

EMFAC Modeling Change Technical Memo

SUBJECT: MODIFICATIONS TO THE INSPECTION AND MAINTENANCE PROGRAMS IN THE WORKING DRAFT OF EMFAC2007

LEAD: DILIP PATEL

SUMMARY

The Inspection and Maintenance (I&M) module in EMFAC2002 contains default assumptions for smog check programs in each area of the state. These assumptions detail whether a particular area has a smog check program, the type of inspection program that is (or has been) employed in that area, the type and model year(s) of vehicles subject to inspections, and any requirements upon change of ownership¹ (COO). Since the official release of EMFAC2002, some of these default assumptions have changed. Further, staff also noted an error in the COO algorithm. The following changes were made in the working draft of EMFAC2007².

- a) Area defaults were modified to reflect areas that have upgraded/adopted the enhanced ASM³ testing program, e.g. areas under the jurisdiction of the Bay Area AQMD and the San Joaquin APCD.
- b) Legislative⁴ changes were enacted in 2004, which eliminated the 30-year rolling exemption for older vehicles and increased the new vehicle exemption from 4 to 6 years.
- c) Modified how COO is modeled.
- d) Removed partial year adjustment for I&M programs

Table 1 shows the incremental difference (ver. 2.211 – ver. 2.209⁵) in summer inventories for calendar year 2002. Table 1 shows that this change will **reduce** the 2002 statewide total emissions of ROG and CO from **all** on-road motor vehicles by 3.7 and 7.7 tons per day, respectively, and slightly **increase** NOx emissions by 0.2 tons per day. To put this in perspective, this will change statewide ROG, CO and NOx emissions from all on-road motor vehicles in 2002 by -0.41% and -0.08%, and 0.01%, respectively. Similarly, Table 2 shows that in 2015 the statewide emissions of ROG, CO and NOx from all on-road motor vehicles will be **reduced** by 14.1, 171.5, and 21.4 tons per day, respectively. This will change statewide ROG, CO and NOx on-road motor vehicle emissions in 2015 by -3.49% and -4.52%, and -2.90%, respectively.

¹ Since 1984, used vehicles in California require a smog check before they are sold. This is referred to as the change of ownership requirement.

² Internal working draft of EMFAC2007 version 2.211, which contains changes to fuel correction factors and Inspection and Maintenance.

³ Acceleration Simulation Mode

⁴ Senate Bill 1107 and Assembly Bill 2683

⁵ Internal working draft of EMFAC2007 version 2.209, used in estimating the effect of fuel correction factors.

**Table 1 Summary of Emissions Changes from Inspection and Maintenance
Calendar Year 2002**

Area	Emission Changes by Pollutant (tons/day)				
	ROG	CO	NOx	PM10	CO2
Statewide	-3.7	-7.7	0.2	0.0	0.0
South Coast Air Basin	0.1	5.6	0.8	0.0	0.0
San Joaquin Valley AB	-0.6	-6.4	-0.7	0.0	0.0
Sacramento Valley AB	-0.1	0.9	0.1	0.0	0.0
San Diego Air Basin	0.0	1.1	0.2	0.0	0.0
San Francisco Bay Area	0.1	3.1	0.6	0.0	0.0

**Table 2 Summary of Emissions Changes from Inspection and Maintenance
Calendar Year 2015**

Area	Emission Changes by Pollutant (tons/day)				
	ROG	CO	NOx	PM10	CO2
Statewide	-14.1	-171.5	-21.4	0.0	0.0
South Coast	-2.0	-32.3	-1.8	0.0	0.0
San Joaquin Valley AB	-1.3	-20.0	-2.2	0.0	0.0
Sacramento Valley AB	-0.3	-4.1	-0.3	0.0	0.0
San Diego Air Basin	-0.3	-5.4	-0.3	0.0	0.0
San Francisco Bay Area	-7.4	-90.3	-14.2	0.0	0.0

Table 1 shows that the I&M changes result in emission reductions from mainly non-I&M (rural) areas. This reduction is associated with the COO program, which starts in non-I&M areas beginning 1984. Vehicles which were previously modeled as not been subject to the I&M program are now subject to testing under the COO program, hence the reduction in emissions in non-I&M areas.

Table 2 shows that by 2015 these changes result in emission reductions from mainly non-I&M areas. These reductions arise from vehicles previously modeled as been not subject to the I&M program now been subject to testing under the COO program. In addition, there are significant reductions in the Bay Area, due to counties upgrading their inspection programs to ASM testing which provides more emission reductions. Further, all areas also benefit from the elimination of the rolling 30-year exemption. This results in more older vehicles being inspected in I&M programs in 2015.

NEED FOR REVISION

The EMFAC model was revised to reflect I&M changes for areas that have upgraded their inspection program to the enhanced ASM program. This will avoid the need for external adjustments to the modeled outputs. Further, the upcoming SIP process requires that the model reflect regulations or measures that have been adopted since

the last update. To be consistent with this policy, staff modified the model to reflect changes enacted in SB1107 and AB2683.

AFFECTED SOURCE CODE/VERSION

EMFACX.f90, FILEIM.f90, FILERECS.f90, FILERW.f90, GET_AREA.for, I_AND_M.for, INPUT.for, INTERIM.for, UTILITIES.for, WIS_RW_EXTRA.for, IMTYPES.f90, MODULES.for, PARAMS.for, SCENDATA.f90, STRINGSMOD.f90, IDRASSIGN.f90, IM_MODULES.f90

METHODOLOGY

There are four distinct but **interrelated** changes made to I&M routines in EMFAC. These changes are detailed in each of the following subsections titled: Area Defaults, Legislative Changes, Change of Ownership, and Partial Year Adjustment.

Area Defaults

To determine the type of I&M programs in each area, staff asked the Bureau of Automotive Repair (BAR) staff to provide a listing showing the number of vehicles tested in each area, by program type. BAR staff submitted a file, dated May 6th, 2004, which contained the population of vehicles tested in each program type (Basic, Change of Ownership, Fully Enhanced, and Partially Enhanced), and by county. Table 3 gives a brief description of these program types. This file was modified by staff to add in each of the Geographic Area Indices (GAI) modeled in EMFAC2002. This process also involved determining vehicles tested in each sub-area for regions that crossed either a basin or district boundaries. The resulting file (Appendix A) shows BAR’s assessment of the number of vehicles tested in each GAI and program type. The vehicle totals were then used to determine the percentage of vehicles tested in each program.

Table 3 Description of Program Types

Program	Description
Basic	In this program, vehicles are tested at Idle and at High Idle.
COO	In non-I&M areas, vehicles are subject to Basic program upon COO. However, in I&M areas, vehicles are subject to the program in effect in that area.
Fully Enhanced	Vehicles are tested on a dynamometer using ASM cycles. Further, these areas have test-only stations to handle high emitting vehicles.
Partially Enhanced	Vehicles are also tested on a dynamometer using ASM cycles but these areas do not have a test-only component.

Appendix A shows that certain areas can have up to four distinct program types. For example in GAI 5 (the portion of El-Dorado county in Lake Tahoe AB), 14% of the vehicles were tested in a Basic program, 17.5% were tested under COO, 15.2% were

tested in a Fully Enhanced program, and 52.9% were tested in a Partially Enhanced program. However, the EMFAC model as currently structured can only handle one program type for one vehicle class in a given area and calendar year. For example, for a given model year; all the passenger cars in GAI 5 can only be subject to either a Basic or a Fully Enhanced program but not both.

To model I&M benefits for each GAI, staff made the following assumptions.

1. There is **no difference** in I&M benefits between vehicles tested in a partially enhanced program versus those tested in a fully enhanced program. The rationale being that with stringent ASM standards there is no difference in the failure rates for vehicles tested in test-only stations versus test-and-repair stations. Further, these standards require proper repairs to pass the test.
2. Assume all vehicles are tested under the most dominant I&M program. For example, if in reality 90% of the vehicles undergo testing in an Enhanced ASM program and 10% in a Basic program; then for modeling purposes it is assumed that all vehicles are tested in the Enhanced ASM program.
3. Vehicles tested under COO program are subject to the I&M program that is most dominant in a given area. For example, in GAI 5, 17.5% of the vehicles are subject to a COO program however, for modeling purposes, these vehicles are treated as if they were subject to an Enhanced ASM program, which is the dominant program in this area.

Table 4 shows the resulting I&M program types, by area, that are modeled in the working draft of EMFAC2007. Table 4 shows areas that have COO. In previous versions of EMFAC, these areas were incorrectly modeled as having no I&M programs. The addition of COO will therefore result in an increase in I&M benefits and a general reduction in the emissions from gasoline fueled vehicles. Table 4 also shows (column "New") areas that have upgraded their inspection programs from Basic to Enhanced ASM. These areas are mainly in the Bay Area and the San Joaquin valley air basins. In addition, staff has downgraded inspection programs in GAI's 66 and 67. These were previously incorrectly assumed as having an Enhanced ASM program when in reality they only had a COO program.

Table 4 I&M Program Types in EMFAC2007 by Area

GAI	County Code	County Name	APCD Name	Basic	COO	Fully Enhanced	New	Starting Date
1	02	Alpine	Great Basin Unified APCD	0.00%	100.00%	0.00%		
2	14	Inyo	Great Basin Unified APCD	0.00%	100.00%	0.00%		
3	26	Mono	Great Basin Unified APCD	0.00%	100.00%	0.00%		
4	17	Lake	Lake County AQMD	0.00%	100.00%	0.00%		
5	09	El Dorado	El Dorado County APCD	0.00%	0.00%	100.00%	upgrade	12/1/2003
6	31	Placer	Placer County APCD	0.00%	0.00%	100.00%	upgrade	4/1/2003
7	03	Amador	Amador County APCD	0.00%	100.00%	0.00%		
8	05	Calaveras	Calaveras County APCD	0.00%	100.00%	0.00%		
9	09	El Dorado	El Dorado County APCD	0.00%	0.00%	100.00%		
10	22	Mariposa	Mariposa County APCD	0.00%	100.00%	0.00%		
11	29	Nevada	Northern Sierra AQMD	100.00%	0.00%	0.00%		
12	31	Placer	Placer County APCD	0.00%	0.00%	100.00%	upgrade	4/1/2003
13	32	Plumas	Northern Sierra AQMD	0.00%	100.00%	0.00%		
14	46	Sierra	Northern Sierra AQMD	0.00%	100.00%	0.00%		
15	55	Tuolumne	Tuolumne County APCD	0.00%	100.00%	0.00%		
16	27	Monterey	Monterey Bay Unified APCD	100.00%	0.00%	0.00%		
17	35	San Benito	Monterey Bay Unified APCD	100.00%	0.00%	0.00%		
18	44	Santa Cruz	Monterey Bay Unified APCD	100.00%	0.00%	0.00%		
19	08	Del Norte	North Coast Unified AQMD	0.00%	100.00%	0.00%		
20	12	Humboldt	North Coast Unified AQMD	0.00%	100.00%	0.00%		
21	23	Mendocino	Mendocino County AQMD	0.00%	100.00%	0.00%		
22	49	Sonoma	Northern Sonoma County APCD	0.00%	100.00%	0.00%		
23	53	Trinity	North Coast Unified AQMD	0.00%	100.00%	0.00%		
24	18	Lassen	Lassen County APCD	0.00%	100.00%	0.00%		
25	25	Modoc	Modoc County APCD	0.00%	100.00%	0.00%		
26	47	Siskiyou	Siskiyou County APCD	0.00%	100.00%	0.00%		
27	04	Butte	Butte County AQMD	100.00%	0.00%	0.00%		
28	06	Colusa	Colusa County APCD	100.00%	0.00%	0.00%		
29	11	Glenn	Glenn County APCD	100.00%	0.00%	0.00%		
30	31	Placer	Placer County APCD	0.00%	0.00%	100.00%		
31	34	Sacramento	Sacramento Metropolitan AQMD	0.00%	0.00%	100.00%		
32	45	Shasta	Shasta County AQMD	100.00%	0.00%	0.00%		
33	48	Solano	Yolo Solano AQMD	0.00%	0.00%	100.00%		
34	51	Sutter	Feather River AQMD	100.00%	0.00%	0.00%		
35	52	Tehama	Tehama County APCD	100.00%	0.00%	0.00%		
36	57	Yolo	Yolo Solano AQMD	0.00%	0.00%	100.00%		
37	58	Yuba	Feather River AQMD	100.00%	0.00%	0.00%		
38	37	San Diego	San Diego County APCD	0.00%	0.00%	100.00%		
39	01	Alameda	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
40	07	Contra Costa	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
41	21	Marin	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
42	28	Napa	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
43	38	San Francisco	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
44	41	San Mateo	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
45	43	Santa Clara	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
46	48	Solano	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
47	49	Sonoma	Bay Area AQMD	0.00%	0.00%	100.00%	upgrade	10/1/2003
48	10	Fresno	San Joaquin Valley APCD	0.00%	0.00%	100.00%		
49	15	Kern	San Joaquin Valley APCD	0.00%	0.00%	100.00%		
50	16	Kings	San Joaquin Valley APCD	0.00%	0.00%	100.00%	upgrade	5/1/2002
51	20	Madera	San Joaquin Valley APCD	0.00%	0.00%	100.00%	upgrade	5/1/2002
52	24	Merced	San Joaquin Valley APCD	0.00%	0.00%	100.00%	upgrade	5/1/2002
53	39	San Joaquin	San Joaquin Valley APCD	0.00%	0.00%	100.00%		
54	50	Stanislaus	San Joaquin Valley APCD	0.00%	0.00%	100.00%		
55	54	Tulare	San Joaquin Valley APCD	0.00%	0.00%	100.00%	upgrade	5/1/2002
56	40	San Luis Obispo	San Luis Obispo County APCD	100.00%	0.00%	0.00%		
57	42	Santa Barbara	Santa Barbara County APCD	100.00%	0.00%	0.00%		
58	56	Ventura	Ventura County APCD	0.00%	0.00%	100.00%		
59	19	Los Angeles	South Coast AQMD	0.00%	0.00%	100.00%		
60	30	Orange	South Coast AQMD	0.00%	0.00%	100.00%		
61	33	Riverside	South Coast AQMD	0.00%	0.00%	100.00%		
62	36	San Bernardino	South Coast AQMD	0.00%	0.00%	100.00%		
63	13	Imperial	Imperial County APCD	0.00%	100.00%	0.00%		
64	33	Riverside	South Coast AQMD	0.00%	0.00%	100.00%		
65	15	Kern	Kern County APCD	100.00%	0.00%	0.00%		
66	33	Riverside	Mojave Desert AQMD	0.00%	100.00%	0.00%	downgrade	
67	33	Riverside	South Coast AQMD	0.00%	100.00%	0.00%	downgrade	
68	19	Los Angeles	Antelope Valley AQMD	0.00%	0.00%	100.00%		
69	36	San Bernardino	Mojave Desert AQMD	100.00%	0.00%	0.00%		

Legislative Changes

In EMFAC2002, the default assumption for I&M programs beginning in 1998 is that vehicles older than 30 years and new vehicles up to 4 years of age are exempt from the I&M program. However, the new vehicles are subject to the COO requirements. In 2004, Senate Bill 1107 and Assembly Bill 2683 were enacted which changed the vehicles subject to inspections in the following way.

1. The exemption for vehicles older than 30 years was eliminated. Beginning April 1, 2005, vehicles from the 1976 model year would be the oldest to be inspected. The 1976 vehicles (including newer model years) would now remain in an I&M program until they retire from the fleet.
2. Effective January 1, 2005, the new vehicle exemption was increased from 4 to 6 years. Further, vehicles up to age 4 are also exempt from the COO requirements. However, vehicles ages 5 and 6 are subject to the COO requirements.

Staff noted that the new vehicle exemption is effective January 2005, whereas, the 30-year rolling exemption is effective April 2005. For modeling purposes, staff decided to add one program with both options beginning January 2005. Staff felt that this was better option and only marginally over-estimated the benefits for 1976 model year vehicles in calendar year 2005. Appendix B has the complete list of options for all I&M programs in EMFAC2007, and Appendix C lists program schedules by geographic area.

Change of Ownership

Since 1984, used vehicles require a valid smog check prior to a sale. This requirement is also known as the Change of Ownership requirement. The COO rate is assumed to be 17%⁶. In an ideal biennial I&M program, one without any vehicle exemptions, the percentage of vehicles inspected in any year equals the 50% scheduled for smog check from the biennial program plus 17% of the off-cycle vehicles from the COO requirement. In an area without an I&M program, 17% of the vehicles annually undergo a smog check due to the COO requirement.

In EMFAC2002 (and prior versions), the COO requirement was only modeled for areas with an I&M program. In the EMFAC2007 program, this requirement is also implemented in all non-I&M areas. Again, Appendix B shows the COO requirements for non-I&M areas.

Further, in EMFAC2002 (and prior versions), it was assumed that vehicles subject to the new vehicle exemption⁷ were also exempt from the COO requirement. However, in reality these vehicles were subject to the COO requirements. To rectify this error, staff have changed the COO assumptions for all historical I&M programs. Again, these changes are noted in Appendix B.

⁶ This rate is from the California I&M Benefits Model, CALIMFAC.

⁷ Prior to 2005 the new vehicle exemption was 1 to 4 years, depending on I&M program type.

Partial Year Adjustments

The EMFAC2002 model, and all prior versions of EMFAC, contain code that gave partial year I&M credits to account for I&M programs beginning at different times of the year. During the course of modifying the code for COO, staff discovered two errors in the calculation of these credits. These are:

1. If an I&M program began in October; then the model incorrectly gave 9/12 of the yearly credit for the first year rather than 3/12 for the remaining yearly credit. This means that for I&M programs beginning in January, the model was only assigning 1/12 of the yearly credit for the first year.
2. Staff corrected how this partial year credit was being applied and then noted that this adjustment was only being calculated for the first I&M program. Appendix B, lists all the I&M programs in the State, and shows that some areas have up to six I&M programs. For example, the South Coast Air Basin (SCAB) has six I&M programs with the first one starting in March 1984, the second in July 1990, and so on. In this case the model would **only** correctly apply the partial year adjustment for the 1984 program. Subsequent I&M programs received no adjustment. In SCAB's case, to correctly calculate the I&M benefits for 1990 calendar year requires tracking the I&M benefits from the 1984 program and the 1990 I&M program. Tracking and calculating the partial year credits is now even more complicated since the addition of the COO requirement. Given these complexities, it was decided to remove the partial year adjustment from all I&M programs.

INVENTORY EFFECTS

Table 5 shows summaries of the statewide summer episodic on-road motor vehicle inventories calculated using internal working draft EMFAC2007 version 2.211, which contains the I&M changes noted in this document. These inventories were calculated by running the model for each sub-area to accurately assess I&M changes on a statewide basis. Table 5 also shows the difference (ver. 2.211 – ver. 2.209) in statewide summer inventories for various calendar years. This change will **reduce** the 2002 statewide total emissions of ROG and CO from **all** on-road motor vehicles by 3.7 and 7.7 tons per day, respectively, and slightly **increase** NOx emissions by 0.2 tons per day. To put this in perspective, this will change statewide ROG, CO and NOx emissions from all on-road motor vehicles in 2002 by -0.41% and -0.08%, and 0.01%, respectively. Similarly, in 2015 the statewide emissions of ROG, CO and NOx from all on-road motor vehicles will be **reduced** by 14.1, 171.5, and 21.4 tons per day, respectively. This will change statewide ROG, CO and NOx on-road motor vehicle emissions in 2015 by -3.49% and -4.52%, and -2.90%, respectively.

Table 5 shows that as a result of these changes there is a large reduction in emissions in 1990, smaller reductions in 2000-2002, and larger reductions in 2005 and later years. The initial reduction to emissions in 1990 is associated with a modeling change that includes a COO program into areas that previously didn't have an I&M program. With this change, implemented in 1984, more vehicles are tested through the COO program

resulting in more I&M benefits. In 2000-2002 period, more areas in the state have I&M programs and hence the relative difference (between models ver.2.211 and ver.2.212) from incorporating COO is reduced. In 2005 and later years, there are large reductions associated with areas in the Bay Area and San Joaquin APCD upgrading/adopting the Enhanced ASM program in 2003, which provides more benefits. Further, in 2005 and later years the reductions are associated with the elimination of the 30-year rolling exemption for older vehicles. This means more older vehicles, which were previously exempt, are now tested in I&M programs resulting in larger I&M benefits.

Tables 6 through 10 show the impact of I&M changes on summer episodic inventories from Sacramento, San Diego, San Francisco, San Joaquin and the South Coast Air Basin, respectively. Tables 6 through 10 also show the same general trend as discussed above for table 5 but there is an increase in emissions for calendar years 2000 to 2005. In the previous version of the model, new vehicles were exempt from the I&M program and the (incorrectly) COO requirement. With the new changes, new vehicles (especially since 1998 when the new vehicle exemption was for 4 years) are now subject to the COO requirement. However, testing new vehicles can result in false failures, and subsequent attempts to repair them can result in an increase in emissions. In 2005, this potential increase is mitigated because new vehicles are exempt from the I&M program and the COO requirement.

Table 5 Impact of I&M Changes on Statewide Inventories

Statewide Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	12044256	389110780	3325.72	29895.28	2319.88	262406.60	43.70
1990	18550046	677172610	2155.16	22511.15	2604.19	425765.20	66.67
2000	22223346	796074050	1043.67	10761.73	1845.58	465655.30	47.18
2002	23188440	825020420	897.00	9204.50	1703.89	479972.20	47.26
2005	24697720	872884160	737.33	7526.17	1463.22	505842.80	48.05
2010	27266634	957360640	541.72	5403.36	1092.93	562305.90	49.22
2015	29638626	1032914600	403.45	3795.42	738.54	612723.50	50.74
2020	32084132	1109514100	316.87	2730.95	518.23	656734.20	52.78

Statewide Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	12044256	389110780	3325.72	29895.28	2319.88	262406.60	43.70
1990	18550046	677172610	2139.71	22392.69	2603.33	425765.20	66.67
2000	22223346	796074050	1040.30	10755.69	1845.62	465655.30	47.18
2002	23188440	825020420	893.30	9196.84	1704.09	479972.20	47.26
2005	24697720	872884160	721.83	7367.59	1444.52	505842.80	48.05
2010	27266634	957360640	524.94	5206.30	1068.66	562305.90	49.22
2015	29638626	1032914600	389.37	3623.96	717.13	612723.50	50.74
2020	32084132	1109514100	304.57	2587.64	498.19	656734.20	52.78

Difference (Ver. 2.212 - Ver. 2.211) in Statewide Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-15.4	-118.5	-0.9	0.0	0.0
2000	0	0	-3.4	-6.0	0.0	0.0	0.0
2002	0	0	-3.7	-7.7	0.2	0.0	0.0
2005	0	0	-15.5	-158.6	-18.7	0.0	0.0
2010	0	0	-16.8	-197.1	-24.3	0.0	0.0
2015	0	0	-14.1	-171.5	-21.4	0.0	0.0
2020	0	0	-12.3	-143.3	-20.0	0.0	0.0

Percentage Change in Statewide Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-0.72%	-0.53%	-0.03%	0.00%	0.00%
2000	0.00%	0.00%	-0.32%	-0.06%	0.00%	0.00%	0.00%
2002	0.00%	0.00%	-0.41%	-0.08%	0.01%	0.00%	0.00%
2005	0.00%	0.00%	-2.10%	-2.11%	-1.28%	0.00%	0.00%
2010	0.00%	0.00%	-3.10%	-3.65%	-2.22%	0.00%	0.00%
2015	0.00%	0.00%	-3.49%	-4.52%	-2.90%	0.00%	0.00%
2020	0.00%	0.00%	-3.88%	-5.25%	-3.87%	0.00%	0.00%

ROG_Tot ¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes.							
PM10_Tot ² - Total emissions from running, starting, idle processes, and from tire wear and brake wear.							

Table 6 Impact of I&M Changes on Sacramento Valley Air Basin Inventories

Sacramento Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	928448	27881342	254.19	2291.22	178.05	19085.89	3.63
1990	1390476	47539700	171.55	1747.66	201.04	30661.57	5.50
2000	1639920	54680392	81.75	792.65	141.32	33685.79	3.63
2002	1750374	57784504	71.97	687.39	131.31	35261.69	3.59
2005	1907740	62629396	60.05	563.36	110.94	37793.46	3.59
2010	2145240	70184440	43.65	393.51	79.40	41812.05	3.55
2015	2397775	77831144	32.16	268.06	52.17	45792.19	3.60
2020	2633766	84078712	25.29	189.94	35.51	49523.75	3.76
Sacramento Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	928448	27881342	254.19	2291.22	178.05	19085.89	3.63
1990	1390476	47539700	170.18	1734.63	201.01	30661.57	5.50
2000	1639920	54680392	81.65	793.26	141.37	33685.79	3.63
2002	1750374	57784504	71.90	688.34	131.43	35261.69	3.59
2005	1907740	62629396	60.04	564.25	111.09	37793.46	3.59
2010	2145240	70184440	43.53	391.15	79.32	41812.05	3.55
2015	2397775	77831144	31.86	263.93	51.92	45792.19	3.60
2020	2633766	84078712	24.86	185.06	35.03	49523.75	3.76
Difference (Ver. 2.212 - Ver. 2.211) in Sacramento Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-1.4	-13.0	0.0	0.0	0.0
2000	0	0	-0.1	0.6	0.0	0.0	0.0
2002	0	0	-0.1	0.9	0.1	0.0	0.0
2005	0	0	0.0	0.9	0.1	0.0	0.0
2010	0	0	-0.1	-2.4	-0.1	0.0	0.0
2015	0	0	-0.3	-4.1	-0.3	0.0	0.0
2020	0	0	-0.4	-4.9	-0.5	0.0	0.0
Percentage Change in Sacramento Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-0.80%	-0.75%	-0.02%	0.00%	0.00%
2000	0.00%	0.00%	-0.13%	0.08%	0.03%	0.00%	0.00%
2002	0.00%	0.00%	-0.09%	0.14%	0.09%	0.00%	0.00%
2005	0.00%	0.00%	-0.03%	0.16%	0.13%	0.00%	0.00%
2010	0.00%	0.00%	-0.27%	-0.60%	-0.10%	0.00%	0.00%
2015	0.00%	0.00%	-0.93%	-1.54%	-0.48%	0.00%	0.00%
2020	0.00%	0.00%	-1.70%	-2.57%	-1.36%	0.00%	0.00%

ROG_Tot¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes.
 PM10_Tot² - Total emissions from running, starting, idle processes, and from tire wear and brake wear.

Table 7 Impact of I&M Changes on San Diego Air Basin Inventories

San Diego Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	934571	31707434	295.64	2698.82	169.31	22068.33	2.82
1990	1606621	63591472	189.81	2056.40	211.32	40894.99	5.30
2000	1899124	73909272	85.78	930.14	149.18	42961.61	4.18
2002	1996742	77007520	71.97	782.65	135.47	44597.09	4.26
2005	2164502	82659608	58.49	637.90	115.65	47704.58	4.44
2010	2336487	87480560	42.59	452.39	85.44	50692.60	4.48
2015	2531560	93885768	32.25	319.55	59.13	54266.88	4.58
2020	2669319	97541648	26.18	236.14	42.87	56283.64	4.69
San Diego Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	934571	31707434	295.64	2698.82	169.31	22068.33	2.82
1990	1606621	63591472	189.30	2053.63	211.27	40894.99	5.30
2000	1899124	73909272	85.77	930.96	149.28	42961.61	4.18
2002	1996742	77007520	71.98	783.75	135.66	44597.09	4.26
2005	2164502	82659608	58.52	639.04	115.91	47704.58	4.44
2010	2336487	87480560	42.47	450.03	85.44	50692.60	4.48
2015	2531560	93885768	31.91	314.19	58.82	54266.88	4.58
2020	2669319	97541648	25.60	229.45	42.09	56283.64	4.69
Difference (Ver. 2.212 - Ver. 2.211) in San Diego Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-0.5	-2.8	-0.1	0.0	0.0
2000	0	0	0.0	0.8	0.1	0.0	0.0
2002	0	0	0.0	1.1	0.2	0.0	0.0
2005	0	0	0.0	1.1	0.3	0.0	0.0
2010	0	0	-0.1	-2.4	0.0	0.0	0.0
2015	0	0	-0.3	-5.4	-0.3	0.0	0.0
2020	0	0	-0.6	-6.7	-0.8	0.0	0.0
Percentage Change in San Diego Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-0.27%	-0.13%	-0.02%	0.00%	0.00%
2000	0.00%	0.00%	-0.01%	0.09%	0.07%	0.00%	0.00%
2002	0.00%	0.00%	0.01%	0.14%	0.14%	0.00%	0.00%
2005	0.00%	0.00%	0.05%	0.18%	0.22%	0.00%	0.00%
2010	0.00%	0.00%	-0.27%	-0.52%	0.00%	0.00%	0.00%
2015	0.00%	0.00%	-1.07%	-1.68%	-0.51%	0.00%	0.00%
2020	0.00%	0.00%	-2.20%	-2.83%	-1.82%	0.00%	0.00%
ROG_Tot ¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes.							
PM10_Tot ² - Total emissions from running, starting, idle processes, and from tire wear and break wear.							

Table 8 Impact of I&M Changes on San Francisco Air Basin Inventories

San Francisco Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	2884329	90067376	768.07	6961.10	544.55	58659.49	8.96
1990	3779228	133990560	392.73	4080.02	503.01	81333.77	12.29
2000	4587554	159271550	194.76	1944.02	348.90	91951.01	9.15
2002	4767933	164169900	172.37	1731.74	329.53	94243.58	9.16
2005	5059512	172580880	144.21	1455.66	287.46	98457.08	9.31
2010	5719370	193298340	109.81	1094.24	219.94	117168.50	10.09
2015	6104226	202212830	79.40	753.97	148.20	123828.40	10.26
2020	6540161	213899180	60.58	529.57	102.79	130334.00	10.55
San Francisco Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	2884329	90067376	768.07	6961.10	544.55	58659.49	8.96
1990	3779228	133990560	391.69	4075.07	502.88	81333.77	12.29
2000	4587554	159271550	194.75	1946.05	349.12	91951.01	9.15
2002	4767933	164169900	172.44	1734.89	330.08	94243.58	9.16
2005	5059512	172580880	133.84	1328.75	271.54	98457.08	9.31
2010	5719370	193298340	98.95	961.46	201.20	117168.50	10.09
2015	6104226	202212830	72.04	663.66	134.02	123828.40	10.26
2020	6540161	213899180	55.63	469.06	92.52	130334.00	10.55
Difference (Ver. 2.212 - Ver. 2.211) in San Francisco Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-1.0	-5.0	-0.1	0.0	0.0
2000	0	0	0.0	2.0	0.2	0.0	0.0
2002	0	0	0.1	3.1	0.6	0.0	0.0
2005	0	0	-10.4	-126.9	-15.9	0.0	0.0
2010	0	0	-10.9	-132.8	-18.7	0.0	0.0
2015	0	0	-7.4	-90.3	-14.2	0.0	0.0
2020	0	0	-5.0	-60.5	-10.3	0.0	0.0
Percentage Change in San Francisco Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-0.26%	-0.12%	-0.03%	0.00%	0.00%
2000	0.00%	0.00%	0.00%	0.10%	0.06%	0.00%	0.00%
2002	0.00%	0.00%	0.04%	0.18%	0.17%	0.00%	0.00%
2005	0.00%	0.00%	-7.19%	-8.72%	-5.54%	0.00%	0.00%
2010	0.00%	0.00%	-9.88%	-12.13%	-8.52%	0.00%	0.00%
2015	0.00%	0.00%	-9.27%	-11.98%	-9.57%	0.00%	0.00%
2020	0.00%	0.00%	-8.18%	-11.43%	-9.99%	0.00%	0.00%
ROG_Tot ¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes.							
PM10_Tot ² - Total emissions from running, starting, idle processes, and from tire wear and brake wear.							

Table 9 Impact of I&M Changes on San Joaquin Valley Air Basin Inventories

San Joaquin Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	881059	32884972	273.65	2796.04	232.43	23756.53	5.56
1990	1451839	60357360	214.58	2380.71	297.57	41553.23	8.78
2000	1991960	81054320	114.32	1235.05	230.44	51192.61	5.92
2002	2123866	85988360	98.74	1065.26	218.60	54090.28	5.94
2005	2324908	94207952	81.33	874.14	192.43	59029.06	6.05
2010	2643518	107741360	58.44	612.85	144.22	67315.45	6.06
2015	2998433	122270790	43.28	425.43	97.02	76668.30	6.22
2020	3351177	135617100	34.34	308.47	67.90	85486.41	6.61

San Joaquin Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	881059	32884972	273.65	2796.04	232.43	23756.53	5.56
1990	1451839	60357360	212.25	2359.47	297.38	41553.23	8.78
2000	1991960	81054320	114.19	1235.66	230.48	51192.61	5.92
2002	2123866	85988360	98.14	1058.88	217.91	54090.28	5.94
2005	2324908	94207952	79.61	850.35	189.69	59029.06	6.05
2010	2643518	107741360	56.92	588.78	141.56	67315.45	6.06
2015	2998433	122270790	41.94	405.43	94.79	76668.30	6.22
2020	3351177	135617100	33.06	292.67	65.81	85486.41	6.61

Difference (Ver. 2.212 - Ver. 2.211) in San Joaquin Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-2.3	-21.2	-0.2	0.0	0.0
2000	0	0	-0.1	0.6	0.0	0.0	0.0
2002	0	0	-0.6	-6.4	-0.7	0.0	0.0
2005	0	0	-1.7	-23.8	-2.7	0.0	0.0
2010	0	0	-1.5	-24.1	-2.7	0.0	0.0
2015	0	0	-1.3	-20.0	-2.2	0.0	0.0
2020	0	0	-1.3	-15.8	-2.1	0.0	0.0

Percentage Change in San Joaquin Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-1.08%	-0.89%	-0.06%	0.00%	0.00%
2000	0.00%	0.00%	-0.12%	0.05%	0.01%	0.00%	0.00%
2002	0.00%	0.00%	-0.61%	-0.60%	-0.31%	0.00%	0.00%
2005	0.00%	0.00%	-2.11%	-2.72%	-1.42%	0.00%	0.00%
2010	0.00%	0.00%	-2.61%	-3.93%	-1.85%	0.00%	0.00%
2015	0.00%	0.00%	-3.09%	-4.70%	-2.30%	0.00%	0.00%
2020	0.00%	0.00%	-3.74%	-5.12%	-3.09%	0.00%	0.00%

ROG_Tot¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes.
 PM10_Tot² - Total emissions from running, starting, idle processes, and from tire wear and brake wear.

Table 10 Impact of I&M Changes on South Coast Air Basin Inventories

South Coast Summer Episodic On-Road Motor Vehicle Inventories (Calculated Using EMFAC2007 draft ver 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	4873676	158731790	1325.65	11339.33	892.98	107712.40	17.33
1990	7641506	275902460	840.20	8566.66	1001.61	173723.90	25.50
2000	8971598	317873090	396.28	4119.07	705.34	183457.50	17.72
2002	9243116	325196640	329.27	3389.97	632.51	186452.40	17.64
2005	9672628	337082500	263.35	2686.00	530.08	192758.10	17.80
2010	10409608	358938080	190.87	1902.79	389.35	205960.50	17.93
2015	11147237	381397700	144.83	1365.29	258.75	223565.60	18.60
2020	11940294	406621700	114.45	990.58	180.16	237487.50	19.22

South Coast Summer Episodic On-Road Motor Vehicle Inventories With I&M Changes (Calculated Using EMFAC2007 draft ver 2.212)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	4873676	158731790	1325.65	11339.33	892.98	107712.40	17.33
1990	7641506	275902460	837.86	8556.28	1001.39	173723.90	25.50
2000	8971598	317873090	396.21	4123.03	705.73	183457.50	17.72
2002	9243116	325196640	329.33	3395.59	633.31	186452.40	17.64
2005	9672628	337082500	263.45	2690.66	530.97	192758.10	17.80
2010	10409608	358938080	190.12	1886.20	388.87	205960.50	17.93
2015	11147237	381397700	142.83	1332.96	256.94	223565.60	18.60
2020	11940294	406621700	111.50	951.75	176.30	237487.50	19.22

Difference (Ver. 2.212 - Ver. 2.211) in South Coast Emission Inventories (tons per day)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0	0	0.0	0.0	0.0	0.0	0.0
1990	0	0	-2.3	-10.4	-0.2	0.0	0.0
2000	0	0	-0.1	4.0	0.4	0.0	0.0
2002	0	0	0.1	5.6	0.8	0.0	0.0
2005	0	0	0.1	4.7	0.9	0.0	0.0
2010	0	0	-0.8	-16.6	-0.5	0.0	0.0
2015	0	0	-2.0	-32.3	-1.8	0.0	0.0
2020	0	0	-2.9	-38.8	-3.9	0.0	0.0

Percentage Change in South Coast Emission Inventories (relative to Ver. 2.211)							
Cal. Year	Population	VMT*(1000)	ROG_Tot ¹	CO_Tot	NOx_Tot	CO2_Tot	PM10_Tot ²
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	-0.28%	-0.12%	-0.02%	0.00%	0.00%
2000	0.00%	0.00%	-0.02%	0.10%	0.06%	0.00%	0.00%
2002	0.00%	0.00%	0.02%	0.17%	0.13%	0.00%	0.00%
2005	0.00%	0.00%	0.04%	0.17%	0.17%	0.00%	0.00%
2010	0.00%	0.00%	-0.39%	-0.87%	-0.12%	0.00%	0.00%
2015	0.00%	0.00%	-1.38%	-2.37%	-0.70%	0.00%	0.00%
2020	0.00%	0.00%	-2.58%	-3.92%	-2.14%	0.00%	0.00%

ROG_Tot ¹ - This includes running, starting, idle exhaust emissions and emissions from all evaporative processes. PM10_Tot ² - Total emissions from running, starting, idle processes, and from tire wear and brake wear.							
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Recommendations

The next version of EMFAC should be modified to account for two or more I&M programs, for a given calendar year, in any given geographic area. This modification is necessary to model areas which have a Basic I&M program in a rural area, and an Enhanced ASM program in an urban area.

The graphical user interface should be modified to allow I&M editing by sub-area. Currently, users cannot edit I&M options by sub-areas if they request emissions estimate for each sub-area.

Staff should analyze the BAR data to determine the number of vehicles inspected in each I&M program, by vehicle class. This will be necessary if the model is modified to reflect that some areas have multiple I&M programs. **For example**, in a given area 100% of the passenger cars are tested in the Enhanced ASM program. However, in this same area only 85% of the light duty trucks were tested in the Enhanced ASM program and 15% in the Basic program. The difference being that 15% the trucks had four wheel drive vehicles and therefore could not be tested on a dynamometer.

Staff should analyze Department of Motor Vehicle's registration data to determine the COO rate, and to see if it has changed and if it changes by vehicle class.

Appendix A BAR Estimated Vehicle Population By Area and Program Type

County Code	County Name	APCD Code	GAI	AB	APCD Name	Estimate Vehicle Population					Estimated % Program Type			
						Basic	COO	Fully Enhanced	Partially Enhanced	Total	Basic	COO	Fully Enhanced	Partially Enhanced
02	Alpine	09	1	GBV	Great Basin Unified APCD		1,320			1,320	0.0%	100.0%	0.0%	0.0%
14	Inyo	09	2	GBV	Great Basin Unified APCD		17,020			17,020	0.0%	100.0%	0.0%	0.0%
26	Mono	09	3	GBV	Great Basin Unified APCD		11,110			11,110	0.0%	100.0%	0.0%	0.0%
17	Lake	13	4	LC	Lake County AQMD		53,460			53,460	0.0%	100.0%	0.0%	0.0%
09	El Dorado	06	5	LT	El Dorado County APCD	3,753	4,549	3,935	13,733	25,969	14.4%	17.5%	15.2%	52.9%
31	Placer	25	6	LT	Placer County APCD	1,238	719	8,018	3,580	13,555	9.1%	5.3%	59.2%	26.4%
03	Amador	01	7	MC	Amador County APCD		33,570			33,570	0.0%	100.0%	0.0%	0.0%
05	Calaveras	04	8	MC	Calaveras County APCD		42,030			42,030	0.0%	100.0%	0.0%	0.0%
09	El Dorado	06	9	MC	El Dorado County APCD	15,998	19,391	16,775	58,547	110,711	14.4%	17.5%	15.2%	52.9%
22	Mariposa	16	10	MC	Mariposa County APCD		17,010			17,010	0.0%	100.0%	0.0%	0.0%
29	Nevada	23	11	MC	Northern Sierra AQMD	81,670				81,670	100.0%	0.0%	0.0%	0.0%
31	Placer	25	12	MC	Placer County APCD	1,444	839	9,355	4,177	15,814	9.1%	5.3%	59.2%	26.4%
32	Plumas	23	13	MC	Northern Sierra AQMD		20,080			20,080	0.0%	100.0%	0.0%	0.0%
46	Sierra	23	14	MC	Northern Sierra AQMD		3,170			3,170	0.0%	100.0%	0.0%	0.0%
55	Tuolumne	39	15	MC	Tuolumne County APCD		49,980			49,980	0.0%	100.0%	0.0%	0.0%
27	Monterey	20	16	NCC	Monterey Bay Unified APCD	267,080				267,080	100.0%	0.0%	0.0%	0.0%
35	San Benito	20	17	NCC	Monterey Bay Unified APCD	38,410				38,410	100.0%	0.0%	0.0%	0.0%
44	Santa Cruz	20	18	NCC	Monterey Bay Unified APCD	185,160				185,160	100.0%	0.0%	0.0%	0.0%
08	Del Norte	22	19	NC	North Coast Unified AQMD		17,280			17,280	0.0%	100.0%	0.0%	0.0%
12	Humboldt	22	20	NC	North Coast Unified AQMD		96,400			96,400	0.0%	100.0%	0.0%	0.0%
23	Mendocino	17	21	NC	Mendocino County AQMD		72,630			72,630	0.0%	100.0%	0.0%	0.0%
49	Sonoma	24	22	NC	Northern Sonoma County APCD		47,530	930		48,460	0.0%	98.1%	1.9%	0.0%
53	Trinity	22	23	NC	North Coast Unified AQMD		11,530			11,530	0.0%	100.0%	0.0%	0.0%
18	Lassen	14	24	NEP	Lassen County APCD		20,600			20,600	0.0%	100.0%	0.0%	0.0%
25	Modoc	19	25	NEP	Modoc County APCD		6,970			6,970	0.0%	100.0%	0.0%	0.0%
47	Siskiyou	33	26	NEP	Siskiyou County APCD		38,160			38,160	0.0%	100.0%	0.0%	0.0%
04	Butte	03	27	SV	Butte County AQMD	144,830				144,830	100.0%	0.0%	0.0%	0.0%
06	Colusa	05	28	SV	Colusa County APCD	14,260				14,260	100.0%	0.0%	0.0%	0.0%
11	Glenn	08	29	SV	Glenn County APCD	19,660				19,660	100.0%	0.0%	0.0%	0.0%
31	Placer	25	30	SV	Placer County APCD	17,948	10,423	116,267	51,913	196,550	9.1%	5.3%	59.2%	26.4%
34	Sacramento	26	31	SV	Sacramento Metropolitan AQMD			856,540	33,760	890,300	0.0%	0.0%	96.2%	3.8%
45	Shasta	32	32	SV	Shasta County AQMD	129,070				129,070	100.0%	0.0%	0.0%	0.0%
48	Solano	41	33	SV	Yolo Solano AQMD			64,870	18,740	83,610	0.0%	0.0%	77.6%	22.4%
51	Sutter	42	34	SV	Feather River AQMD	57,640				57,640	100.0%	0.0%	0.0%	0.0%
52	Tehama	37	35	SV	Tehama County APCD	37,950				37,950	100.0%	0.0%	0.0%	0.0%
57	Yolo	41	36	SV	Yolo Solano AQMD			99,780	13,720	113,500	0.0%	0.0%	87.9%	12.1%
58	Yuba	42	37	SV	Feather River AQMD	40,410				40,410	100.0%	0.0%	0.0%	0.0%
37	San Diego	28	38	SD	San Diego County APCD	50,730	23,810	1,979,510		2,054,050	2.5%	1.2%	96.4%	0.0%
01	Alameda	02	39	SF	Bay Area AQMD			1,016,350		1,016,350	0.0%	0.0%	100.0%	0.0%
07	Contra Costa	02	40	SF	Bay Area AQMD			726,360		726,360	0.0%	0.0%	100.0%	0.0%
21	Marin	02	41	SF	Bay Area AQMD	7,810		190,370		198,180	3.9%	0.0%	96.1%	0.0%
28	Napa	02	42	SF	Bay Area AQMD	16,890		81,290		98,180	17.2%	0.0%	82.8%	0.0%
38	San Francisco	02	43	SF	Bay Area AQMD			410,720		410,720	0.0%	0.0%	100.0%	0.0%
41	San Mateo	02	44	SF	Bay Area AQMD	22,220		563,000		585,220	3.8%	0.0%	96.2%	0.0%
43	Santa Clara	02	45	SF	Bay Area AQMD	440		1,246,330		1,246,770	0.0%	0.0%	100.0%	0.0%

Appendix A –continued-

County Code	County Name	APCD Code	GAI	AB	APCD Name	Estimate Vehicle Population					Estimated % Program Type			
						Basic	COO	Fully Enhanced	Partially Enhanced	Total	Basic	COO	Fully Enhanced	Partially Enhanced
48	Solano	02	46	SF	Bay Area AQMD			205,210	110	205,320	0.0%	0.0%	99.9%	0.1%
49	Sonoma	02	47	SF	Bay Area AQMD	33,310		277,220		310,530	10.7%	0.0%	89.3%	0.0%
10	Fresno	29	48	SJV	San Joaquin Valley APCD	42,780		362,020	87,870	492,670	8.7%	0.0%	73.5%	17.8%
15	Kern	29	49	SJV	San Joaquin Valley APCD	12,460		270,160	60,000	342,620	3.6%	0.0%	78.9%	17.5%
16	Kings	29	50	SJV	San Joaquin Valley APCD	12,760			55,810	68,570	18.6%	0.0%	0.0%	81.4%
20	Madera	29	51	SJV	San Joaquin Valley APCD	21,730			55,530	77,260	28.1%	0.0%	0.0%	71.9%
24	Merced	29	52	SJV	San Joaquin Valley APCD	36,120		49,950	50,780	136,850	26.4%	0.0%	36.5%	37.1%
39	San Joaquin	29	53	SJV	San Joaquin Valley APCD	6,850		344,330	34,080	385,260	1.8%	0.0%	89.4%	8.8%
50	Stanislaus	29	54	SJV	San Joaquin Valley APCD	8,140		246,080	55,960	310,180	2.6%	0.0%	79.3%	18.0%
54	Tulare	29	55	SJV	San Joaquin Valley APCD	21,600		76,090	126,880	224,570	9.6%	0.0%	33.9%	56.5%
40	San Luis Obispo	30	56	SCC	San Luis Obispo County APCD	192,350				192,350	100.0%	0.0%	0.0%	0.0%
42	Santa Barbara	31	57	SCC	Santa Barbara County APCD	285,800				285,800	100.0%	0.0%	0.0%	0.0%
56	Ventura	40	58	SCC	Ventura County APCD	40		544,850	34,530	579,420	0.0%	0.0%	94.0%	6.0%
19	Los Angeles	34	59	SC	South Coast AQMD		2,540	5,982,130		5,984,670	0.0%	0.0%	100.0%	0.0%
30	Orange	34	60	SC	South Coast AQMD			2,047,280		2,047,280	0.0%	0.0%	100.0%	0.0%
33	Riverside	34	61	SC	South Coast AQMD		237	654,657	206,585	861,479	0.0%	0.0%	76.0%	24.0%
36	San Bernardino	34	62	SC	South Coast AQMD	35,580		849,170	6,310	891,060	4.0%	0.0%	95.3%	0.7%
13	Imperial	10	63	SS	Imperial County APCD		101,680			101,680	0.0%	100.0%	0.0%	0.0%
33	Riverside	34	64	SS	South Coast AQMD		63	174,023	54,915	229,001	0.0%	0.0%	76.0%	24.0%
15	Kern	11	65	MD	Kern County APCD	82,810				82,810	100.0%	0.0%	0.0%	0.0%
33	Riverside	27	66	MD	Mojave Desert AQMD		11,210			11,210	0.0%	100.0%	0.0%	0.0%
33	Riverside	34	67	MD	South Coast AQMD						0.0%	100.0%	0.0%	0.0%
19	Los Angeles	43	68	MD	Antelope Valley AQMD	100		195,140		195,240	0.1%	0.0%	99.9%	0.0%
36	San Bernardino	27	69	MD	Mojave Desert AQMD	246,030	6,190			252,220	97.5%	2.5%	0.0%	0.0%
Total						2,193,070	741,500	19,668,710	1,027,530	23,630,810	9.3%	3.1%	83.2%	4.35%
% of Total						9.28%	3.14%	83.23%	4.35%	100.00%				

Data source: BAR July of 2003 snap shot of DMV_Vehicles table from VID.

Note: All numbers are rounded to the nearest tenth.
 Counties in yellow shaded county codes split into two APCDs/AQMDs.
 The vehicle population estimates are based on the Smog Check program change after 12/01/03.

Appendix B I&M Programs Modeled in EMFAC2007

Program number	Subprogram number	Description	Program start year	Program start month	Inspection frequency	Change of ownership rate	Random roadside inspection rate	Remote sensing inspection rate	Tamper detection inspection rate	Inspection test type	Visual/functional checks	Emission standard stringency	Repair cost limits	Mechanic performance - inspections	Mechanic performance - repairs	Model years included		
																Min. age for inspected vehicles	Max. age for inspected vehicles	Earliest model year in program
I _{PROG}	I _{SUB}	Descript	I _{StartYr}	I _{StartMo}	I _{MFREQ}	C _{OR}	R _{RR}	R _{SR}	T _{DR}	I _{TEST}	I _{FUNC}	I _{TEST}	I _{RCOST}	I _{MECHI}	I _{MECHR}	I _{MINAGE}	I _{MAXAGE}	I _{MINMY}
1	1	BAR 1984 (1984)	1984	3	Biennial	17.00	0	0	0	IDLE	88 LEVEL	84 Cutpoints	\$50	Initial	Initial	0	45	1966
1	2	BAR 1984 (1984)	1984	3	Biennial	17.00	0	0	0	IDL/2500	88 LEVEL	84 Cutpoints	\$50	Initial	Initial	0	45	1980
2	1	COO 1984 (1984)	1984	3	No Schedule	17.00	0	0	0	IDLE	88 LEVEL	84 Cutpoints	\$50	Initial	Initial	0	45	1966
2	2	COO 1984 (1984)	1984	3	No Schedule	17.00	0	0	0	IDL/2500	88 LEVEL	84 Cutpoints	\$50	Initial	Initial	0	45	1980
3	1	BAR 1990A (1990)	1990	1	Biennial	17.00	0	0	0	IDLE	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
3	2	BAR 1990A (1990)	1990	1	Biennial	17.00	0	0	0	IDLE	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
3	3	BAR 1990A (1990)	1990	1	Biennial	17.00	0	0	0	IDL/2500	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1980
4	1	COO 1990A (1990)	1990	1	No Schedule	17.00	0	0	0	IDLE	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
4	2	COO 1990A (1990)	1990	1	No Schedule	17.00	0	0	0	IDLE	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
4	3	COO 1990A (1990)	1990	1	No Schedule	17.00	0	0	0	IDL/2500	FULL	90 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1980
5	1	BAR 1990B (1996)	1996	7	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
6	1	COO 1990B (1996)	1996	7	No Schedule	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	SB 1997	Enhanced	Enhanced	0	45	1966
7	1	Enh Basic (1998)	1998	6	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
8	1	COO Basic (1998)	1998	6	No Schedule	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
9	1	Enh Intrm (2001)	2001	1	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
9	2	Enh Intrm (2001)	2001	1	Biennial	17.00	0	0	0	ASM	FULL	Interim Cutpts	\$450-CAA	Enhanced	Enhanced	0	30	1974
10	1	Enh Basic (2005)	2005	1	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	45	1976
11	1	COO Basic (2005)	1998	6	No Schedule	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
12	1	Enh Intrm (2005)	2005	1	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	45	1976
12	2	Enh Intrm (2005)	2005	1	Biennial	17.00	0	0	0	ASM	FULL	Interim Cutpts	\$450-CAA	Enhanced	Enhanced	0	45	1976
13	1	Enh SIP (2010)	2010	1	Biennial	17.00	0	0	0	IDL/2500	FULL	96 Cutpoints	\$450-CAA	Enhanced	Enhanced	0	45	1976
13	2	Enh SIP (2010)	2010	1	Biennial	17.00	0	0	0	ASM	FULL	SIP Cutpoints	\$450-CAA	Enhanced	Enhanced	0	45	1976
14	1	User	2040	1	Biennial	17.00	0	0	0	ASM	FULL	SIP Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
14	2	User	2040	1	Biennial	17.00	0	0	0	ASM	FULL	SIP Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
15	1	User	2040	1	Biennial	17.00	0	0	0	ASM	FULL	SIP Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974
15	2	User	2040	1	Biennial	17.00	0	0	0	ASM	FULL	SIP Cutpoints	\$450-CAA	Enhanced	Enhanced	0	30	1974

Appendix C I&M Program Schedules By Geographic Areas

Geographic Area Index	Program Number	Implementati on Year	Implementati on Month	Description of Area	Program Description
1	2	1984	3	Alpine (GBV)	COO 1984 (1984)
1	4	1990	1	Alpine (GBV)	COO 1990A (1990)
1	6	1996	7	Alpine (GBV)	COO 1990B (1996)
1	8	1998	6	Alpine (GBV)	COO Basic (1998)
1	11	2005	1	Alpine (GBV)	COO Basic (2005)
2	2	1984	3	Inyo (GBV)	COO 1984 (1984)
2	4	1990	1	Inyo (GBV)	COO 1990A (1990)
2	6	1996	7	Inyo (GBV)	COO 1990B (1996)
2	8	1998	6	Inyo (GBV)	COO Basic (1998)
2	11	2005	1	Inyo (GBV)	COO Basic (2005)
3	2	1984	3	Mono (GBV)	COO 1984 (1984)
3	4	1990	1	Mono (GBV)	COO 1990A (1990)
3	6	1996	7	Mono (GBV)	COO 1990B (1996)
3	8	1998	6	Mono (GBV)	COO Basic (1998)
3	11	2005	1	Mono (GBV)	COO Basic (2005)
4	2	1984	3	Lake (LC)	COO 1984 (1984)
4	4	1990	1	Lake (LC)	COO 1990A (1990)
4	6	1996	7	Lake (LC)	COO 1990B (1996)
4	8	1998	6	Lake (LC)	COO Basic (1998)
4	11	2005	1	Lake (LC)	COO Basic (2005)
5	2	1984	3	El Dorado (LT)	COO 1984 (1984)
5	4	1990	1	El Dorado (LT)	COO 1990A (1990)
5	6	1996	7	El Dorado (LT)	COO 1990B (1996)
5	8	1998	6	El Dorado (LT)	COO Basic (1998)
5	9	2003	12	El Dorado (LT)	Enh Intrm (2001)
5	12	2005	1	El Dorado (LT)	Enh Intrm (2005)
6	2	1984	3	Placer (LT)	COO 1984 (1984)
6	4	1990	1	Placer (LT)	COO 1990A (1990)
6	6	1996	7	Placer (LT)	COO 1990B (1996)
6	8	1998	6	Placer (LT)	COO Basic (1998)
6	9	2003	4	Placer (LT)	Enh Intrm (2001)
6	12	2005	1	Placer (LT)	Enh Intrm (2005)
7	2	1984	3	Amador (MC)	COO 1984 (1984)

7	4	1990	1	Amador (MC)	COO 1990A (1990)
7	6	1996	7	Amador (MC)	COO 1990B (1996)
7	8	1998	6	Amador (MC)	COO Basic (1998)
7	11	2005	1	Amador (MC)	COO Basic (2005)
8	2	1984	3	Calaveras (MC)	COO 1984 (1984)
8	4	1990	1	Calaveras (MC)	COO 1990A (1990)
8	6	1996	7	Calaveras (MC)	COO 1990B (1996)
8	8	1998	6	Calaveras (MC)	COO Basic (1998)
8	11	2005	1	Calaveras (MC)	COO Basic (2005)
9	2	1984	3	El Dorado (MC)	COO 1984 (1984)
9	4	1990	1	El Dorado (MC)	COO 1990A (1990)
9	3	1991	10	El Dorado (MC)	BAR 1990A (1990)
9	5	1996	7	El Dorado (MC)	BAR 1990B (1996)
9	7	1998	6	El Dorado (MC)	Enh Basic (1998)
9	9	2001	1	El Dorado (MC)	Enh Intrm (2001)
9	12	2005	1	El Dorado (MC)	Enh Intrm (2005)
10	2	1984	3	Mariposa (MC)	COO 1984 (1984)
10	4	1990	1	Mariposa (MC)	COO 1990A (1990)
10	6	1996	7	Mariposa (MC)	COO 1990B (1996)
10	8	1998	6	Mariposa (MC)	COO Basic (1998)
10	11	2005	1	Mariposa (MC)	COO Basic (2005)
11	2	1984	3	Nevada (MC)	COO 1984 (1984)
11	4	1990	1	Nevada (MC)	COO 1990A (1990)
11	3	1991	10	Nevada (MC)	BAR 1990A (1990)
11	5	1996	7	Nevada (MC)	BAR 1990B (1996)
11	7	1998	6	Nevada (MC)	Enh Basic (1998)
11	10	2005	1	Nevada (MC)	Enh Basic (2005)
12	2	1984	3	Placer (MC)	COO 1984 (1984)
12	4	1990	1	Placer (MC)	COO 1990A (1990)
12	3	1990	10	Placer (MC)	BAR 1990A (1990)
12	5	1996	7	Placer (MC)	BAR 1990B (1996)
12	7	1998	6	Placer (MC)	Enh Basic (1998)
12	9	2003	4	Placer (MC)	Enh Intrm (2001)
12	12	2005	1	Placer (MC)	Enh Intrm (2005)
13	2	1984	3	Plumas (MC)	COO 1984 (1984)
13	4	1990	1	Plumas (MC)	COO 1990A (1990)
13	6	1996	7	Plumas (MC)	COO 1990B (1996)
13	8	1998	6	Plumas (MC)	COO Basic (1998)
13	11	2005	1	Plumas (MC)	COO Basic (2005)
14	2	1984	3	Sierra (MC)	COO 1984 (1984)

14	4	1990	1	Sierra (MC)	COO 1990A (1990)
14	6	1996	7	Sierra (MC)	COO 1990B (1996)
14	8	1998	6	Sierra (MC)	COO Basic (1998)
14	11	2005	1	Sierra (MC)	COO Basic (2005)
15	2	1984	3	Tuolumne (MC)	COO 1984 (1984)
15	4	1990	1	Tuolumne (MC)	COO 1990A (1990)
15	6	1996	7	Tuolumne (MC)	COO 1990B (1996)
15	8	1998	6	Tuolumne (MC)	COO Basic (1998)
15	11	2005	1	Tuolumne (MC)	COO Basic (2005)
16	2	1984	3	Monterey (NCC)	COO 1984 (1984)
16	4	1990	1	Monterey (NCC)	COO 1990A (1990)
16	3	1991	1	Monterey (NCC)	BAR 1990A (1990)
16	5	1996	7	Monterey (NCC)	BAR 1990B (1996)
16	7	1998	6	Monterey (NCC)	Enh Basic (1998)
16	10	2005	1	Monterey (NCC)	Enh Basic (2005)
17	2	1984	3	San Benito (NCC)	COO 1984 (1984)
17	4	1990	1	San Benito (NCC)	COO 1990A (1990)
17	3	1992	1	San Benito (NCC)	BAR 1990A (1990)
17	5	1996	7	San Benito (NCC)	BAR 1990B (1996)
17	7	1998	6	San Benito (NCC)	Enh Basic (1998)
17	10	2005	1	San Benito (NCC)	Enh Basic (2005)
18	2	1984	3	Santa Cruz (NCC)	COO 1984 (1984)
18	4	1990	1	Santa Cruz (NCC)	COO 1990A (1990)
18	3	1991	1	Santa Cruz (NCC)	BAR 1990A (1990)
18	5	1996	7	Santa Cruz (NCC)	BAR 1990B (1996)
18	7	1998	6	Santa Cruz (NCC)	Enh Basic (1998)
18	10	2005	1	Santa Cruz (NCC)	Enh Basic (2005)
19	2	1984	3	Del Norte (NC)	COO 1984 (1984)
19	4	1990	1	Del Norte (NC)	COO 1990A (1990)
19	6	1996	7	Del Norte (NC)	COO 1990B (1996)
19	8	1998	6	Del Norte (NC)	COO Basic (1998)
19	11	2005	1	Del Norte (NC)	COO Basic (2005)
20	2	1984	3	Humboldt (NC)	COO 1984 (1984)
20	4	1990	1	Humboldt (NC)	COO 1990A (1990)
20	6	1996	7	Humboldt (NC)	COO 1990B (1996)
20	8	1998	6	Humboldt (NC)	COO Basic (1998)
20	11	2005	1	Humboldt (NC)	COO Basic (2005)
21	2	1984	3	Mendocino (NC)	COO 1984 (1984)
21	4	1990	1	Mendocino (NC)	COO 1990A (1990)
21	6	1996	7	Mendocino (NC)	COO 1990B (1996)

21	8	1998	6	Mendocino (NC)	COO Basic (1998)
21	11	2005	1	Mendocino (NC)	COO Basic (2005)
22	2	1984	3	Sonoma (NC)	COO 1984 (1984)
22	4	1990	1	Sonoma (NC)	COO 1990A (1990)
22	6	1996	7	Sonoma (NC)	COO 1990B (1996)
22	8	1998	6	Sonoma (NC)	COO Basic (1998)
22	11	2005	1	Sonoma (NC)	COO Basic (2005)
23	2	1984	3	Trinity (NC)	COO 1984 (1984)
23	4	1990	1	Trinity (NC)	COO 1990A (1990)
23	6	1996	7	Trinity (NC)	COO 1990B (1996)
23	8	1998	6	Trinity (NC)	COO Basic (1998)
23	11	2005	1	Trinity (NC)	COO Basic (2005)
24	2	1984	3	Lassen (NEP)	COO 1984 (1984)
24	4	1990	1	Lassen (NEP)	COO 1990A (1990)
24	6	1996	7	Lassen (NEP)	COO 1990B (1996)
24	8	1998	6	Lassen (NEP)	COO Basic (1998)
24	11	2005	1	Lassen (NEP)	COO Basic (2005)
25	2	1984	3	Modoc (NEP)	COO 1984 (1984)
25	4	1990	1	Modoc (NEP)	COO 1990A (1990)
25	6	1996	7	Modoc (NEP)	COO 1990B (1996)
25	8	1998	6	Modoc (NEP)	COO Basic (1998)
25	11	2005	1	Modoc (NEP)	COO Basic (2005)
26	2	1984	3	Siskiyou (NEP)	COO 1984 (1984)
26	4	1990	1	Siskiyou (NEP)	COO 1990A (1990)
26	6	1996	7	Siskiyou (NEP)	COO 1990B (1996)
26	8	1998	6	Siskiyou (NEP)	COO Basic (1998)
26	11	2005	1	Siskiyou (NEP)	COO Basic (2005)
27	2	1984	3	Butte (SV)	COO 1984 (1984)
27	4	1990	1	Butte (SV)	COO 1990A (1990)
27	3	1991	3	Butte (SV)	BAR 1990A (1990)
27	5	1996	7	Butte (SV)	BAR 1990B (1996)
27	7	1998	6	Butte (SV)	Enh Basic (1998)
27	10	2005	1	Butte (SV)	Enh Basic (2005)
28	2	1984	3	Colusa (SV)	COO 1984 (1984)
28	4	1990	1	Colusa (SV)	COO 1990A (1990)
28	3	1991	10	Colusa (SV)	BAR 1990A (1990)
28	5	1996	7	Colusa (SV)	BAR 1990B (1996)
28	7	1998	6	Colusa (SV)	Enh Basic (1998)
28	10	2005	1	Colusa (SV)	Enh Basic (2005)

29	2	1984	3	Glenn (SV)	COO 1984 (1984)
29	4	1990	1	Glenn (SV)	COO 1990A (1990)
29	3	1991	3	Glenn (SV)	BAR 1990A (1990)
29	5	1996	7	Glenn (SV)	BAR 1990B (1996)
29	7	1998	6	Glenn (SV)	Enh Basic (1998)
29	10	2005	1	Glenn (SV)	Enh Basic (2005)
30	1	1984	3	Placer (SV)	BAR 1984 (1984)
30	4	1990	1	Placer (SV)	COO 1990A (1990)
30	3	1990	7	Placer (SV)	BAR 1990A (1990)
30	5	1996	7	Placer (SV)	BAR 1990B (1996)
30	7	1998	6	Placer (SV)	Enh Basic (1998)
30	9	2001	1	Placer (SV)	Enh Intrm (2001)
30	12	2005	1	Placer (SV)	Enh Intrm (2005)
31	1	1984	3	Sacramento (SV)	BAR 1984 (1984)
31	4	1990	1	Sacramento (SV)	COO 1990A (1990)
31	3	1990	7	Sacramento (SV)	BAR 1990A (1990)
31	5	1996	7	Sacramento (SV)	BAR 1990B (1996)
31	7	1998	6	Sacramento (SV)	Enh Basic (1998)
31	9	2001	1	Sacramento (SV)	Enh Intrm (2001)
31	12	2005	0	Sacramento (SV)	Enh Intrm (2005)
32	2	1984	3	Shasta (SV)	COO 1984 (1984)
32	4	1990	1	Shasta (SV)	COO 1990A (1990)
32	3	1991	10	Shasta (SV)	BAR 1990A (1990)
32	5	1996	7	Shasta (SV)	BAR 1990B (1996)
32	7	1998	6	Shasta (SV)	Enh Basic (1998)
32	10	2005	1	Shasta (SV)	Enh Basic (2005)
33	2	1984	3	Solano (SV)	COO 1984 (1984)
33	4	1990	1	Solano (SV)	COO 1990A (1990)
33	3	1991	3	Solano (SV)	BAR 1990A (1990)
33	5	1996	7	Solano (SV)	BAR 1990B (1996)
33	7	1998	6	Solano (SV)	Enh Basic (1998)
33	9	2001	1	Solano (SV)	Enh Intrm (2001)
33	12	2005	1	Solano (SV)	Enh Intrm (2005)
34	2	1984	3	Sutter (SV)	COO 1984 (1984)
34	4	1990	1	Sutter (SV)	COO 1990A (1990)
34	3	1991	10	Sutter (SV)	BAR 1990A (1990)
34	5	1996	7	Sutter (SV)	BAR 1990B (1996)
34	7	1998	6	Sutter (SV)	Enh Basic (1998)
34	10	2005	1	Sutter (SV)	Enh Basic (2005)
35	2	1984	3	Tehama (SV)	COO 1984 (1984)
35	4	1990	1	Tehama (SV)	COO 1990A (1990)

35	3	1991	10	Tehama (SV)	BAR 1990A (1990)
35	5	1996	7	Tehama (SV)	BAR 1990B (1996)
35	7	1998	6	Tehama (SV)	Enh Basic (1998)
35	10	2005	1	Tehama (SV)	Enh Basic (2005)
36	1	1984	3	Yolo (SV)	BAR 1984 (1984)
36	3	1990	7	Yolo (SV)	BAR 1990A (1990)
36	5	1996	7	Yolo (SV)	BAR 1990B (1996)
36	7	1998	6	Yolo (SV)	Enh Basic (1998)
36	9	2001	1	Yolo (SV)	Enh Intrm (2001)
36	12	2005	1	Yolo (SV)	Enh Intrm (2005)
37	2	1984	3	Yuba (SV)	COO 1984 (1984)
37	4	1990	1	Yuba (SV)	COO 1990A (1990)
37	3	1991	10	Yuba (SV)	BAR 1990A (1990)
37	5	1996	7	Yuba (SV)	BAR 1990B (1996)
37	7	1998	6	Yuba (SV)	Enh Basic (1998)
37	10	2005	1	Yuba (SV)	Enh Basic (2005)
38	1	1984	3	San Diego (SD)	BAR 1984 (1984)
38	3	1990	7	San Diego (SD)	BAR 1990A (1990)
38	5	1996	7	San Diego (SD)	BAR 1990B (1996)
38	7	1998	6	San Diego (SD)	Enh Basic (1998)
38	9	2001	1	San Diego (SD)	Enh Intrm (2001)
38	12	2005	1	San Diego (SD)	Enh Intrm (2005)
39	1	1984	3	Alameda (SF)	BAR 1984 (1984)
39	3	1990	7	Alameda (SF)	BAR 1990A (1990)
39	5	1996	7	Alameda (SF)	BAR 1990B (1996)
39	7	1998	6	Alameda (SF)	Enh Basic (1998)
39	9	2003	10	Alameda (SF)	Enh Intrm (2001)
39	12	2005	1	Alameda (SF)	Enh Intrm (2005)
40	1	1984	3	Contra Costa (SF)	BAR 1984 (1984)
40	3	1990	7	Contra Costa (SF)	BAR 1990A (1990)
40	5	1996	7	Contra Costa (SF)	BAR 1990B (1996)
40	7	1998	6	Contra Costa (SF)	Enh Basic (1998)
40	9	2003	10	Contra Costa (SF)	Enh Intrm (2001)
40	12	2005	1	Contra Costa (SF)	Enh Intrm (2005)
41	1	1984	3	Marin (SF)	BAR 1984 (1984)
41	3	1990	7	Marin (SF)	BAR 1990A (1990)
41	5	1996	7	Marin (SF)	BAR 1990B (1996)
41	7	1998	6	Marin (SF)	Enh Basic (1998)
41	9	2003	10	Marin (SF)	Enh Intrm (2001)
41	12	2005	1	Marin (SF)	Enh Intrm (2005)

42	1	1984	3	Napa (SF)	BAR 1984 (1984)
42	3	1990	7	Napa (SF)	BAR 1990A (1990)
42	5	1996	7	Napa (SF)	BAR 1990B (1996)
42	7	1998	6	Napa (SF)	Enh Basic (1998)
42	9	2003	10	Napa (SF)	Enh Intrm (2001)
42	12	2005	1	Napa (SF)	Enh Intrm (2005)
43	1	1984	3	San Francisco (SF)	BAR 1984 (1984)
43	3	1990	7	San Francisco (SF)	BAR 1990A (1990)
43	5	1996	7	San Francisco (SF)	BAR 1990B (1996)
43	7	1998	6	San Francisco (SF)	Enh Basic (1998)
43	9	2003	10	San Francisco (SF)	Enh Intrm (2001)
43	12	2005	1	San Francisco (SF)	Enh Intrm (2005)
44	1	1984	3	San Mateo (SF)	BAR 1984 (1984)
44	3	1990	7	San Mateo (SF)	BAR 1990A (1990)
44	5	1996	7	San Mateo (SF)	BAR 1990B (1996)
44	7	1998	6	San Mateo (SF)	Enh Basic (1998)
44	9	2003	10	San Mateo (SF)	Enh Intrm (2001)
44	12	2005	1	San Mateo (SF)	Enh Intrm (2005)
45	1	1984	3	Santa Clara (SF)	BAR 1984 (1984)
45	3	1990	7	Santa Clara (SF)	BAR 1990A (1990)
45	5	1996	7	Santa Clara (SF)	BAR 1990B (1996)
45	7	1998	6	Santa Clara (SF)	Enh Basic (1998)
45	9	2003	10	Santa Clara (SF)	Enh Intrm (2001)
45	12	2005	1	Santa Clara (SF)	Enh Intrm (2005)
46	1	1984	3	Solano (SF)	BAR 1984 (1984)
46	3	1990	7	Solano (SF)	BAR 1990A (1990)
46	5	1996	7	Solano (SF)	BAR 1990B (1996)
46	7	1998	6	Solano (SF)	Enh Basic (1998)
46	9	2003	10	Solano (SF)	Enh Intrm (2001)
46	12	2005	1	Solano (SF)	Enh Intrm (2005)
47	1	1984	3	Sonoma (SF)	BAR 1984 (1984)
47	3	1990	7	Sonoma (SF)	BAR 1990A (1990)
47	5	1996	7	Sonoma (SF)	BAR 1990B (1996)
47	7	1998	6	Sonoma (SF)	Enh Basic (1998)
47	9	2003	10	Sonoma (SF)	Enh Intrm (2001)
47	12	2005	1	Sonoma (SF)	Enh Intrm (2005)
48	1	1984	3	Fresno (SJV)	BAR 1984 (1984)
48	3	1990	7	Fresno (SJV)	BAR 1990A (1990)
48	5	1996	7	Fresno (SJV)	BAR 1990B (1996)
48	7	1998	6	Fresno (SJV)	Enh Basic (1998)
48	9	2001	1	Fresno (SJV)	Enh Intrm (2001)

48	12	2005	1	Fresno (SJV)	Enh Intrm (2005)
49	1	1986	1	Kern (SJV)	BAR 1984 (1984)
49	3	1990	7	Kern (SJV)	BAR 1990A (1990)
49	5	1996	7	Kern (SJV)	BAR 1990B (1996)
49	7	1998	6	Kern (SJV)	Enh Basic (1998)
49	9	2001	1	Kern (SJV)	Enh Intrm (2001)
49	12	2005	1	Kern (SJV)	Enh Intrm (2005)
50	2	1984	3	Kings (SJV)	COO 1984 (1984)
50	4	1990	1	Kings (SJV)	COO 1990A (1990)
50	3	1991	10	Kings (SJV)	BAR 1990A (1990)
50	5	1996	7	Kings (SJV)	BAR 1990B (1996)
50	7	1998	6	Kings (SJV)	Enh Basic (1998)
50	10	2005	1	Kings (SJV)	Enh Basic (2005)
51	2	1984	3	Madera (SJV)	COO 1984 (1984)
51	4	1990	1	Madera (SJV)	COO 1990A (1990)
51	3	1991	10	Madera (SJV)	BAR 1990A (1990)
51	5	1996	7	Madera (SJV)	BAR 1990B (1996)
51	7	1998	6	Madera (SJV)	Enh Basic (1998)
51	9	2002	5	Madera (SJV)	Enh Intrm (2001)
51	12	2005	1	Madera (SJV)	Enh Intrm (2005)
52	2	1984	3	Merced (SJV)	COO 1984 (1984)
52	4	1990	1	Merced (SJV)	COO 1990A (1990)
52	3	1990	7	Merced (SJV)	BAR 1990A (1990)
52	5	1996	7	Merced (SJV)	BAR 1990B (1996)
52	7	1998	6	Merced (SJV)	Enh Basic (1998)
52	9	2002	5	Merced (SJV)	Enh Intrm (2001)
52	12	2005	1	Merced (SJV)	Enh Intrm (2005)
53	1	1988	4	San Joaquin (SJV)	BAR 1984 (1984)
53	3	1990	7	San Joaquin (SJV)	BAR 1990A (1990)
53	5	1996	7	San Joaquin (SJV)	BAR 1990B (1996)
53	7	1998	6	San Joaquin (SJV)	Enh Basic (1998)
53	9	2001	1	San Joaquin (SJV)	Enh Intrm (2001)
53	12	2005	1	San Joaquin (SJV)	Enh Intrm (2005)
54	2	1984	3	Stanislaus (SJV)	COO 1984 (1984)
54	4	1990	1	Stanislaus (SJV)	COO 1990A (1990)
54	3	1990	7	Stanislaus (SJV)	BAR 1990A (1990)
54	5	1996	7	Stanislaus (SJV)	BAR 1990B (1996)
54	7	1998	6	Stanislaus (SJV)	Enh Basic (1998)
54	9	2001	1	Stanislaus (SJV)	Enh Intrm (2001)
54	12	2005	1	Stanislaus (SJV)	Enh Intrm (2005)

55	1	1988	9	Tulare (SJV)	BAR 1984 (1984)
55	3	1991	7	Tulare (SJV)	BAR 1990A (1990)
55	5	1996	7	Tulare (SJV)	BAR 1990B (1996)
55	7	1998	6	Tulare (SJV)	Enh Basic (1998)
55	9	2002	5	Tulare (SJV)	Enh Intrm (2001)
55	12	2005	1	Tulare (SJV)	Enh Intrm (2005)
56	2	1984	3	San Luis Obispo (SCC)	COO 1984 (1984)
56	4	1990	1	San Luis Obispo (SCC)	COO 1990A (1990)
56	3	1990	7	San Luis Obispo (SCC)	BAR 1990A (1990)
56	5	1996	7	San Luis Obispo (SCC)	BAR 1990B (1996)
56	7	1998	6	San Luis Obispo (SCC)	Enh Basic (1998)
56	10	2005	1	San Luis Obispo (SCC)	Enh Basic (2005)
57	2	1984	3	Santa Barbara (SCC)	COO 1984 (1984)
57	4	1990	1	Santa Barbara (SCC)	COO 1990A (1990)
57	3	1990	7	Santa Barbara (SCC)	BAR 1990A (1990)
57	5	1996	7	Santa Barbara (SCC)	BAR 1990B (1996)
57	7	1998	6	Santa Barbara (SCC)	Enh Basic (1998)
57	10	2005	1	Santa Barbara (SCC)	Enh Basic (2005)
58	1	1984	3	Ventura (SCC)	BAR 1984 (1984)
58	3	1990	7	Ventura (SCC)	BAR 1990A (1990)
58	5	1996	7	Ventura (SCC)	BAR 1990B (1996)
58	7	1998	6	Ventura (SCC)	Enh Basic (1998)
58	9	2001	1	Ventura (SCC)	Enh Intrm (2001)
58	12	2005	1	Ventura (SCC)	Enh Intrm (2005)
59	1	1984	3	Los Angeles (SC)	BAR 1984 (1984)
59	3	1990	7	Los Angeles (SC)	BAR 1990A (1990)
59	5	1996	7	Los Angeles (SC)	BAR 1990B (1996)
59	7	1998	6	Los Angeles (SC)	Enh Basic (1998)
59	9	2001	1	Los Angeles (SC)	Enh Intrm (2001)
59	12	2005	1	Los Angeles (SC)	Enh Intrm (2005)
60	1	1984	3	Orange (SC)	BAR 1984 (1984)
60	3	1990	7	Orange (SC)	BAR 1990A (1990)
60	5	1996	7	Orange (SC)	BAR 1990B (1996)
60	7	1998	6	Orange (SC)	Enh Basic (1998)
60	9	2001	1	Orange (SC)	Enh Intrm (2001)
60	12	2005	1	Orange (SC)	Enh Intrm (2005)
61	1	1984	3	Riverside (SC)	BAR 1984 (1984)
61	3	1990	7	Riverside (SC)	BAR 1990A (1990)
61	5	1996	7	Riverside (SC)	BAR 1990B (1996)
61	7	1998	6	Riverside (SC)	Enh Basic (1998)
61	9	2001	1	Riverside (SC)	Enh Intrm (2001)

61	12	2005	1	Riverside (SC)	Enh Intrm (2005)
62	1	1984	3	San Bernardino (SC)	BAR 1984 (1984)
62	4	1990	1	San Bernardino (SC)	COO 1990A (1990)
62	3	1990	7	San Bernardino (SC)	BAR 1990A (1990)
62	5	1996	7	San Bernardino (SC)	BAR 1990B (1996)
62	7	1998	6	San Bernardino (SC)	Enh Basic (1998)
62	9	2001	1	San Bernardino (SC)	Enh Intrm (2001)
62	12	2005	1	San Bernardino (SC)	Enh Intrm (2005)
63	2	1984	3	Imperial (SS)	COO 1984 (1984)
63	4	1990	1	Imperial (SS)	COO 1990A (1990)
63	6	1996	7	Imperial (SS)	COO 1990B (1996)
63	8	1998	6	Imperial (SS)	COO Basic (1998)
63	11	2005	1	Imperial (SS)	COO Basic (2005)
64	2	1984	3	Riverside (SS)	COO 1984 (1984)
64	4	1990	1	Riverside (SS)	COO 1990A (1990)
64	3	1990	7	Riverside (SS)	BAR 1990A (1990)
64	5	1996	7	Riverside (SS)	BAR 1990B (1996)
64	7	1998	6	Riverside (SS)	Enh Basic (1998)
64	9	2001	1	Riverside (SS)	Enh Intrm (2001)
64	12	2005	1	Riverside (SS)	Enh Intrm (2005)
65	2	1984	3	Kern (MD)	COO 1984 (1984)
65	4	1990	1	Kern (MD)	COO 1990A (1990)
65	3	1990	7	Kern (MD)	BAR 1990A (1990)
65	5	1996	7	Kern (MD)	BAR 1990B (1996)
65	7	1998	6	Kern (MD)	Enh Basic (1998)
65	10	2005	1	Kern (MD)	Enh Basic (2005)
66	2	1984	3	Riverside (MD/MDAQMD)	COO 1984 (1984)
66	4	1990	1	Riverside (MD/MDAQMD)	COO 1990A (1990)
66	6	1996	7	Riverside (MD/MDAQMD)	COO 1990B (1996)
66	8	1998	6	Riverside (MD/MDAQMD)	COO Basic (1998)
66	11	2005	1	Riverside (MD/MDAQMD)	COO Basic (2005)
67	2	1984	3	Riverside (MD/SCAQMD)	COO 1984 (1984)
67	4	1990	1	Riverside (MD/SCAQMD)	COO 1990A (1990)
67	6	1996	7	Riverside	COO 1990B (1996)

67	8	1998	6	(MD/SCAQMD) Riverside	COO Basic (1998)
67	11	2005	1	(MD/SCAQMD) Riverside (MD/SCAQMD)	COO Basic (2005)
68	2	1984	3	Los Angeles (MD)	COO 1984 (1984)
68	4	1990	1	Los Angeles (MD)	COO 1990A (1990)
68	3	1990	7	Los Angeles (MD)	BAR 1990A (1990)
68	5	1996	7	Los Angeles (MD)	BAR 1990B (1996)
68	7	1998	6	Los Angeles (MD)	Enh Basic (1998)
68	9	2001	1	Los Angeles (MD)	Enh Intrm (2001)
68	12	2005	1	Los Angeles (MD)	Enh Intrm (2005)
69	2	1984	3	San Bernardino (MD)	COO 1984 (1984)
69	4	1990	1	San Bernardino (MD)	COO 1990A (1990)
69	3	1991	3	San Bernardino (MD)	BAR 1990A (1990)
69	5	1996	7	San Bernardino (MD)	BAR 1990B (1996)
69	7	1998	6	San Bernardino (MD)	Enh Basic (1998)
69	10	2005	1	San Bernardino (MD)	Enh Basic (2005)