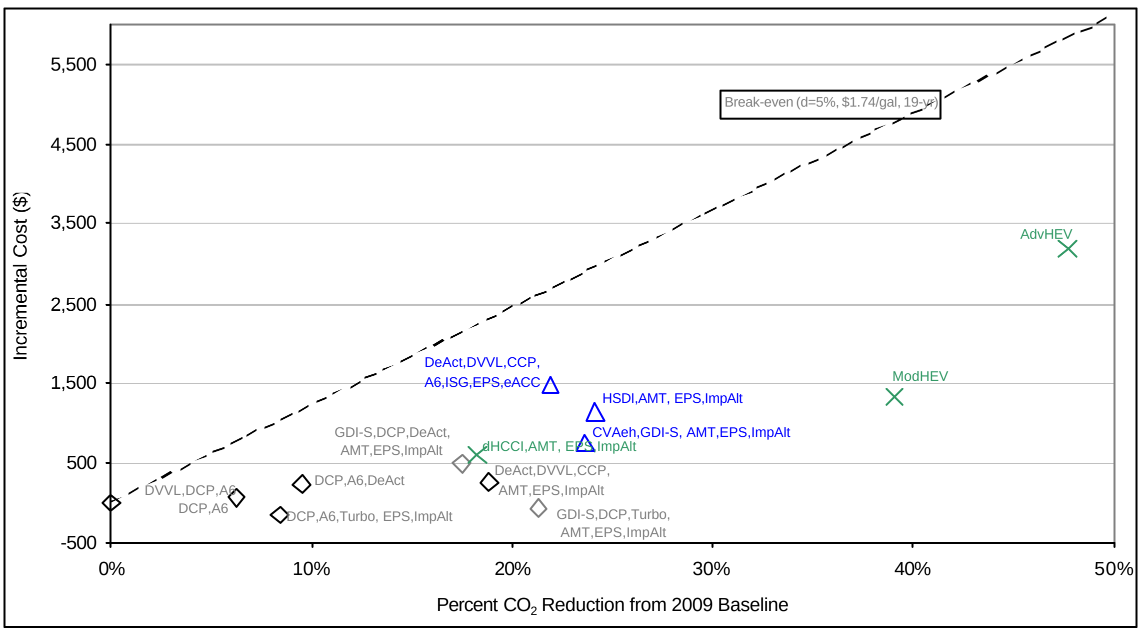
Revised Figure 5-7. Incremental Costs for Technology Packages on 2009 Baseline Small Cars



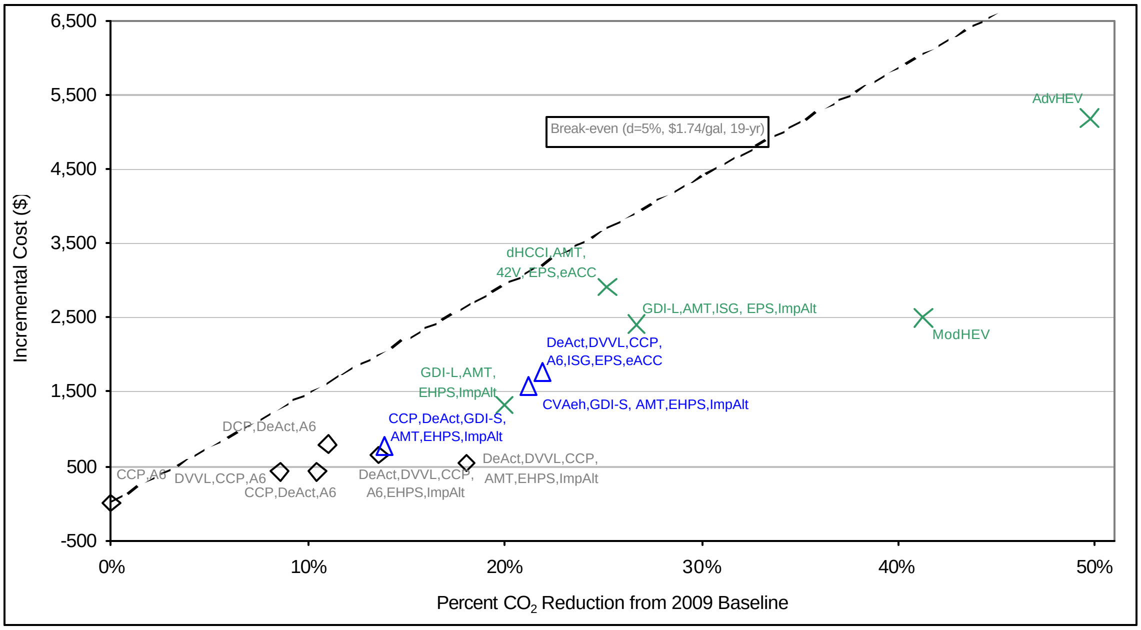
Revised Figure 5-8. Incremental Costs for Technology Packages on 2009 Baseline Large Cars



Revised Figure 5-9. Incremental Costs for Technology Packages on 2009 Baseline Minivans



Revised Figure 5-10. Incremental Costs for Technology Packages on 2009 Baseline Small Trucks



Revised Figure 5-11. Incremental Costs for Technology Packages on 2009 Baseline Large Trucks