

CHAPTER 8: LIGHT-DUTY VEHICLES

This chapter describes the minimum criteria and requirements for Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program) light-duty vehicle projects.

A. Projects Eligible for Funding

Voluntary Accelerated Vehicle Retirement (VAVR) projects are eligible for Moyer Program funding. VAVR projects scrap older, more-polluting vehicles earlier than their expected lifetime that are still operational and have useful remaining life. Two types of VAVR projects are allowed: conventional and high emitting. Retirement of a high emitting vehicle results in emission reductions greater than those generated by conventional projects. To be eligible for a high emitting VAVR project, a vehicle's Smog Check results must exceed the pass/fail emission standards for the vehicle's model year and class.

The Bureau of Automotive Repair (BAR) concurrently administers two different vehicle retirement programs similar to the Moyer Program, the Enhanced Fleet Modernization Program's (EFMP) Retirement-Only component and their own Consumer Assistance Program (CAP). Although the Moyer Program, EFMP Retirement-Only Program, and CAP are administered and operated in a consistent manner, each program has different eligibility requirements, funding sources, and accepts vehicles at different times within the Smog Check cycle. The Moyer Program accepts vehicles that have passed their most recent Smog Check, while CAP accepts vehicles that have failed their most recent Smog Check. EFMP Retirement-Only however, accepts vehicles that have either passed or failed their most recent Smog Check, but is limited to income eligible applicants only.

B. Maximum Eligible Funding Amounts

VAVR projects are subject to the Moyer Program cost-effectiveness limit and must meet all other relevant criteria in Section D of this chapter. Incentives paid for eligible VAVR projects are limited to a maximum of \$1,500 per vehicle. Air quality management districts or air pollution control districts (air districts) have the authority to set more stringent project requirements.

C. Regulatory Background

Moyer Program VAVR projects are subject to the requirements of the VAVR Regulation, California Code of Regulations (CCR), title 13, section 2601 et seq. Air districts may choose to act as the enterprise operator in lieu of contracting out this work to a third party. However, costs incurred by the air district to perform the duties of an enterprise operator shall be considered administrative costs.

VAVR projects funded through AB 923 are authorized by Health and Safety Code section 44229(b)(4) which states that these projects must be in compliance with

guidelines adopted by the Air Resources Board (ARB). This chapter constitutes ARB's adopted guidelines for VAVR projects.

D. Project Criteria

The following criteria provide the minimum requirements for Moyer Program VAVR projects. All projects must also conform to Chapter 2: General Criteria, as well as the project application, contract, reporting, and other requirements as described in Chapter 3: Program Administration. Participating air districts retain the authority to impose additional or more restrictive requirements to address local concerns.

Vehicle Eligibility Requirements:

1. Participation shall be entirely voluntary for vehicle owners.
2. A vehicle volunteered for retirement must be a diesel or gasoline powered passenger car or light-duty truck up to 10,000 pounds gross vehicle weight.
3. A vehicle volunteered for retirement must be currently registered with the Department of Motor Vehicles (DMV) as an operating vehicle and must have been registered for at least 24 consecutive months, to an address within the air district in which the VAVR enterprise is operated, prior to the date of the sale to a VAVR enterprise. Smog Checks must be performed as required by DMV in order for the vehicle to be considered registered.
 - (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 up to 60 days during the previous 24 month registration period and occurring at least 90 days immediately prior to its sale to the VAVR enterprise.
 - (B) A vehicle may also be eligible if the registration has lapsed for a period not to exceed 181 days during the previous 24 months and all appropriate registration fees and late penalties have been paid to DMV, provided that the vehicle is registered for at least 90 days immediately prior to its sale to a VAVR enterprise.
4. A vehicle volunteered for retirement shall be driven to the VAVR enterprise purchase site to be retired under its own power.
5. A vehicle volunteered for retirement whose emission control systems have been tampered with as defined in CCR, title 16, section 3340.41.5 is not eligible until such tampering has been completely corrected.
6. A vehicle volunteered for retirement shall not be operating under a Smog Check repair cost waiver or economic hardship extension.

7. If a vehicle volunteered for retirement is within 60 days of its next required Smog Check, the vehicle shall pass a Smog Check without receiving a repair cost waiver or economic hardship extension prior to acceptance by a VAVR enterprise.
8. If a vehicle volunteered for retirement is within 61-90 days of its next required Smog Check, the air district shall verify that the vehicle has not failed a Smog Check during this time frame.
9. A vehicle volunteered for retirement shall pass functional and equipment eligibility inspections as specified in the VAVR Regulation, CCR, title 13, section 2603(b).
10. For high emitting VAVR projects, a vehicle volunteered for retirement must receive a confirmatory Smog Check to establish its baseline emissions, and the emissions must exceed the pass/fail emission standards for the model year and vehicle class as defined in CCR, title 16, section 3340.
 - (A) Only vehicles identified as potential high emitters through a technology operated in accordance with the VAVR Regulation, CCR, title 13, section 2610 and approved by ARB are eligible to receive extra emission reductions credit for VAVR projects.
 - (B) If a vehicle's emissions are within the pass/fail standards, the vehicle is not a high emitter and does not qualify for high emitter projects but may be retired for default emission reductions through a conventional VAVR project.
 - (C) For pre-1974 model years, the pass/fail emission standards for the 1974 model year may be used to qualify vehicles for the project.
 - (D) Smog Checks must be full tests and not "fast pass" tests. The test must be conducted only by BAR-licensed technicians according to BAR protocols and completed as close to the retirement date as reasonably possible.
 - (E) Diesel powered vehicles are not eligible for high emitting VAVR projects.

E. Emissions Measurement Methods

1. Smog Checks for model year 1999 and older gasoline powered vehicles are performed via a conventional Acceleration Simulation Mode (ASM) test. For certain vehicles, such as four-wheel and all-wheel drive vehicles, the Smog Check cannot be performed via an ASM test for safety or other mechanical reasons. In those limited cases, the Two Speed Idle (TSI) test may be used. TSI tests must be performed in strict compliance with BAR protocols.
 - (A) Consistent with the model's limitations, TSI test results and the BAR protocol may only be used to predict ROG emissions, as TSI tests do not

directly measure either NOx or PM. For high emitting vehicles that are retired, default evaporative ROG, NOx, and PM emission reductions may be claimed.

2. Smog Checks for model year 2000 and newer gasoline powered vehicles and 1998 and newer diesel powered vehicles are performed via an On-Board Diagnostic Inspection (OIS) test. The OIS test must be performed in strict compliance with BAR protocols.
 - (A) Consistent with the model's limitations, OIS test results and the BAR protocol may only be used to predict ROG, NOx, and PM emissions, as the OIS test does not directly measure tailpipe emissions.

F. Air District Project Plan Requirements

1. An air district shall submit a detailed VAVR program project plan to ARB for approval and must receive written approval from ARB's Executive Officer (EO) prior to implementing a VAVR program. The program must follow the approved plan, and any substantive changes must be pre-approved by ARB in writing.
2. The air district project plan shall include, at a minimum, the following:
 - (A) The name, title, and telephone number of the air district program contact.
 - (B) An evaluation of environmental justice considerations including, but not limited to, outreach addressing community needs.
 - (C) An estimate of the number of vehicles to be retired, and an estimate of the cost-effectiveness with all assumptions and calculations used.
 - (D) Copies of contracts with enterprise operators, consultants, and any other third party contractor(s) participating in the project.
 - (E) A description of and timetable for monitoring and auditing enterprise operators, consultants, and other third party contractor(s).
 - (F) A copy of the statement of certification that an enterprise operator(s) has demonstrated compliance with all applicable provisions of the VAVR Regulation.
 - (G) The protocol for verifying vehicle eligibility including confirmation of compliance with any Smog Check requirements and for informing the public of the availability of vehicles eligible for retirement.
 - (H) A sample of the records that will be required of the enterprise operator(s).
 - (I) A description of any project criteria elements stricter than the ARB minimum requirements.

3. For high emitter projects, the air district project plan shall also include, at a minimum, the following:
 - (A) A detailed operating description of the technology and software used to identify high emitting vehicles including, but not limited to, set up, typical operation, location and location criteria, calibration, and maintenance.
 - (B) A copy of the standard operating procedures for that technology including software maintenance and the criteria to be used to identify a high emitting vehicle with documentation that operating personnel are trained and qualified.
 - (C) A detailed description of the methodology used to calculate extra emission reductions, including changes to any ARB-recommended method.
 - (D) If an air district intends to include an evaporative emissions testing element, the plan must specify the test equipment and include a copy of the test protocol.
 - (E) If an air district intends to include a PM measuring element, the plan must specify the test equipment and include verification that the methodology for measuring PM is scientifically valid, documentation that the results are reproducible, and a complete copy of the methodology.
 - (F) An itemized breakdown of estimated project costs including, but not limited to, funds allocated to identifying high emitters, the number of vehicles to be retired, data analysis, outreach to and solicitation of vehicle owners.

G. Recordkeeping and Reporting

1. For each VAVR project, the air district shall retain the following records for inclusion in the annual report to ARB.
 - (A) Vehicle Identification Number and license plate digits
 - (B) Vehicle odometer reading
 - (C) Vehicle make and model
 - (D) Name, address, and phone number of legal vehicle owner(s)
 - (E) Name and business address of the enterprise operator
 - (F) Emission reductions claimed
 - (G) Total air district cost to retire each vehicle
 - (H) Date of vehicle purchase and retirement by the enterprise operator

- (I) Data identifying vehicles as potential high emitters along with confirmatory Smog Check date and results (High Emitter VAVR)
2. For each VAVR project, the enterprise operator shall maintain the following records. These records are not required for the annual report but must be made available to ARB for review.
 - (A) Reproduction of California Certificate of Title and registration, as signed-off by the seller at time of final sale to the enterprise operator.
 - (B) Reproduction of the applicable certificate of functional and equipment eligibility.
 - (C) Reproduction of the applicable Notice to Dismantler (DMV Registration 42 form).
 - (D) Reproduction of written documentation from DMV verifying that a vehicle meets the vehicle registration requirements of ARB's VAVR Regulation.
 - (E) Copies of documentation demonstrating that the retired vehicle did not fail a Smog Check within 90 days prior to its sale to the enterprise operator.
 3. Air districts and enterprise operators shall retain these records for the three year life of the project plus an additional two years.

H. Minimum Project Application Requirements

Air districts must ensure project applications include the specific information needed to determine program eligibility and populate the Clean Air Reporting Log (CARL), including the information needed to track the project and calculate project cost-effectiveness.

I. Offering Vehicles/Parts to the Public

1. Enterprise operators must inform the air district of the vehicles ready for dismantling, and the air district must provide an easily accessible and detailed description of the vehicles to interested parties including collectors and enthusiasts as defined in CCR, title 13, section 2605(a)(1).
2. The enterprise operator must wait a minimum of ten days after informing the air district of vehicles ready for dismantling before submitting a Notice to Dismantle to DMV, and if interested parties contact the enterprise operator, the enterprise operator must hold the vehicle for a minimum of seven additional days as defined in CCR, title 13, section 2605(a).
3. Upon completion of the ten day waiting period (and additional seven day extension as applicable), the emission-related and drive train parts must be removed from the retired vehicle and destroyed prior to offering the remaining

non-emission-related and non-drive train parts for resale, as defined in CCR, title 13, section 2606(b).

4. If a vehicle, or a vehicles emission-related or drive train parts, are resold instead of retired, no emission reductions will be generated; and no Moyer Program funds may be used for retiring the vehicle. However, non-emission-related and non-drive train parts from the vehicle may be sold at the discretion of the enterprise operator.

J. Emission Benefits

Emission reductions from conventional VAVR projects are calculated using the VAVR Regulation methodology as described in CCR, title 13, section 2608(g). They are equal to the retired vehicle's emission rates minus those of the replacement vehicle with the difference multiplied by the average vehicle miles traveled by light-duty vehicles in the year of vehicle retirement and then multiplied by the three year project life. The retired vehicle's emission rates are equal to those for gasoline powered, light-duty vehicles for the model year of the retired vehicle in the year of vehicle retirement. Replacement vehicle emissions are the fleet average emissions for all gasoline powered light-duty vehicles for model years 1990 through the year of vehicle retirement. Emission rates and average vehicle miles traveled are generated by ARB's motor vehicle emissions model. ROG, NOx, and PM emission reductions over the three year project life by vehicle model year are located in Tables 8-1 through 8-5 below. These tables will be updated on an as needed basis through a mail-out to reflect revisions to the motor vehicle emissions model or to include additional years.

**Table 8-1
Retired Vehicle Emission Reductions, CY 2016 (lbs/3yr)**

| MY | ROG Total | NOx Exhaust | PM10 Exhaust |
|-----------|------------------|--------------------|---------------------|
| pre 1973 | 376.3 | 141.8 | 2.21 |
| 1973 | 382.2 | 146.1 | 2.28 |
| 1974 | 340.8 | 147.3 | 2.35 |
| 1975 | 288.9 | 146.3 | 2.37 |
| 1976 | 271.2 | 182.9 | 2.43 |
| 1977 | 254.4 | 194.7 | 2.4 |
| 1978 | 166.9 | 107.5 | 2.41 |
| 1979 | 161.5 | 102.8 | 2.44 |
| 1980 | 150.9 | 106.1 | 2.38 |
| 1981 | 136.3 | 83.7 | 0.94 |
| 1982 | 149.1 | 84.3 | 0.95 |
| 1983 | 165.1 | 85 | 0.92 |
| 1984 | 164.9 | 90.5 | 0.94 |
| 1985 | 155.3 | 88.5 | 0.96 |
| 1986 | 166.4 | 89.4 | 0.98 |
| 1987 | 153.9 | 86.9 | 1.01 |
| 1988 | 146.8 | 85 | 1.04 |
| 1989 | 133.6 | 76.3 | 1.05 |
| 1990 | 123.1 | 66 | 1.04 |
| 1991 | 100.4 | 68.2 | 0.55 |
| 1992 | 99.2 | 71.7 | 0.57 |
| 1993 | 92.2 | 69.6 | 0.59 |
| 1994 | 84 | 63.9 | 0.6 |
| 1995 | 71.6 | 51.4 | 0.6 |
| 1996 | 56.6 | 38.4 | 0.13 |
| 1997 | 46.3 | 36.5 | 0.14 |
| 1998 | 23.5 | 30.5 | 0.14 |
| 1999 | 19.6 | 27.8 | 0.14 |
| 2000 | 14.5 | 21.5 | 0.14 |
| 2001 | 12.4 | 19.9 | 0.14 |
| 2002 | 10.9 | 19.8 | 0.14 |
| 2003 | 8.3 | 19.1 | 0.15 |

Source: EMFAC2014 V1.0.7

**Table 8-2
Retired Vehicle Emission Reductions, CY 2017 (lbs/3yr)**

| MY | ROG Total | NOx Exhaust | PM10 Exhaust |
|-----------|------------------|--------------------|---------------------|
| pre 1974 | 377.5 | 143.3 | 2.24 |
| 1974 | 338.2 | 144.9 | 2.3 |
| 1975 | 286.6 | 144.6 | 2.32 |
| 1976 | 269.5 | 182.1 | 2.38 |
| 1977 | 252.3 | 192.2 | 2.36 |
| 1978 | 165.3 | 105.4 | 2.36 |
| 1979 | 160.3 | 101.2 | 2.39 |
| 1980 | 149.6 | 103.9 | 2.34 |
| 1981 | 135.1 | 82 | 0.92 |
| 1982 | 148.3 | 82.6 | 0.93 |
| 1983 | 165.8 | 83.5 | 0.9 |
| 1984 | 165.3 | 88.9 | 0.92 |
| 1985 | 155.8 | 87.1 | 0.93 |
| 1986 | 167.6 | 88.1 | 0.96 |
| 1987 | 154.8 | 85 | 0.99 |
| 1988 | 149 | 84.3 | 1.02 |
| 1989 | 137 | 75.7 | 1.02 |
| 1990 | 127.4 | 66.4 | 1.02 |
| 1991 | 103.1 | 68.7 | 0.54 |
| 1992 | 102.3 | 72.3 | 0.56 |
| 1993 | 95.9 | 70.4 | 0.57 |
| 1994 | 88.2 | 64.8 | 0.59 |
| 1995 | 75.7 | 52.7 | 0.59 |
| 1996 | 60.4 | 39.7 | 0.13 |
| 1997 | 49.7 | 37.8 | 0.13 |
| 1998 | 25.6 | 31.7 | 0.13 |
| 1999 | 21.7 | 29 | 0.13 |
| 2000 | 16.7 | 22.8 | 0.13 |
| 2001 | 14.7 | 21.4 | 0.14 |
| 2002 | 13.1 | 21.1 | 0.14 |
| 2003 | 10.6 | 20.5 | 0.14 |

Source: EMFAC2014 V1.0.7

**Table 8-3
Retired Vehicle Emission Reductions, CY 2018 (lbs/3yr)**

| MY | ROG Total | NOx Exhaust | PM10 Exhaust |
|-----------|------------------|--------------------|---------------------|
| pre 1975 | 333.7 | 140.9 | 2.24 |
| 1975 | 283 | 141.3 | 2.25 |
| 1976 | 265.2 | 177.2 | 2.31 |
| 1977 | 250.7 | 189.7 | 2.3 |
| 1978 | 163.6 | 102.4 | 2.3 |
| 1979 | 158.7 | 98.3 | 2.33 |
| 1980 | 148.3 | 101.1 | 2.28 |
| 1981 | 133.9 | 79.5 | 0.89 |
| 1982 | 147.4 | 80.3 | 0.9 |
| 1983 | 166 | 81.1 | 0.87 |
| 1984 | 166.2 | 86.7 | 0.9 |
| 1985 | 156.6 | 84.8 | 0.91 |
| 1986 | 169.2 | 86.1 | 0.93 |
| 1987 | 156 | 83.2 | 0.95 |
| 1988 | 150.4 | 82 | 0.98 |
| 1989 | 139.8 | 74.6 | 0.99 |
| 1990 | 130.6 | 65.5 | 0.98 |
| 1991 | 105.3 | 68.6 | 0.52 |
| 1992 | 105.2 | 72.3 | 0.54 |
| 1993 | 99.3 | 70.5 | 0.55 |
| 1994 | 92.4 | 65.5 | 0.57 |
| 1995 | 80 | 53.3 | 0.57 |
| 1996 | 64.3 | 40.5 | 0.12 |
| 1997 | 53.2 | 39 | 0.13 |
| 1998 | 28 | 32.8 | 0.13 |
| 1999 | 24.1 | 30.2 | 0.13 |
| 2000 | 19 | 24 | 0.13 |
| 2001 | 17.1 | 22.6 | 0.13 |
| 2002 | 15.6 | 22.5 | 0.13 |
| 2003 | 13 | 21.8 | 0.14 |

Source: EMFAC2014 V1.0.7

**Table 8-4
Retired Vehicle Emission Reductions, CY 2019 (lbs/3yr)**

| MY | ROG Total | NOx Exhaust | PM10 Exhaust |
|-----------|------------------|--------------------|---------------------|
| pre 1976 | 279.3 | 137.8 | 2.19 |
| 1976 | 262.3 | 174.9 | 2.24 |
| 1977 | 246.6 | 184.8 | 2.23 |
| 1978 | 161.5 | 99.6 | 2.23 |
| 1979 | 157.1 | 95.7 | 2.26 |
| 1980 | 146.5 | 98.1 | 2.21 |
| 1981 | 132.8 | 77.4 | 0.86 |
| 1982 | 146.5 | 78 | 0.88 |
| 1983 | 166 | 78.7 | 0.84 |
| 1984 | 166.5 | 84.2 | 0.87 |
| 1985 | 157.8 | 82.6 | 0.88 |
| 1986 | 171.1 | 83.9 | 0.9 |
| 1987 | 157.3 | 81.3 | 0.92 |
| 1988 | 152 | 80.2 | 0.95 |
| 1989 | 141.4 | 72.4 | 0.96 |
| 1990 | 133.1 | 64.6 | 0.95 |
| 1991 | 106.6 | 67.6 | 0.5 |
| 1992 | 107.4 | 72.1 | 0.52 |
| 1993 | 102.3 | 70.5 | 0.53 |
| 1994 | 96.1 | 65.8 | 0.55 |
| 1995 | 84.1 | 54 | 0.55 |
| 1996 | 68.1 | 40.7 | 0.12 |
| 1997 | 56.6 | 39.7 | 0.12 |
| 1998 | 30.2 | 34 | 0.12 |
| 1999 | 26.5 | 31.4 | 0.12 |
| 2000 | 21.3 | 25.1 | 0.12 |
| 2001 | 19.3 | 23.6 | 0.12 |
| 2002 | 17.9 | 23.5 | 0.13 |
| 2003 | 15.4 | 23 | 0.13 |

Source: EMFAC2014 V1.0.7

**Table 8-5
Retired Vehicle Emission Reductions, CY 2020 (lbs/3yr)**

| MY | ROG Total | NOx Exhaust | PM10 Exhaust |
|-----------|------------------|--------------------|---------------------|
| pre 1977 | 257.3 | 169.2 | 2.18 |
| 1977 | 244.9 | 182.3 | 2.17 |
| 1978 | 159.5 | 96.4 | 2.17 |
| 1979 | 155.3 | 93.1 | 2.2 |
| 1980 | 145 | 95.2 | 2.15 |
| 1981 | 131.3 | 74.8 | 0.84 |
| 1982 | 145.6 | 75.9 | 0.85 |
| 1983 | 165.7 | 76.2 | 0.82 |
| 1984 | 166.6 | 81.8 | 0.84 |
| 1985 | 158.6 | 80.2 | 0.85 |
| 1986 | 173.7 | 81.7 | 0.87 |
| 1987 | 158.9 | 79.2 | 0.89 |
| 1988 | 153.7 | 78.5 | 0.92 |
| 1989 | 143.3 | 70.9 | 0.93 |
| 1990 | 134.3 | 62.5 | 0.92 |
| 1991 | 107.5 | 66.5 | 0.49 |
| 1992 | 108.7 | 71 | 0.5 |
| 1993 | 104.7 | 70.3 | 0.52 |
| 1994 | 99.4 | 66.1 | 0.53 |
| 1995 | 87.6 | 54.4 | 0.53 |
| 1996 | 71.6 | 41 | 0.12 |
| 1997 | 59.8 | 40 | 0.12 |
| 1998 | 32.1 | 34.6 | 0.12 |
| 1999 | 28.7 | 32.6 | 0.12 |
| 2000 | 23.6 | 26.3 | 0.12 |
| 2001 | 21.5 | 24.6 | 0.12 |
| 2002 | 20 | 24.3 | 0.12 |
| 2003 | 17.5 | 24 | 0.13 |

Source: EMFAC2014 V1.0.7

1. Emission reductions from retired diesel powered vehicles are also calculated using the VAVR Regulation methodology. Because of limited data and minor differences in emission rates from one year to another, average emission reductions are shown for only two model year ranges in the four calendar year intervals shown. Replacement vehicle emission rates are the same as those used for gasoline powered vehicles. Average ROG, NOx, and PM emission reductions over the three year project life by model year range are located in Tables 8-6 and 8-7. There are no evaporative emission reductions for the retirement of a diesel powered vehicle.

**Table 8-6
Retired Diesel Powered Vehicle Emission Reductions**

| Model Year Range | Pollutant | CY 2014-2017 (lbs/3 yrs) |
|------------------|-----------|--------------------------|
| Pre-1984 | ROG | 11.6 |
| | NOx | 53.4 |
| | PM | 11.5 |
| 1984-1992 | ROG | 10.8 |
| | NOx | 42.8 |
| | PM | 8.4 |

Source: EMFAC2014 V1.0.7

**Table 8-7
Retired Diesel Powered Vehicle Emission Reductions**

| Model Year Range | Pollutant | CY 2018-2021 (lbs/3 yrs) |
|------------------|-----------|--------------------------|
| Pre-1984 | ROG | 10.8 |
| | NOx | 48.9 |
| | PM | 10.1 |
| 1984-1992 | ROG | 10.3 |
| | NOx | 39.6 |
| | PM | 7.4 |

Source: EMFAC2014 V1.0.7

2. Please refer to Appendix C for a discussion of the methodology for estimating emission reductions and how to calculate VAVR project cost-effectiveness.

3. Currently, none of the air district VAVR programs have components for high emitter projects. ARB will provide the methodology for any new plans which include special cases, such as high emitter projects, through a mail-out as needed.