PUBLIC MEETING AGENDA

February 23, 2006

9:00 a. m.

Agenda Items to be heard;

06-2-1: 06-2-2:

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ELECTRONIC BOARD BOOK

California Environmental Protection Agency

Air Resources Board

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
(This facility is accessible to persons with disabilities.)

PUBLIC MEETING AGENDA

February 23, 2006
9:00 a.m.

Item #

06-2-1: Report to the Board on a Health Update: Childhood Asthma and Exposure to Traffic

Staff will present the results of a study that examined the associations between traffic-related pollution and childhood asthma in 208 children from 10 southern California communities. The children came from the Children's Health Study cohort. The study found that a lifetime history of doctor-diagnosed asthma was associated with traffic related pollutants. There was also increased asthma associated with closer residential distance to freeways.

06-2-2: Public Meeting to Consider the 2005-2006 Lower-Emission School Bus Guidelines and Funding Allocation

The 2006 Guidelines for implementing the Lower-Emission School Bus Program are for use by the California Energy Commission and by participating local air districts in implementing the program using 2005-2006 fiscal year state budget money primarily, and would also be used by participating local air districts in distributing AB923 school bus funds. Staff will be proposing to allocate the 2005-2006 FY state budget bus replacement funds to replace the oldest school buses in California first.

CLOSED SESSION – LITIGATION

In an item postponed from its January 26, 2006 meeting, the Board will hold a closed session as authorized by Government Code section 11126(e) to confer with, and receive advice from, its legal counsel regarding the following pending lawsuits:

- *Central Valley Chrysler-Jeep, Inc. et al.* v. *Witherspoon*, U.S. District Court (E.D. Cal. – Fresno), No. CIV-F-04-6663 REC LJO.
- *Fresno Dodge, Inc. et. al. v. California Air Resources Board and Witherspoon*, Superior Court of California (Fresno County), Case No. 04CE CG03498.
- *General Motors Corp. et. al. v. California Air Resources Board and Witherspoon,* Superior Court of California (Fresno County), No. 05CE CG02787.
- *Commonwealth of Massachusetts, et al. v. United States Environmental Protection Agency*, U.S. Court of Appeal for the District of Columbia Circuit No. 03-1361.
- *Caterpillar et al. v California Air Resources* Board, Superior Court of California (Sacramento County), No. 05AS01133, and *Engine Manufacturers Association v. California Air Resources Board*, Superior Court of California (Sacramento County), No. 05CS00386. (Consolidated cases)
- *California Trucking Assn., et al.* v. *California Air Resources Board, et al.*, Superior Court of California (Fresno County), Case No. 00 CE CG 10832.
- *State of New York, et al. v. Environmental Protection Agency*, U. S. Court of Appeals, D. C. Circuit, Case No. 03-1380 (NSR II).

- *El Comite para el Bienestar de Earlimart; Association of Irritated Residents; Community and Children's Advocates Against Pesticide Poisoning; Wishtoyo Foundation; Ventura Coastkeeper* v. *Paul Helliker; Terry Tamminen; Catherine Witherspoon; Alan Lloyd; William Burke; Joseph Calhoun; Dorene D'Adamo; Mark DeSaulnier; C. Hugh Friedman; William F. Friedman; Matthew McKinnon; Barbara Patrick; Barbara Riordan and Ron Roberts, in their official capacities,* U.S. District Court (E.D. Cal.), No. CIV.S 04-0882.

- *National Paint and Coatings Association, Inc. v. State of California, California Air Resources Board*, Superior Court of California (Sacramento County), Case No. 04CS01707.

- *People of the State of California and California Air Resources Board v. Yamaha Motor Corporation USA, et al.*. Superior Court of California (Orange County), Case No. 05CC08702.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD.

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of five minutes to ensure that everyone has a chance to speak.

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING:

CONTACT THE CLERK OF THE BOARD, 1001 I Street, 23rd Floor, Sacramento, CA 95814 (916) 322-5594
FAX: (916) 322-3928
ARB Homepage: www.arb.ca.gov

To request special accommodation or language needs, please contact the following:

- TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.
- Assistance for Disability-related accommodations, please go to http://www.arb.ca.gov/html/ada/ada.htm or contact the Air Resources Board ADA Coordinator, at (916) 323-4916.
- Assistance in a language other than English, please go to http://www.arb.ca.gov/as/eeo/languageaccess.htm or contact the Air Resources Board Bilingual Coordinator, at (916) 324-5049.

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

California Environmental Protection Agency

Air Resources Board

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

PUBLIC MEETING AGENDA

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9:00 a.m.

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CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER PROPOSED REVISIONS TO THE LOWER-EMISSION SCHOOL BUS PROGRAM GUIDELINES AND THE ALLOCATION OF 2005 - 2006 FISCAL YEAR STATE BUDGET FUNDS FOR THE LOWER-EMISSION SCHOOL BUS PROGRAM

The Air Resources Board (the Board or ARB) will conduct a public meeting at the time and place noted below to consider the approval of staff's proposed revisions to the Lower-Emission School Bus Program Guidelines (Guidelines). The revised Guidelines are protocols that will be used by the California Energy Commission (CEC) and local air pollution control and air quality management districts in implementing the program with 2005 – 2006 fiscal year State budget funds. The revised Guidelines also provide the protocols applicable to other funds for lower-emission school bus projects, such as Assembly Bill 923 funds or other local air district funds. In addition, staff has included a legislatively-directed allocation methodology for the disbursement of the 2005 – 2006 fiscal year State funds, which requires replacement of pre-1977 model year buses, in order of oldest bus first. This funding allocation methodology differs from that used previously in the program.

DATE: February 23, 2006

TIME: 9:00 a.m.

PLACE: Cal/EPA Headquarters Building
Byron Sher Auditorium, Second Floor
1001 "I" Street
Sacramento, California 95814

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., February 23, 2006. The agenda for the meeting will be available at least 10 days before February 23, 2006.

If you have a disability-related accommodation need, please go to http://www.arb.ca.gov/html/ada/ada.htm for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please go to http://inside.arb.ca.gov/as/eeo/languageaccess.htm or contact the Bilingual Coordinator at (916) 324-5049. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

BACKGROUND

Program History: The Lower-Emission School Bus Program is a grant program administered by the ARB that provides funds to purchase new buses for California's

public schools, and to retrofit in-use diesel buses with emission control devices to reduce their toxic particulate matter (PM) emissions. The primary goal of the Lower-Emission School Bus Program is to reduce the exposure of school children to both cancer-causing and smog-forming pollution. The program does not impose any regulatory requirements on school districts and their participation in the program is voluntary.

The Lower-Emission School Bus Program was established in the 2000 – 2001 fiscal year with an initial allocation of $50 million through the State budget process. To expend those funds, the Board approved the first Lower-Emission School Bus Program Guidelines in December 2000. The ARB issued subsequent Guideline updates in May 2003 and June 2004 to incorporate necessary administrative and technical modifications. The original Guidelines approved in 2000 and subsequent updates are available at the ARB's internet site at http://www.arb.ca.gov/msprog/schoolbus/schoolbus.htm. Since 2000, a total of nearly $76 million in State funding has been used to replace over 500 pre-1987 model year buses and to retrofit about 3,000 in-use diesel buses with PM-reducing emission control devices.

The State Legislature has appropriated $25 million to continue the Lower-Emission School Bus Program for the 2005 - 2006 fiscal year. In doing so, the Legislature appropriated half of the funding for the replacement of pre-1977 model year school buses and half for the retrofit of in-use diesel school buses. Staff estimates that with the 2005 - 2006 fiscal year State budget funds, approximately 90 pre-1977 model year buses can be replaced with new, lower-emitting models meeting the latest federal motor vehicle safety standards, and nearly 1,000 in-use diesel buses can be retrofitted with ARB-verified diesel emission control devices.

Staff has developed the proposed Guideline revisions in cooperation with California public school districts, the CEC, the California Department of Education, the California Highway Patrol (CHP), air pollution control and air quality management districts, and other interested stakeholders. Staff conducted a public workshop on October 14, 2005, to present concepts for the proposed Guideline revisions and the proposed funding allocation methodology for disbursement of the 2005 – 2006 fiscal year State budget funds. Environmental organizations, engine and retrofit device manufacturers, school bus vendors, school transportation officials, and other stakeholders provided valuable input at the workshop, through comment letters, phone calls, and via email. The ARB is committed to continue working with all affected stakeholders to ensure that the program is effectively implemented.

Budget Language for the 2005 – 2006 Fiscal Year Lower-Emission School Bus Program Funds: The 2005 – 2006 fiscal year State budget language appropriating Lower-Emission School Bus Program funds states that the new school bus purchase funds shall be used to replace pre-1977 model year school buses with new buses that comply with the most recent federal motor vehicle safety standards and that have been

certified by the ARB to meet the lowest achievable emission levels irrespective of the fuel stock. Regarding the retrofit portion of the funds, the budget language requires the ARB to fund retrofit technologies that: "(a) have at least a level 3 verification from the Board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO_2 across the device." (Senate Bill 77, Stats. 2005, Ch. 38)

Need for the Program: The Lower-Emission School Bus Program has focused on replacing pre-1987 model year buses because they emit high levels of oxides of nitrogen (NOx) and PM, both of which cause harmful health effects. Targeting funds to replace pre-1977 model year buses is a priority because these older buses are not only high-emitters, but also are not subject to federal motor vehicle safety standards for school buses that first took effect in April 1977.

Health studies have shown children are more susceptible to adverse health effects from air pollution. The ARB is particularly concerned about children's exposure to diesel related-pollutants during school bus commutes. The Children's School Bus Exposure Study, sponsored by ARB in 2003, showed that children's primary exposure to diesel pollutants from school buses occurs while they are riding the bus. The study showed that self-pollution from the bus's own exhaust has a significant impact on exposure, especially when the bus windows are closed. Both compressed natural gas-fueled school buses and the diesel-fueled buses equipped with diesel particulate filters showed on-board concentrations of pollutants that were significantly lower than those measured on conventional diesel buses.

Particulate matter has been linked to a range of serious health problems. Particles are deposited deep in the lungs and can result in increased hospital admissions and emergency room visits; increased respiratory symptoms and disease; decreased lung function, particularly in children and individuals with asthma; alterations in lung tissue and respiratory tract defense mechanisms; cancer and premature death.
In August 1998, the ARB governing board identified PM emissions from diesel-fueled engines as a toxic air contaminant. Children, with their growing lungs and faster respiratory rates, are even more susceptible. Diesel-powered vehicles operating in heavily congested urban areas cause direct exposure of the public to toxic diesel particulates.

NOx emissions are an ozone precursor, and react with volatile organic compounds in the atmosphere to form photochemical smog. The adverse health effects associated with exposure to elevated ozone levels include aggravation of asthma, breathing and respiratory problems, loss of lung functions, and possible damage to lung tissue. It is the ARB's goal to protect public health by reducing exposure to both diesel PM and ozone precursor emissions.

PROPOSED FUNDING ALLOCATION FOR 2005 – 2006 FISCAL YEAR STATE BUDGET FUNDS

A letter dated October 11, 2005, from a group of 27 Legislators representing a cross section of regional and political interests directs the staff to use the $12.5 million in new school bus purchase funds to replace the oldest of the pre-1977 model year buses first throughout California. This letter clarifies the legislative intent of the 2005 – 2006 fiscal year State budget language affecting Lower-Emission School Bus Program funds. Therefore, staff is proposing to allocate the $12.5 million in new bus purchase funds to replace the oldest school buses in California, oldest bus first. Based on data from the CHP school bus safety certification program, as updated by ARB staff calls to school districts, the staff has confirmed the public school districts throughout California with the oldest buses. The new bus purchase funds would be used by the CEC and local air districts to replace specific pre-1977 model year buses in identified fleets.

The staff proposes that the $12.5 million in retrofit funds be disbursed to participating air districts on a per capita basis; this is the same funding methodology used for the disbursement of previous years' retrofit funds. Under the staff's proposal, all local air districts in California will have the opportunity to apply for school bus retrofit funds and the air districts will continue direct implementation of the retrofit program in their respective regions for school districts and private transportation providers under contract to school districts.

PROPOSED GUIDELINE REVISIONS

The proposed Guideline revisions include new program protocols specific to the 2005 - 2006 fiscal year State budget funds. Additionally, the proposed Guidelines include modifications generally applicable to other sources of funds (i.e., local district funds) that are available for lower-emission school bus projects. One new source of funding is provided through Assembly Bill 923 (Stats. 2004, Ch. 707). This legislation provides a mechanism for air districts to increase the motor vehicle registration fee surcharge by two dollars, which may be used for new school bus purchases. When used for new school bus purchases, AB 923 specifies that the funds must be used pursuant to the Lower-Emission School Bus Program Guidelines. For other sources of local funding dedicated to lower-emission school bus projects, the ARB encourages air districts to follow the protocols set forth in the proposed Guideline revisions.

The proposed Guideline revisions specific to the 2005 - 2006 fiscal year State budget funds are summarized below:

- Replacement of pre-1977 buses exclusively
- Replacement of buses in the order of oldest bus replaced first

- Retrofit funding exclusively for devices obtaining the highest percent reductions (referred to as Level 3), with a priority on funding devices that produce the lowest NO_2 emissions across the device
- New program timetable

The proposed general Guideline revisions applicable to all funds (State budget funds, AB 923 funds, and other local funds) are:

- Waive required school district match for new bus funding
- Eliminate, as a goal or requirement, that a specified percentage of the replacement buses must be alternative-fueled, subject to local air district rules
- Add requirement for CHP inspection after retrofit and prior to return to service
- Allow funding to be used for required maintenance of diesel particulate filters
- Allow funding to be used for data logging of each bus to be retrofit
- Add provision for use of certain local air district funds to be used for fuel tank replacement for in-use compressed natural gas-fueled buses

AVAILABILITY OF DOCUMENTS

The ARB staff will present the proposed revisions to the Lower-Emission School Bus Program Guidelines and the proposed allocation of the 2005 – 2006 fiscal year State budget funds to the Board for consideration at the February 23, 2006, Board meeting. Copies of the proposed Guidelines and staff report, including a discussion of the environmental impacts of the proposal, may be obtained from the Board's Public Information Office, 1001 "I" Street, 1st Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990, prior to the scheduled meeting. These documents may also be obtained from ARB's internet site at http://www.arb.ca.gov/msprog/schoolbus/schoolbus.htm.

SUBMITTAL OF PUBLIC COMMENTS AND AGENCY CONTACT PERSON

Interested members of the public may present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written submissions not physically submitted at the meeting must be received no later than 12:00 noon, February 22, 2006, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 "I" Street, 23rd Floor
Sacramento, California 95814

Electronic mail is to be sent to schoolbus06@listserv.arb.ca.gov and received at the ARB no later than 12:00 noon, February 22, 2006.

Facsimile submissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB no later than 12:00 noon February 22, 2006.

The Board encourages members of the public to bring to the attention of staff in advance of the meeting any suggestions or comments. The Board requests, but does not require, 30 copies of any written submission. Also, the ARB requests that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Ms. Cherie Rainforth, Air Resources Engineer, at (916) 323-2507.

CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

Date: January 24, 2006

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.arb.ca.gov.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD

STAFF REPORT:

PROPOSED 2005-2006 LOWER-EMISSION SCHOOL BUS PROGRAM GUIDELINES AND FUNDING ALLOCATION

Date of Release: January 24, 2006
Scheduled for Consideration: February 23, 2006

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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Executive Summary

The mission of the Air Resources Board (ARB or Board) is to provide clean healthful air to California's residents, and to protect those most vulnerable to the harmful effects of air pollution. To aid in this mission, the State Legislature appropriated and Governor Schwarzenegger approved $25 million in the 2005-2006 fiscal year (FY) State budget for the Lower-Emission School Bus Program – a program designed to reduce school children's exposure to both cancer-causing and smog-forming pollution.

Exhaustive studies have shown that children are more susceptive to the health effects of air pollutants due to the lung development occurring and that children can experience on-board bus exposures higher than expected. Therefore ARB is particularly concerned about the exposure of children to diesel related pollutants during school bus commutes. The primary goal of the Lower-Emission School Bus Program is to reduce school children's exposure to both toxic PM emissions and smog-forming oxides of nitrogen (NOx) through two program components: 1) new school bus purchase to replace the oldest, highest-polluting buses with new, lower-emitting buses meeting the latest federal motor vehicle safety standards; and 2) retrofitting in-use diesel school buses to significantly reduce PM emissions. The $25 million in State funds for the 2005-2006 FY will replace about 90 of California's oldest school buses and retrofit nearly 1,000 in-use diesel school buses.

During the first four years of the Lower-Emission School Bus Program, about 500 pre-1987 school buses have been replaced and about 3,000 in-use diesel buses have been retrofitted using State funds which have been distributed on a per capita basis. The demand for replacement school buses has far exceeded availability, especially for replacement of pre-1977 buses which do not meet federal safety standards. The demand for retrofit funds has been somewhat limited, in part due to the need to fuel with ultra-low sulfur diesel (ULSD) fuel. However, retrofits are the most cost-effective use of the school bus funding in order to reduce children's exposure to toxic PM. They provide at least an 85 percent reduction in emissions at a cost of about 10 percent of a new bus. In addition, starting in September 2006, the ULSD fuel required for some retrofit technology will become the standard diesel fuel across California, eliminating one concern related to retrofits in the past.

Staff is proposing to modify the allocation methodology used for the disbursement of the 2005-2006 FY State budget funding for school bus replacement. A contingent of 27 legislators has requested that these replacement funds be disbursed to replace the oldest school buses in California first. This request came in a letter, included below, from a diverse group of legislators representing a cross section of regional and political interests. Allocation by oldest bus first will help those regions with a significant number of older buses to "catch-up" to other regions that have been able to replace their oldest buses more frequently. Moving forward, most districts will have some ability to replace their oldest buses more regularly through a new source

of funding available to districts with the adoption of an additional $2 motor vehicle registration surcharge.

The Lower-Emission School Bus Program Guidelines (Guidelines) have been completely revised as a new document. It is included as Appendix A of this staff report. The staff report discusses the policy analysis which supports the Guidelines.

The Guidelines document includes new provisions to cover funding expenditure requirements specific to the 2005-2006 FY State budget funds as well as modifications generally applicable to all funds to be spent pursuant to the Guidelines. One new source of funding available to air districts for new school bus purchase is provided by Assembly Bill 923 (AB 923: Statutes of 2004, Chapter 707). This legislation provides a mechanism for air districts to increase the motor vehicle registration surcharge by an additional two dollars which may be used for the new purchase of school buses pursuant to the Lower-Emission School Bus Program.

The proposed changes to the Guidelines specific to 2005-2006 FY State funding are summarized below.

- Replacement of pre-1977 buses exclusively
- Replacement of buses in the order of oldest bus replaced first
- Retrofit funding exclusively for devices obtaining the highest percent reductions (referred to as Level 3)), with a priority on funding devices that produce the lowest NO_2 emissions across the device
- New program timetable

The modifications applicable to all funds pursuant to the Guidelines, including the State budget funds as well as other funding, such as AB 923, are:

- Waive required school district match for new bus funding
- Eliminate, as a goal or requirement, that a specified percentage of the replacement buses must be alternative-fueled, subject to local air district rules
- Add requirement for CHP inspection after retrofit and prior to return to service
- Allow funding for required maintenance of diesel particulate filters
- Allow funding for data logging of each bus to be retrofit
- Add provision for use of certain local air district funds to be used for fuel tank replacement for in-use compressed natural gas-fueled buses

The letter directing ARB to replace California's oldest buses first is provided below:

CALIFORNIA LEGISLATURE

STATE CAPITOL
SACRAMENTO, CALIFORNIA
95814

October 11, 2005

Barbara Riordan, Acting Chair
State Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Clean School Bus Funding Allocation Plan

Dear Ms. Riordan:

As you know, this year's budget includes $12.5 million for the replacement of school buses manufactured before 1977. According to the allocation plan laid out in a memo from Air Resources Board (ARB) staff to Secretary Lloyd dated September 21, 2005, school districts may not be able to apply for these funds until September 2006. With this schedule, two school years may pass before our children are able to benefit from these funds.

According to discussions with your staff, it is our understanding that the ARB is now revising this schedule so that funds will be distributed by June 2006 or earlier. We would appreciate a copy of this updated allocation schedule.

We have been told that, because the budget language specifies a different allocation method than the per-capita basis used in the past, the ARB feels it is necessary to hold public workshops and gather other comments on the alternative allocation scheme. Prior to any workshops, we would like to clarify the legislative intent of the budget language in order to expedite the allocation process.

The budget language of §3900-0001-0044 (Motor Vehicle Account) specifies that $12.5 million is to be allocated for the ARB to "replace pre-1977 school buses with new school buses that comply with the most recent passenger safety standards." Because these funds are not sufficient

to replace all of the pre-1977 buses in California, we are asking the ARB to allocate funds to replace the oldest of the pre-1977 buses first based upon manufacture date.

If a second factor is needed to prioritize funding between buses with the same manufacture date, we feel it is appropriate for the ARB to use the bus' total mileage, although this was not included specifically in the budget language.

While we would like to replace all pre-1977 buses, removing the oldest offending buses first will maximize both the air quality and safety benefits achievable. This distribution method will also ensure that the reduced risks to children's health from diesel emissions have an equitable geographic distribution.

We encourage the ARB to expedite the distribution of these important funds.

Sincerely,

Senator Pro-Tem Don Perata
Ninth District

Senator Dean Florez
Sixteenth District

Senator Charles Poochigian
Fourteenth District

Assembly Member Michael Villines
Twenty-ninth District

Senator Jim Battin
Thirty-seventh District

Assembly Member Greg Aghazarian
Twenty-sixth District

Senator Denise Ducheny
Fortieth District

Assembly Member Joe Baca
Sixty-second District

Assembly Member Joe Coto
Twenty-third District

Assembly Member Joe Canciamilla
Eleventh District

Senator Martha Escutia
Thirtieth District

Assembly Member Alan Nakanishi
Tenth District

Assembly Member Van Tran
Sixty-eighth District

Assembly Member John J. Benoit
Sixty-fourth District

Assembly Member David Cogdill
Twenty-fifth District

Senator Tom Torlakson
Seventh District

Assembly Member Paul Koretz
Forty-second District

Assembly Member Ira Ruskin
Twenty-first District

Assembly Member Kevin McCarthy
Thirty-second District

Assembly Member Todd Spitzer
Seventy-first District

Assembly Member Bonnie Garcia
Eightieth District

Assembly Member Wilma Chan
Sixteenth District

Assembly Member Roy Ashburn
Eighteenth District

Assembly Member Betty Karnette
Twenty-seventh District

Assembly Member Rebecca Cohn
Twenty-fourth District

Senator Wesley Chesbro
Second District

Assembly Member Fran Pavley
Forty-first District

cc: Governor Arnold Schwarzenegger
Secretary Alan Lloyd

I. INTRODUCTION AND SUMMARY

A. Introduction

The Legislature appropriated and Governor Schwarzenegger approved $25 million in the 2005-2006 fiscal year (FY) budget to the California Air Resources Board (ARB or Board) for cleaner, safer school buses. The Legislature specified in the budget language that these funds are to be used to reduce the risk to children's health from diesel emissions from school buses. Half of the funded amount, $12.5 million, shall be used to replace pre-1977 model year (MY) school buses with new school buses that comply with the most recent federal motor vehicle safety standards and that have been certified by the ARB to meet the lowest achievable emission levels irrespective of the fuel stock. The other half of the funds shall be used to retrofit in-use diesel school buses to protect children's health and reduce particulate matter (PM) emissions from those buses by at least 85 percent. ARB was directed by the Legislature to provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses.

The proposed 2006 Lower-Emission School Bus Program Guidelines (Guidelines), Appendix A, have been developed to provide guidance for the expenditure of these State funds as well as for other funding sources. Guidance for both the bus replacement (Lower-Emission School Bus Replacement Program) and retrofit (School Bus Retrofit Program) components of this program are contained in the Guidelines document. Assembly Bill 923 funds (AB 923: Statutes of 2004, Chapter 707) allocated to the purchase of new school buses are subject to the Guidelines. Air districts may also choose to apply these guidelines for the expenditure of other local funds.

Though the California Energy Commission (CEC) administers the Lower-Emission School Bus Replacement Program, the largest local air districts may seek authorization from CEC and ARB to administer their own programs. The School Bus Retrofit Program will be administered by air districts that choose to participate. Air districts and CEC will notify school districts of opportunities to participate in the programs. ARB will monitor the ongoing implementation of both program components and assist where needed.

It is a statewide priority to reduce the harmful emissions from older buses as expeditiously as possible. A demanding schedule for implementation, as shown on the timetable in Table 1 and Table 2, has been set. ARB, CEC, and the air districts are committed to the prompt successful implementation of this program.

B. Summary of the Program

As exhaustive studies have shown that children are more susceptive to the health effects of air pollutants due to the lung development occurring, ARB is particularly concerned about the exposure of children to diesel related pollutants during school bus commutes. The primary goal of the Lower-Emission School Bus Program is to

reduce school children's exposure to both toxic PM emissions and smog-forming oxides of nitrogen (NOx) through two program components: 1) new school bus purchase and 2) retrofitting in-use diesel school buses. Together these two components will enable the replacement of the oldest, highest-polluting buses with new, lower-emitting buses meeting the latest federal motor vehicle safety standards and significantly reduce PM emissions from existing buses.

About 500 pre-1987 school buses have been replaced and about 3,000 in-use diesel buses have been retrofitted during the first four years of the program using State funds. The program received about $76 million during these first four years of the program, $66 million allocated through the State budget process the first two years and $9.52 million through Proposition 40 funding the second two years. Proposition 40 was the voter-approved initiative to conserve natural resources and improve state and local parks. All of the Proposition 40 funds were directed towards new bus purchase. Overall, nearly $60 million was allocated to replacement of pre-1987 buses and $16.5 to retrofit in-use diesel school buses.

In 1977, the federal motor vehicle safety standards went into effect. These standards require school buses to be equipped with seats that provide crash protection as well as other safety related equipment. Based on data provided through the California Highway Patrol (CHP) school bus safety certification program, staff estimates that there are over 200 but less than 300 school buses manufactured before 1977 currently in use in public school bus fleets. Additionally, these buses were not subject to NOx and PM emission standards and thus are high-emitting. Replacing these buses will result in reduced risk to children's health and safety. The State budget appropriation for new school bus purchase for the 2005-2006 FY is specifically designated for the replacement of pre-1977 school buses. The $25 million in State funds for the 2005-2006 FY will replace approximately 90 pre-1977 school buses and retrofit nearly 1,000 in-use diesel buses. The timetables for allocation of these funds are given in Table 1 and Table 2 below.

Table 1 Lower-Emission School Bus Replacement Program Timetable

February 23, 2006	Board acts on allocation plan and guidelines
March – June 2006	Funding Agreements to local air districts and CEC
August 1, 2007	New buses delivered and infrastructure completed
December 31, 2007	Final reports due to ARB

Table 2 Lower-Emission School Bus Retrofit Program Timetable	
October 27, 2005	Retrofit grant agreements to larger air districts for 90% of retrofit funds
February 23, 2006	Board acts on allocation plan and guidelines
March 31, 2006	Smaller air districts apply to ARB to participate
May - June, 2006	Remainder of grant agreements finalized
June 30, 2007	Air districts obligate all retrofit funds
September 30, 2008	Final reports to ARB on use of funds

The new proposed Guidelines document (Appendix A) is intended as a stand alone document to provide guidance for spending funds on new school buses or on retrofits for school buses. If approved, the document will replace previously issued Guidelines and addendums. The sources of funding include the 2005-2006 FY State budget funds, AB 923 funds, and other local funds per the air districts' discretion. The proposed changes are summarized in the Executive Summary.

II. NEED FOR THE PROGRAM

A. Background

Data provided through the CHP school bus safety certification program indicate that there are currently less than 300 public school buses in use that were manufactured before 1977, as shown in Table 3 below. These buses were manufactured before either federal motor vehicle safety standards or any emission standards went into effect. As shown in the table, there are on the order of 3,000 to 4,000 school buses manufactured between 1977 and 1986 in public school fleets. These buses conform to the federal motor vehicle safety standards and were controlled for NOx, but had no PM controls. The remainder of the fleet was manufactured in 1987 or later and is subject to both NOx and PM emission standards as well as the safety standards.

Table 3 California's Public School Bus Fleet				
Model Year	**Approx. # of Buses**	**Safety Standard**	**NOx Standard**	**PM Standard**
Pre-1977	200 to < 300	NO	NO	NO
1977-1986	3,000 - 4,000	YES	YES	NO
1987- 2005	~12,000	YES	YES	YES
Total	16,000			

The average school bus travels about 14,000 miles per year, according to ARB's On-Road Mobile Source Emission Inventory Model EMFAC2002 (version 2.2 April 23, 2003). This low annual mileage is part of the reason that school buses remain on the road much longer than most other heavy duty vehicles. Limited transportation budgets to replace older buses are also a factor. Additionally, the low annual mileage reduces the cost effectiveness of replacing these buses which makes them poor candidates for Carl Moyer funding.

B. School Buses in California

There are nearly 27,000 school buses in California. California Department of Education (CDE) survey data indicates that approximately 16,000 of the buses are owned by public schools. The remainder of the school bus fleet is privately owned. A small fraction is owned by private schools while the rest are owned by private contractors providing service for public schools.

In California, per Title 13 California Code of Regulations section 1201(b) paragraphs 1 and 2, school buses are designated either as Type 1 (seating capacity is 16 or more) or Type 2 (Seating capacity is no more than 20 occupants, and the bus is under a 10,000 pound gross vehicle weigh rating). Fuels used in school buses are primarily gasoline, diesel, and compressed natural gas (CNG). Diesel, is by far the most common fuel used today in school buses, at approximately 80 percent of all California school buses. Gasoline is only commonly used in the smaller Type 2 buses. To date, CNG buses have primarily been funded through state and local incentive programs, such as the CEC's Safe School Bus Clean Fuel Efficiency Demonstration Program, the Lower-Emission School Bus Program, and local air district programs. Currently there are about 800-900 alternative-fueled buses in California's school bus fleet. The estimated emissions for year 2005 from all school buses are approximately 14 tons per day of NOx and about 0.5 tons per day of PM.

C. 1977 Federal Motor Vehicle Safety Standards – Need for safer buses

In 1977, the federal government established safety requirements for new school buses.[1,2] No consistent safety requirements were in place for buses produced prior to 1977. Therefore, replacement of these oldest buses has been a priority. Among the requirements that the new safety standards specify are:

- Special passenger crash protection equipment
- Better brakes
- Emergency exits
- Swing out stop arms, warning lights and special mirrors
- Rollover protection and fuel system protection.

D. Children's Health Risk

Health studies have demonstrated that children are more susceptive to adverse health effects from air pollution.[3] In 2003, ARB sponsored a study conducted by University of California Riverside and Los Angeles campuses to assess effects of children's exposure to diesel exhaust pollutants during their commutes in school buses.[4] The study measured pollutant concentration inside the bus over an actual school bus route in Los Angeles. For comparison, a diesel-fueled bus equipped with a diesel particulate filter (DPF) and a CNG-fueled bus were also included. The results from the study were:

- Bus stop and bus loading/unloading activities have a very small effect on exposure due to low concentrations and the short time involved

- Self-pollution from the bus's own exhaust has a significant impact especially when the windows are closed.
- Cleaner buses also have lower in-vehicle exposure. Both the CNG-fueled bus and the DPF equipped diesel-fueled bus show significantly reduced on-board concentrations of pollutants as compared to conventional diesel buses.
- Older buses (pre-1987) have higher emissions than the newer buses and present a greater health risk to the children during the commute.
- Other traffic exhaust emissions also add to exposure risk, with the risk being higher on the primary urban route as compared to the suburban or rural route.

Increased exposures from commuting by school bus are estimated to increase a child's lifetime cancer risk due to diesel PM by approximately 4 percent or an increase of 30 per million lifetime risk. An increased risk of lower respiratory symptoms (~ 6 percent) and daily hospitalizations for asthma (~ 1 percent) are also estimated.[5] Despite the increase in exposure to diesel related pollutants, commuting by school bus is still the safest way for children to travel to school when overall mortality rates are considered.[6]

An additional study of traffic related emissions supported by ARB is the Children's Health Study, which began in 1992.[7] This is a large, long-term, study of the effects of chronic air pollution exposures on the health of children living in Southern California. This study has shown that local exposure to outdoor nitrogen dioxide (NO_2) or other freeway-related pollutants has adverse effects on the respiratory health of children. NO_2 can be a by product of catalyzed diesel particulate filters. The ARB is in the process of developing NO_2 limits to be included in verification requirements.

E. Need for Funding

Approximately 4,000 of California's current school buses were manufactured prior to the institution of PM emission standards. Staff estimates that over 200 but less than 300 of these buses serving public schools were manufactured before the 1977 model year when federal safety standards and NOx emission standards went into effect. To date, most older buses have remained in service due to the lack of school district funding to replace them.

About 800 school districts in California operate their own buses. Some of these school districts contract with private transportation providers. Funding for school transportation services typically comes from the respective school district's general funds. Currently, there are insufficient special state or local funding sources designated for this non-mandated service. School transportation must compete for both capital and operating funds with mandated school district responsibilities as well as funding to support classroom needs. School transportation officials address these funding issues in various ways. Many school districts have increased the distance criteria for providing home to school transportation services to students so that fewer buses are needed. As general home to school transportation is not State-mandated, some school districts do not provide transportation themselves but rely

on public transportation or parent-provided transportation. To avoid the capital expenditure of purchasing new school buses, a common choice school districts elect is to maintain existing buses as long as possible. The subsequent result is an aging fleet of buses. Due to the low annual mileage of school buses, these buses continue to operate reliably and have relatively few maintenance issues. However, these older buses are not nearly as safe as current buses and emit very high emissions.

The following briefly summarizes other sources of funding for California bus replacement besides the Lower-Emission School Bus Program.

1) Assembly Bill 923 Funds

A new source of funding for clean air projects became available to air districts in 2005. Through the passage of AB 923 in September 2004, air districts were authorized to increase the motor vehicle registration surcharge from four to six dollars. The additional two dollar surcharge provides up to $55 million annually and may be used for a number of clean air projects, including the new purchase of school buses pursuant to the Lower-Emission School Bus Program.

In order for an air district to institute this surcharge, the governing board of the air district must adopt and approve a resolution providing for the fee increase and a corresponding program for the expenditure of the resulting funds. To date, fourteen of the thirty-five air districts have adopted this surcharge, including most of the large districts.

2) Small School Districts/California Department of Education

The Small School District Bus Replacement Program, administered by the California Department of Education, was initiated in the 1983-1984 fiscal year. The program is open to any school district or county office of education with an average daily attendance of less than 2,501. Funding for this program is based on three priorities; replacement, reconditioning, or fleet expansion of school buses that do not conform to Federal Motor Vehicle Safety Standards. Current fiscal year funding is about $4.9 million. Historically, funding has allowed for the replacement of approximately 45 to 50 new buses each year. New guidelines for the program are currently being developed.

3) Assembly Bill 2766 Funds

Revenues collected from the first four dollars of the motor vehicle registration surcharge, authorized by the passage of Assembly Bill 2766 (AB 2766: Statutes of 1990, Chapter 1705), may be used to fund the replacement of on-board fuel tanks in CNG-fueled school buses. The Department of Transportation requires, per title 49 Code of Federal Regulations (CFR) Part 571.304, that these tanks be visually inspected every three years or 36,000 miles and not used after the end of manufacturer's recommended service life, typically 15 years.

4) Local Air District Grant Programs

A few school districts have secured air quality incentive funds from local air districts through competitive programs, such as those funded through a fee on motor vehicle registrations. In these cases, the air districts co-fund the cost of low-emitting alternative fuel buses and fuel infrastructure. Air districts have also funded a few electric school bus projects. However, most air quality incentive program funds, including the ARB's own Carl Moyer Program, offer only incremental funding, e.g., the difference in cost between a new conventional diesel bus and a new alternative fuel bus. This is not adequate co-funding for most school districts. Also, school bus replacement projects are less competitive than other heavy-duty vehicle projects because school buses travel fewer miles per day and overall emit less than other heavy vehicles that are used more; thus school bus projects may not meet certain program criteria, such as overall cost effectiveness. Within the Carl Moyer Program, a new program referred to as fleet modernization provides funding for the scrappage and replacement of an old heavy-duty vehicle with a new heavy-duty vehicle. ARB is currently evaluating the expansion of this program to school buses.

5) Additional Programs

Two additional funding programs that have been utilized are the United States Environmental Protection Agency's (U.S. EPA) Clean School Bus USA program and the Katz Safe School Bus Clean Fuel Efficiency Demonstration Program. The Clean School Bus USA program is a modest cost-shared grant program that funds bus purchases, retrofits, and other emission control strategies. This program was funded at $5 million nationally for each of the 2003 and 2004 fiscal years, $7.5 million for the 2005 fiscal year, and has a proposed budget of $10 million for 2006. One California project was funded in 2003 which included the retrofitting of 62 buses. Two California projects were funded in 2004, involving both retrofits and the replacement of seven pre-1987 diesel buses. This is a competitive program which receives about 120 grant requests per year totaling over $50 million. The program is able to fund only about 20 of the projects. The Katz program conducted by the CEC funded a total of 826 buses in the program's four main phases from 1988 to 1999. Approximately half of these buses were alternative-fueled. This program has concluded and no funds are available.

III. LOWER-EMISSIONS SCHOOL BUS REPLACEMENT PROGRAM

$12.5 million has been appropriated through the State budget process for new bus purchases to replace about 90 pre-1977 school buses for the 2005-2006 FY. The Governor requested an allocation plan for the bus replacement and the $12.5 million in retrofit funds. The allocation plan was submitted to the California Environmental Protection Agency (Cal/EPA) for approval on September 21, 2005 and is provided in Appendix C. The Cal/EPA response approving the plan is provided in Appendix D. On October 11, 2005, a letter from the Legislature was received that supplied further clarification on the intent of the budget language. This letter, included in the Executive Summary above, requested that the funding be used to replace the oldest

school buses in California and was signed by 27 legislators representing a wide cross-section of regional and political interests.

In past years, the Lower-Emission School Bus Program has provided funding for the replacement of pre-1987 school buses with the requirement that pre-1977 buses in a given district, if any, be replaced first. Additional incentive for replacing the oldest buses was also provided by requiring a smaller portion of the purchase price to be funded by the school district (match funding) for the replacement of pre-1977 buses than for the replacement of 1977 to 1986 buses. The funding appropriated from the State budget for the 2005-2006 FY specifically requires the replacement of pre-1977 buses due to safety concerns.

Past funds have been allocated to air districts according to their respective population size. The larger air districts have administered their own bus replacement programs in previous years and CEC has administered a program for the remainder of the air districts. The following paragraphs discuss the options considered for allocating the $12.5 million in new bus funds.

A. Funding Allocations for School Bus Replacements, 2005 – 2006 Funds

Historically, the funding allocation for the Lower Emission School Bus Program has been on a per capita basis. The budget language for the 2005-2006 fiscal year funding (Appendix B) stipulates that ARB provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses. While this language is not explicit in specifying the funding allocation, a legislative letter (included in the Executive Summary above) was provided to clarify the intent of the budget language. This letter requested that the new school bus purchase funding be allocated to replace the oldest school buses first. This letter was signed by 27 legislators representing a wide cross section of regional and political interests.

A workshop was held on October 14, 2005, to present different allocation options and to receive public comment. These options are discussed in Section V.A. Staff is proposing that the allocation method advocated by the legislative letter, replacing the oldest buses first, be approved.

Staff has revised the estimated cost per bus from $125,000, used at the October 14, 2005 workshop, to $140,000 to reflect a mix of CNG and diesel-fueled buses and to better represent the expected funded amount based on no match requirements, the addition of sales tax, and funding of some infrastructure. This means that the $12.5 million will probably replace about 90 buses.

1) Oldest Bus First Funding Allocation

As proposed, selected buses would be replaced, oldest first, until the funds are exhausted. A list of the oldest buses in California is given in Appendix F. There are about 120 buses are on this list. We estimate that the available funding will replace about 90 buses on this list; therefore buses near the end of the list may not be

replaced. This list of buses is from the CHP based on their 2004-2005 bus safety certification records. ARB staff conducted a phone survey of the operators of buses on this list to verify that the buses are still in service.

The buses range in model years from 1951 to 1973. The first 89 buses on the list are 1972 model year and older. The last 31 buses on the list are 1973 buses. Staff proposes that for the situation where only a portion of a group of identical MY buses can be replaced, the buses selected for replacement be chosen by lottery in order to release the funds in the most expeditious manner. Proposed new bus funding allocations are shown in Table 4 below for the larger air districts that will administer their own programs and for the CEC administered program, where only the districts with larger numbers of buses to be replaced are shown. For these allocations, it was assumed that the 89 buses that are 1972 and older are replaced. The funding amounts shown are based on an approximate cost of $140,000 per bus. This value should allow the funding of a mix of diesel-fueled and alternatively-fueled buses. If the funding allows for the replacement of more than 89 buses, the additional replaced buses will be chosen by lottery from the 1973 model year buses.

Table 4. Proposed New Bus Funding Allocation

Air District Administered Program	Approx. Funding	Approx. # of New Buses
San Joaquin Valley APCD	$4,200,000	30
South Coast AQMD	$2,100,000	15
Bay Area AQMD	$560,000	4
San Diego County APCD	$0	0
Sacramento Metropolitan AQMD	$0	0
Total Air District Administered Program	$6,860,000	49
CEC Administered Program		
Kern	$1,540,000	11
Ventura APCD	$980,000	7
Monterey Bay Unified APCD	$700,000	5
All Other Districts	$2,380,000	17
Total CEC Administered Program	$5,640,000	~40
Total	$12,500,000	~89

B. Eligible Buses

Buses eligible to be replaced under the Lower-Emission School Bus Guidelines are buses with Gross Vehicle Weigh Rating (GVWR) greater than 14,000 pounds owned by public school districts. To be eligible for replacement, buses must have a current CHP safety certification as of December 31, 2005, and at the time a school district is awarded funding to replace the bus (i.e., the school bus cannot have a lapsed CHP safety certification), and must be currently registered with the Department of Motor Vehicles. Buses to be replaced with the 2005-2006 FY State budget funding must

be pre-1977 buses. For funding not subject to the 2005-2006 FY budget language restraints, buses to be replaced must be pre-1987 model-year, with preference given to pre-1977 buses.

C. Alternative-fueled and Conventional-Fueled Bus Purchases

With the adoption of the Lower-Emission School Bus Program Guidelines in December 2000, the Board designated two-thirds of the new bus purchase funding for lower-emitting alternative-fueled school buses and one-third of the funding for lower-emitting diesel-fueled school buses. While originally the Board's intent was for this policy to be implemented on a regional basis, the reduced funding levels during the following years resulted in ARB maintaining the funding split as a statewide goal with less emphasis on region-specific implementation.

Making the alternative-fueled/diesel-fueled bus funding split a statewide goal provides guidance for the purchases while allowing air districts the flexibility to tailor their bus replacement programs to the needs specific to their region. This has allowed air districts with severe ozone nonattainment areas to concentrate their purchases on buses that provide NOx emission benefits while allowing diesel-fueled bus purchases in regions where the necessary alternative fuel refueling infrastructure is not available.

Although the previous allocation of two-thirds alternative fuel and one-third diesel has been effective in the past as both a requirement and a goal, it is not clear that a ratio is necessary or appropriate for the current allocation. Some of the oldest buses are in school districts located in areas without access to alternative fuel infrastructure. Others are in areas where citing issues limit their access to alternative fuel. In order to facilitate the replacement of California's oldest public school buses, staff recommends that these school districts be allowed to choose to replace their buses on the oldest bus list with either a diesel-fueled or alternative-fueled bus subject to local air district rules. However, staff also recommends that funding for alternative-fueled buses include up to an additional ten percent of the bus purchase price as funding for alternative fuel infrastructure when needed in order to obtain the greater emission benefits of alternative fuel.

The following paragraphs discuss the staff's proposed emission criteria for new bus purchases, the South Coast Air Quality Management District's (SCAQMD's) alternative-fuel rule and its possible impact on replacing the oldest buses, CNG infrastructure, and CNG fuel tank replacement for in-use CNG-fueled buses.

1) Emission Criteria

The proposed emission criteria for the Lower-Emission School Bus Program Guidelines purchase requirements for both alternative-fueled and diesel-fueled school buses are given in Table 5 below, along with the certification standards.

Table 5 Proposed Emission Criteria for Use of Lower-Emission School Bus Funding				
	2006 Model Year		2007 - 2009 Model Year	
	HC+NOx (g/bhp-hr)	PM (g/bhp-hr)	NOx (g/bhp-hr)	PM (g/bhp-hr)
Alternative-fueled school buses	1.8	0.01	0.5	0.01
Diesel-fueled school buses	2.5	0.01	1.2	0.01
Mandatory Diesel Engine Standards applicable to school buses	2.5	0.10	1.2[(a)]	0.01

(a) Between 2007 and 2009, U.S EPA requires 50 percent of heavy-duty diesel engine family certifications to meet the 0.2 g/bhp-hr NOx standard. Averaging is allowed, and it is expected that most engines will conform to the fleet NOx average of approximately 1.2 g/bhp-hr

The proposed NOx emission requirements for alternative-fueled school buses are more stringent than the mandatory standards but are consistent with the levels at which alternative-fueled school bus engines are expected to certify to for these model years. The 2006 requirement is consistent with an optional reduced-emission NOx certification standard, and the 2007 – 2009 requirement was set at 0.5 g/bhp-hr to be consistent with the certification level publicly stated by the leading alternative-fueled school bus engine manufacturer for their 2007 engine.

The NOx emission criteria for diesel-fueled school bus purchases are consistent with the mandatory standards. The 2007 – 2009 NOx emission criterion for diesel-fueled buses was set at the average of the range diesel engines are expected to certify at. The major diesel-fueled school bus engine manufacturers have confirmed that their 2007 school bus engine will certify to meet this level.

The PM emission criteria are set at 0.01 g/bph-hr for the purchase of both 2006 and 2007 - 2009 school buses. These standards are consistent with the previous requirement set in the 2004 Guidelines. It is lower than the mandatory standard for the 2006 engines, requiring the addition of exhaust aftertreatment. This PM standard becomes mandatory for all heavy-duty 2007 – 2009 model year engines.

2) South Coast Air Quality Management District School Bus Fleet Rule

The SCAQMD adopted fleet rules in April 2001 requiring the purchase of alternative-fueled vehicles for certain fleets of 15 or more vehicles, when government funding for the incremental cost is available. SCAQMD Rule 1195, which applies specifically to school bus fleets, includes exemptions which allow diesel-fueled bus purchases in certain cases. However, the exemptions dealing with lack of available infrastructure and the lack of funding for infrastructure have sunseted. For the past several years, the SCAQMD has only funded alternative-fueled school buses. However, some school districts in the SCAQMD still have an all diesel-fueled school bus fleet. Owners of all-diesel-fueled fleets within the SCAQMD may object to the purchase of an alternative-fueled bus as a replacement or believe that an alternative-fueled vehicle is not practical for their fleet. SCAQMD will work to ensure that the oldest

buses are replaced in their district consistent with 2005-2006 budget language requirements and their local fleet rule requirements.

3) Refueling Infrastructure

An additional consideration unique to the operation of CNG buses is the need for a specialized CNG refueling infrastructure. Where practical, buses may use existing local CNG fueling sites depending on the proximity to the school district bus maintenance facility and allowable access. School districts may need to install a refueling system if an existing local CNG refueling infrastructure is not available. Staff proposes that for the 2006 Guidelines, as in previous guidelines, up to ten percent of new bus funding for alternatively-fueled buses be allowed to be used for refueling infrastructure as needed. This equates to approximately $14,000 of infrastructure funding per alternative-fueled bus purchased. However, costs for dedicated CNG fueling sites can be very high such that a school district would need to be replacing a large number of buses with alternative-fueled buses in order to be granted enough infrastructure funds to build a station. In areas like the SCAQMD, where there are buses to be replaced in fleets without any CNG refueling infrastructure, additional funding may be required from the local air district to provide the refueling infrastructure necessary to support the introduction of alternative-fueled vehicles to these fleets.

While a few independent corporations produce CNG fueling systems that cost about $12,000 per CNG-fueled school bus (to time-fill a single bus), some school districts have indicated that these systems are not practically applicable for school bus fleet use. Estimates for station capital costs can range from about $250,000[8], for a combination of 20 time-fill units and one fast-fill unit, to approximately $320,000[9], for a fast fill station capable of refueling up to 20 school buses overnight. While these costs are on par with the funding allotment of approximately $14,000 per bus, a school would need to be replacing close to 20 buses in order to have sufficient funding to build one of these stations. Since State funds available this year will only replace 15 buses in the South Coast AQMD, and the new buses are divided between a number of different school districts, additional local infrastructure funding will likely be needed if CNG-fueled buses are to be purchased by school districts with no natural gas fueling infrastructure.

4) CNG Tank Replacement

The replacement of CNG fuel tanks that have exceeded their maximum life is a need that currently does not have a designated source of funding. The Department of Transportation mandates CNG fuel tanks must be visually inspected every 3 years or 36,000 miles and replaced after the manufacturer's recommended service life, typically 15 years. A school bus life of 25 years results in the need to replace the natural gas fuel tanks once during the life of the bus. After the fuel tanks on a CNG bus reach their 15 year life, the bus must be taken out of service if the tanks are not replaced.

Staff is not proposing to fund fuel tank replacement with the 2005-2006 FY State budget allocation because the oldest bus first method of fund allocation and the need to accelerate the release of the new bus funds makes funding tank replacement difficult with this funding source. However, staff is proposing that the Guidelines recommend, but not require, that air districts allocate a portion of their AB 2766 funding for this purpose. The passage of AB 2766 authorized revenues collected from the first four dollars of the motor vehicle registration surcharge to be used for the reduction of air pollution from vehicles. Staff believes that funding fuel tank replacement is a cost effective method of keeping lower-emitting school buses on the road. For in-use buses requiring tank replacement in the near future, the replacement and installation cost is approximately $24,000 per bus, based on a typical number of six fuel tanks per bus. This estimate includes $19,000 for materials and $5,000 for labor.

D. Consideration of Match Requirements

1) School District Match

The Lower-Emission School Bus Program Guidelines have historically required a school district match for new bus purchases. The required school district match under existing guidelines for replacing a pre-1977 school bus is $10,000 per replaced bus. Local air districts are allowed to provide the match. Requiring a school district match retains the concept of program buy-in for school districts. However, with the "oldest bus first" method for allocating the new bus purchase funds, waiving the match may facilitate the replacement of these specific buses by allowing school districts without financial capability to provide match funds to participate. Waiving the match increases the funded amount per bus and drops the estimated number of buses to be replaced by about 7 buses. Staff recommends that the school district match be waived for all pre-1977 buses. Staff would leave it to local air district discretion if they wanted to require a match for buses purchased with AB 923 or other local funds.

2) Air District Match

For the first two years of the program, the Lower-Emission School Bus Program Guidelines required that air districts that administered their own new bus purchase programs contribute their own funds to match 10 percent of their State grant awards. This air district match was eliminated in the 2003 Guidelines Update due to language in AB 425. Under these proposed guidelines, there would still be no required air district match.

E. Impact of the Seat Belt Law

Assembly Bill 15 (AB 15: Statutes of 1999, Chapter 648) initiated a requirement for lap/shoulder belts for all new school buses purchased after January 1, 2002. Implementation was delayed by Senate Bill 568 (SB 568: Statutes of 2001, Chapter 581) until July 1, 2004, for new Type 2 small school buses and until July 1, 2005, for new Type 1 large school buses. The use of lap/shoulder belts will limit seating capacity on new buses to a maximum of two per seat.

Currently, school districts within California typically transport two older students per seat and three younger students per seat to comply with federal motor vehicle safety standards. Buses that only transport older children, those in seventh through twelfth grade, are not expected to lose seating capacity. However, school buses that currently transport primary school-aged children at a capacity of three children per seat will lose maximum seating capacity. This lower seating capacity of newer buses is further pressure on school districts to retain their older buses.

F. Local Funds

AB 923 requires that the purchase of school buses with these funds be pursuant to the Lower-Emission School Bus Program Guidelines. Additionally, local air districts may choose to use the Guidelines when purchasing school buses with other local funds. However, since these local funds, AB 923 or otherwise, are not subject to the restrictions specified by the 2005-2006 FY budget language, they are not subject to the requirement to target the replacement of pre-1977 school buses, oldest bus first. Air districts may choose to replace pre-1987 in-use diesel buses in addition to pre-1977 school buses. Since PM was essentially uncontrolled until 1987, the air quality benefit of replacing a pre-1987 bus is equivalent to the benefit of replacing a pre-1977 bus.

IV. LOWER-EMISSION SCHOOL BUS RETROFIT PROGRAM

The main goal of the Lower-Emission School Bus Program is to reduce children's exposure to diesel school bus emissions. As school buses typically do not accumulate excessive yearly mileage, averaging about 14,000 miles per year, they remain in service for extended periods of time. Therefore, retrofitting in-use diesel school buses can provide significant emission reductions for many years. These significant reductions are cost-effective and immediate.

The Lower-Emission School Bus Retrofit Program utilizes allocated funding for the purchase of ARB verified emission reduction technologies and their associated maintenance costs. $12.5 million has been appropriated through the State budget process for the retrofit of in-use diesel school buses for the 2005-2006 FY. This funding is expected to retrofit nearly 1,000 in-use diesel school buses. The budget language which appropriated this funding requires that the funding be used for retrofit devices that reduce PM by at least 85 percent. However, staff has included discussions of other levels of reduction in the Guidelines so that the document may be applicable to other sources of funding (such as AB 2766) that are not subject to this requirement.

A. Availability of Ultra-Low Sulfur Diesel Fuel

Catalyzed diesel particulate filters require fuel with a maximum of 15 parts per million (ppm) of sulfur. Higher levels of fuel sulfur result in reduced catalyst efficiencies due to contamination of the catalyst reaction sites. This requirement for low sulfur fuel has restricted some air districts from embracing the retrofit program in the past. However, starting June 1, 2006, all diesel fuel at production or import

facilities will be required to meet the 15 ppm sulfur standard. Beginning September 1, 2006, retail sales of conventional diesel fuel will be required to meet this standard. With the widespread availability of ultra-low sulfur fuel, all air districts should be able to participate in the retrofit program. Since conventional diesel fuel will meet the ultra-low sulfur standard, the ARB will no longer provide the $500 fuel subsidy to fleets participating in the retrofit program that was offered at the program's inception in 2000.

B. Verified Technologies

The ARB verifies the emissions reductions and durability of diesel retrofit devices. Information concerning the diesel emission control devices or strategies which have been verified by the ARB is available on the ARB's Diesel Emission Control Strategies web page: http://www.arb.ca.gov/diesel/verdev/archive.htm. These strategies are categorized into three primary categories, depending on their reduction of PM. Level 1 devices provide greater than 25 percent reduction in PM; Level 2 devices provide greater than 50 percent reduction in PM; finally, Level 3 devices provide greater than 85 percent reduction in PM. The budget language appropriating the retrofit funding for 2005-2006 FY requires retrofit devices that reduce PM by at least 85 percent (Level 3).

The emission control strategies listed on the ARB Diesel Emission Control Strategies web site are verified for specific engine families and engine model years. These are listed in the executive order issued for the verification. Some verification executive orders include specific operating conditions, such as exhaust temperature profiles, that must be met in order for the control device to function properly. When operating conditions are specified in the verification executive order for the retrofit device being considered for installation, it is important that the prospective bus be data logged during normal route operation to verify that these operating requirements are satisfied. Data logging is discussed further in section IV.D. It is recommended that the school bus operator check directly with the control strategy manufacturer or their local distributor to ensure compatibility with the bus engine type and operating requirements when choosing a control strategy.

1) Level 3 Diesel Emission Control Strategies

Level 3 verification requires an 85 percent PM reduction. Currently, all verified Level 3 diesel emission control strategies include a DPF. DPFs are the most commonly available aftertreatment device. Installation involves integrating the DPF into the vehicle's exhaust system. In many cases the DPF replaces the existing engine muffler.

Two basic types of particulate filters are used: passive and active. Active devices require additional energy input to the system in order to burn off the collected soot. Passive devices are designed to burn off this soot without energy input beyond that provided by the engine exhaust gas. Most Level 3 DPF devices utilize passive technology. In general, passive DPFs remove PM by collecting particles and oxidizing them during vehicle use. The oxidation process is referred to as

regeneration. Passive DPFs typically rely on a precious metal catalyst contained in the filter to allow regeneration at common engine exhaust temperatures. The exhaust temperatures required for regeneration may vary from one control strategy to another. Recently, the first Level 3 active DPF device was verified. In active filters the regeneration temperature is achieved by means of an external heat source. This typically involves an electric or other heat source to increase oxidation in the filter. The currently verified active filter is uncatalyzed and relies on the operator "plugging-in" the vehicle during the night when the filter requires regeneration.

Under typical vehicle operation, DPF systems do not cause any additional engine wear or affect normal vehicle maintenance. However, DPF devices generally require periodic maintenance to remove ash caused by motor oil combustion residues. This periodic maintenance can be handled by a maintenance contract at the time of device purchase, period cleaning by outside contractor, or cleaning by the bus maintenance personnel. If the bus maintenance personnel perform this function, either a DPF de-asher must be purchased or the DPF must be taken offsite for cleaning. The cleaning option chosen may be based on the number of DPFs to be cleaned, whether buses can be out of service while the DPF is taken off site, and the workload of the maintenance personnel. Cost for cleaning a DPF, baking to remove any residual soot and de-ashing, is approximately $800 per cleaning. A device to clean the filters on-site can be purchased for approximately $13,000. In light of the need to avoid placing non mandated costs on the public school districts, it is recommended that these lifetime cleaning costs be included in the funding of the DPF system. A cost of $4,000 over the 11 year life of the DPF has been used to estimate the number of retrofits possible with the $12.5 million funding for 2005-2006 FY. This estimate was based on the assumption that the DPF requires cleaning once every two years at a cost of $800 per cleaning.

Table 6 below lists the engines commonly applicable to school buses and the model years that can be retrofit with a diesel particulate filter. Retrofit manufacturers include Cleaire, Donaldson, International, Johnson Matthey, and Lubrizol. More complete information on verified Level 3 retrofit devices and the engines and operating requirements for their application can be found at the ARB web site: http://www.arb.ca.gov/diesel/verdev/level3/level3.htm.

Table 6 School Bus Engines Eligible for Retrofit		
Engine Manufacturer	**Applicable Common School Bus Engine Models**(a)	**Engine Model Years**(b)
International	DT 466, DT 466E, T444E, 7.3 L, 6.0 L	Broad applicability for 1994 – 2003.
Caterpillar	3116, 3126, 3176, C-7	
Cummins	B3.9L, B5.9L, C8.3L, ISB, ISC	Partial availability for 1993 and 2004-2006
(a) DPFs are applicable to other engine models (b) Verification as of December 7, 2005. Further verification is currently in progress to potentially include older model year engines.		

2) Levels 1 and 2 Diesel Emission Control Strategies

Level 1 and Level 2 ARB verified diesel emission control strategies may not be funded with the 2005-2006 State retrofit funds. However, they are discussed here to provide a broader application of the Guidelines to other sources of funding, such as Carl Moyer funding. Although technologies verified at Level 1 and Level 2 provide a lower percent reduction in PM, they may provide broader applicability.

Currently there are only two Level 2 technologies verified for on-road application by the ARB Diesel Emission Control Strategies Verification Program. One is a flow through filter and the other an alternative fuel. All of the Level 1 technologies include a diesel oxidation catalyst (DOC). For a number of these Level 1 technologies, the DOC is paired with a crankcase filter. Open crankcase engines can have significant emissions from the crankcase that do not pass through the exhaust system. Test data has indicated that these emissions contribute to poor air quality within the bus cabin.[10] Retrofitting older buses with these devices may result in considerable emission benefits and improvement in bus cabin air quality.

C. Funding Allocations for In-Use Diesel Retrofits – 2005-2006 FY State budget funds

The $12.5 million appropriated through the State budget process for the 2005-2006 FY for the retrofit of in-use diesel school buses, will be allocated to air districts on a per capita basis, as shown in Table 7 below. Approximately 90 percent of the retrofit funding has already been disbursed. These funds have been released to the air districts with greater than one percent of the State's population. These air districts have participated in the retrofit program previously. The remaining funds were pooled to be distributed to the other 26 air districts on an equal basis. Each of the 26 districts will receive a minimum funding allocation of $41,885 in retrofit funds assuming all districts choose to participate. These districts must decide by March 2006 if they wish to participate in the retrofit program and communicate their decision to ARB. Any funding left unclaimed will be reallocated to an air district that is able to obligate additional funds.

Four of the nine air districts shown in Table 7 below have unspent retrofit funds from previous years. These air districts, designated by a footnote in the table below, must obligate prior retrofit funds by March 15, 2006, or submit a plan to the ARB by March 31, 2006, demonstrating their ability to obligate both their prior retrofit funds and the 2005-2006 FY retrofit funds. If the Executive Officer does not approve the plan, a district's 2005 – 2006 fiscal year retrofit funding may be reallocated to other local air districts participating in the retrofit program.

Table 7 Retrofit Funding Allocations (2005 – 2006 FY)

Region	Funds	Approximate # of Retrofits Fundable[c]
Air Districts with ≥ 1% of Statewide Population		
Bay Area AQMD[a]	$2,395,000	165
Mojave Desert AQMD[a]	$153,000	10
Monterey Bay Unified APCD[a]	$266,000	18
Sacramento Metropolitan AQMD	$456,000	31
San Diego County APCD	$1,051,000	72
San Joaquin Valley APCD	$1,223,000	84
Santa Barbara County APCD[a]	$145,000	10
South Coast AQMD	$5,449,000	375
Ventura County APCD	$273,000	18
SUBTOTAL	$11,411,000	783
Air District Retrofit Pool: Air Districts with < 1% of Statewide Population[b]		
All Other Air Districts (26)	$1,089,000	75
TOTAL	**$12,500,000**	**858**

(a) Air districts with unspent retrofit funds from previous years must obligate those funds by March 15, 2006, or submit a plan to ARB by March 31, 2006, in order to receive 05-06 FY retrofit funds.
(b) Each air district in the Retrofit Pool that chooses to participate would receive a minimum allocation of $41,885. Air districts in the Retrofit Pool with unspent retrofit funds from previous years must obligate those funds by March 15, 2006, or submit a plan to ARB by March 31, 2006, in order to receive 05-06 FY retrofit funds.
(c) Approximate number of funded retrofits based on Level 3 PM retrofit device cost of $14,500, Includes up to $4,000 for de-ashing.

1) Budget Language Requirements

The budget language which appropriated the retrofit funds (Appendix B) provided specific guidance regarding the technologies to be funded. These technologies are to reduce particulate matter emissions by at least 85 percent. Additionally, they are to: (a) have at least a level 3 verification from the Board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO_2 across the device. Compliance with these requirements is discussed in the following paragraphs.

By June 1, 2006, all sales of diesel fuel at production or import facilities will be required to meet the 15 ppm sulfur limit. After this date, California diesel fuel will be ultra-low sulfur fuel. Consequently, all verified Level 3 devices will meet the requirement to operate on California diesel fuel or ultra-low sulfur diesel fuel.

The purchase of a verified Level 3 device is required for this funding. There are many Level 3 verified technologies applicable to school buses; however, not every technology is appropriate for every school bus and every school bus route. Matching the appropriate technology to each bus and route can be accomplished by verifying applicability to the engine family and data logging the bus to determine that the exhaust gas temperatures generated during normal operation meet the regeneration requirements for the device. The consideration of an active filter, which requires the addition of energy, such as an electric resistance heater, to burn off the collected soot, provides a broader range of applicability.

The requirement for broad ranges of applicability and of operability allows more in-use diesel buses to be eligible for retrofit. In order to achieve broad ranges of applicability and operation, a device must be able to handle high soot loading and low exhaust temperatures. These conditions require either an active filter, which requires the addition of energy, such as an electric resistance heater, to burn off the collected soot, or an passive filter with a high catalyst loading, both of which increase the cost of the system.

The last requirement is for funded devices to produce the lowest possible NO_2 across the device. Most catalyzed Level 3 devices generate relatively high levels of NO_2. A verification limit on NO_2 production goes into effect in January 2007 and will be reviewed by the Board by spring 2006. Recently, an uncatalyzed Level 3 device which does not generate NO_2 has been verified. This device requires plugging-into an electrical outlet at a frequency ranging from every night to once every three weeks depending on the emission level of the bus and the bus usage. The budget language favors this type of device. Staff proposes that air districts fund available low NO_2 devices if they are applicable to the available bus engines and if any necessary infrastructure can be installed and funded.

This means that available uncatalyzed active filters should be given priority for funding among the applications received, even if more expensive than catalyzed passive filters. Retrofit funds can be used for reasonable infrastructure costs. Uncatalyzed active filters both operate across broad ranges of school bus operating conditions and duty cycles and do not generate NO_2. If school bus retrofit funding remains unspent after all reasonable applications for uncatalyzed active Level 3 devices are funded, then other Level 3 devices could be funded.

2) Eligible Buses

Buses eligible for retrofit using these State funds are diesel buses with a GVWR greater than 14,000 pounds either owned by public schools or are buses owned by private contractors which are providing service to public schoosl,.

D. Data Logging

To ensure that an appropriate emission control technology is installed on each bus, it is recommended that measurements of the target bus's exhaust temperature profile be taken if the selected control device's verification executive order includes exhaust temperature requirements. Even if a bus engine is in the correct engine family for a specific retrofit device, the bus route may not produce the exhaust temperatures necessary for regeneration of the device. The emission control system vendor needs accurate information on how the buses are operated to select and size a retrofit device. Installing sensors and data logging equipment on buses, prior to retrofit, to gather accurate and complete exhaust temperature data for the vehicles is an important step in selecting the appropriate system. The data logging process requires minimal installation time and does not interfere with normal bus operations.[11] After the assessment, the most appropriate emission control system may be selected and installed. Data logging is recommended for every bus prior to retrofit if the selected control device's verification executive order includes exhaust temperature requirements. It is recommended that $50[12] be included in the retrofit funding to cover the cost of data logging for each prospective bus when applicable.

E. CHP Post-Retrofit Inspection

Title 13 Section 1272 (c) requires that the California Highway Patrol (CHP) inspect a school bus that has undergone any chassis modification. This includes the installation of a retrofit device. This inspection must be performed prior to the bus's return to service. The inspection is to determine if the installation was performed according to the manufacturer's specifications. It is required in order to protect the school district and the children in the case of improper installation.

During annual bus inspections this summer, the CHP discovered some buses with retrofit installations that did not conform to the emission control system manufacturer's specifications. After discovering these faulty installations, the CHP re-inspected all the school buses with emission control system retrofits. Ninety-six percent of these buses passed inspection and four percent of the buses were found to have discrepancies. Through cooperation of the CHP, ARB, and the emission control system manufacturers, most of the faulty installations were corrected and the buses returned to service before the end of August.

Staff proposes that the Guidelines include the requirement that buses receive a CHP inspection after a retrofit device is installed and before the bus is returned to service. Staff proposes that the Guidelines stipulate that this requirement be included in all contract agreements between air districts and public school districts or private companies under contract to public school districts. Additionally, staff proposes that ARB shall report retrofit project information to the CHP. This reported information shall include the entity to which the air district awarded funds, identification of the buses on which the retrofits were installed, and identification of the retrofit device installed. These extra steps will assure that all school bus retrofits receive a CHP inspection for proper installation.

F. Local funds

Air districts may choose to use local funds to retrofit buses. They may choose to retrofit buses in their district not meeting eligibility requirements for State funds, such as those owned by private schools. In evaluating retrofit projects, air districts may choose to retrofit buses ineligible for Level 3 verified devices with Level 1 or 2 devices. The Lower-Emission School Bus Program Guidelines include guidance on these devices to facilitate these local programs.

V. ISSUES

A. Allocation Options

Three different funding allocation options were presented at the October 14, 2005 workshop. These options include 1) replacing the oldest buses first, 2) an allocation based on pre-1977 school bus population, and finally, 3) the historical per capita funding allocation.

The bus population data base has been refined since the October 2005 workshop. The workshop data base was obtained from CDE based on a voluntary survey of school districts. To increase the accuracy of the data, staff obtained school bus population data from the CHP based on their school bus safety certification records. Staff conducted a phone survey of the school districts whose fleets included a 1974 model year bus or older to confirm that these buses were still active in their fleets. The survey results showed that only approximately one-third of these buses listed in the data base were still used either regularly or as a back-up bus. Staff collected information about all of the pre-1977 school buses in the fleets that they contacted. The allocations based on the bus populations were updated based on these refined survey data.

Table 8 presents a comparison of the allocation criteria for the three different allocation methods. This table shows only the five largest air districts. A table showing all the applicable air districts is provided in Appendix E. An estimate of the funding and corresponding number of new buses for the three allocation methods is given in Appendix E.

Table 8 Comparison of New Bus Funding Allocation Criteria for the Five Largest Air Districts			
Air Districts	Funding Allocation Based On:		
	% of Oldest Buses (Pre-1973)	% of Pre-1977 Bus Pop.	% of People Pop.
[illegible]			
San Joaquin Valley APCD	34%	46%	10%
South Coast AQMD	17%	12%	44%
Bay Area AQMD	4%	9%	19%
San Diego County APCD	N/A	<1%	8%
Sacramento Metropolitan AQMD	N/A	<1%	4%
Remaining Air districts	45%	32%	15%
Total	100%	100%	100%

As can be seen, the allocation criteria make a significant difference in determining the percentage of funds for each air district. Several air districts have argued that they have proactively spent their own funds over the past several years in reducing the number of older school buses within their region and should not now be penalized for those positive actions. Staff believes these arguments have merit; however, there is also merit in providing an extra boost for those school districts and air districts that haven't had the funds to replace older school buses in the past. Staff is proposing to allocate these State funds on an oldest bus first criteria consistent with the legislative direction.

B. Alternative-fueled and Conventional-Fueled Bus Purchases

ARB is proposing to give school districts the choice of either a diesel-fueled or alternative-fueled school bus as a replacement bus. There is a significant reduction in bus exhaust emissions and an improvement in cabin air quality whether the pre-1977 bus is replaced by a new alternative-fueled bus or a new DPF equipped diesel-fueled bus. Staff believes that requiring the purchase of an alternative-fueled bus could result in some of the oldest buses not being replaced in school districts without access to alternative fuel refueling facilities. One exception to allowing choice is in the SCAQMD, which has a local regulation that requires any new school bus purchase made be alternative-fueled unless grant funding is not available for the incremental cost of the alternative-fueled bus (see in section III.C.2). While purchasing an alternative-fueled bus provides a reduction in NOx over the diesel-fueled bus purchase, the lower price of the diesel-fueled bus allows more pre-1977 buses to be replaced for a set funding amount if diesel-fueled buses are purchased rather than alternative-fueled buses. The following paragraphs discuss this trade-off.

1) Emissions/Cost Trade-off

Table 9 shows, as an example, the number of CNG or diesel buses that may be purchased if the entire $12.5 million in funding were to be spent on a single fuel type. This analysis assumes that all buses purchased are 2007 model year buses.

The assumed average bus prices shown in the second column of Table 9 do not include sales tax or infrastructure funding. The funded amounts shown in the third column of Table 9 include sales tax and a range for alternative-fueled bus funding with and without the allowable 10 percent for refueling infrastructure. About 20 to 30 percent fewer buses are purchased for a set funding level if alternative-fueled buses are purchased rather than diesel-fueled buses.

Table 9 CNG / Diesel Bus Purchase Trade-off

Fuel Type	Assumed Avg. Bus Price (pre-sales tax)	Funded Amount with Sales Tax and 10% Infrastructure Funding for Alternative-Fuel	# of buses if $12.5M spent on single fuel type [a]
CNG	$144,000	$155,000 - $169,000[b]	74 - 81[b]
Diesel	$115,000	124,000	101

(a) 7.75 percent sales tax and no school district match included in calculation
(b) Range from no infrastructure funding needed to 10 percent of funds for infrastructure

Replacing a pre-1977 bus with either a 2007 alternative-fueled or diesel-fueled bus provides a significant near-term emission benefit of about 1.5 pounds per day of NOx and about 0.06 pounds per day of PM. That benefit is due to fleet turnover - the new bus has significantly lower emissions than the old bus. However, the benefit would continue only as long as the old bus would have remained on the road. For most heavy-duty vehicles, the remaining life of an older vehicle is assumed to be three to five years. The ARB is currently assessing whether it is appropriate to assume a longer remaining life for school buses.

For bus replacement with a new alternative-fueled bus, the alternative-fueled bus is certified to a lower NOx level than required. Therefore alternative-fueled bus replacement would provide an additional NOx benefit of 0.1 pounds per day. This additional benefit would last for the lifetime of the new bus.

VI. EMISSION BENEFITS

The ARB staff estimates that the retrofit of about 860 in-use diesel school buses funded by the 2005-2006 FY State budget allocation of $12.5 million will reduce PM emissions by approximately 45 to 60 tons over the lifetime of the retrofit devices. This estimate assumes that each retrofit device has an 11 year life in school bus applications. The range in retrofit emission benefits is due to the uncertainty in which Level 3 devices will be purchased and the age of the engines to be retrofit.

ARB staff used the EMFAC2002 emissions model to estimate the emission benefits associated with replacing 90 pre-1977 school buses with 2007 model year buses to be about 135 pounds per day of NOx and 5 pounds per day of PM. It was assumed that all new bus purchases were 2007 model year. These reductions reflect the immediately realized benefits from replacing an old, pre-1977 bus with a new 2007 model year bus. This analysis does not attempt to estimate the remaining life of the older buses or calculate the lifetime emission benefits of school bus replacement.

ARB staff will address these issues as it evaluates a potential fleet modernization program for school buses as part of the Carl Moyer Program.

These emission benefit calculations are discussed in more detail in Appendix G

VII. ENVIRONMENTAL JUSTICE

For the 2005-2006 FY State funds now available for new school bus purchases, the Legislature has directed that the funds be used to replace the oldest buses in California first. Therefore, the funds will be used to replace specific pre-1977 school buses in public school districts identified by ARB staff as having the oldest school buses in California. That legislative directive takes precedence over environmental justice criteria for state school bus funding. For AB 923 funding, and for other air district funding, ARB encourages air districts to consider environmental justice and therefore a discussion of environmental justice criteria follows.

It is important that school bus projects benefit all communities of California, particularly those disproportionately affected by air pollution. Health and Safety Code section 43023.5 requires air districts with populations greater than one million inhabitants to distribute not less than 50 percent of the funds appropriated by the State Legislature for the purchase of new, lower-emitting school buses to directly reduce air contaminants or the associated public health risk in communities with the most significant exposures, including communities of minority populations and/or low-income populations. The ARB, CEC, and local air districts have worked cooperatively to implement this requirement affecting State funding appropriations within the Lower-Emission School Bus Program beginning in 2001, when the statute first went into effect. This requirement remains in effect until January 1, 2007, unless subsequent legislation deletes or extends the date.

While Health and Safety Code section 43023.5 affects only State funding appropriations, the ARB encourages air districts to expend their local AB 923 funds dedicated to new school bus purchases, and other local funds used for new school bus purchases, in a manner consistent with the Health and Safety Code provision. In addition, the ARB also encourages air districts not subject to Health and Safety Code section 43023.5 (i.e., those air districts with less than one million inhabitants) to expend their local funds for new school bus purchases in a similar manner.

To assist air districts in their efforts to focus funds for new school bus purchases in communities pursuant to Health and Safety Code section 43023.5, the ARB has developed recommended criteria for use in the Lower-Emission School Bus Program. These criteria would be used primarily by air districts, should they choose to do so, in expending their local funds on new school bus purchases since the 2005-2006 FY State funds are targeted directly at removing the oldest buses in the fleet first. While the ARB recognizes that communities disproportionately affected by air pollution are not limited to low-income communities and/or communities of color, the ARB-recommended criteria use the percentage of students within a public school district participating in the free and reduced-lunch meal program as a way to identify

a region in which to target funds for new school bus purchases. Alternatively, air districts may develop different criteria, in consultation with the ARB staff, to identify communities in which to focus funds for new school bus purchases.

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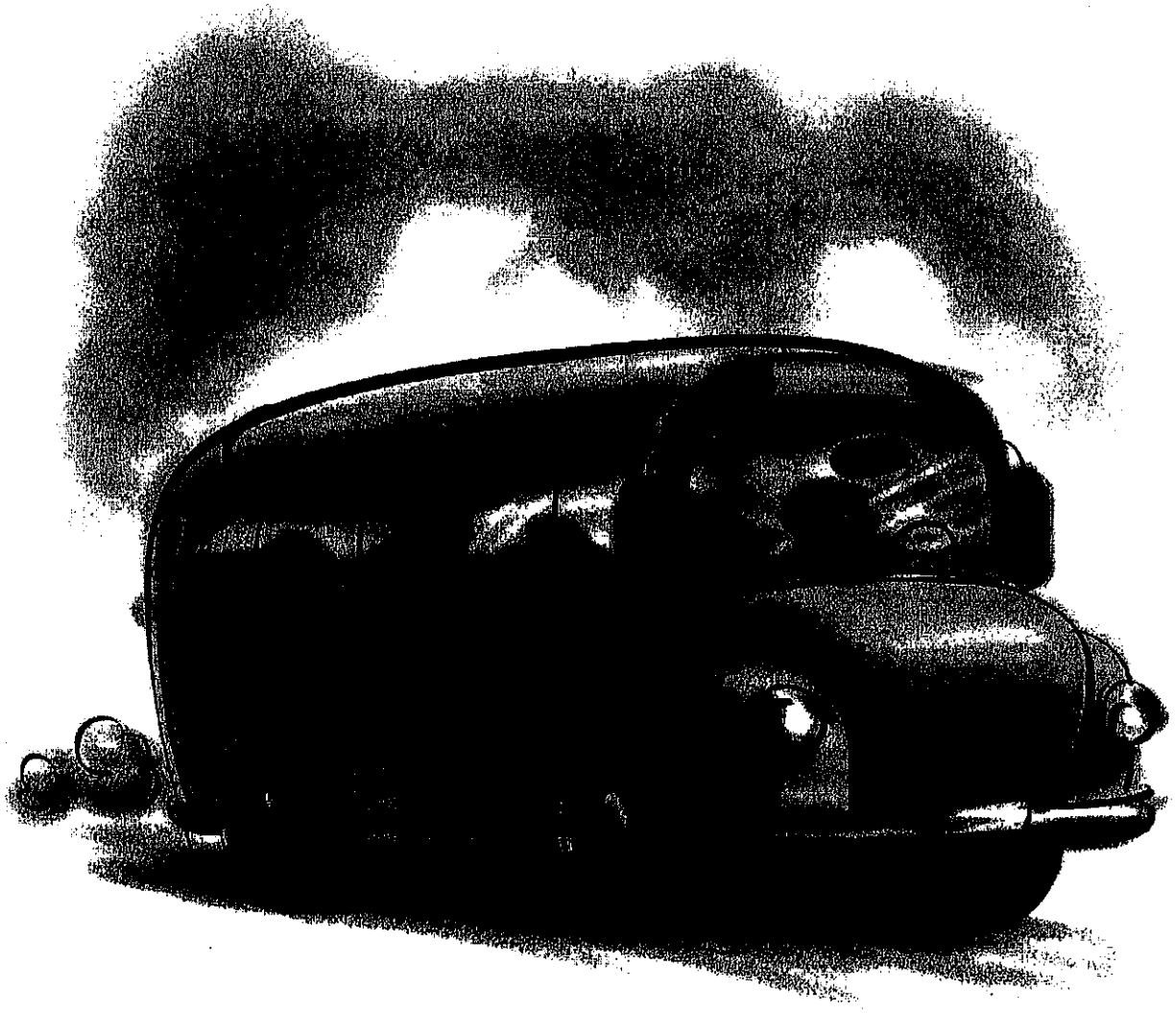
Appendix A
Proposed 2006 Revision
Lower-Emission School Bus Guidelines

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Proposed Revisions 2006

LOWER-EMISSION SCHOOL BUS PROGRAM GUIDELINES



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I. INTRODUCTION AND SUMMARY

A. Introduction

The State Legislature has appropriated $25 million in the 2005-2006 fiscal year (FY) budget to the California Air Resources Board (ARB or Board) for the Lower-Emission School Bus Program. The primary goal of the Lower-Emission School Bus Program is to reduce school children's exposure to both cancer-causing and smog-forming pollution. The program will provide grants to school districts to reduce harmful emissions from school buses in two ways: 1) to purchase new school buses to replace older, high-emitting buses; and 2) to retrofit in-use diesel school buses with ARB-verified emission control strategies. The $25 million allocated in the 2005-2006 FY State budget is divided equally between the two program components.

This document, the Lower-Emission School Bus Program Guidelines (Guidelines), provides the protocols for use by the California Energy Commission (CEC) and the local air pollution control and air quality management districts in implementing the program with 2005-2006 fiscal year State budget funds. It also provides the protocols applicable to other funds for lower-emission school bus projects, such as Assembly Bill 923 funds or other funding sources (e.g., local district funds; motor vehicle registration fee surcharge funds).

B. Summary of the Program

The Lower-Emission School Bus Program was established in the 2000-2001 FY with an allocation of $50 million through the State budget process. The program received an additional $16 million for the 2001-2002 FY. In the following two years, the program received nearly another $10 million from Proposition 40 funds, the voter-approved initiative to conserve natural resources and improve state and local parks. State funds for the first four years of the program have totaled nearly $76 million. Of these State funds, nearly $60 million has been used to replace over 500 pre-1987 model year buses and $16.5 million has been used to retrofit about 3,000 in-use diesel buses with emission control devices that reduce particulate matter (PM) emissions.

1. Administering Agencies

Some larger local air districts will directly administer the State new bus purchase funds in their own regions. The CEC shall administer the remainder of the funds. The retrofit funds shall be administered by local air districts that choose to participate. The agency administering the funds, either CEC or a local air district, will be referred to as the "administering agency."

2. Funding Sources and Associated Allocation Requirements

These Guidelines provide guidance for both the expenditure of the 2005-2006 FY State budget funds appropriated by the State Legislature and for other sources of funding for lower-emission school bus projects. The 2005-2006 FY State budget funds are subject

to constraints specified by the budget language that do not apply to other sources of funding. The Guidelines note where these constraints are specific to 2005-2006 FY State budget funding and provide more general guidance for other sources of funding.

(a) 2005-2006 FY State Budget Allocation

The State Legislature has appropriated $25 million for the Lower-Emission School Bus Program in the 2005-2006 FY. Half of the funding is to be used for new school bus purchases and half for in-use diesel bus retrofits. The ARB has been directed to allocate the 2005-2006 FY State budget new bus purchase funds to replace pre-1977 model year school buses, in order of oldest bus first. This allocation method provides for selected buses (listed in Appendix A) to be replaced, oldest first, until the funds are exhausted. Appendix A includes a list of the oldest school buses in California, as determined by the data base from the California Highway Patrol (CHP) school bus safety certification program. A phone survey conducted by ARB staff verified that these buses were still actively in use in school bus fleets. Current funding is not sufficient to replace all of the buses on the list.

The ARB will allocate the retrofit funding to air districts throughout California on a per capita basis. The 2005-2006 FY State budget language is specific regarding the technologies to be funded by the retrofit portion of the funds. According to the budget language (Senate Bill 77, Stats. 2005, Ch. 38), the funded technologies shall reduce particulate matter emissions by at least 85 percent and produce the lowest possible NO_2 across the device. Additionally, the budget language includes other less specific requirements. Section IV of this document provides compliance requirements for the retrofit component of the program.

(b) Assembly Bill 923 Funds

Funds provided through Assembly Bill 923 (AB 923; Stats. 2004, Ch. 707) are another possible source of new school bus purchase funding. This legislation has provided a mechanism for air districts to increase the motor vehicle registration fee surcharge from four dollars to six dollars. The additional two dollar surcharge may be used by air districts for a number of clean air projects including the new purchase of school buses pursuant to these Lower-Emission School Bus Program Guidelines.

(c) Assembly Bill 2766 Funds

Revenues collected from the first four dollars of the motor vehicle registration fee surcharge, authorized by the passage of Assembly Bill 2766 (AB 2776: Stats. 1990, Ch. 1705), are to be used for the reduction of air pollution from vehicles. These revenues may be used by air districts to fund the replacement of on-board fuel tanks on school buses operating on compressed natural gas (CNG). The Department of Transportation requires, per title 49 Code of Federal Regulations (CFR) Part 571.304, that these tanks be visually inspected every three years or 36,000 miles, and not used after the end of the manufacturer's recommended service life, typically 15 years.

(d) Local District Funds

Local air district funds available for new school bus purchases or retrofits for in-use diesel buses are not subject to the constraints of the budget language for the 2005-2006 FY State budget funding. However, ARB recommends that retrofit funds be used to purchase the highest level of ARB-verified technology possible that is applicable to the engine and the associated bus route.

(e) Future State Budget Funds

Future State budget funds shall be spent in accordance with the criteria in the appropriation bill.

C. Program Status

Over 500 pre-1987 model year school buses have been replaced with new, lower-emitting buses and about 3,000 in-use diesel buses have been equipped with ARB-verified retrofit devices during the first four years of the program using State funds. With the $25 million in funding for the 2005-2006 fiscal year, approximately 90 more new buses will be purchased to replace pre-1977 model year buses and nearly 1,000 more in-use diesel buses will be equipped with ARB-verified in-use diesel retrofit devices. The most recent data from the CHP school bus safety certification program, cross checked by ARB staff through a phone survey of school districts, indicate that less than 300 school buses manufactured before 1977 remain in the current public school bus fleet.

D. Timetables for the 2005-2006 FY State Budget Funding

Timetables for the two components of the Lower-Emission School Bus Program are shown below in Table 1 and Table 2. Dates shown are the final dates for execution of the designated activities related to the 2005-2006 FY State budget funding.

Table 1 Lower-Emission School Bus Replacement Program Timetable	
February 23, 2006	Board acts on allocation plan and proposed guidelines
March – June 2006	Funding grant agreements to local air districts and CEC
August 1, 2007	New buses delivered and infrastructure completed
December 31, 2007	Final reports due to ARB

Table 2 Lower-Emission School Bus Retrofit Program Timetable	
October 27, 2005	Retrofit funding grant agreements to larger air districts for 90% of retrofit funds
February 23, 2006	Board acts on allocation plan and guidelines
March 31, 2006	Smaller air districts apply to ARB to participate
May - June, 2006	Remainder of grant agreements finalized
June 30, 2007	Air districts obligate all retrofit funds
September 30, 2008	Final reports to ARB on use of funds

II. ADMINISTRATION OF LOWER-EMISSION SCHOOL BUS PROGRAM

A. Funding Agreements/Awards to Administering Agencies

1. New School Bus Purchase Funds

The ARB will allocate new school bus purchase funds to replace the oldest school buses in California (see Appendix A). Therefore, specific buses will be targeted for replacement based on school bus age. The ARB staff will initiate grant award agreements for the new school bus purchase funds with the three largest air districts that administer school bus programs for school districts in their respective regions and that have the oldest buses in California. These three air districts are: the Bay Area Air Quality Management District, the San Joaquin Valley Air Pollution Control District, and the South Coast Air Quality Management District. The new bus purchase funds available to school districts with the oldest buses throughout the remainder of California shall be administered by CEC. The ARB will provide the funds to CEC through an interagency contract and eligible school districts must apply directly to the CEC to receive the funds. Eligible school districts shall be contacted by either the air district or the CEC and asked to apply for new bus funds.

2. In-Use Diesel School Bus Retrofit Funds

As done previously in the Lower-Emission School Bus Program, the ARB will allocate retrofit funds on a per capita basis to participating air districts. Table 3 shows the nine air districts with greater than one percent of the State's population; funding allocations to these air districts account for approximately 90 percent of the retrofit funding. Grant agreements for retrofit funds were sent to the nine air districts shown in Table 3 on October 27, 2005.

The ARB will release retrofit funds to these air districts, which have participated in the retrofit program previously, upon meeting the terms and conditions of their grant agreements. Four of these nine air districts have unspent retrofit funds from previous years. The terms and conditions of their grant agreements state that they must obligate prior retrofit funds by March 15, 2006, or submit a plan to the ARB by March 31, 2006, demonstrating their ability to obligate prior retrofit funds and the 2005-2006 FY retrofit funds. If the Executive Officer does not approve the plan, a district's 2005 – 2006 fiscal year retrofit fund allocation may be reallocated to other local air districts participating in the retrofit component of the Lower-Emission School Bus Program.

Table 3 Retrofit Funding Allocations (2005 – 2006 FY)		
Region	**Funds**	**Approximate # of Retrofits Fundable[c]**
[redacted]		
Bay Area AQMD[a]	$2,395,000	165
Mojave Desert AQMD[a]	$153,000	10
Monterey Bay Unified APCD[a]	$266,000	18
Sacramento Metropolitan AQMD	$456,000	31
San Diego County APCD	$1,051,000	72
San Joaquin Valley APCD	$1,223,000	84
Santa Barbara County APCD[a]	$145,000	10
South Coast AQMD	$5,449,000	375
Ventura County APCD	$273,000	18
SUBTOTAL	$11,411,000	783
[redacted]		
All Other Air Districts (26)	$1,089,000	75
TOTAL	**$12,500,000**	**858**

(a) Air districts with unspent retrofit funds from previous years must obligate those funds by March 15, 2006, or submit a plan to ARB by March 31, 2006, in order to receive 05-06 FY retrofit funds.
(b) Each air district in the Retrofit Pool that chooses to participate would receive a minimum allocation of $41,885. Air districts in the Retrofit Pool with unspent retrofit funds from previous years must obligate those funds by March 15, 2006, or submit a plan to ARB by March 31, 2006, in order to receive 05-06 FY retrofit funds.
(c) Approximate number of funded retrofits based on ARB-verified Level 3 PM retrofit device estimated average cost of $14,500. Includes up to $4,000 for de-ashing.

The ARB will notify the 26 smaller air districts of the opportunity to participate in the retrofit program and will allocate the remaining 2005-2006 FY State budget retrofit funds equally to these air districts, should they choose to participate in the program. Each of the 26 smaller air districts (comprising the Retrofit Pool, as shown in Table 3) is eligible for a minimum allocation of $41,885 in retrofit funds. This minimum allocation assumes all 26 of the smaller air districts choose to participate in the retrofit program. Air districts that plan to apply for retrofit funding must respond to ARB by March 31, 2006. The smaller air districts shall indicate if they can accept the minimum allocation of $41,885 or if they can accept more retrofit funding, up to a maximum of $145,000. Grant agreements will be supplied to the air districts upon receipt of their intention to accept the funds. Unclaimed funds will be reallocated to air districts that are able to obligate the additional funds.

B. Fund Disbursement to Air Districts

The air districts shall provide two documents in order to receive their allocated funding. These documents are the grant agreement, provided by ARB, signed by an air district official with fiscal authority, and a resolution from the district governing board (or other

documentation signed by a duly authorized official) that authorizes the district to accept the funds. Districts may want to include language and funding amounts in the resolution that provide the districts with the opportunity to accept additional funds, should additional program funds become available.

C. Air Districts' Lower-Emission School Bus Program Notification

Administering agencies shall notify school districts of opportunities to participate in the Lower-Emission School Bus Program. The ARB will monitor the ongoing implementation of both program components and assist the administering agencies where needed.

1. Outreach

Outreach prior to and during the time frame of program notification is critical for the success of a local program. The air districts and the CEC should focus their outreach in a way that encourages applications from all school districts, including environmental justice communities and rural districts. Below are brief descriptions of the types of practices that might be included as part of an air district's or the CEC's outreach activities.

(a) List of School Districts

Air districts and the CEC should maintain a list of school districts within their respective regions and the contact information for the school bus fleet maintenance personnel. A notification should be mailed to the contacts on the list when funds are available.

(b) Local Newspaper Announcement

Air districts are encouraged to put an announcement in local newspapers and in appropriate local newsletters.

(c) Web Site Notification

If an air district has a web site, the Lower-Emission School Bus Program opportunity notice should be advertised on the district's web site. If the district has a newsletter, the Lower-Emission School Bus Program opportunity notice should be advertised in the district's newsletter. Similarly, the CEC should advertise its program opportunity notice on its web site.

(d) Site Visits

Air districts are encouraged to conduct site visits or telephone conference calls with school districts, particularly to advise them of the opportunity to participate in the retrofit component of the program.

2. Environmental Justice

For the 2005-2006 FY State funds now available for new school bus purchases, the Legislature has directed that the funds be used to replace pre-1977 model year school buses, in order of oldest bus first. Therefore, the funds shall be used to replace specific pre-1977 model year school buses in public school districts identified by ARB staff as

having the oldest school buses in California. That legislative directive takes precedence over environmental justice criteria for State school bus funding. For AB 923 funding, and for other air district funding, ARB encourages air districts to consider environmental justice; therefore, a discussion of environmental justice criteria follows.

It is important that school bus projects funded through the Lower-Emission School Bus Program benefit all communities of California, particularly those disproportionately affected by air pollution. Health and Safety Code section 43023.5 requires air districts with populations greater than one million inhabitants to distribute not less than 50 percent of the funds appropriated by the State Legislature for the purchase of new, lower-emitting school buses to directly reduce air contaminants or the associated public health risk in communities with the most significant exposures, including communities of minority populations and/or low-income populations. The ARB, CEC, and local air districts have worked cooperatively to implement this requirement affecting State funding appropriations within the Lower-Emission School Bus Program beginning in 2001, when the statute first went into effect. This requirement remains in effect until January 1, 2007, unless subsequent legislation deletes or extends the date.

While Health and Safety Code section 43023.5 affects only State funding appropriations, the ARB encourages air districts to expend their local AB 923 funds dedicated to new school bus purchases, and other local funds used for new school bus purchases, in a manner consistent with the Health and Safety Code provision. In addition, the ARB also encourages air districts not subject to Health and Safety Code section 43023.5 (i.e., those air districts with less than one million inhabitants) to expend their local funds for new school bus purchases in a similar manner.

To assist air districts in their efforts to focus funds for new school bus purchases in communities pursuant to Health and Safety Code section 43023.5, the ARB has developed recommended criteria for use in the Lower-Emission School Bus Program. These criteria would be used primarily by air districts, should they choose to do so, in expending their local funds on new school bus purchases since the 2005-2006 FY State funds are targeted directly at removing the oldest buses in the fleet first. While the ARB recognizes that communities disproportionately affected by air pollution are not limited to low-income communities and/or communities of color, the ARB-recommended criteria use the percentage of students within a public school district participating in the free and reduced-lunch meal program as a way to identify a region in which to target funds for new school bus purchases. Alternatively, air districts may develop different criteria, in consultation with the ARB staff, to identify communities in which to focus funds for new school bus purchases.

D. Award Process

For the 2005-2006 FY State budget new bus purchase funding, the administering agency shall contact each school district in its respective region with the oldest buses to be replaced, as indicated in Appendix A. The administering agency shall determine the application due dates necessary to complete the program according to the program timetable specified in Table 1. School districts desiring to replace these buses must

submit an application to the administering agency by the date determined by the administering agency. Buses shall be replaced oldest first until the 2005-2006 FY State funds are expended. If, towards the end of the process, there are two or more buses of the same age competing for remaining funds, ARB will use a lottery selection method to allocate the final funding.

For other sources of new bus funding, the administering agency will release a program opportunity notice to the school districts in their respective regions. Each interested school district must complete an application for the Lower-Emission School Bus Program grant money. The administering agency will review the application for completeness and eligibility and award grants through a non-competitive process (e.g., lottery-type award process for all eligible applicants). School districts will be notified by mail after awards are approved by the administering agency.

Those interested in participating in the retrofit program shall apply directly to their local air district for funding. Applicants (school districts and private transportation contractors who provide service for public schools) must complete an application for the Lower-Emission School Bus Particulate Matter Retrofit Program grant money and submit it to their local air district. The air district shall review the application for completeness and eligibility and make grant awards through a non-competitive process. Applicants shall be notified by mail after awards are approved by the air district.

Staff at the administering agency shall prepare funding agreements that set forth the terms, conditions, and reporting requirements for each grant. No funds will be released until the school district and the administering agency have signed the funding agreement. Air district staff shall notify ARB when retrofit funds are released so that ARB may notify CHP of the bus modifications.

1. Application

(a) New School Bus Purchase

Applicants for new bus purchase funds must submit an application to the administering agency (application will be supplied by the administering agency).

Required information includes (at a minimum):

- Bus(es) to be replaced: VIN number, ID number, type, make and model year, fuel, total mileage, mileage for last school year, GVWR, proof of CHP certification for the current school year (and as of December 31, 2005), and method of bus disposal.
- Bus(es) to be purchased: type of bus(es), make and model year, engine size, manufacturer, cost, and assumed date(s) of delivery.
- Fuel: type(s) of fuel needed, availability of refueling capability and delivery of fuel by bus delivery date(s).

- If requesting alternative fuel and electric infrastructure funding: demonstrated need based on accessibility of off-site station; cost of CNG slow-fill equipment; cost of recharging station.

Grant applications must include a resolution from the school district governing board (or a duly authorized official with authority to make financial decisions) authorizing the submittal of the application and identifying the individual authorized to implement and administer the bus replacement project.

(b) School Bus Retrofit

Applicants that want to purchase and install retrofit devices on eligible school buses using grant funds must submit an application to the administering agency (application will supplied by the administering agency).

Required information includes (at a minimum):

- Name of school district, Joint Powers Authority (JPA), or school transportation contractor.
- Bus(es) to be retrofitted: VIN number, bus manufacturer, model year, total mileage, and engine type.
- Identification of the retrofit device installed (manufacturer and model).
- Availability of ultra-low sulfur diesel (ULSD) fuel on PM retrofit installation date(s), if retrofit device is installed prior to September 1, 2006.

Grant applications must include a resolution from the school district governing board (or other documentation signed by a duly authorized official) authorizing the submittal of the application and identifying the individual authorized to implement and administer the retrofit device installation project.

(c) Application Tracking

Districts must have a system for tracking applications. At a minimum, the tracking system shall include the name and address of the bus owner, whether the application is in regards to a bus replacement, retrofit, or tank replacement, and the model year of the bus to be replaced, retrofit, or receiving tank replacement. The district shall also maintain a copy of each application and a file for each selected project.

2. How Awards are Made

School districts will be notified by mail after awards are approved by the administering agency. Staff at these agencies shall prepare funding agreements that set forth the terms, conditions, and reporting requirements for each grant. Retrofit funding agreements shall include the requirement that the retrofitted bus be CHP inspected prior to return to service.

The payment schedule shall be established in the funding agreement. No funds shall be released until the applicant and the administering agency have signed the funding

agreement. In general, payment will be made as purchase costs are incurred and documentation is provided to the administering agency.

Applicants can only be reimbursed for project costs incurred on or after the date of approval by the administering agency. The administering agency will not fund, nor be liable for any portion of, an applicant's cost of preparing and submitting an application.

The administering agency shall issue payment for a bus, infrastructure, fuel tank replacement, or retrofit device to vendors pursuant to the requirements of section 41200, et seq. of the. California Education Code (California Proposition 98), to minimize the financial impacts to schools. The administering agency may not purchase buses, infrastructure, or replacement fuel tanks directly.

In the case of a new bus purchase, the school bus delivery deadline of August 1, 2007, specified in Table 1, must be included in the contract language in which the administering agency awards program funds to school districts and in the purchase order agreement between school districts and school bus distributors. The ARB will assess a monetary penalty against the business entity (e.g. engine manufacturer, school bus manufacturer, or school bus distributor) responsible for a delivery delay causing a failure to meet the delivery deadline. The performance penalty is discussed further in Section II.E.

3. Reporting Requirements and Records Retention

(a) New Bus Purchases and Infrastructure

All school districts must report to the appropriate administering agency (CEC or participating air districts) upon ordering and delivery of bus(es), and contracts let for, and completion of, any funded alternative fuel or electric infrastructure funded by State monies. Any other requirements implemented by the administering agency must be specified in the funding agreements with school districts.

The administering agencies shall submit a final report to ARB by or before December 31, 2007. At a minimum, the administering agency shall report:

- Number of school buses replaced, and the model years of the replaced buses per air district.
- Model years, manufacturer, and fuel type of new buses funded.
- Efforts to meet environmental justice requirements.
- Penalty fees levied.
- Location and type of infrastructure funded.

Administering agencies shall retain files for each funded project containing the application, contract, invoice, proof of payment, and a copy of the CHP safety certification, bus registration, and documentation of the disposal of the replaced bus. These files shall be maintained for five years, the minimum number of years a new bus

purchased with program funding must remain in the school district fleet that received the funding.

(b) Retrofit Device Purchase and Installation

All participating school districts and private transportation contractors must report to the participating air district upon ordering, delivery, and installation of retrofit devices. Any other requirements by the administering agency will be specified in the funding agreements with school districts.

Air districts shall submit a final retrofit report to the ARB by September 30, 2008. At a minimum, the report shall include the entity to which the air district awarded funds, identification of the buses on which the retrofits were installed, and identification of the retrofit device installed (manufacturer and model).

Air districts shall retain files for each funded project containing the application, contract, invoice, proof of payment, and a copy of the CHP certification for the post-retrofit safety certification inspection of the retrofitted bus. These files shall be maintained for five years.

E. Performance Penalty for Late Delivery of School Buses

The ARB will assess a monetary performance penalty against the business entity responsible for a delay that results in the failure to deliver program-funded school buses to school districts by the specified delivery deadline of August 1, 2007. Specifically, the ARB will assess a performance penalty of $100.00 per day per bus for each day a bus is delivered after the delivery deadline. The purpose of this performance penalty is to ensure a level playing field for all business entities that stand to profit from the sale of program-funded school buses, to minimize any potential risks to school districts, and to forestall delays in achieving emission benefits.

For the air districts that self-administer the program, the performance penalty will be administered through a withhold by the ARB of five percent of the total grant fund award to each air district until after the August 1, 2007, delivery deadline. Upon confirmation by each air district that all program-funded buses have been delivered to school districts by August 1, 2007, the ARB will immediately release the remaining five percent of their respective grant awards to each air district. For each bus delivered late, the air districts shall reduce the grant payment to either the school bus distributor or the school district (depending on the contract arrangements for the payment of bus purchase orders) by $100.00 per day per bus for each day a bus is delivered after August 1, 2007. The ARB will retain an amount equal to the calculated performance penalty from the applicable air district's grant withhold. Upon confirmation of final bus delivery to the school districts, the ARB will then release the remaining grant award balance, if any, to the air district.

The CEC shall similarly administer the performance penalty for the regions in California for which the CEC administers the program. For each bus delivered late, the CEC shall reduce the grant payment to either the school bus vendor or the school district (depending on the contract arrangements for the payment of bus purchase orders) by

$100.00 per day per bus for each day a bus is delivered after August 1, 2007. For each bus delivered after this deadline, the ARB will reimburse the CEC, upon receipt of contractually-specified invoices, an amount equal to the State's share of the bus purchase price minus the calculated performance penalties.

The delivery deadline must be included in the contract language in which the public agency (either the CEC or the local air districts that self-administer the program) awards funds to school districts, and in the terms and conditions of the purchase order agreement between school districts and school bus distributors. In addition, each funding award contract and school bus purchase order agreement must contain the following statement:

"The ARB shall assess a performance penalty of $100.00 per day per bus on the business entity responsible for a delay that results in the failure to deliver to school districts any school bus purchased with funds from the Lower-Emission School Bus Program by the delivery deadline contained in this agreement. For each bus delivered to a school district after August 1, 2007, the local air district or the California Energy Commission, whichever public agency is responsible for administering the program, shall reduce the grant award payable to the school bus distributor or school district by an amount equal to the calculated performance penalties."

Any funds generated through the enforcement of this performance penalty will be used to augment program funding on a statewide basis.

F. Minimum Contract Requirements

For the purpose of these Guidelines, a contract is defined as a contract, grant, or other legally binding agreement used by CEC, an air district, or an applicant to obligate and expend funds for a project funded through the Lower-Emission School Bus Program.

When paying for projects using Lower-Emission School Bus Program Funds, air districts must enter into a contract with the applicant. The contract must be signed and the project milestones (e.g., delivery, installation, final inspection, and acceptance) shown in the contract must be met before Lower-Emission School Bus Program funds are given to the vendor.

All air districts participating in the Lower-Emission School Bus Program must incorporate the following minimum requirements in contracts entered into with applicants that have been selected to receive funds under the Lower-Emission School Bus Program. Each district shall establish the actual language in their contracts in consultation with the district's legal staff. Applicants must incorporate these minimum requirements in purchase order agreements with vendors.

1. Party Names and Date

All contracts shall state the name of the district and the applicant as parties to the contract. All contracts shall also state that, in addition to enforcement by the district, the

ARB, as an intended third party beneficiary, reserves the right to audit and enforce the terms of the contract at any time during the contract term.

2. Project Completion

The contract shall include a specified time frame in which project completion shall occur, so that the funds are expended within the two-year required time frame. The contract shall also require that no work may begin on the project until the contract is fully executed.

3. New Bus Purchase Delivery Deadline

Contracts for new bus purchases with 2005-2006 FY funds shall include a delivery deadline of August 1, 2007. This delivery deadline must be included in the contract language in which the administering agency awards funds to school districts, and in the terms and conditions of the purchase order agreement between school districts and school bus distributors. In addition, each funding award contract and school bus purchase order agreement must contain the following statement:

"The ARB shall assess a performance penalty of $100.00 per day per bus on the business entity responsible for a delay that results in the failure to deliver to school districts any school bus purchased with funds from the Lower-Emission School Bus Program by the delivery deadline contained in this agreement. For each bus delivered to a school district after August 1, 2007, the local air district or the California Energy Commission, whichever public agency is responsible for administering the program, shall reduce the grant award payable to the school bus distributor or school district by an amount equal to the calculated performance penalties."

4. Requirement for CHP Safety Inspection after Retrofit Installation

All retrofit contract agreements between air districts and applicants must include the requirement that each retrofitted bus undergo a CHP safety certification inspection after the retrofit installation and prior to the bus's return to service.

5. Non-Compliance Terms

Districts shall include terms to cancel contracts or withhold payment for non-compliance with or not meeting the obligations of the contract, and may include a term that cancels the contract if it is not executed by the owner in a timely manner.

G. Documentation of Obligation and Expenditure of Previous Grant Awards

Air districts that have previously been awarded Lower-Emission School Bus Program retrofit funds must have submitted, or submit with the application documents, documentation of the status (obligation/expenditure) of all previous years' retrofit funds. This documentation must, at a minimum, include the names and address of the school districts that received the funds, the number of buses retrofitted, the manufacturer and make of the retrofit device, the expenditure for each retrofit, and the total expenditure.

H. Obligation of Funds

Air districts shall obligate any Lower-Emission School Bus Program retrofit State budget funds by one year from June 30 of the fiscal year that the district receives its initial grant award. This requirement ensures ARB that State funds will be spent in a timely manner as required by law. Funds are considered to be obligated when the air district takes one of the following actions:

- The air district's governing board approves a project for funding through a resolution, minute order, letter or other written instrument.
- The Air Pollution Control Officer or designated district staff, if given the authority by the governing board, approves a contract.
- The contract between the air district and the school bus owner is fully executed.

I. Expenditures

Lower-Emission School Bus Program State budget funds shall be expended by the air districts two years from June 30 of the fiscal year that the district receives its initial grant award. Air districts expend funds by paying invoices associated with approved projects.

In the event previous years' funds (that were obligated and invoiced) are returned to an air district, those returned funds may be re-obligated to projects along with the current year's funds. Administering agencies shall advise the ARB of returned funds and their intent to re-obligate the funds to eligible projects. For tracking purposes, returned funds must be reported with the correct previous year's reports.

J. ARB Administrative Action

The administrative action described in this paragraph is the procedure the ARB shall use to recapture any State budget retrofit funds. Any Lower-Emission School Bus Program State budget retrofit funds not obligated by an air district by June 30, 2007, shall be returned to the ARB. The returned funds shall be reallocated to another district or districts based on their ability to obligate the funds.

K. Earned Interest

Any Lower-Emission School Bus Program funds provided by the State that are deposited in interest bearing accounts must be reported to ARB. The interest income must be used to fund projects that meet the current Lower-Emission School Bus Program Guidelines. Projects funded by interest earned shall be included in the final report for the year from which the interest accrued.

III. LOWER-EMISSION SCHOOL BUS REPLACEMENT PROGRAM REQUIREMENTS

The school bus replacement program utilizes allocated funding for the purchase of new lower-emission school buses and infrastructure. For the 2005-2006 FY State budget funds allocated by the State Legislature, $12.5 million is designated for the replacement of pre-1977 model year school buses with new school buses that comply with the most

recent motor vehicle federal safety standards and that have been certified by the ARB to meet the lowest achievable emission levels, irrespective of fuel stock.

Approximately 10 percent of the funds spent on alternative-fueled buses may be used for new alternative fuel infrastructure, refueling stations, more capacity at existing stations, and recharging stations. Fuel tank replacement of in-use CNG-fueled buses may be funded from AB 2766 funds. The following sections describe the protocols and criteria for the expenditure of the 2005-2006 FY State budget legislative funds, as well as for new bus purchase funds from other sources.

A. Eligible Buses and Infrastructure

1. Eligible Applicants

Public school districts in California that own their own buses are eligible to receive funding for the replacement of older school buses. Where a JPA has been formed by several school districts, and the JPA holds ownership of the school buses, then the JPA is also eligible to participate. School transportation contractors are not eligible to apply. Also, school bus purchases by non-profit agencies, private schools, and other private companies are not eligible for State budget allocation funding.

2. Buses Eligible for Replacement

Older in-use diesel or gasoline school buses with a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds may be eligible for replacement. Buses of this weight rating require heavy-duty engines. To be eligible for replacement, buses must have a current CHP safety certification as of December 31, 2005, and at the time a school district is awarded funding to replace the bus (i.e., the school bus cannot have a lapsed CHP safety certification), and must be currently registered with the Department of Motor Vehicles. While diesel-fueled buses are primarily targeted for replacement, gasoline-fueled buses that do not include an original-equipment catalytic converter are also eligible per the replacement priority given below.

The replacement of buses manufactured prior to April 1977, when federal motor vehicle safety standards went into effect, is a priority for the school bus replacement program. The State budget appropriation for new school bus purchases for the 2005-2006 FY specifically allocates $12.5 million for the replacement of pre-1977 model year school buses, and will replace about 90 pre-1977 model year school buses.

For other sources of funds not subject to the 2005-2006 FY State budget language, ARB is allowing the replacement of pre-1987 model year buses because pre-1987 model year buses emit high levels of NOx and PM. The ARB's replacement priority is given below:

- Replacement of in-use pre-1977 model year school buses. First, each new purchase shall replace any in-use diesel pre-1977 model year school buses in the given fleet, and the pre-1977 model year buses must be crushed or otherwise rendered inoperative.

- Next, any pre-1977 model year heavy-duty gasoline buses that did not include an original-equipment catalytic converter shall be replaced and the pre-1977 model year buses crushed or otherwise rendered inoperative.
- Where fleets contain too few or no pre-1977 model year buses, pre-1987 model year diesel buses may be replaced. The 1977-1986 model year replaced bus will be crushed, or, alternatively, replace a CHP-certified, in-use pre-1977 model year school bus in another California bus fleet (not limited to public school bus fleets). Then this replaced pre-1977 model year bus must be crushed or otherwise rendered inoperative.
- Next, ARB criteria provide that any 1977-1986 model year heavy-duty gasoline buses that did not include an original-equipment catalytic converter may be replaced. The replaced bus must be crushed, or replace a CHP-certified, in-use, pre-1977 model year school bus in another California bus fleet (not limited to public school bus fleets). Then this replaced bus must be crushed or otherwise rendered inoperative.

3. Replacement Bus Requirements

The recipient school district must make an enforceable commitment to own and operate the new bus for five years or more. Only replacement buses may be funded by this program. Fleet expansion buses are not eligible for funding. New heavy-duty buses with engines that run on either diesel or an alternative fuel are eligible for funding if the engines meet or exceed the emission criteria shown in Table 4 below. Alternative-fueled buses may be powered by natural gas, liquefied petroleum gas (LPG or propane), electricity, methanol, or ethanol fuels, provided that the other program requirements are met. New heavy-duty gasoline internal combustion engine buses are not eligible for purchase.

The emission requirements for both new alternative-fueled and new diesel-fueled school buses purchased with program funding are set forth Table 4 below. For comparison purposes, the table also includes mandatory diesel engine certification standards.

Table 4 Emission Criteria for use of Lower-Emission School Bus Funding

	2006 Model Year		2007 - 2009 Model Year	
	HC+NOx (g/bhp-hr)	PM (g/bhp-hr)	NOx (g/bhp-hr)	PM (g/bhp-hr)
Alternative-fueled school buses	1.8	0.01	0.5	0.01
Diesel-fueled school buses	2.5	0.01	1.2	0.01
Mandatory Diesel Engine Standards applicable to school buses	2.5	0.10	1.2[(a)]	0.01

(a) Between 2007 and 2009, U.S EPA requires 50 percent of heavy-duty diesel engine family certifications to meet the 0.2 g/bhp-hr oxides of nitrogen (NOx) standard. Averaging is allowed, and it is expected that most engines will conform to the fleet NOx average of approximately 1.2 g/bhp-hr

4. CNG/Diesel Purchase Split Statewide Goal

Previously, the Lower-Emission School Bus Program included a statewide new bus purchase funding goal of two-thirds of the State funding for alternative-fueled school bus purchases (and associated infrastructure) and one-third of the State funding for diesel-fueled school bus purchases. However, this statewide goal will not apply to the 2005-2006 FY State budget new bus purchase funding that is to be allocated to replace the oldest buses in California. In order to secure the replacement of these oldest buses, the school districts with these buses will be given the choice of either a diesel-fueled or alternative-fueled school bus as a replacement bus, subject to local air district rules.

5. CNG: Infrastructure and Fuel Tank Replacement

Ten percent of new bus funding for alternative-fueled buses may be used for refueling infrastructure when no local CNG refueling site is available or the existing local CNG refueling site is inadequate. This equates to about $14,000 per bus based on a $144,000 new CNG bus cost, excluding applicable sales tax.

Air districts may allocate their AB 2766 funding for fuel tank replacement for in-use CNG-fueled buses. The fuel tank replacement funding shall be used for replacing CNG fuel tanks that have exceeded their maximum life and can no longer be certified. The Department of Transportation mandates CNG fuel tanks must be visually inspected every 3 years or 36,000 miles and replaced after the manufacturer's recommended service life, typically 15 years. A school bus life of 25 years results in the need to replace the natural gas fuel tanks once during the life of the bus. School districts should consult with their local air districts regarding the application process to receive AB 2766 funds for fuel tank replacement on in-use CNG-fueled buses.

B. Match Funds

1. School District

School districts are not required to provide match funds for pre-1977 model year school buses replaced with 2005-2006 FY State budget funding. Air districts funding new school bus purchases with funds other than the 2005-2006 FY State budget money may choose to require $10,000 in match funds from a school district replacing a pre-1977 model bus and $25,000 in match funds from a school district replacing a 1977-1986 model year bus. Other grant funds, such as air district funds (e.g., motor vehicle registration fee monies) can be used to satisfy the school district match fund obligation to the extent the other grant or funding language allows this. To maximize State funds, Carl Moyer Program funds cannot be used as a source of the school district funds.

2. Air District

Air districts that administer their own programs using funds appropriated by the State Legislature are not required to contribute match funding.

IV. LOWER-EMISSION SCHOOL BUS PARTICULATE MATTER RETROFIT PROGRAM REQUIREMENTS

The school bus retrofit program utilizes allocated funding for the purchase of ARB-verified diesel retrofit devices and their associated maintenance costs. For the 2005-2006 FY, $12.5 million is available for the purchase of PM retrofits that are verified Level 3 control technologies achieving at least an 85 percent or greater reduction in particulate matter.

A. Eligibility Requirements

1. Eligible Applicants

Public school districts that own their own buses are eligible to receive funding for retrofits, including JPAs formed by several school districts, where the JPA holds ownership of the school buses. Private school transportation providers that contract with public school districts to provide transportation services are also eligible to receive grant funding.

2. Buses Eligible for Retrofit

All in-use diesel-fueled buses with a GVWR greater than 14,000 pounds, for which there is an ARB-verified retrofit device available, qualify for retrofit funding. The goal is to retrofit the highest polluting buses that can be reliably retrofitted with emission control devices.

3. Eligible Retrofit Devices

All retrofit devices purchased must be verified technologies, per the ARB's diesel emission control strategies verification procedures as prescribed in title 13, California Code of Regulations (CCR) sections 2700 through 2710. A current list of these devices verified by the ARB can be accessed through the ARB web site at: http://www.arb.ca.gov/diesel/verdev/verdev.htm. These ARB-verified strategies are categorized into three different levels depending on the degree of PM reduction provided by the strategy. These PM reduction levels are defined in Table 4.

Table 4 Verification Classifications for Diesel Emission Control Strategies

Pollutant	*Reduction*	*Classification*
PM	< 25%	Not Verified
	≥ 25%	Level 1
	≥ 50%	Level 2
	≥ 85%, or ≤ 0.01 g/bhp-hr	Level 3
NOx	< 15%	Not Verified
	≥ 15%	Verified in 5% Increments

Under the ARB's verification procedures, emission control strategies are verified for specific engine families and engine model years. These are listed in the executive order issued for the verification. Some verification executive orders include specific

operating conditions, such as exhaust temperature profiles, that must be met in order for the control device to function properly. When operating conditions are specified for a control device, it is important that the prospective bus be data logged during normal route operation to verify that these operating requirements are satisfied. This requirement is discussed in Section IV.A.4(a). The ARB recommends that the school bus operator check directly with the control device manufacturer or the local distributor to ensure compatibility with the bus engine type and operating requirements when choosing a control strategy.

The funded amount for each bus eligible for retrofit covers the total purchase price of the ARB-verified retrofit technology, including installation, plus $50 for data logging, and up to an additional $4,000 to cover costs for cleaning services to de-ash particulate filters throughout their estimated 11 year life. These funded amounts additional to the purchase and installation are discussed in Section IV.A.4.

(a) 2005-2006 FY State Budget Funding Eligible Device Requirements

The budget language appropriating retrofit funding for the 2005-2006 FY requires it be used to fund retrofit devices that reduce PM by at least 85 percent. This equates to a Level 3 device. The budget language specifically states that funded retrofit devices shall: "(a) have at least a Level 3 verification from the Board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO_2 across the device." (Senate Bill 77, Stats. 2005, Ch. 38)

Based on the budget language requirements, all retrofit devices purchased with 2005-2006 FY State funding must be ARB-verified Level 3 devices. By June 1, 2006, all sales of diesel fuel at production or import facilities will be required to meet a 15 parts per million sulfur limit. After this date, California diesel fuel will be ultra-low sulfur diesel fuel. Consequently, all verified Level 3 devices will meet the requirement to operate on California diesel fuel or ultra-low sulfur diesel fuel.

Additionally, based on the budget language requirements, air districts shall fund grant applicants choosing Level 3 technologies that inherently produce less NO_2 than other candidate devices provided that the technologies and their required maintenance are practically applicable to the buses to be retrofit and the corresponding bus fleet operations, and that the costs of the device and related infrastructure are reasonable. Air districts may use all available specifications and data in determining which retrofit technologies produce the lowest possible NO_2.

For practical implementation, this means that air districts shall give priority to applications from school districts requesting funds to install uncatalyzed active particulate filters on eligible school buses, even if they are more expensive than a catalyzed passive particulate filter. If school bus retrofit funding is still available after all reasonable applications for uncatalyzed active Level 3 devices and any necessary infrastructure are funded, then an air district may fund other Level 3 devices. (For a

more detailed discussion of NO_2 emissions from retrofit technologies, please refer to the January 2006 Staff Report for the Lower-Emission School Bus Program.)

(b) Funding Not Subject to 2005-2006 FY State Budget Language

Air districts may choose to spend local funds on retrofitting buses with Level 3 devices or on retrofitting buses ineligible for Level 3 technologies with appropriate Level 1 or 2 technologies. However, retrofits funds should be used on the highest level of technology possible that is applicable to the engine and the associated bus route.

Although technologies verified at Level 1 and Level 2 provide a lower percent reduction in PM, they may provide broader applicability.

Currently, there are only two Level 2 technologies verified for on-road application by the ARB Diesel Emission Control Strategies Verification Program. One is a flow through filter and the other an alternative fuel. All of the Level 1 technologies include a diesel oxidation catalyst (DOC). For a number of these Level 1 technologies, the DOC is paired with a crankcase filter. A current list of the devices verified by the ARB can be accessed through the ARB web site at: http://www.arb.ca.gov/diesel/verdev/verdev.htm.

4. Other Eligible Costs

(a) Data Logging

To ensure that an appropriate emission control technology is installed on each bus, funding of $50 per bus shall be included in the funded amount to cover the cost of data logging for the candidate bus if the selected control device's verification executive order includes exhaust temperature requirements. Data logging the buses on their routes provides accurate information on how the buses are operated. The emission control system vendor needs this information to select and size a retrofit device. Data logging involves installing sensors and data logging equipment on the buses to be retrofit to gather accurate and complete exhaust temperature data. The data logging process requires minimal installation time and does not interfere with normal bus operations.[1] After the assessment, the emission control system vendor can select the most appropriate emission control system for installation.

(b) Maintenance Costs

Up to $4,000 may be allocated to fund passive diesel particulate filter (DPF) maintenance (baking and de-ashing) in addition to the cost of purchase and installation of the retrofit device. DPF devices generally require periodic maintenance to remove ash caused by motor oil combustion residues. This periodic maintenance can be handled by a maintenance contract at the time of device purchase, period cleaning by outside contractor, or cleaning by the bus maintenance personnel. The ARB estimated a cost of $4,000 over the 11 year life based on the assumption that the DPF requires cleaning once every two years at a cost of up to $800 per cleaning.

[1] MECA, Diesel Retrofit< http://www.meca.org/galleries/default-file/retrofitFAQ_(revised).pdf, accessed November 2, 2005.

Active DPFs also require periodic cleaning. The manufacturer of the ARB-verified active DPF currently available is in the process of determining cleaning requirements, cleaning frequencies, and costs. We expect the associated cleaning costs to be less than those for passive DPFs and we will allow funding for this periodic maintenance.

B. CHP Inspection Prior to Return to Service

Any bus that has had a retrofit device installed must receive a CHP safety inspection prior to return to service. Title 13, CCR section 1272 (c) requires that the CHP inspect a school bus that has undergone any chassis modification; this includes the installation of a retrofit device. This inspection is to determine if the retrofit device installation or other modification was performed according to the manufacturer's procedures and is required in order to protect the school district and the children in the case of improper installation or modification. All contract agreements between air districts and applicants must include the requirement that retrofitted buses receive a CHP safety certification inspection prior to return to service.

C. Availability of Ultra-Low Sulfur Diesel Fuel

Starting June 1, 2006, all sales of California diesel fuel will be required to meet the 15 parts per million sulfur standard at production or import facilities. This requirement is imposed on retail facilities three months later. Therefore, beginning September 1, 2006, conventional California diesel at the pump will be required to be the ULSD fuel necessary for catalyzed aftertreatment technologies. With the widespread availability of ULSD fuel, fuel availability should not be a limiting factor for participation in the retrofit program component. As such, the ARB will no longer provide the $500 fuel subsidy to fleets participating in the retrofit program that was offered at the program's inception in 2000.

APPENDIX A
LIST OF CALIFORNIA'S OLDEST SCHOOL BUSES

California's Oldest School Buses

Mfg date	Air District	School District	City
1/1/1951	Kern	MOJAVE UNIFIED SCHOOL DIST	CALIFORNIA CITY
1/1/1958	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1959	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1959	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1959	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1960	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1960	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1962	San Joaquin Valley Unified	LAMONT SCHOOL DISTRICT	LAMONT
1/1/1962	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1962	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
11/11/1962	Kern	SOUTH FORK UNION SCHOOL DISTRICT	WELDON
1/1/1964	Mendocino	ROUND VALLEY UNIF SCHOOL DIST	COVELO
1/1/1964	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1964	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1965	North Coast Unified	SO HUMBOLDT UNIF SCHOOL DIST	GARBERVILLE
1/1/1965	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1965	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1966	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1966	San Joaquin Valley Unified	PLEASENT VIEW SCHOOL DISTRICT	PORTERVILLE
1/1/1966	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1967	Calaveras	MARK TWAIN UNION SCHOOL DISTRICT	ANGELS CAMP
1/1/1967	Colusa	PIERCE JT UNIF SCHOOL DIST	ARBUCKLE
1/1/1967	Kern	SOUTHERN KERN UNIFIED SCH DIST	ROSAMOND
1/1/1967	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1967	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1967	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA
1/1/1967	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
1/1/1967	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
8/1/1967	Glenn	ORLAND PUBLIC SCHOOLS	ORLAND
1/1/1968	Mendocino	WILLITS UNIF SCHOOL DIST	WILLITS
1/1/1968	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS
1/1/1968	San Joaquin Valley Unified	GREENFIELD UNION SCHOOL DISTRICT	BAKERSFIELD
1/1/1968	San Joaquin Valley Unified	CORCORAN UNIFIED SCHOOL DISTRICT	CORCORAN
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	Tuolumne	FOOTHILLS HORIZON STAN CO DEPT ED	SONORA
7/19/1968	Ventura	FILLMORE UNIFIED SCHOOL DIST.	FILLMORE
1/1/1969	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1969	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1969	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1969	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1969	San Joaquin Valley Unified	MERCED UNION HIGH SCHOOL DISTRICT	MERCED
1/1/1969	San Joaquin Valley Unified	GREENFIELD UNION SCHOOL DISTRICT	BAKERSFIELD
1/1/1969	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1969	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA

1/1/1969	South Coast	DOWNEY UNIFIED SCHOOL DISTRICT	DOWNEY
4/1/1969	Bay Area	BERRYESSA UNION SCHOOL DISTRICT	SAN JOSE
8/1/1969	South Coast	HUNTINGTON BEACH CITY SCHOOL DIST	HUNTINGTON BEACH
8/27/1969	Feather River	SUTTER UNION HIGH SCHOOL DISTRICT	SUTTER
1/1/1970	Antelope Valley	WILSONA SCHOOL DISTRICT	LANCASTER
1/1/1970	Kern	SOUTHERN KERN UNIFIED SCH DIST	ROSAMOND
1/1/1970	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1970	San Joaquin Valley Unified	WASCO UNION ELEMENTARY SCHOOL DIST	WASCO
1/1/1970	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1970	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
1/1/1971	Bay Area	NEWARK UNIFIED SCHOOL DISTRICT	NEWARK
1/1/1971	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1971	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1971	Kern	SIERRA SANDS UNIFIED SCHOOL DIST.	RIDGECREST
1/1/1971	San Joaquin Valley Unified	WASCO UNION ELEMENTARY SCHOOL DIST	WASCO
1/1/1971	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1971	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1971	San Joaquin Valley Unified	MERCED UNION HIGH SCHOOL DISTRICT	MERCED
1/1/1971	Ventura	FILLMORE UNIFIED SCHOOL DIST.	FILLMORE
1/1/1971	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
6/7/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
6/9/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
6/10/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
9/1/1971	Placer	WESTERN PLACER UNIFIED SCHOOL DISTR	LINCOLN
9/1/1971	South Coast	HUNTINGTON BEACH CITY SCHOOL DIST	HUNTINGTON BEACH
1/1/1972	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1972	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1972	Great Basin	BISHOP UNION ELEMENTARY SCHOOL DIST	BISHOP
1/1/1972	Kern	SIERRA SANDS UNIFIED SCHOOL DIST.	RIDGECREST
1/1/1972	Mojave Desert	VICTOR VALLEY UNION HIGH SCHOOL	VICTORVILLE
1/1/1972	Mojave Desert	VICTOR VALLEY UNION HIGH SCHOOL	VICTORVILLE
1/1/1972	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1972	Monterey Bay Unified	SANTA CRUZ CITY SCHOOLS	SANTA CRUZ
1/1/1972	San Joaquin Valley Unified	ATWATER ELEMENTARY SCHOOL DISTRICT	ATWATER
1/1/1972	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1972	San Joaquin Valley Unified	COALINGA-HURON UNIFIED SCHOOL DST	COALINGA
1/1/1972	San Joaquin Valley Unified	CORCORAN UNIFIED SCHOOL DISTRICT	CORCORAN
1/1/1972	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1972	San Joaquin Valley Unified	TULARE JOINT UNION HIGH SCHOOL	TULARE
1/1/1972	South Coast	DOWNEY UNIFIED SCHOOL DISTRICT	DOWNEY
1/1/1972	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
11/1/1972	South Coast	A B C UNIFIED SCHOOL DISTRICT	ARTESIA
11/28/1972	North Coast Unified	DEL NORTE COUNTY UNIF SCHOOL DIST	CRESCENT CITY
1/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
1/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
1/1/1973	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1973	Mendocino	UKIAH UNIF SCHOOL DIST	UKIAH
1/1/1973	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS

1/1/1973	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1973	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS
1/1/1973	San Joaquin Valley Unified	MADERA UNIFIED SCHOOL DISTRICT	MADERA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1973	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1973	San Joaquin Valley Unified	COALINGA-HURON UNIFIED SCHOOL DST	COALINGA
1/1/1973	San Joaquin Valley Unified	DELANO JOINT UNION HIGH SCHOOL	DELANO
1/1/1973	San Joaquin Valley Unified	DELANO JOINT UNION HIGH SCHOOL	DELANO
1/1/1973	San Joaquin Valley Unified	ELK HILLS SCHOOL DISTRICT	TUPMAN
1/1/1973	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1973	San Joaquin Valley Unified	MADERA UNIFIED SCHOOL DISTRICT	MADERA
1/1/1973	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA
5/1/1973	Siskiyou	BIG SPRINGS UNION ELEM SCHOOL DIST	MONTAGUE
5/1/1973	South Coast	RIM OF THE WORLD UNIFIED SCHOOL DIS	LAKE ARROWHEAD
7/1/1973	Butte	PARADISE UNIFIED SCHOOL DISTRICT	PARADISE
8/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
8/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
9/1/1973	Antelope Valley	EASTSIDE UNION SCHOOL DISTRICT	LANCASTER
9/1/1973	Imperial	BRAWLEY SCHOOL DISTRICT	BRAWLEY
10/1/1973	Imperial	BRAWLEY SCHOOL DISTRICT	BRAWLEY
12/1/1973	Mojave Desert	NEEDLES UNIFIED SCHOOL DISTRICT	NEEDLES

Appendix B
FY 2005-06 Budget Language Lower Emission School Bus Program $25 million

ARB
FY 2005-06 Budget Language
Lower Emission School Bus Program
$25 million

Budget Language

3900-001-0044 (Motor Vehicle Account)

1. Of the amount appropriated in this item, $12,500,000 shall be used by the State Air Resources Board to replace pre-1977 school buses with new school buses that comply with the most recent passenger safety standards, and that have been certified by the board to meet the lowest achievable emission levels irrespective of the fuel stock used.

2. Of the amount appropriated in this item, $2,500,000 shall be used to retrofit in-use diesel school buses to protect children's health and reduce particulate matter emissions from those buses by at least 85 percent.

3. In expending funds under Provision 2, the State Air Resources Board shall require retrofit technologies to do all of the following: (a) have at least a level 3 verification from the board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO2 across the device.

4. It is the intent of the Legislature in appropriating these funds that the State Air Resources Board provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses.

3900-001-0115 (Air Pollution Control Fund)

1. Of the amount appropriated in this item, $10,000,000 shall be used to retrofit in-use diesel school buses to protect children's health and reduce particulate matter emissions from those buses by at least 85 percent.

2. In expending funds under Provision 1, the State Air Resources Board shall require retrofit technologies to do all of the following: (a) have at least a level 3 verification from the board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO2 across the device.

3. It is the intent of the Legislature in appropriating these funds that the State Air Resources Board provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses.

Governor's Veto Message

To ensure that this augmentation is spent most appropriately, I am directing the Air Resources Board to develop a plan by September 15, 2005, for allocation of these resources, and to submit this plan to the California Environmental Protection Agency for review and approval. The allocation plan must consider the overall financial capacity of the applicant to reasonably replace these buses without state assistance, the exposure to children, and the age of the buses slated for replacement.

Appendix C
Clean School Bus Allocation Plan

Alan C. Lloyd, Ph.D.
Agency Secretary

Air Resources Board

1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

TO: Alan C. Lloyd, Ph.D.
Agency Secretary

FROM: Catherine E. Witherspoon
Executive Officer

DATE: September 21, 2005

SUBJECT: CLEAN SCHOOL BUS ALLOCATION PLAN

The State budget for FY 2005-06 appropriated $25 million to the Air Resources Board to clean up California's school buses by replacing or retrofitting older, high-emitting buses. In his signing message on the budget bill, the Governor directed ARB to develop a plan for allocating these funds by September 15, 2005, and to submit that plan to Cal/EPA for review and approval. Our allocation plan is set forth below.

ARB has existing guidelines for the allocation of school bus funds, which were adopted by the Board in December 2000, after full public hearing and in consideration of extensive public testimony. ARB has used those guidelines to allocate one-time state appropriations and the school bus revenues provided by Proposition 40. The current $25 million appropriation is not cross-linked to the existing guidelines so we have discretion about how to proceed. However, since the existing guidelines reflect the Governing Board's policy perspective (as known to staff) and some degree of past consensus, staff has used its provisions as a starting point for discussion.

Since the $25 million was appropriated, we have been approached by individual Legislators and by stakeholders who want ARB staff to modify the manner in which past funds have been allocated. Namely, to switch from a population-based allocation scheme to a vehicle age-based distribution so that air districts with the largest population of pre-1977 school buses would get more of the replacement funds. Staff has also been asked to consider route length when allocating particulate filter funds, so that rural schools with the longest commutes and highest children's exposure would have priority for trap installation. These are very worthy concepts for consideration. But since they diverge from past practice, ARB staff believes it is necessary to workshop these concepts with all affected stakeholders prior to implementation. It may also be necessary to return to the Board for policy guidance if staff is unable to form a rough consensus between the affected parties.

Funding Directives

The Legislature established several allocation criteria for the expenditure of the new school bus funds (see Enclosure 1). One half of the $25 million ($12.5 million) is to be spent on replacing pre-1977 school buses. New replacement school buses must have the lowest possible emissions regardless of fuel type and must comply with current passenger safety standards. These funds are sufficient to replace approximately 100 pre-1977 buses. The other half of the money ($12.5 million) is to be spent on diesel retrofits that achieve at least an 85% reduction in particulate matter. Approximately 1,000 in-use diesel school buses can be retrofitted using these funds. All of the money must be appropriated in a way that provides equitable geographical distribution and reduces health risks to children.

School Bus Age

ARB's current school bus guidelines place equal priority on replacing both pre-1977 and pre-1987 buses. Particulate emissions from school buses were unregulated until 1987 and oxides of nitrogen standards were very lax until 1987. Therefore, from an air quality standpoint both pre-1977's and pre-1987's are basically uncontrolled. Nonetheless, the current appropriation directs that ARB replace pre-1977 buses only. There are approximately 1,000 pre-1977 buses in service today. Approximately 100 of those can be replaced with $12.5 million dollars, leaving aside the match issue (see below) and whether any individual air districts choose to purchase alternative fuel buses instead.

Applicants' Financial Capacity

The Governor's signing message directed ARB to consider school district's ability to pay for new school buses without state assistance. This language is directed at match requirements which, when applied, stretch the State's dollars farther but also prevent poor school districts from participating. To date, ARB has required a $10,000 match for pre-1977 school bus replacements. Individual air districts are authorized to provide match funds for schools that are unable to pay, using local funds (for example, their motor vehicle registration surcharge revenue). There is no question that several school districts are impoverished, particularly those in rural areas. But even at the current match levels, there are many more applicants than funds available. For that reason, ARB staff is not proposing any change to match requirements at this time. If match requirements are eliminated, the number of new school buses purchased to replace pre-1977 buses would drop by about 10%, meaning we could afford 90 rather than 100 new school buses. A new diesel school bus costs $110,000. Natural gas school buses cost $140,000 and there may be additional costs for fueling infrastructure.

Children's Exposure

The Legislature directed ARB to allocate funds in a manner that reduces children's exposure to school bus emissions. A new issue that ARB staff will be considering is in-bus exposures. Our Children's School Bus Exposure Study, completed in 2003, indicates that children who ride school buses have increased exposure to diesel particulate. The study found that diesel exhaust levels inside buses are higher than those inside passenger cars. Exposure was highest in the oldest school buses and for children on the longest commutes. The results indicated that self-contamination from the bus's own exhaust is occurring, along with pollution from other vehicles. Another factor to consider is background diesel concentrations. All California children are continuously exposed to ambient diesel particulate but that exposure is highest in urban, heavily trafficked areas and in schools closest to dense diesel sources such as ports, warehouse distribution centers or rail yards. The estimated current exposure for California's 14 air basins is shown in Enclosure 2.

Geographical Distribution

This is the most controversial issue surrounding the new appropriation. The expressed legislative intent is for the Board to provide "an equitable geographic distribution" of the school bus funds. That suggests continuing on with the current population-based criteria. However, the control language also mandates the replacement of pre-1977 vehicles only and ARB staff have been asked to shift the allocation criteria towards the geographical distribution of those vehicles. In addition, various children's exposure scenarios need to be considered. There is no simple solution to these issues. Public dialogue is needed to proceed.

Public workshop

ARB staff plans to conduct at least one public meeting to inform all stakeholders of the funding directives for the $25 million school bus appropriation. Stakeholders include legislative staff, the California Energy Commission which administered funds to rural schools in prior years, air districts, school districts, bus and retrofit manufacturers, environmental groups, and the California Highway Patrol (CHP) among others. At that meeting, staff will also discuss outstanding issues including match requirements and allocation formulas. Staff will update stakeholders on technological developments that have occurred since the last round of school bus funding. Finally, staff will discuss the legal requirement for CHP to inspect retrofitted school buses prior to those buses being placed back into service. The public meetings would occur in the next two months pending your approval of our allocation plan.

Guidelines Update

Even before the new $25 million appropriation, ARB's existing school bus guidelines needed to be updated. Now there are new issues that need to be addressed. Accordingly, ARB staff is preparing a guideline update this fall, to be presented to the Board next spring. Anticipated changes include reinstating retrofit provisions (which were deleted under Proposition 40 funding), adding a requirement for CHP inspection of school buses after retrofit installation, and allowing funding for replacement of the compressed natural gas fuel tanks after 15 years (their useful life and the length of current safety certifications). Proposed purchase requirements for 2007 and later model year school buses will also be added, since the current guidelines extend through 2006 only. Finally staff will report on the public dialogue about the new $25 million appropriation and make recommendations for further changes to the guidelines, as appropriate.

Funding Timeline

The projected timetable for allocating the $25 million school bus funds is given below. We recognize it is important to get the money to school districts as quickly as possible and will make every effort to accelerate this timetable. But given the need for additional public process on the allocation criteria and other issues, it is clear that we are looking at least a few months of new work.

Clean School Bus Program Appropriation Funding Timeline	
October/November 2005	Public meeting(s)
January 2005	Draft school bus guideline changes released for public review
March 2006	Board considers and approves guideline updates
May 2006	ARB enters into funding agreements with local air districts and California Energy Commission (CEC)
By September, 2006	School districts apply for new bus and/or retrofit funding
By December 31, 2007	Final expenditure reports due to ARB from air districts and CEC

I hope that this school bus allocation plan meets with your approval. We will keep you informed as we move ahead. If you have any questions, please call me directly or contact Mr. Jack Kitowski, Chief, On-Road Controls Branch, at (916) 323-6169 or jkitowsk@arb.ca.gov.

Enclosures (2)

cc: Honorable ARB Board Members
Patty Zwarts, Legislative Director, Cal/EPA
Tom Cackette, Chief Deputy Executive Officer, ARB
Jack Kitowski, Chief, On-Road Controls Branch, ARB
Rob Oglesby, Legislative Director, ARB

Enclosure 1

ARB
FY 2005-06 Budget Language
Lower Emission School Bus Program
$25 million

Budget Language

3900-001-0044 (Motor Vehicle Account)

1. Of the amount appropriated in this item, $12,500,000 shall be used by the State Air Resources Board to replace pre-1977 school buses with new school buses that comply with the most recent passenger safety standards, and that have been certified by the board to meet the lowest achievable emission levels irrespective of the fuel stock used.

2. Of the amount appropriated in this item, $2,500,000 shall be used to retrofit in-use diesel school buses to protect children's health and reduce particulate matter emissions from those buses by at least 85 percent.

3. In expending funds under Provision 2, the State Air Resources Board shall require retrofit technologies to do all of the following: (a) have at least a level 3 verification from the board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO2 across the device.

4. It is the intent of the Legislature in appropriating these funds that the State Air Resources Board provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses.

3900-001-0115 (Air Pollution Control Fund)

1. Of the amount appropriated in this item, $10,000,000 shall be used to retrofit in-use diesel school buses to protect children's health and reduce particulate matter emissions from those buses by at least 85 percent.

2. In expending funds under Provision 1, the State Air Resources Board shall require retrofit technologies to do all of the following: (a) have at least a level 3 verification from the board; (b) apply to the broadest range of year, make, and model of school bus diesel engine; (c) operate on CARB diesel fuel or ultra-low sulfur diesel fuel; (d) operate across the broadest range of school bus operating conditions and duty cycles; and (e) produce the lowest possible NO2 across the device.

3. It is the intent of the Legislature in appropriating these funds that the State Air Resources Board provide equitable geographic distribution of the funds in a manner that reduces the risk to children's health from diesel emissions from school buses.

Governor's Signing Message

To ensure that this augmentation is spent most appropriately, I am directing the Air Resources Board to develop a plan by September 15, 2005, for allocation of these resources, and to submit this plan to the California Environmental Protection Agency for review and approval. The allocation plan must consider the overall financial capacity of the applicant to reasonably replace these buses without state assistance, the exposure to children, and the age of the buses slated for replacement.

Enclosure 2

Projected PM_{10} Concentration Attributed to Emissions from Diesel Exhaust				
Air Basin	***Base Year 1990 (micro g/m3)***	***1995 (micro g/m3)***	***2000 (micro g/m3)***	***2010 (micro g/m3)***
Great Basin Valleys	0.2	0.1	0.1	0.1
Lake County	0.3	0.2	0.2	0.2
Lake Tahoe	1.0	0.5	0.4	0.3
Mojave Desert	0.8	0.6	0.4	0.4
Mountain Counties	0.6	0.4	0.4	0.3
North Central Coast	1.4	1.0	0.8	0.7
North Coast	1.2	0.9	0.8	0.8
Northeast Plateau	1.1	0.8	0.7	0.6
Sacramento Valley	2.5	1.6	1.2	1.1
Salton Sea	2.6	1.8	1.5	1.4
San Diego	2.9	1.9	1.4	1.2
SanFrancisco Bay Area	2.5	1.9	1.6	1.5
San Joaquin Valley	2.6	1.7	1.3	1.2
South Central Coast	1.8	1.2	1.1	1
South Coast	3.6	2.7	2.4	2.4
Statewide	***3.0***	***2.2***	***1.8***	***1.7***

Source: "Proposed Identification of Diesel Exhaust as a Toxic Air Contaminants" Appendix III, Part A, "Exposure Assessment", as approved by the Scientific Review Panel on April 22, 1998.

Appendix D
Secretary's Lloyd's Response Approving Plan for Determining Fund Allocation

California Environmental Protection Agency

Air Resources Board • Department of Pesticide Regulation • Department of Toxic Substances Control
Integrated Waste Management Board • Office of Environmental Health Hazard Assessment
State Water Resources Control Board • Regional Water Quality Control Boards

Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

TO: Catherine Witherspoon
Executive Officer
Air Resources Board

FROM: Alan C. Lloyd, Ph.D. Alan C. Lloyd
Agency Secretary
California Environmental Protection Agency

DATE: September 23, 2005

SUBJECT: ARB's SCHOOL BUS PROGRAM ALLOCATION PLAN

This memorandum is to convey my approval of ARB's school bus program allocation plan. It is clear that you have given careful thought to the instructions in the Governor's signing message, and in the budgetary control language approved by the State Legislature. In addition, I support your decision to provide an open, transparent public process so that all parties understand what is going on and have an opportunity to comment.

I am concerned about the proposed timetable, however. Pursuant to your schedule, the ultimate recipients of the funds – California school districts – will not receive any money until late next year. I appreciate all the intermediate steps that must be taken and the workload involved, but it is imperative that children's health be protected by the earliest possible date. I know this is the Governor's desire. To that end, I urge you to reexamine your schedule and make every possible effort to accelerate it. I would also like ARB to consider whether it is possible to make an initial, minimum allocation of school bus funds while the larger question of alternate allocation formulas is pending. All districts should have sufficient funds to acquire at least one bus.

I have spoken with Chairwoman, Barbara Riordan, and she agrees with my sentiments.

Thank you again for your thoughtful and complete allocation plan. You may proceed with implementation, subject to the qualifications noted above.

cc: Terry Tamminen (w/ARB plan)
Richard Costigan (w/ARB plan)
Dan Skopec (w/ARB plan)
Patty Zwarts
Honorable Members, Air Resources Board

Appendix E
Allocation Options Criteria and Preliminary Allocations

Comparison of New Bus Funding Allocation Methodologies		
Air Districts	**Est. % of pre-77 bus pop**	**% of People Pop**
San Joaquin Valley Unified APCD	46%	10%
South Coast AQMD	12%	44%
Bay Area AQMD	8%	19%
San Diego County APCD	0.4%	8%
Sacramento Metropolitan AQMD	0.4%	4%
Total Self-Administered Programs	***68%***	***85%***
Kern County APCD	6.5%	0.3%
Ventura County APCD	3.0%	2.2%
Monterey Bay Unified APCD	4.8%	2.1%
Feather River AQMD	2.6%	0.4%
Mendocino County AQMD	1.7%	0.3%
North Coast Unified AQMD	0.9%	0.5%
Mojave Desert AQMD	2.2%	1.2%
Antelope Valley APCD	0.9%	0.9%
Calaveras County APCD	0.4%	0.1%
Colusa County APCD	0.4%	0.1%
Glenn County APCD	0.4%	0.1%
Great Basin Unified APCD	1.3%	0.1%
Placer County APCD	1.3%	0.8%
Tuolumne County APCD	0.9%	0.2%
Northern Sierra AQMD	2.2%	0.35%
Butte County AQMD	1.3%	0.63%
Shasta County AQMD	0.4%	0.5%
Imperial County APCD	0.4%	0.49%
El Dorado County AQMD	0.4%	0.50%
Siskiyou County APCD	0.4%	0.13%
Remaining Air Districts	0%	3.6%
Total for CEC-Administered Program	***32%***	***15%***
Total Entire Program	**100%**	**100%**

Note: Oldest 89 buses are the 1972 model year and older school buses in California. If additional buses can be funded, funded buses will be chosen by lottery from all 1973 buses in State

Comparison of New Bus Funding Methodologies

Methodology	Oldest Bus First	% of Pre-77 Bus Pop.		% of People Pop	
Air Districts	[illegible]	Est. Funding	Est. # of Buses to be replaced	Est. Funding	Est. # of Buses to be replaced
[illegible] Air District-Administered Program					
San Joaquin Valley Unified APCD	[illegible]	$ 5,779,000	41	$ 1,223,000	9
South Coast AQMD	[illegible]	$ 1,494,000	11	$ 5,449,000	39
Bay Area AQMD	[illegible]	$ 1,061,000	8	$ 2,395,000	17
San Diego County APCD	[illegible]	$ 54,000	0	$ 1,051,000	8
Sacramento Metropolitan AQMD	[illegible]	$ 54,000	0	$ 456,000	3
Total Air District-Administered Programs	[illegible]	***$ 8,442,000***	***60***	***$10,574,000***	***76***
[illegible] CEC-Administered Program					
Kern County APCD	[illegible]	$ 812,000	5	Pool	Pool
Ventura County APCD	[illegible]	$ 379,000	2	$ 273,000	2
Monterey Bay Unified APCD	[illegible]	$ 595,000	4	$ 266,000	2
Feather River AQMD	[illegible]	$ 325,000	2	Pool	Pool
Mendocino County AQMD	[illegible]	$ 216,000	1	Pool	Pool
North Coast Unified AQMD	[illegible]	Pool	Pool	Pool	Pool
Mojave Desert AQMD	[illegible]	$ 271,000	1	$ 153,000	1
Antelope Valley APCD	[illegible]	Pool	Pool	Pool	Pool
Calaveras County APCD	[illegible]	Pool	Pool	Pool	Pool
Colusa County APCD	[illegible]	Pool	Pool	Pool	Pool
Glenn County APCD	[illegible]	Pool	Pool	Pool	Pool
Great Basin APCD	[illegible]	$ 162,000	1	Pool	Pool
Place County APCD r	[illegible]	$ 162,000	1	Pool	Pool
Tuolumne County APCD	[illegible]	Pool	Pool	Pool	Pool
Northern Sierra AQMD	[illegible]	$ 271,000	1	Pool	Pool
Butte County AQMD	[illegible]	$ 162,000	1	Pool	Pool
Shasta County AQMD	[illegible]	Pool	Pool	Pool	Pool
Imperial County APCD	[illegible]	Pool	Pool	Pool	Pool
El Dorado Count AQMD	[illegible]	Pool	Pool	Pool	Pool
Siskiyou County APCD	[illegible]	Pool	Pool	Pool	Pool
Remaining Air Districts	[illegible]	N/A	N/A	Pool	Pool
Total for CEC-Administered Program	[illegible]	***$4,058,000***	***29***	***$1,926,000***	***14***
Total Entire Program	[illegible]	**$12,500,000**	**~89**	**$12,500,000**	**~89**

Note: Oldest 89 buses are the 1972 model year and older school buses in California. If additional buses can be funded, funded buses will be chosen by lottery from all 1973 buses in State

Appendix F
List of California's Oldest School Buses

California's Oldest School Buses

Mfg date	Air District	School District	City
1/1/1951	Kern	MOJAVE UNIFIED SCHOOL DIST	CALIFORNIA CITY
1/1/1958	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1959	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1959	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1959	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1960	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1960	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1962	San Joaquin Valley Unified	LAMONT SCHOOL DISTRICT	LAMONT
1/1/1962	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1962	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
11/11/1962	Kern	SOUTH FORK UNION SCHOOL DISTRICT	WELDON
1/1/1964	Mendocino	ROUND VALLEY UNIF SCHOOL DIST	COVELO
1/1/1964	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1964	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1965	North Coast Unified	SO HUMBOLDT UNIF SCHOOL DIST	GARBERVILLE
1/1/1965	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1965	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1966	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1966	San Joaquin Valley Unified	PLEASENT VIEW SCHOOL DISTRICT	PORTERVILLE
1/1/1966	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1967	Calaveras	MARK TWAIN UNION SCHOOL DISTRICT	ANGELS CAMP
1/1/1967	Colusa	PIERCE JT UNIF SCHOOL DIST	ARBUCKLE
1/1/1967	Kern	SOUTHERN KERN UNIFIED SCH DIST	ROSAMOND
1/1/1967	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1967	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1967	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA
1/1/1967	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
1/1/1967	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
8/1/1967	Glenn	ORLAND PUBLIC SCHOOLS	ORLAND
1/1/1968	Mendocino	WILLITS UNIF SCHOOL DIST	WILLITS
1/1/1968	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS
1/1/1968	San Joaquin Valley Unified	GREENFIELD UNION SCHOOL DISTRICT	BAKERSFIELD
1/1/1968	San Joaquin Valley Unified	CORCORAN UNIFIED SCHOOL DISTRICT	CORCORAN
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1968	Tuolumne	FOOTHILLS HORIZON STAN CO DEPT ED	SONORA
7/19/1968	Ventura	FILLMORE UNIFIED SCHOOL DIST.	FILLMORE
1/1/1969	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1969	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1969	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1969	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1969	San Joaquin Valley Unified	MERCED UNION HIGH SCHOOL DISTRICT	MERCED
1/1/1969	San Joaquin Valley Unified	GREENFIELD UNION SCHOOL DISTRICT	BAKERSFIELD
1/1/1969	South Coast	FONTANA UNIFIED SCHOOL DIST	FONTANA
1/1/1969	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA

1/1/1969	South Coast	DOWNEY UNIFIED SCHOOL DISTRICT	DOWNEY
4/1/1969	Bay Area	BERRYESSA UNION SCHOOL DISTRICT	SAN JOSE
8/1/1969	South Coast	HUNTINGTON BEACH CITY SCHOOL DIST	HUNTINGTON BEACH
8/27/1969	Feather River	SUTTER UNION HIGH SCHOOL DISTRICT	SUTTER
1/1/1970	Antelope Valley	WILSONA SCHOOL DISTRICT	LANCASTER
1/1/1970	Kern	SOUTHERN KERN UNIFIED SCH DIST	ROSAMOND
1/1/1970	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1970	San Joaquin Valley Unified	WASCO UNION ELEMENTARY SCHOOL DIST	WASCO
1/1/1970	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1970	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
1/1/1971	Bay Area	NEWARK UNIFIED SCHOOL DISTRICT	NEWARK
1/1/1971	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1971	Kern	MUROC UNIFIED SCHOOL DISTRICT	BORON
1/1/1971	Kern	SIERRA SANDS UNIFIED SCHOOL DIST.	RIDGECREST
1/1/1971	San Joaquin Valley Unified	WASCO UNION ELEMENTARY SCHOOL DIST	WASCO
1/1/1971	San Joaquin Valley Unified	CENTRAL UNIFIED SCHOOL DISTRICT	FRESNO
1/1/1971	San Joaquin Valley Unified	KERMAN UNIFIED SCHOOL DISTRICT	KERMAN
1/1/1971	San Joaquin Valley Unified	MERCED UNION HIGH SCHOOL DISTRICT	MERCED
1/1/1971	Ventura	FILLMORE UNIFIED SCHOOL DIST.	FILLMORE
1/1/1971	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
6/7/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
6/9/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
6/10/1971	Feather River	MARYSVILLE JOINT UNIFIED SCHOOL DIS	MARYSVILLE
9/1/1971	Placer	WESTERN PLACER UNIFIED SCHOOL DISTR	LINCOLN
9/1/1971	South Coast	HUNTINGTON BEACH CITY SCHOOL DIST	HUNTINGTON BEACH
1/1/1972	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1972	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1972	Great Basin	BISHOP UNION ELEMENTARY SCHOOL DIST	BISHOP
1/1/1972	Kern	SIERRA SANDS UNIFIED SCHOOL DIST.	RIDGECREST
1/1/1972	Mojave Desert	VICTOR VALLEY UNION HIGH SCHOOL	VICTORVILLE
1/1/1972	Mojave Desert	VICTOR VALLEY UNION HIGH SCHOOL	VICTORVILLE
1/1/1972	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1972	Monterey Bay Unified	SANTA CRUZ CITY SCHOOLS	SANTA CRUZ
1/1/1972	San Joaquin Valley Unified	ATWATER ELEMENTARY SCHOOL DISTRICT	ATWATER
1/1/1972	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1972	San Joaquin Valley Unified	COALINGA-HURON UNIFIED SCHOOL DST	COALINGA
1/1/1972	San Joaquin Valley Unified	CORCORAN UNIFIED SCHOOL DISTRICT	CORCORAN
1/1/1972	San Joaquin Valley Unified	PORTERVILLE PUBLIC SCHOOLS	PORTERVILLE
1/1/1972	San Joaquin Valley Unified	TULARE JOINT UNION HIGH SCHOOL	TULARE
1/1/1972	South Coast	DOWNEY UNIFIED SCHOOL DISTRICT	DOWNEY
1/1/1972	Ventura	OXNARD UNION HIGH SCHOOL DISTRICT	OXNARD
11/1/1972	South Coast	A B C UNIFIED SCHOOL DISTRICT	ARTESIA
11/28/1972	North Coast Unified	DEL NORTE COUNTY UNIF SCHOOL DIST	CRESCENT CITY
1/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
1/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
1/1/1973	Bay Area	SAN MATEO UNION HIGH SCHOOL DIST	SAN MATEO
1/1/1973	Mendocino	UKIAH UNIF SCHOOL DIST	UKIAH
1/1/1973	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS

1/1/1973	Monterey Bay Unified	MONTEREY PENINSULA UNIFIED SCH DIST	MONTEREY
1/1/1973	Monterey Bay Unified	SALINAS UNION HIGH SCHOOL	SALINAS
1/1/1973	San Joaquin Valley Unified	MADERA UNIFIED SCHOOL DISTRICT	MADERA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1973	San Joaquin Valley Unified	RICHLAND UNION SCHOOL DST	SHAFTER
1/1/1973	San Joaquin Valley Unified	COALINGA-HURON UNIFIED SCHOOL DST	COALINGA
1/1/1973	San Joaquin Valley Unified	DELANO JOINT UNION HIGH SCHOOL	DELANO
1/1/1973	San Joaquin Valley Unified	DELANO JOINT UNION HIGH SCHOOL	DELANO
1/1/1973	San Joaquin Valley Unified	ELK HILLS SCHOOL DISTRICT	TUPMAN
1/1/1973	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1973	San Joaquin Valley Unified	MADERA UNIFIED SCHOOL DISTRICT	MADERA
1/1/1973	San Joaquin Valley Unified	CERES UNIFIED SCHOOL DISTRICT	CERES
1/1/1973	San Joaquin Valley Unified	SELMA UNIFIED SCHOOL DIST	SELMA
1/1/1973	South Coast	AZUSA UNIFIED SCHOOL DISTRICT	AZUSA
5/1/1973	Siskiyou	BIG SPRINGS UNION ELEM SCHOOL DIST	MONTAGUE
5/1/1973	South Coast	RIM OF THE WORLD UNIFIED SCHOOL DIS	LAKE ARROWHEAD
7/1/1973	Butte	PARADISE UNIFIED SCHOOL DISTRICT	PARADISE
8/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
8/1/1973	Bay Area	MORGAN HILL UNIFIED SCHOOL DISTRICT	MORGAN HILL
9/1/1973	Antelope Valley	EASTSIDE UNION SCHOOL DISTRICT	LANCASTER
9/1/1973	Imperial	BRAWLEY SCHOOL DISTRICT	BRAWLEY
10/1/1973	Imperial	BRAWLEY SCHOOL DISTRICT	BRAWLEY
12/1/1973	Mojave Desert	NEEDLES UNIFIED SCHOOL DISTRICT	NEEDLES

Appendix G
Emission Benefit Calculations

Appendix G
Emission Benefit Calculation Methodologies

Emission Benefits from New School Bus Purchases

The staff used the ARB's emission inventory modeling program, EMFAC2002 (April 2003 version), to estimate the emission benefits associated with replacing pre-1977 model year school buses with 2007 model year buses. The base assumptions derived from EMFAC2002 are:

- A pre-1977 model year bus accrues about 40 miles per day and emits about 1.9 pounds per day of NOx and 0.09 pounds per day of PM.

- A 2007 model year bus accrues about 40 miles per day and emits about 0.3-0.4 pounds per day of NOx and 0.03 pounds per day of PM.

Consequently, for each pre-1977 model year bus replaced with a new bus (2007 model year), about 1.5 pounds per day of NOx and 0.06 pounds per day of PM are reduced. With funds available to replace about 90 buses (i.e., $12.5 million in total funding at a cost of $140,000 per bus), total emission reductions would be about 135 pounds per day of NOx and 5 pounds per day of PM.

These are immediate, near-term reductions due to fleet turnover – the new bus has significantly lower emissions than the old bus. These benefits continue only as long as the old bus would have remained on the road. The ARB staff is currently assessing the length of time that the old bus would have remained on the road and the potential lifetime emission benefit through a fleet modernization program that is part of the Carl Moyer Program.

In cases where a pre-1977 model year bus is replaced with a 2007 model year alternative-fueled bus, the alternative-fueled bus is certified to a lower NOx standard than is required by regulation. This means that an alternative-fueled bus replacement will provide an additional NOx emission reduction of about 0.1 pounds per day. This additional emission benefit would last for the lifetime of the new bus.

Emission Benefits from In-Use Diesel Retrofits

Passive DPFs use the heat generated from the engine to catalytically oxidize collected diesel PM. Active DPFs use an external source of heat to oxidize collected PM with or without the aid of a catalyst.

There are several models of passive DPFs ARB-verified for installation on school buses in California. These passive DPFs are only verified for 1994 and later model year engines. Currently, there is one ARB-verified uncatalyzed active DPF for use on school buses; however, it is also only verified for 1994 and later

model year engines. We expect that this active DPF will be ARB-verified in the near future for 1988 through 1993 model year engines as well.

The ARB staff calculated emission reductions from the installation of ARB-verified retrofit devices on in-use diesel school buses. In this analysis, the staff included both active and passive Level 3 DPFs (technologies that achieve an 85% or greater reduction in PM emissions) in order to capture the largest population of school buses eligible for retrofits. The staff estimates that the $12.5 million in 2005-2006 fiscal year State funds will fund about 860 retrofit devices for in-use diesel school buses. For purposes of this analysis, the staff assumed:

- A Level 3 DPF, whether active or passive, has an 11 year life
- Active DPFs are installed on 1988-1993 model year buses and passive DPFs are installed on 1994 through 2004 model year buses
- Each retrofitted bus travels approximately 15,000 miles per year (according to EMFAC2002, the actual mileage rate is 14,836 miles per year)
- Typical cost for an active DPF is about $18,500, including installation, infrastructure, and periodic maintenance (de-ashing and baking to burn off unoxidized PM)
- Typical cost for a passive DPF is about $12,000, including installation and periodic maintenance (de-ashing and baking to burn off unoxidized PM)

Using the above assumptions, the staff estimates that retrofits on in-use diesel buses will reduce PM emissions by 45 to 60 tons over the expected 11 year DPF life. To the extent that active DPFs are also installed on the eligible 1994 through 2004 model year school bus population, the number of funded retrofits and total emission benefits will decrease due to the higher costs of active DPFs.