

**State of California  
AIR RESOURCES BOARD**

**STAFF REPORT: INITIAL STATEMENT OF REASONS FOR  
PROPOSED RULEMAKING**

**Public Meeting to Consider Regulations for an Enhanced Fleet  
Modernization Program (Car Scrap)**

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## **Executive Summary**

Voluntary accelerated vehicle retirement or “car scrap” programs provide monetary incentives to vehicle owners to retire older, more polluting vehicles. The purpose of these programs is to reduce fleet emissions by accelerating the turnover of the existing fleet and subsequent replacement with newer, cleaner vehicles. Reducing emissions from the existing fleet is a component of California’s State Implementation Plan, which outlines the State’s strategy for meeting health-based ambient air quality standards.

### **Background**

There are currently over one million vehicles retired every year as part of normal fleet turnover in California. California’s low-emission new car standards are dependent on this natural turnover for significant emission reductions. However, extra emission reductions benefits can be achieved through the early retirement of fully functional but high emitting vehicles. An existing State vehicle retirement program retires roughly 22,000 older vehicles annually and local air districts scrap an additional 5,000 vehicles, primarily for air quality benefits.

Reducing emissions from the existing fleet is an important part of California’s strategy to meet health-based ambient air quality standards. A disproportionate amount of the light-duty fleet emissions are from older, high-emitting vehicles. By 2010, vehicles 15 years and older will account for about 20 percent of the fleet (and about 14 percent of the miles traveled), but still be responsible for over 62 percent of the smog-forming emissions from cars.

California’s mild climate contributes to the longer survival rates of the state fleet. About half of all light-duty vehicles survive at least 15 years and one-quarter at least 20 years. However, of those that survive 20 years, about 40 percent will still be in use at least 10 more years. And due to economic conditions, consumers are holding onto older vehicles with greater frequency. Providing monetary incentives can provide the necessary and cost-effective “push” for retiring many of these older, inherently higher-emitting vehicles.

### **Enhanced Fleet Modernization Program**

In October 2007, Governor Schwarzenegger signed Assembly Bill 118 (Nunez, Chapter 750, Statutes of 2007) into law. This legislation provides approximately \$200 million annually for new programs to improve air quality through the development and use of advanced technologies as well as alternative and renewable fuels. The legislation also includes roughly \$30 million annually for an Enhanced Fleet Modernization Program (EFMP) to augment the State’s existing voluntary accelerated vehicle retirement program (the existing Consumer Assistance Program is administered by the Bureau of Automotive Repair and provides \$1,000 for the

voluntary retirement of vehicles failing their most recent Smog Check). This rulemaking provides the regulatory framework for implementing the EFMP as required by AB 118.

### Proposal Overview

There are two main features to the proposed rulemaking. First, the proposal would provide incentives statewide for vehicles not currently eligible under the Consumer Assistance Program by removing the existing requirements that vehicles be *subject* to and *fail* Smog Check to participate. Allowing vehicles that are not currently undergoing registration or that have passed their Smog Check to participate greatly expands the vehicle population that can be retired in any given year and is projected to result in the retirement of up to 15,000 vehicles annually when fully funded. Participants would receive \$1,000 per vehicle or \$1,500 per vehicle if they meet low-income requirements.

Second, the proposal would establish a pilot voucher program in the South Coast and San Joaquin Valley air basins that targets the highest-emitting vehicles and requires their replacement with newer, cleaner vehicles. The local air districts would work behind the scenes with the Bureau of Automotive Repair (BAR) to determine vehicle eligibility and low-income status. Once approved, the districts would provide the applicant a Letter of Eligibility from BAR and a redeemable voucher. Consumers would retire their vehicle at a participating dismantler, receiving immediate compensation for vehicle retirement. Consumers could then redeem their voucher at participating dealerships toward the purchase of a replacement vehicle. Staff proposes that the voucher compensation be \$2,000 or \$2,500 per vehicle depending on income level. Staff is also proposing that income eligible participants be able to choose from a wider pool of replacement vehicles. A summary of the proposed incentives is provided in the table below.

**Proposed Program Incentives**

<b>Consumer</b>	<b>Retirement Incentive</b>	<b>Replacement Voucher<sup>1</sup></b>	<b>Total Incentives</b>	<b>Replacement Model Years (rolling)</b>
All	\$1,000	\$2,000	\$3,000	Newest 4 Model Years
Income Eligible <sup>2</sup>	\$1,500	\$2,500	\$4,000	Newest 8 Model Years

<sup>1</sup> Available in South Coast and San Joaquin air basins

<sup>2</sup> Income not to exceed 225 percent of the federal poverty limit

Though the proposed regulations would significantly expand existing vehicle eligibility requirements, most functional and operational requirements would be consistent with the State’s existing program. For example, eligible vehicles would have to pass the

same visual and functional inspections and be retired at dismantlers under contract to the Bureau of Automotive Repair. Additional flexibility is, however, provided to the registration requirements currently in place to enable wider participation.

The proposed pilot voucher program is groundbreaking for the State to administer. Consequently, ARB staff will monitor the program closely to determine if changes are needed, including an expansion of the voucher component.

### **Proposed EFMP Benefits**

At the anticipated funding level of \$30 million annually, the proposal is expected to result in the early retirement of up to 15,000 vehicles statewide each year, nearly doubling the existing State program. In addition, the proposal provides the framework and budget for a voucher program designed to fund up to 3,500 participants per year. Based on these projections, the total emission benefits of the program are estimated to be up to 1.6 tons of hydrocarbons and oxides of nitrogen each day when fully funded. The available funding in the first year is \$16.4 million, which is sufficient to retire about 9,500 vehicles and provide 1,300 vouchers.

The proposed program is voluntary and does not require participation by consumers or businesses. For businesses choosing to participate, the program is expected to provide modest positive impacts. Businesses that will benefit include licensed dismantlers and new or used car dealerships due to the increase in vehicles scrapped and the expected increase in vehicle sales at car dealerships.

Cost-effectiveness reflects the cost incurred per ton of pollution reduced and is used to ensure that State funds are spent efficiently and achieve the maximum air quality benefit. The legislation directs that cost-effectiveness be considered but does not specify a limit. As proposed, the overall cost-effectiveness of the program is estimated to be \$16,000 per ton. The most costly element, greater incentives for income-eligible participants, generally exceeds the cost-effectiveness of other incentive programs. However, providing greater incentives for income-eligible participants is justified by their need for additional support to purchase newer vehicles, and the legislative direction.

### **Staff Recommendation**

The ARB staff recommends that the Board adopt the regulations as proposed in this Initial Statement of Reasons. The proposal meets the legislative direction to expand the State's existing vehicle retirement program to specifically target the highest polluting vehicles in the areas with the greatest air quality problems. The proposal takes into consideration flexible compensation related to the replacement of the vehicles being retired and the impacts to low-income populations.

## **Introduction**

Air pollution is a serious problem for California – over 90 percent of Californians live in areas that have unhealthy air at times. Air pollution has been tied to serious health impacts. Research in Southern California shows that children exposed to unhealthy levels of ozone, or smog, suffer decreased lung function growth and increased asthma. In addition, recent evidence has linked the onset of asthma with exposure to elevated ozone levels in exercising children.

The emissions that cause smog come from a multitude of sources – cars, trucks, and industrial sources, as well as hairspray, lawnmowers, and paints. One of the prime contributors to air pollution in California is the automobile. Although new cars are over 97 percent cleaner than their uncontrolled predecessors, in 2010, almost 20 percent of the smog-forming emissions in the Los Angeles area will still be caused by cars, minivans, pick-up trucks, and sport-utility vehicles.

A disproportionate amount of these emissions are from older, high-emitting vehicles. For example, by 2010, vehicles 15 years and older will account for about 20 percent of the fleet (and about 14 percent of the miles traveled), but still be responsible for over 60 percent of the smog-forming emissions from cars. In California, about half of all cars survive at least 15 years and one-quarter to at least 20 years. However, it is interesting to note that of those cars that do survive to 20 years, about 40 percent of those will survive at least 10 more years. Clearly, reducing emissions from the existing light-duty fleet is an important part of California's strategy to meet the health based ambient air quality standards.

In response to these issues, the ARB has developed program guidelines for vehicle retirement for use by local air districts. Although voluntary accelerated vehicle retirement (VAVR) programs operate in several areas of the State, the programs have not achieved their full potential because they have not been funded at the originally anticipated levels. AB 118 recognized this deficiency and responded by provided additional funding through 2015 to specifically target the highest emitting vehicles in areas with the worst air quality.

## **Existing Retirement Programs**

State and local programs exist and are governed by basic rules established by the ARB. To qualify, vehicles meet registration, functionality, and equipment eligibility criteria. The important distinction between the local and State program is that the local programs generate mobile source emission reduction credits that can be retired for clean air, or traded and sold. In contrast, the BAR scrap program is not used to generate tradable emission credits. A review of these programs is helpful in putting the proposed rulemaking into context.

**Statewide Consumer Assistance Program:** The state currently provides \$1,000<sup>1</sup> through the Bureau of Automotive Repair's (BAR's) Consumer Assistance Program (CAP) for the retirement of vehicles that did not pass their most recent Smog Check. Typically, these are older vehicles, but there is not a specific range of model years targeted by the program<sup>2</sup>. Any vehicle that has failed the Smog Check test (and has met registration and physical condition requirements) is eligible. Although there are air quality benefits, the objective of CAP is to provide options, both vehicle retirement and repair assistance, for Californians facing difficulties in registering their vehicles resulting from a failing Smog Check. The program is only available during the Smog Check cycle and for vehicles that fail the test.

A total of 88,000 vehicles have been retired since the program's inception and demand has historically exceeded available funds. In addition, 235,000 vehicles have received repair assistance since the program's inception.

**Local Car Scrap Programs:** Local air districts also administer programs that provide incentives to voluntarily retire older vehicles. District programs are referred to as Voluntary Accelerated Vehicle Retirement (VAVR) programs. The five air districts that currently operate programs include Antelope Valley Air Pollution Control District (APCD), Bay Area Air Quality Management District (AQMD), San Joaquin Valley APCD, Santa Barbara County APCD, and the South Coast AQMD. Although the incentive amounts are fairly similar to CAP, with incentives in the \$650 to \$1,000 range, VAVR programs do not strictly overlap with the state program since the vehicles participating in district programs must be outside of the registration renewal cycle and had to have passed their last Smog Check to be eligible. VAVR programs are typically operated with state or local incentive funds, although the South Coast AQMD operates a privately funded program that generates mobile source offset credits.

District VAVR programs have retired substantially fewer vehicles than the State's CAP program. The Bay Area AQMD operates the largest VAVR program, retiring over 4,000 vehicles each year.

There are also two other more recently initiated vehicle retirement programs which are operated by local air districts and designed to retire probable gross-polluting vehicles. Both programs are pilot programs that are limited in scope and funding compared to the programs discussed above. The South Coast AQMD operates a program called High Emitter Repair or Scrap (HEROS) that uses mobile remote sensing equipment to identify gross polluters and then solicits voluntary participation through the offer of compensation for repair or retirement. The San Joaquin Valley APCD operates the REMOVE II program by soliciting owners of vehicles that are targeted as probable high emitters based on Smog Check test data. Although very limited in size to date, REMOVE II is the only program in the state to currently offer

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<sup>1</sup> BAR is in the process of amending the program to provide \$1,500 to low-income participants.

<sup>2</sup> Pre-1976 model year vehicles are not subject to Smog Check and are thus ineligible for CAP.

incentives based on the purchase of a replacement vehicle. Table 1 provides a summary of the state and district vehicle scrap programs.

**Table 1: Existing State and Local Car Scrap Program**

Entity	Vehicles Accepted	Incentive
BAR	1976 and newer	\$1,000 <sup>1</sup>
Antelope Valley	1988 and older	\$900 <sup>2</sup>
Bay Area	1987 and older	\$650 <sup>2</sup>
San Joaquin Valley (REMOVE II)	Targeted High Emitter	\$1,000 \$5,000 with LEV II replacement
Santa Barbara	1988 and older	\$800
South Coast	1994 and older	\$500 to \$1,000
South Coast (HEROS)	Gross Polluter	\$2,000

<sup>1</sup> BAR is in the process of amending CAP to provide \$1,500 to low-income participants.

<sup>2</sup> The district is in the process of increasing their retirement incentive to \$1,000.

Collectively, all of these existing programs are not sufficient in scope or funding<sup>3</sup> to meet the State Implementation Plan (SIP) commitments for vehicle retirement. Vehicle retirement programs have consistently been included in the State’s clean air plans due to their cost-effectiveness, but funding has been a chronic problem.

The 2007 SIP includes a commitment to expand the State’s existing program to achieve reductions equivalent to the early retirement of 50,000 and 10,000 vehicles per year in the South Coast and San Joaquin Valley air basins, respectively. These totals represent about half of one percent of the vehicles subject to Smog Check in each region. The annual retirement of 60,000 vehicles would provide emission benefits equal to 2 percent of light-duty vehicles emissions in 2014. The funds allocated under AB 118 represent a “down-payment” on the SIP commitment by providing enough funding to retire roughly one-fourth of the total needed to meet the emission reductions identified for vehicle retirement in the SIP.

**Overview: Enhanced Fleet Modernization Program**

The proposed Enhanced Fleet Modernization Program (EFMP) is a voluntary vehicle retirement program authorized by AB 118 (Nunez, Chapter 750, Statutes of 2007<sup>4</sup>, section 44125(a)). The purpose of the legislation is to augment the State’s existing vehicle retirement programs by targeting the highest emitting vehicles in the areas with the worst air quality. Funding for the program is provided via a \$1 increase in

<sup>3</sup> Combined annual expenditures for district programs are approximately \$6 million.

<sup>4</sup> A copy of the legislation pertaining to EFMP is contained in Appendix B.



vehicle registration fees and totals roughly \$30 million annually through 2015. The program will be administered by BAR, beginning April 1, 2010. AB 118 establishes six significant design criteria or guidelines for the new program:

- 1) Retired vehicles must be permanently removed from operation by a dismantler under contract with the BAR
- 2) Districts retain their authority to administer vehicle retirement programs
- 3) The program will target high polluting passenger vehicles, light-duty and medium-duty trucks that have been continuously registered<sup>5</sup> in California for two years
- 4) The program shall be focused where the greatest air quality impact can be identified
- 5) Compensation is flexible, depending on emissions, age and replacement vehicle factors
- 6) Cost-effectiveness and impacts on disadvantaged and low-income populations shall be considered

The Legislature specifically provided greater program flexibility by placing the EFMP within Article 11 of the California Health and Safety Code, independent of the requirements of either the CAP or VAVR authorizing legislation. While AB 118 directs that districts retain their authority to administer existing VAVR programs, the proposal will impact these programs by competing for many of the pool of vehicles<sup>6</sup>. With that said, the EFMP proposal is designed to provide consistency with existing programs where possible while still addressing the specific directives contained within the legislation.

## **Public Outreach**

ARB staff conducted four workshops in support of the proposed regulation. Notices of each workshop were sent to list serves established for the program, and workshops were webcasted when technically feasible to allow remote participation. At the first workshop in May 2008, ARB staff provided background on legislative directions of AB 118, existing State and local programs, and the plans for regulatory development of the EFMP. At the second and third workshops in September and December 2008, ARB staff presented draft regulatory concepts. During the last workshop in March 2009, staff presented the final program concepts and draft regulatory language for public comment. Workshop attendees emphasized the need for program simplicity and greater flexibility for low-income populations.

Throughout the regulatory process, ARB staff worked with stakeholders to refine the proposal and to respond to the concerns raised. Regular coordination meetings were

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<sup>5</sup> AB 118 provides some flexibility by allowing that vehicles either be continuously registered for two years or otherwise proven to have been driven primarily in California for two years and not registered in any other state

<sup>6</sup> In response, some districts are in the process of modifying their programs to increase the amount offered to be consistent with CAP and to remove any inherent advantages to the proposed program.

held with BAR staff, but ARB staff also met with representatives from the South Coast AQMD, San Joaquin Valley APCD, Bay Area AQMD, the Clean Air Dialogue Working Group of the California Environmental Dialogue, the California New Car Dealers Association, and car dismantlers. Extra outreach was also taken to ensure that those representing environmental justice communities were aware of the regulatory process.

ARB staff endeavored to craft a regulation that addressed as many issues as possible while retaining the goal of maintaining a balance between flexibility and the requirement that emission reductions from vehicle retirement be real, surplus, quantifiable, and enforceable.

## **Summary of the Proposed Regulation**

The purpose of the proposed rulemaking is to improve California air quality through the voluntary retirement of light- and medium-duty vehicles. The proposed program will be administered by BAR through contracts with dismantlers, air districts and other entities, as appropriate. A discussion of the program's main elements and their rationale is provided below. The proposed regulatory text is contained in Appendix A.

### **Eligibility Requirements**

As directed by AB 118, the proposed regulation would provide greater flexibility for program participation than currently allowed under existing programs. For example, the proposal does not restrict participation based on model year<sup>7</sup>. Concerning vehicle class and size, the staff proposal would increase the existing weight limit<sup>8</sup> of CAP and VAVR programs to 10,000 pounds gross vehicle weight and allow medium-duty vehicles to participate. The expanded flexibility increases the pool of eligible vehicles and responds to legislative direction that medium-duty trucks be included.

To ensure real and surplus reductions, existing state and local programs require that vehicles be registered in California for the previous two years. This requirement limits participation and excludes in some cases extremely high emitting vehicles. AB 118 provides flexibility by specifically expanding eligibility to unregistered vehicles that can otherwise prove to have been driven primarily in California for two years and not registered in any other state.

In response to this direction, ARB staff proposes to allow unregistered vehicles with proof of ownership and proof of use in California to participate. Proof of use would include, but not be limited to, insurance or repair receipts tied to an address in California for a period of no less than two years. Staff also proposes to relax the requirement that vehicles be continuously registered for the preceding two years to be consistent with the flexibility allowed under the VAVR programs. Under VAVR

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<sup>7</sup> CAP does not include pre-1976 vehicles; VARV programs do not include vehicles generally newer than 1990.

<sup>8</sup> CAP and VAVR programs are limited to vehicles under 8,500 pounds gross vehicle weight.

programs, a vehicle may be eligible if the vehicle has been placed in planned non-operational status for a total of two or few months during the two-year period. Due to the relatively large incentives for the pilot voucher program, ARB staff proposes to limit the program to one voucher per person.

## **Program Incentives**

There are two main features of the proposed EFMP. First, the proposal significantly expands the existing statewide program by removing the requirements that vehicles be *subject* to Smog Check and *fail* in order to participate. Second, additional compensation would be made available to consumers with “targeted” vehicles in areas with the most severe air quality to incentivize the retirement of probable gross polluting vehicles along with the purchase of newer, cleaner vehicles.

### **Incentives for Early Retirement Only**

The first feature, expansion of the existing retirement program would be available statewide and include vehicles that have been declined from the CAP<sup>9</sup> program for administrative reasons and vehicles that are not currently subject to biennial Smog Check. This expansion of the existing retirement program is a significant change because a given vehicle would be eligible for retirement at any time, not just within 120 days of failing a Smog Check test. The potential increase in eligible population and decrease in program restrictions is large. BAR staff estimates that 7,500 vehicles declined from the CAP program for administrative reasons alone would be eligible for EFMP incentives.

ARB staff proposes that the general incentive for EFMP be \$1,000 per vehicle and \$1,500 per vehicle for low-income consumers. The proposed incentive levels are consistent with the CAP program and will provide enough compensation to ensure robust program participation. The combination of additional funds and greatly expanded eligible population under EFMP is expected to nearly double the number of vehicles currently retired each year by BAR.

### **Replacement Incentives for Targeted Vehicles**

AB118 also directs that flexibility be considered in providing compensation and be based on factors including, but not limited to, vehicle age, emission benefits of the vehicle’s retirement, emissions impact of any replacement vehicle, and location of vehicles in areas of the state with the poorest air quality. ARB staff proposes that BAR target probable high emitters through direct mailing in areas with the greatest air quality problems and offer additional incentives for replacement with newer, cleaner

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<sup>9</sup> The state currently provides \$1,000 through CAP for the retirement of vehicles that did not pass their most recent Smog Check. The objective of CAP is to provide options, both vehicle retirement and repair assistance, for Californians facing difficulties in registering their vehicles due to emissions-related issues resulting from a failing Smog Check.

vehicles. Only targeted vehicles would be eligible for an additional incentive for vehicle replacement.

The targeted, probable high emitter population consists of an estimated 300,000 pre-1976 vehicles, about 200,000 light-duty and medium-duty diesel vehicles and an additional large population of the highest emitting vehicles of the High Emitter Profile (HEP) database, as identified by BAR. Staff also proposes that districts be allowed to identify voucher program participants by other approved approaches including remote sensing.

Targeted vehicles will on average have higher baseline emissions than those in conventional retirement programs where the vehicles are selected by model year alone. Because targeted vehicles are probable gross polluters, additional funds can be made available for a cleaner replacement vehicle while still maintaining acceptable cost effectiveness. Targeting gross polluters and providing a replacement incentive for a sufficiently new vehicle allows mitigation of one of the historic criticisms of voluntary vehicle retirement programs: the assumption of a cleaner replacement vehicle.

The proposed incentives for the pilot voucher program are shown in Table 2. Ideally, only the newest and cleanest vehicles would be allowed as replacement vehicles. However, given financial considerations, staff proposes to require that the replacement vehicle be of the most recent four model years. This flexibility allows for much lower cost to the consumer while still resulting in the purchase of a vehicle meeting the ARB’s Low Emission Vehicle II standards<sup>10</sup>.

The proposal is structured to provide greater funding and flexibility to low-income participants to allow them to get into a newer vehicle at a manageable cost. Low-income populations are given the flexibility to replace their vehicles with an eight year or newer model certified to at least LEV I standards. By 2014, all low-income eligible owners will purchase vehicles certified to LEV II standards. These provisions provide certainty that only significantly cleaner, less polluting vehicles will be used as replacements.

**Table 2: Proposed Program Incentives**

<b>Consumer</b>	<b>Retirement Incentive</b>	<b>Replacement Voucher</b>	<b>Total Incentives</b>	<b>Replacement Model Years (rolling)</b>
All	\$1,000	\$2,000	\$3,000	Newest 4 Model Years
Income Eligible	\$1,500	\$2,500	\$4,000	Newest 8 Model Years

<sup>10</sup> By 2007, essentially all vehicles will be certified under LEV II.

To start, ARB staff proposes that vouchers be available only in the South Coast and San Joaquin Valley air basins. If successful and more funds are available, the voucher program would be expanded to other areas, including the Bay Area air basins.

Staff proposes that BAR contract with dismantlers for the retirement portion of the EFMP program, as well as contract with the South Coast AQMD and San Joaquin APCD to administer the pilot voucher program. Under the proposal, the districts would oversee and work with participating dealerships for redemption of the vouchers. The districts would also effectively function as a field office of the BAR under an expanded CAP program for retirement of the vehicles receiving a voucher. The districts would also be directly responsible for administering and tracking vouchers and ensuring that funds are available. Dealerships would receive the vouchers from the consumer and submit the voucher, retirement receipt, and other paperwork to the districts for reimbursement.

### **Consumer Process**

The process for a consumer to retire their vehicle under the proposed program would be consistent with the current CAP process. Consumers apply and receive approval from BAR via the mail. Once approved, the consumer takes the approval letter and vehicle to a dismantler under contract with BAR for retirement and compensation.

The consumer process for the pilot voucher program is shown in Figure 1. As illustrated, targeted consumers would apply to the districts for program approval. Targeted consumers could apply in person, via mail or at participating district events. The South Coast AQMD and San Joaquin Valley APCD would work behind the scenes with the Bureau of Automotive Repair (BAR) to determine vehicle eligibility and low-income status. Once approved by BAR for retirement and district staff for the voucher, the districts would then deliver to the consumer both a Letter of Eligibility supplied by BAR and a voucher supplied by the district. The consumer would take the Letter of Eligibility and the vehicle to a participating dismantler that would issue the retirement incentive as currently done under CAP. The voucher from the district and the retirement receipt from the dismantler could then be presented by the consumer for redemption at a participating new or used dealership within the air basin. The proposal is designed to be as consumer friendly as possible while ensuring that the appropriate controls are in place to prevent program abuse and fraud.

## Figure 1: Voucher Process

## Proposed EFMP Budget

AB118 provides roughly \$30 million annually to fund the EFMP. Table 3 provides an expected ongoing budget for the program. Given the uncertainty in program participation, ARB staff will monitor the program closely to determine if changes are needed, including an expansion of the voucher component. The available funding in the first year is \$16.4 million, of which \$3 million is dedicated to vouchers. This funding is sufficient to retire about 9,500 vehicles and provide 1,300 vouchers. The funding for each district is based on the ratio in the SIP resulting in \$2.5 million for South Coast AQMD and \$500,000 for San Joaquin Valley APCD.

**Table 3: EFMP Budget**

Agency	Allocations (in millions)	Vehicles Retired	Vouchers
BAR	\$22	15,000	NA
Local Air Districts	\$8	NA	3,500
Total	\$30	15,000	3,500

## Environmental and Economic Impacts

Vehicle retirement programs reduce fleet emissions by accelerating both the turnover of the existing fleet and the consequent replacement with newer, cleaner vehicles. Reducing emissions from the existing fleet is a critical part of California's SIP. The proposed program is strictly voluntary and does not require mandatory participation by businesses. For those choosing to participate, the regulation is expected to have modest positive impacts. The proposal's environmental and economic benefits are discussed in this section.

### Emission Benefits

The proposed EFMP is expected to result in the accelerated retirement of up to 15,000 vehicles annually statewide, with almost 9,500 planned for the first full fiscal year. In addition, it is anticipated that the voucher program will provide incentives for about 3,500 participants, with about 1,300 planned for the first full fiscal year in the South Coast and San Joaquin Valley air basins. A detailed analysis of the estimated emission benefits is provided in Appendix C.

Emission benefits were estimated by taking the emissions difference between the retired vehicle and the replacement vehicle as calculated using EMFAC (the state's

mobile source emission inventory model). The EMFAC model output of the total daily emissions for the model year(s) of interest was divided by the total number of vehicles of that model year in order to arrive at the estimated daily emissions for a vehicle of that model year. The difference in estimated daily emissions between the vehicles of each model year is then multiplied by the expected life of the benefit; i.e. the expected remaining life of the retired vehicle. This difference is the estimated benefit per vehicle participating in the program.

The emission benefits for the program are shown in Table 4. As shown in the Table, the majority of the program's benefits will be derived from the retirement of older vehicles and replacement with fleet average vehicles. While the emission benefits are greater on a per vehicle basis for vehicles receiving a voucher (emissions from the replacement vehicle are assumed to be the 2006 fleet average), there are far fewer vehicles in the voucher program. The overall program is expected to reduce smog-forming emissions by 1.6 tons per day. Emission benefits for the first full fiscal year, including the pilot voucher program, are estimated at about 1.0 ton per day NO<sub>x</sub> +HC. In addition, it is expected that there will be both particulate matter (PM) and green house gas emission reductions as newer vehicles tend to emit less PM and tend to have better fuel economy.

**Table 4: Estimated Emission Benefits**

	<b>Vehicles</b>	<b>Tons NO<sub>x</sub> and HC (tons per day)</b>
Vehicle Retirement	11,500	1.3
Vehicle Retirement and Replacement	3,500	0.3
	15,000	1.6

### **Economic Impacts**

Vehicle retirement programs are voluntary for air districts, businesses, and vehicle owners, and a positive economical impact is created. Vehicle owners and businesses will not participate in VAVR programs if it is not economically beneficial. Potentially, a small number of new jobs may be created due to this increase. The doubling in retirement vehicles to the State's existing program may result in a modest increase in new jobs for dismantlers. As for dealerships, given the recent steep decline in the auto sales industry, the EFMP may help to maintain current employment levels as opposed to creating new jobs.

Owners of older, more polluting vehicles will benefit in that an expanded market will be created for their vehicles. An eligible vehicle with a useful life that may have had little resale value would have a cash value as a result of the vehicle's retirement. In turn, newer vehicles will be purchased in part by the incentive received from retiring a



vehicle. Individuals and businesses selling the newer vehicles may benefit slightly by an expanded market for their vehicles.

## **Environmental Justice**

The proposal contains increased incentives and flexibility for income eligible participants. Consumers whose incomes do not exceed federal poverty guidelines as currently defined under CAP<sup>11</sup>, would be eligible for additional incentives upon proof of income status. Income eligible participants taking advantage of the clean vehicle voucher would also receive a higher voucher amount and be able to choose from a wider pool of replacement vehicles.

## **Cost-Effectiveness**

Cost-effectiveness is a metric used to ensure that state funds are well spent and achieve the maximum air quality benefit. As an example, the Carl Moyer Program Incentives Program limits projects to those not exceeding a cost-effectiveness of \$16,000 per weighted ton of hydrocarbon, oxides of nitrogen and particulate matter reduced. AB 118 directs that cost-effectiveness be considered but does not specify a cost-effectiveness limit. The cost effectiveness presented in this staff report does not include particulate matter in the calculations. Inclusion of particulate matter emissions in the cost-effectiveness estimations would tend to increase the cost-effectiveness of the program. The full analysis of the program's cost-effectiveness is presented in Appendix D.

Table 5 provides a summary of the cost-effectiveness for the program. Cost-effectiveness will vary significantly and depend on the age of the retired vehicle, whether a voucher is used, and in cases where additional incentives are provided for low-income participants. The cost-effectiveness for vouchers and income-eligible participants is higher than the Moyer limit but is consistent with the direction contained in the legislation that consideration be given to encourage cleaner vehicle replacements and low-income participation. Overall, the average cost-effectiveness of the program is estimated to be \$16,000 per ton. Appendix D provides a detailed explanation of the methodology and assumptions of these estimates.

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<sup>11</sup> Refer to Appendix E for the maximum household income for income eligible participants.

**Table 5: Estimated Cost Effectiveness**

<b>Consumer</b>	<b>Retirement</b>	<b>Voucher</b>	<b>Total</b>	<b>Dollar per ton (NO<sub>x</sub> + HC)</b>
General	\$1,000	No	\$1,000	\$13,000
	\$1,000	\$2,000	\$3,000	
Income-Eligible	\$1,500	No	\$1,500	\$18,000
	\$1,500	\$2,500	\$4,000	
All Participants				\$16,000 <sup>1</sup>

<sup>1</sup> Based on historical data from BAR's CAP program, a 56% income eligible/44% non-income eligible split is used to calculate the overall cost effectiveness.

## **Summary and Staff Recommendation**

Voluntary accelerated vehicle retirement or “car scrap” programs provide monetary incentives to vehicle owners to retire older, more polluting vehicles. The purpose of these programs is to reduce fleet emissions by accelerating the turnover of the existing fleet and consequent replacement with newer, cleaner vehicles. Reducing emissions from the existing fleet is a critical part of California’s State Implementation Plan, which outlines the state’s overall clean air strategy.

The proposal will almost double the State’s existing vehicle retirement programs by providing approximately \$30 million annually through 2015 to specifically target the higher polluting vehicles in the areas with the greatest air quality problems. The proposal introduces a new pilot voucher program that provides greater compensation for newer vehicle purchases in the South Coast and San Joaquin Valley air basins and includes additional incentives and flexibility for low-income populations.

The ARB staff recommends that the Board adopt the regulations as proposed in this Initial Statement of Reasons. Staff also proposes that a full review of the program occur by the end of 2010 to determine program effectiveness and to recommend any necessary changes.

## References

1. Air Resources Board's Proposed Strategy for California's 2007 State Implementation Plans, pages 100-101, April 26, 2007
2. Air Resources Board, The Carl Moyer Program Guidelines: Approved Revision 2008, Chapter XI, April 22, 2008.
3. Air Resources Board, Vehicle Retirement Program Comparisons (VAVR) Table, May 2008.
4. Air Resources Board, Report to the California Legislature: Status Report on the Development of Guidelines for the Enhanced Fleet Modernization Program (AB 118, Article 11), February 2009
5. Air Resources Board's Emissions Inventory, <http://www.arb.ca.gov/>
6. Emissions Tables, EMFAC2007. v2.3, Updated November 2006
7. Bureau of Automotive Repair, Consumer Assistance Program Application, 2008.
8. R. L. Polk & Co., Medium Age of Vehicles, PRNewswire, March 3, 2009

# Appendix A: Proposed Regulatory Order

## PROPOSED REGULATION ORDER

### Regulation for AB 118 Enhanced Fleet Modernization Program

Adopt new sections 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, and 2630 title 13, chapter 8.1, California Code of Regulations (CCR) to read as follows:

(Note: The entire text of sections 2620 through 2630 is new language.)

#### Chapter 8.1. AB 118 Enhanced Fleet Modernization Program

##### § 2620. Purpose

The purpose of this regulation is to improve California air quality through the voluntary early retirement of vehicles as directed by the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Assembly Bill 118 Statutes of 2007, Chapter 750; Health and Safety Code sections 44125-44126) section 44125(a). Vehicle owners, who meet certain eligibility requirements, are offered the following:

- (a) Payment for the voluntary retirement from operation of a motor vehicle and/or;
- (b) Additional payment, in the form of a voucher, to owners of targeted vehicles for the purchase of a cleaner vehicle meeting emission and/or model year requirements, if they voluntarily retire a targeted vehicle.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

##### § 2621. Definitions

- (a) “**ARB or Board**” means the California Air Resources Board.
- (b) “**BAR or Bureau**” means the Bureau of Automotive Repair in the Department of Consumer Affairs.
- (c) “**Dismantle**” means to, crush, stamp, shred, or otherwise render permanently and irreversibly incapable of functioning as originally intended, any vehicle or vehicle part.
- (d) “**Dismantler**” means the person or business, defined and licensed according to the requirements of California Vehicle Code sections 220, 221, 11500, et seq., and other business codes and the regulations of the Department of Motor Vehicles (DMV),

who under contract with BAR dismantles or otherwise removes from service those vehicles obtained in the Enhanced Fleet Modernization Program.

(e) **“District”** means a local air quality management district or air pollution control district, as defined by California Health and Safety Code, Part 3, Section 40000 et seq., which has responsibility for administering air pollution control programs.

(f) **“Drive Train Parts”** means all parts associated with the drive train such as engine, drive mechanism, transmission, differential, axles, and brakes.

(g) **“EFMP” means** the Enhanced Fleet Modernization Program.

(h) **“Emissions-Related Part”** means any vehicle part which affects any regulated emissions from a vehicle that is subject to California or federal emissions standards and includes, but is not limited to, those parts specified in the “Emissions-Related Parts List,” adopted by the State Board on November 4, 1977, as last amended June 1, 1990.

(i) **“Income Eligible”** means eligible for increased financial incentives according to the income eligible definition used in the BAR Consumer Assistance Program (CAP).

(j) **“Solicited Vehicle”** means a vehicle identified by the Bureau and the Board and solicited by the Bureau for participation in the EFMP retirement program. These vehicles are identified by probability of being a high polluting vehicle. Solicited vehicles include: all pre-1976 model year vehicles; diesel vehicles; and additional vehicles identified by analysis of the data generated by the Smog Check programs.

(k) **“Targeted Vehicle”** means a vehicle identified by the Bureau, the Board, or the district to be eligible for a voucher and retirement under the EFMP. These vehicles are identified by probability of being a high polluting vehicle. Targeted vehicles include: all pre-1976 model year vehicles; diesel vehicles; and additional vehicles identified by analysis of the data generated by the Smog Check programs or vehicles identified by other means such as remote sensing. Targeted vehicles identified by analysis of emissions data will have a higher probability of high emissions than solicited vehicles; targeted vehicles are a subset of solicited vehicles.

(l) **“Voucher”** means a document with a specified redemption value issued by the district, and redeemed at a vehicle dealer for the replacement of a retired vehicle with a cleaner vehicle.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2622. Program Administration**

(a) The Enhanced Fleet Modernization Program shall be administered by the Bureau through contracts with dismantlers, districts and other appropriate entities as necessary.

(b) The Bureau may contract annually with local air pollution control districts to administer the voucher portion of the EFMP. Districts may use up to five (5) percent of program funds to recover administrative costs incurred.

(c) The Bureau shall coordinate annually with the Board to determine the appropriate budget for the voucher program, given past performance.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2623. Program Limits**

An applicant determined to be eligible under the Enhanced Fleet Modernization Program may receive the following assistance:

(a) Payment up to one thousand dollars (\$1,000) for each vehicle retired from operation at a dismantler operating under contract with the Bureau of Automotive Repair; or

(b) For income eligible participants, payment up to fifteen hundred dollars (\$1,500) for each vehicle retired from operation at a dismantler operating under contract with BAR.

(c) Once the dismantler has purchased the vehicle, the consumer's eligibility status or the amount paid to the consumer cannot change.

Targeted Vehicles may also qualify for:

(d) Payment, in the form of a voucher, up to two thousand dollars (\$2,000) toward the purchase of a replacement vehicle four years old or newer; or

(e) For income eligible participants, payment, in the form of a voucher, up to twenty-five hundred dollars (\$2,500) toward the purchase of a replacement vehicle eight years old or newer.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2624. Eligibility Requirements**

(a) In order to apply for participation in the EFMP, an individual must submit a completed application as specified at Section 3394.6 of Title 16 of Division 33, Article 11 of the California Code of Regulations, to BAR with original signature(s).

(b) In order to participate in the EFMP, a vehicle must meet the following requirements, as applicable:

(1) It shall be voluntarily sold to a Dismantler under contract with the BAR;

(2) It shall be currently registered with the DMV as an operable vehicle and shall have been so registered continuously for at least 24 months prior to the date of application to an address or addresses within the state., or

(A) A vehicle may also be eligible if the owner of the vehicle placed the vehicle in planned non-operational status per Vehicle Code Section 4604, et seq., for a total of sixty (60) or fewer days during the continuous twenty-four (24) months registration period and occurring at least ninety (90) days prior to the date of application, or

(B) A vehicle may also be eligible if the registration has lapsed for less than 121 days during the previous twenty-four (24) months, pursuant to Health and Safety Code 44094, and all appropriate registration fees and late penalties have been paid to the DMV, provided that the vehicle is registered for at least ninety (90) days immediately prior to the date of application;

(C) Determination of an individual vehicle's registration history shall be based on:

1. Registration data for that vehicle obtained from DMV records ;and

2. If C.1 provides inconclusive results for an individual vehicle, then copies of the applicable vehicle registration certificates may be used;

(D) An unregistered vehicle may also be eligible if proven to have been driven primarily in California for the last two years and not have been registered in any other state or country in the last two years. Documentation of operation in California includes the following.

1. Proof of insurance for the last two years; or

2. Invoice(s) (showing the vehicle identification number) for vehicle repairs and/or maintenance during the previous two years and proof of owner's residence in the state during the same period.

(3) It shall be a vehicle with up to 10,000 pounds gross vehicular weight rating: including a passenger vehicle, truck, sports utility vehicle (SUV), or van;

(4) It may be operating under a Smog Check repair cost waiver or economic hardship extension issued pursuant to Health and Safety Code Section 44017 or 44017.1;

(5) It may be currently operating under a Temporary Operating Permit issued by the Department of Motor Vehicles.

(6) Vehicles that are tampered, pursuant to Section 3340.41.5 of Title 16, Division 33, Article 5.5 of the California Code of Regulations, shall be eligible for acceptance into the EFMP program.

(c) Each vehicle shall pass the visual and operational inspection required by the Consumer Assistance Program, performed by the dismantler or BAR representative, and conducted on-site at the dismantler location. The inspection requirements for the Consumer Assistance Program are defined in CCR Sections 3394.4 (c) (8) and 3394.4 (c) (9). Vehicles failing the requirements pursuant to Section 2624 may be re-inspected by the Dismantler for compliance with these requirements at any time after modifications have been made to the vehicle to correct the deficiency(ies).

(d) An applicant shall not have retired another vehicle through the EFMP or the BAR Consumer Assistance Program within the preceding twelve (12) month period: and a vehicle owner who is a joint owner of a vehicle shall not have retired more than two (2) vehicles through the EFMP or BAR Consumer Assistance Program within a twelve (12) month period.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2625. Ineligible Vehicles**

(a) A dismantled vehicle pursuant to Section 11519 of the Vehicle Code.

(b) A vehicle registered to a non-profit organization or a business.

(c) A Vehicle operated by a fleet licensed and registered pursuant to Section 44020 of the Health and Safety Code.



(d) A vehicle being initially registered in California.

(e) A vehicle undergoing a transfer of ownership.

**§ 2626. Targeted Vehicles and Vehicle Solicitation**

(a) BAR will identify vehicles with the greatest potential for having the highest emissions for participation in the EFMP. BAR shall use existing vehicle emissions data to identify and solicit program participation beginning with vehicles with the highest emissions potential first. Solicited vehicles include: all pre-1976 model year vehicles; diesel vehicles; and additional vehicles identified by analysis of the data generated by the Smog Check programs.

(b) BAR will adjust solicitation based on consumer participation.

(c) BAR shall primarily focus solicitation efforts in the South Coast and San Joaquin Valley basins.

(d) Districts may solicit Targeted Vehicles as appropriate for participation in the voucher portion of the EFMP. Targeted vehicles shall be those with the greatest potential for having the highest emissions. Targeted vehicles shall be pre-1976 vehicles, diesel vehicles, or other vehicles as identified using the BAR High Emitter Profile model, or by other means as approved by the Board.

**§ 2627. Vouchers**

(a) Vouchers will initially be offered in the South Coast and San Joaquin Valley air basins with inclusion of other air districts as determined by the Board. The Bureau shall consult with the Board annually regarding the status and expansion of the voucher program.

(b) BAR shall contract with the district to administer the voucher program.

(c) The district administering the voucher program shall submit applications for EFMP retirement to BAR for approval and determination of income eligibility. If approved, BAR shall issue a Letter of Eligibility (LOE), which the district will give to the applicant.

(d) The district administering the voucher program shall contract with participating vehicle dealers for redemption of the vouchers.

(1) All entities under contract to redeem vouchers must be licensed as dealers; private-party vehicle transactions are not eligible for voucher redemption.

(2) The voucher may not be redeemed on the purchase of a dismantled vehicle (pursuant to Section 11519 of the Vehicle Code).

(3) The voucher may not be redeemed on the purchase of a vehicle with a salvaged title.

(e) No person may receive more than one voucher from the EFMP program.

(f) Vehicles shall not be eligible for a voucher unless they meet the registration requirements of Section 2624 at an address in the district where the voucher is issued.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2628. Parts Recycling and Resale.**

Dismantlers, and their agents, contractors and employees shall not remove any parts from an EFMP purchased vehicle for resale or reuse unless specifically exempted by BAR through contract.

(a) No compensation with public funds from the EFMP shall be granted for any vehicle from which emission-related or drive train parts have been sold.

(b) All activities associated with retiring vehicles, including but not limited to the disposal of vehicle fluids and vehicle components, shall comply with:

(1) Local water conservation regulations;

(2) State, county, and city energy and hazardous materials response regulations;  
and

(3) Local water agency soil, surface, and ground water contamination regulations.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2629. Records and Auditing**

(a) Records shall be securely maintained by the dismantler for each vehicle purchase and transaction in the EFMP program.

(b) Records shall be maintained by the district for each voucher redemption and transaction in the EFMP program.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

**§ 2630. Severability**

Each part of this article shall be deemed severable, and in the event that any provision of this article is held to be invalid, the remainder of this article shall continue in full force and effect.

NOTE: Authority cited: 39600, 39601, and 44125, Health and Safety Code.  
Reference cited: 39600, 39601, and 44125, Health and Safety Code.

## **Appendix B: Assembly Bill 118 (Nunez, Chapter 750, Statutes of 2007)**

SEC. 4. Article 11 (commencing with Section 44125) is added to Chapter 5 of Part 5 of Division 26 of the Health and Safety Code, to read:

### **Article 11. Enhanced Fleet Modernization Program**

44125. (a) No later than July 1, 2009, the state board, in consultation with the Bureau of Automotive Repair (BAR), shall adopt a program to commence on January 1, 2010, that allows for the voluntarily retirement of passenger vehicles and light-duty and medium-duty trucks that are high polluters. The program shall be administered by the BAR pursuant to guidelines adopted by the state board.

(b) The guidelines shall ensure all of the following:

(1) Vehicles retired pursuant to the program are permanently removed from operation and retired at a dismantler under contract with the BAR.

(2) Districts retain their authority to administer vehicle retirement programs otherwise authorized under law.

(3) The program is available for high polluting passenger vehicles and light-duty and medium-duty trucks that have been continuously registered in California for two years prior to acceptance into the program or otherwise proven to have been driven primarily in California for the last two years and have not been registered in any other state or country in the last two years.

(4) The program is focused where the greatest air quality impact can be identified.

(5) Compensation levels for retired vehicles are flexible, taking into account factors including, but not limited to, the age of the vehicle, the emission benefits of the vehicle's retirement, the emissions impact of any replacement vehicle, and the location of vehicles in areas of the state with the poorest air quality.

(6) Cost-effectiveness and impacts on disadvantaged and low-income populations are considered.

44126. The Enhanced Fleet Modernization Subaccount is hereby created in the High Polluter Removal and Repair Account. All moneys deposited in the subaccount shall be available to the department and the BAR, upon appropriation by the Legislature, to establish and implement the program created pursuant to this article.

## Appendix C: Estimated Emissions Benefits of EFMP

Emission benefits for the EFMP are estimated by taking the difference between the retired vehicle and the replacement vehicle as calculated using EMFAC (the state's mobile source emission inventory model). EMFAC output of the total daily emissions for the model year(s) of interest is divided by the total number of vehicles of that model year in order to arrive at the estimated daily emissions for a vehicle of that model year. The difference in estimated daily emissions between the vehicles of each model year is then multiplied by the expected life of the benefit; i.e. the expected remaining life of the retired vehicle.

This difference is the estimated benefit per vehicle participating in the program. Note that the estimate will vary based on the assumptions used for both the retired vehicle and the replacement vehicle. Several estimates based on a variety of assumptions about the retired vehicle and replacement vehicle are presented below. These estimates provide an expected range for the emissions benefit. Total program benefits are then estimated by multiplying the estimated per vehicle benefit by the estimated number of vehicles participating in the program.

### Estimated Emissions Benefit Per Retired Vehicle in 2010

Retired Vehicle <sup>3,7</sup>	Replacement Vehicle <sup>3,7</sup>	Scenario Description	Tons <sup>1,2,4</sup> ROG + NO <sub>x</sub>
Retirement <i>WITHOUT</i> Voucher			
1985-1988 MY <sup>5</sup>	2001 MY <sup>6</sup>	Typical retirement	.11
Pre-1976 MY	2001 MY <sup>6</sup>	Older car retirement	.33
Diesel (LDA all MY)	2001 MY <sup>6</sup>	Diesel retirement	.03
1985-1988 MY <sup>5</sup>	2010 MY	New vehicle replacement	.13
Retirement <i>WITH</i> Voucher			
1985-1988 MY <sup>5</sup>	2006 MY <sup>8</sup>	Typical voucher (replacement 4 yrs old or newer)	.13
1985-1988 MY <sup>5</sup>	2002 MY <sup>8</sup>	Typical Income eligible w/ voucher (replacement 8yrs old or newer)	.11

Notes:

- 1) EMFAC2007 v2.3 (Nov 1 2006), Summer Planning Inventory, Statewide.
- 2) The estimated benefit is calculated for the planned commencement of the EFMP in calendar year 2010.
- 3) The emissions of retired vehicles from model years 1976 to present are assumed 30% higher than the average of the model year of the retired vehicle. This assumption reflects the planned efforts to solicit HEP vehicles. The emissions of the replacement vehicle are the average of the model year of the replacement.
- 4) The useful remaining life of the retired vehicle is three years. The daily estimate produced by EMFAC is multiplied by 365 days per year and then multiplied by the assumed three year life.
- 5) The model year of the retired vehicle is assumed to be 1985-1988. This assumption is based on the center of the model year distribution of vehicles retired under the state's existing vehicle retirement program, CAP (Consumer Assistance Program) run by the state Bureau of Automotive Repair.
- 6) The model year of the replacement vehicle is nine years old, or 2001. This is approximately the mean age of the entire fleet in 2010.
- 7) All vehicles up to 8500 lbs GVWR are included for a given model year. This implies that the distribution of vehicle types and vehicle GVWR for the retired vehicles is the same as the ratio in the model.
- 8) Assumes the oldest (highest emitting) model year replacement acceptable to the voucher program.

Example Calculation:

Scenario: Retired vehicle is 1985-1988 model year and the replacement vehicle is 2001 model year.

For the retired vehicle, EMFAC outputs the following daily emissions estimate:

Vehicle Class	LDA	LDT1	LDT2	MDV	TOTAL
Class Population	420,479	143,516	147,955	51,764	763,714
ROG Emissions (tons per day)	21.29	7.39	8.82	3.05	40.55
NOx Emissions (tons per day)	13.05	8.08	8.75	3.28	33.16
Total ROG + NOx (tons per day)	34.34	15.47	17.57	6.33	73.71
Calculations:					
ROG + NOx (tons per vehicle per year)	0.0298	0.0393	0.0433	0.0446	0.0352
ROG + NOx (tons per vehicle for 3 years)	0.0894	0.1180	0.1300	0.1339	<b>0.1057</b>

For the replacement vehicle, EMFAC outputs the following daily emissions estimate:

Vehicle Class	LDA	LDT1	LDT2	MDV	TOTAL
Class Population	764,293	269,455	288,972	161,880	1,484,600
ROG Emissions (tons per day)	5.19	1.91	2.45	1.97	11.52
NOx Emissions (tons per day)	6.85	3.69	5.68	4.1	20.32
Total ROG + NOx (tons per day)	12.04	5.6	8.13	6.07	31.84
Calculations:					
ROG + NOx (tons per vehicle per year)	0.0057	0.0076	0.0103	0.0137	0.0078
ROG + NOx (tons per vehicle for 3 years)	0.0172	0.0228	0.0308	0.0411	<b>0.0235</b>

The emissions benefit is therefore calculated as .1057 tons -.0235 tons =.0822 tons

Using an assumed 30% higher than average emissions from the retired vehicle due to solicitation efforts for high emission vehicles.... $1.3*(.1057)-.0235=.1139$  tons

Actual EMFAC output is shown at the end of this appendix. All of the other emission benefits shown in the table above are calculated similarly.

#### Discussion of Assumptions and Estimates

Selection of the 1985-1988 model years as a typical retired vehicle is a conservative assumption that results in the calculation of a lower benefit. The 1985-1988 model years were selected to represent the typical retired vehicle because they are the center of the distribution of model years that are actually scrapped under the Bureau of Automotive Repair's Consumer Assistance Program (CAP). However, that program specifically excludes pre-1976 vehicles. Inclusion of the omitted pre-1976 models would tend to increase the estimate because they are generally the highest emitting vehicles in the fleet. It may also be expected that the fractional population of pre-1976 vehicles in the population of retired vehicles is higher than their fractional population in the total fleet as the incentive offered for retirement may appear as a better value to consumers selling older vehicles.

Selection of a nine year old vehicle as the replacement may under or over estimate the emissions of the replacement vehicle depending on assumptions about the replacement vehicle. The mean age of vehicles in the fleet is about nine years old, thus it is a logical choice for replacement vehicle. However, the emissions of the nine year old vehicle are estimated by EMFAC to be about 32% less than the mean emissions of the entire fleet.

It is also likely that the replacement vehicle for emissions calculations purposes is theoretically not a vehicle of mean age (nine years old), nor a vehicle of mean fleet emissions, but a brand new vehicle; if the owner of the retired vehicle buys a used vehicle as a replacement, then the seller of that used vehicle will presumably replace

the vehicle with another, and so on, until ultimately someone purchases a new vehicle. It is not typical for the replacement vehicle to appear from nowhere with no effect on the existing fleet; the replacement is either taken from someone else in the fleet who replaces their vehicle, or in rare situations it may come from out of state. A simple difference in emissions of the vehicle actually retired and the actual replacement vehicle is only an estimate of that *individual driver's* emissions benefit and not an accurate estimate of the effect of the retirement action on the emissions of the fleet. The effect of the retirement on the entire fleet must take into account the replacement for the replacement vehicle and so on. In order to present a conservative emission benefit, this analysis does not include the assumption that every replacement is a new vehicle.

**Estimated Total Emissions Benefit for the EFMP**

The total emissions benefit of the EFMP program is calculated by multiplying the per vehicle benefit by the number of participating vehicles. Given that the available funds are fixed and the amount offered per vehicle is pre-determined, there is perhaps less uncertainty in the number of participating vehicles. The total emissions benefit for a number of different scenarios is presented below. Staff's expectation for the maximum potential funding of the program is retirement of up to 15,000 vehicles with vouchers issued for up to 3,500 of those vehicles; the estimates of total program benefits shown below use this assumption. Note that the total number of tons shown below is calculated by multiplying the total per vehicle benefit calculated earlier in this appendix by 15,000 retired vehicles. The tons per day estimate is the total benefit in tons divided by 365 days per year and then divided by three (benefit is assumed to be over a three year period as discussed earlier).

**Estimated Total Emissions Benefit for EFMP<sup>1</sup>**

<b>Retired Vehicle</b>	<b>Replacement Vehicle</b>	<b>Scenario Description</b>	<b>Total Tons ROG + NO<sub>x</sub></b>	<b>tons per day ROG + NO<sub>x</sub></b>
1985-1988 MY	2001 MY	Typical retirement	1,750	1.6
All Pre-1990	2001 MY	Capture of some older vehicles	2,550	2.3
All Pre-1976 MY	2001 MY	Older vehicle retirement	5,100	4.7

<sup>1</sup>Preliminary budget proposals from BAR reflecting current economic conditions for FY 2010/2011 fund this program at about 50% of the level used to construct the table above. Therefore, the estimated emission benefit for FY 2010/2011 is about 50% of the values shown above.



## Appendix D: Calculation of Cost Effectiveness of EFMP

The cost effectiveness of the EFMP will vary based on the types of vehicles retired, the number of vouchers granted, and the actual funds appropriated. An estimate for the total program is shown below.

### Estimated Cost Effectiveness of EFMP program:

	Income Eligible	General (Non-Income Eligible)	Total <sup>1</sup> EFMP
Retirement Cost (# vehicles x \$ incentive)	8,500 x \$1,500 = \$12,750,000	6,500 x \$1,000 = \$6,500,000	\$19,250,000
Voucher Cost	1,900 x \$2500 = \$4,750,000	1,600 x \$2000 = \$3,200,000	\$7,950,000
Administration	\$1,575,000	\$1,225,000	\$2,800,000
Total Cost	\$19,075,000	\$10,925,000	\$30,000,000
Emissions Benefit (# vehicles x tons benefit)	8,500 x .1139 = 970 tons	6,500 x .1139 = 740 tons	1,710 tons
<b>Cost Effectiveness <sup>2</sup></b>	\$18,100/ton	\$13,100/ton	<b>\$15,900/ton</b>

#### Notes:

- 1) Assumes the following:
  - a) Total funding of approximately \$30 million; approximately \$8 million for vouchers.
  - b) Approximately 57/43 split of income eligible/non-income eligible incentives (ratio taken from existing CAP retirement program).
  - c) Emissions benefits from EMFAC as described in appendix of estimated emission benefits.
  - d) Retired vehicle is 1985-1988 model year.
  - e) Replacement is mean age vehicle (nine years old)
  - f) 30% increase in retired vehicle emissions (from EMFAC) to account for planned efforts to solicit high emitters.
- 2) Consistent with other incentive programs, administration costs are not included in cost effectiveness calculations.

## Appendix E: Income Eligibility Table

<b>Number of People in Household</b>	<b>Maximum Annual Gross Household Income</b>
1	\$23,400
2	\$31,500
3	\$36,600
4	\$47,700
5	\$55,800
6	\$63,900
7	\$72,000
8	\$80,000
More than 8, for each add:	\$8,100

Reference: Smog Check Consumer Assistance Program Application, Bureau of Automotive Repair, Feb 2008