State of California
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Responses

PUBLIC HEARING TO CONSIDER THE ADOPTION OF A PUBLIC TRANSIT BUS FLEET RULE AND EMISSION STANDARDS FOR NEW URBAN BUSES

First Public Hearing Date: January 27, 2000
Continued to: February 24, 2000
Agenda Item No.: 00-1-2

I. GENERAL

This rulemaking was initiated by a Notice of Public Hearing to consider the adoption of a public transit bus fleet rule and emission standards for new urban buses released and made available to the public on December 10, 1999. A Staff Report (Initial Statement of Reasons for the proposed regulation) was also made available for public inspection on December 10, 1999. The Staff Report, which is incorporated by reference herein, contained the text of the regulation as initially proposed by the staff, along with an extensive description of the rationale for the regulation. The regulation as originally proposed added sections 1956.1, 1956.2, 1956.3, and 1956.4 to the California Code of Regulations (CCR), title 13. It also included amendments to section 1956.8, title 13, CCR, and to the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Engines and Vehicles" (hereinafter "Standards and Test Procedures"), which is incorporated by reference in sections 1956.1 and 1956.8.

At a public hearing conducted on January 27, 2000, the Air Resources Board (the "Board" or "ARB") considered the adoption of a regulation for a public transit bus fleet rule and emission standards for new urban buses. At this hearing, the staff presented modifications to the regulation originally proposed in the Staff Report released on December 10, 1999, in response to comments received subsequent to publication of the Staff Report. After extensive public testimony, the Board Chairman closed the public record for the proposed regulation and continued the hearing until February 24, 2000.

At the February 24 hearing, the staff presented additional modifications to the regulation originally proposed in response to public testimony and Board direction at the January 27 hearing. At the conclusion of the hearing, the Board approved the staff's proposal with the modifications presented at both the January and February hearings, with minor changes. In accordance with section 11346.8 of the Government Code, the Board directed the Executive Officer, through Resolution 00-2, to make the text of the modified amendments available to the public for a supplemental written comment period of 15 days. The Executive Officer was then directed either to adopt the amendments

with such additional modifications as may be appropriate in light of comments received, or to present the regulation to the ARB for further consideration if warranted in light of the comments.

The text of the ARB-approved modifications, with the modifications clearly identified, was made available for a supplemental 15-day comment period by issuance of a Notice of Public Availability of Modified Text and Supporting Documents on August 16, 2000. The Notice, which is incorporated by reference herein, contained the text of the modified regulation with additions shown by double underline and deletions shown by ~~double underline strikeout~~. The Notice also contained descriptions of the significant modifications by section number, subdivision, and when applicable, by paragraph. While three written comment letters relevant to the modifications were received during the supplemental 15-day comment period, only two of the letters contained specific objections or recommendations regarding the regulatory modifications.

After considering the comments received during the supplemental 15-day comment period, the Executive Officer issued Executive Order G-00-060, adopting the regulation as modified, described in the Notice of Public Availability of Modified Text and Supporting Documents," into sections 1956.1, 1956.2, 1956.3, 1956.4, 1956.8, 1965, and to three documents incorporated by reference: 1) the amended Standards and Test Procedures document incorporated by reference in sections 1956.1(b) and 1956.8(b), title 13, CCR; 2) the amended "California Motor Vehicle Emission Control and Smog Index Label Specifications" incorporated by reference in section 1965, title 13, CCR; and 3) the newly adopted "California Certification Procedures for PM Retrofit Devices for Heavy-Duty Diesel Engines" incorporated by reference in section 1956.2(f)(7),
title 13, CCR.

Modifications to the original proposal

There were a number of modifications presented by the ARB staff at the January and February hearings and approved by the Board to revise sections 1956.1, 1956.2, 1956.3, 1956.4, and 1956.8, title 13, CCR, and the Standards and Test Procedures document. In addition, other modifications were made and included in the Notice of Public Availability of Modified Text and Supporting Documents that were not presented at either the January or February hearing. These changes were sufficiently related to the original text of the regulation such that the public was placed on notice that the changes could result from the originally proposed regulatory action. All the significant modifications included in the regulation are described below. Other modifications were made to correct typographical errors, provide conformity throughout the regulation, and to improve its clarity.

Section 1956.1, Title 13, CCR: Exhaust Emission Standards and Test Procedures – 1985 and Subsequent Model Heavy-Duty Urban Bus Engines and Vehicles

Paragraph (a)(7) was added to require that diesel-fueled, dual-fuel, and bi-fuel urban bus engines shall meet a 0.01 grams per brake horsepower-hour (g/bhp-hr) particulate matter (PM) standard beginning with 2002 and subsequent model year engines produced beginning October 1, 2002. This modification was drafted in response to a commitment by the Engine Manufacturers Association (EMA) to produce such engines meeting a 0.01 g/bhp-hr PM standard, made subsequent to the publication of the originally proposed regulation in the Staff Report released on December 10, 1999.

Paragraphs (a)(8) and (a)(9) were modified to provide clarity in the applicability of the ARB's optional, reduced emission standards for 2002 and subsequent model year urban bus engines, produced beginning October 1, 2002.

Paragraph (a)(11) was modified to include bi-fuel urban bus engines, to provide clarity with respect to proposed emission standards for non-methane hydrocarbons, carbon monoxide, and formaldehyde, and to provide specificity regarding the ability of engine manufacturers to sell bus engines certified to emission standards other than those required by paragraph (a)(11).

Paragraph (a)(12) was modified to delete restrictions on averaging, banking, and trading provisions for engine manufacturers based on comments made by the EMA subsequent to the publication of the originally proposed regulation in the Staff Report released on December 10, 1999.

Subdivision (b) was added to incorporate by reference the document entitled "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," adopted April 8, 1985, and last amended on February 26, 1999.

Section 1956.2, Title 13, CCR: Fleet Rule for Urban Transit Bus Operators

Subdivision (a) was modified to require transit agencies choosing the fleet rule's diesel path to notify the ARB of this action.

Subdivision (b) was added to define, for the purpose of the fleet rule described in section 1956.2, the following terms: "alternative fuel"; "active fleet"; "transit agency"; and "urban bus."

Paragraph (c)(5) was added to clarify requirements for diesel-fueled, dual-fuel, or bi-fuel new bus purchases made by transit agencies on the alternative-fuel path.

Paragraph (d)(4) was modified to clarify requirements for diesel-fueled, dual-fuel, bi-fuel, or alternative-fuel new bus purchases made by transit agencies on the diesel path.

Paragraph (d)(7) was added to allow urban bus fleets, upon approval by the Executive Officer, to implement an alternative emission reduction strategy to achieve emission reductions greater than those that would be achieved through implementation of the staff's originally proposed emission standards for model year 2004 through 2006 diesel-fueled and dual-fuel urban bus engines.

Paragraph (e)(1) was modified to allow zero-emission buses not defined as an urban bus to be used in calculating a transit agency's oxides of nitrogen (NOx) fleet average standard.

Subdivision (f), pertaining to PM retrofit requirements, was modified for clarity based on comments from the EMA made subsequent to the publication of the originally proposed regulation in the Staff Report released on December 10, 1999. It was also modified to accelerate the PM retrofit schedule for transit agencies on the diesel path based on comments from environmental groups at the January hearing.

Paragraph (f)(7) was added to incorporate, by reference, a certification procedure for use by retrofit device manufacturers in certifying retrofit devices to reduce PM emissions from diesel-fueled, dual-fuel, bi-fuel, and diesel hybrid electric urban transit buses. While the PM retrofit requirements were included in the notice of public hearing issued on December 10, 1999, the entire certification procedure is a modification recommended by staff at the January hearing and approved by the Board at the February hearing. As presented at the January hearing, the certification procedure was originally included in section 1956.2, title 13, CCR. To provide clarity and specificity, the staff removed the procedure from section 1956.2 subsequent to the February hearing, added more detail to the certification requirements, and incorporated the procedure within a new, separate document entitled "California Certification Procedures for PM Retrofit Devices for Heavy-Duty Diesel Engines."

The legal authorities and references cited for section 1956.2, title 13, CCR, were modified to include Health and Safety Code section 43701(b) pertaining to the ARB's authority to require retrofits for heavy-duty diesel vehicles.

Section 1956.3, Title 13, CCR: Zero-Emission Bus Requirements

Paragraphs (c)(4)(A) and (c)(4)(B) were added to allow transit agencies to earn credits for placing zero-emission buses, other than zero-emission buses used in required demonstration projects, in service earlier than required by the purchase/lease requirements specified in subdivision (c).

Section 1956.4, Title 13, CCR: Reporting Requirements for all Urban Bus Transit Agencies

The term “leasing companies” was deleted from the title of section 1956.4 because the reporting requirements described therein only apply to urban bus transit agencies.

The reporting requirements were modified in subdivisions (a), (d), and (f) to reflect that urban bus transit agencies must submit annual reports regarding bus purchases and leases, and compliance with required PM retrofit requirements, rather than just maintain records for inspection upon request.

Paragraph (a)(2) was modified to specify requirements for a transit agency that is requesting a deviation from the 85 percent alternative-fuel bus purchase/lease requirement for transit agencies on the fleet rule’s alternative-fuel path.

Subdivision (b) was added to specify that urban bus transit agencies on the fleet rule’s diesel path must submit an initial report stating an agency’s intent to follow the diesel path and annual reports regarding new bus purchases and leases.

Subdivision (d) was modified to conform the reporting requirements for PM retrofits to the modified PM retrofit requirements for transit agencies on the fleet rule’s diesel path.

Paragraph (f)(2) was modified to specify requirements for a transit agency that is requesting a deviation from the 15 percent zero-emission purchase/lease requirement for large transit agencies on the fleet rule’s diesel and alternative-fuel paths.

Subdivision (g) was added to include reporting requirements for transit agencies exempted from the requirements for new purchases of 2004 through 2006 model year diesel-fueled, dual-fuel, bi-fuel, or alternative-fuel urban buses.

Section 1956.8, Title 13, CCR: Exhaust Emission Standards and Test Procedures – 1985 and Subsequent Model Heavy-Duty Engines and Vehicles

The language in paragraph (a)(1) was modified to accurately reflect the contents of the modified table contained therein.

Footnote G in paragraph (a)(1) is new language in the regulation originally proposed in the Staff Report released on December 10, 1999, that was not shown as a proposed amendment. Hence, it was included in the Notice of Public Availability of Modified Text and Supporting Documents as modified text for which public comment was invited.

The table in paragraph (a)(2) was modified in response to comments made by International Truck and Engine Corporation (formerly known as Navistar) subsequent to publication of the originally proposed regulation in the Staff Report released on December 10, 1999. The modifications to the table and the addition of new footnote H are intended to clarify that each heavy-duty engine manufacturer is subject to its respective requirements in settlement agreements reached with the ARB and the United States Environmental Protection Agency (U.S. EPA) in an enforcement action concerning violations of emission standards. In addition, the table was retitled to more accurately reflect its contents.

Paragraphs (a)(4)(A) and (a)(4)(B) were modified to conform with footnote modifications in paragraphs (a)(1) and (a)(2), pertaining to the dual fueling mode certification process.

Footnote A in subdivision (h) was modified to include reference to section 1961, title 13, CCR – Exhaust Emission Standards and Test Procedures – 2004 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

Section 1965, Title 13, CCR: Emission Control and Smog Index Labels – 1979 and Subsequent Model Year Motor Vehicles

Section 1965 in title 13 incorporates by reference the document entitled "California Motor Vehicle Emission Control and Smog Index Label Specifications." These specifications for tune-up labels, vehicle/engine emission configuration bar-code labels, and vehicle identification number bar-code labels apply to all new 1979 and subsequent model-year heavy-duty engines, as well as other categories of motor vehicles. Minor conforming amendments to section 1965 were inadvertently omitted from the regulatory text as originally proposed in the Staff Report released on December 10, 1999. Hence, section 1965, as amended, was noticed for the 15-day supplemental public comment period and is now included in the modified regulation, along with conforming modifications to the incorporated document "California Motor Vehicle Emission Control and Smog Index Label Specifications."

California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles

The Standards and Test Procedures document is incorporated by reference in sections 1956.1 and 1956.8, title 13, CCR. The ARB and the U.S. EPA work closely together in regulating motor vehicles, including heavy-duty diesel vehicles. Hence, this document contains various sections of the Code of Federal Regulations (CFR) promulgated by the U.S. EPA pertaining to heavy-duty diesel vehicles, including urban transit buses. Some of the CFR provisions in the Standards and Test Procedures Document remain the same as those for the

federal motor vehicle control program, while others have been modified to conform to the unique requirements of California's motor vehicle control program. Various sections of the CFR with proposed amendments were inadvertently omitted from the regulatory text as originally proposed in the Staff Report released on December 10, 1999. The omitted CFR sections, sections 86.098-15 and 86.004-15, title 40, were noticed for the 15-day supplemental public comment period, and are now included in the regulation with conforming amendments based on modifications to sections 1956.8 and 1956.1, title 13, CCR.

In addition, CFR sections 86.098-11 and 86.004-11, title 40, which were included in the regulation as originally proposed, contain additional amendments to conform them to the modifications to CCR sections 1956.1 and 1956.8. For CFR section 86.098-11, the additional amendments include clarification of the PM standard for 2002 and subsequent model year diesel-fueled, dual-fuel, and bi-fuel urban bus engines produced beginning October 1, 2002, and further clarification of the optional, reduced emission standards for urban bus engines and heavy-duty truck engines. For CFR section 86.004-11, the additional amendments include clarification of the emission standards for all 2004 and subsequent model year urban bus engines, and language included in the regulation as originally proposed in the Staff Report released on December 10, 1999, that was not shown in underline/strikeout format as proposed amendments.

Incorporated Documents

The regulation contains three documents incorporated by reference. They are: 1) the amended Standards and Test Procedures document incorporated by reference in sections 1956.1(b) and 1956.8(b), title 13, CCR; 2) the amended "California Motor Vehicle Emission Control and Smog Index Label Specifications" incorporated by reference in section 1965, title 13, CCR; and 3) the newly adopted "California Certification Procedures for PM Retrofit Devices for Heavy-Duty Diesel Engines" incorporated by reference in section 1956.2(f)(7), title 13, CCR. These documents are available upon request from the ARB in accordance with section 1902, title 13, CCR. These documents are incorporated by reference because it would cumbersome, unduly expensive, and otherwise impractical to publish them in the CCR. It has been a longstanding and accepted practice for the ARB to incorporate ARB test methods and other similar documents by reference because the interested audience is small.

Mandates

The Board has determined that this regulatory action will result in a mandate for transportation planning agencies and commissions (the entities that fund transit agencies), and for transit agencies statewide. However, the Board finds that these costs are not reimbursable pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, because transportation planning agencies,

commissions, and transit agencies may recover their additional costs through existing federal, state, and local funding transportation funding mechanisms, and/or through increased user fees (i.e., trip fares).

Alternatives and Reports

The Staff Report released and made available to the public on December 10, 1999, did not include any proposed alternatives designed specifically to lessen the adverse economic impact on small businesses, nor were any identified and proposed by the public during the 45-day comment period prior to the January hearing.

The Board has further determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

Finally, in accordance with section 11346.3(c) of the Government Code, the Board has determined that the reporting requirements applicable to the transit agencies are necessary for public health, safety, and welfare.

II. SUMMARY OF COMMENTS AND AGENCY RESPONSES

The ARB received over 5,900 written comment letters during the 45-day comment period (over 5,800 were form-type letters), and received additional comments by way of oral testimony taken over a period of nearly eight hours during the public hearing on January 27, 2000. On August 16, 2000, the Notice of Public Availability of Modified Text and Supporting Documents, which contains the modified text of the regulation and an explanation of the proposed modifications, was made available to the public for a supplemental comment period of 15 days. During the 15-day comment period, the ARB received three written comment letters. Set forth below is a summary of all individuals and organizations that provided written comments during the 45-day comment period, oral testimony at the public hearing on January 27, 2000, and written comments during the 15-day supplemental comment period.

45-day Comment Submittals

The following 27 transit-related organizations, industry groups, environmental organizations, local air districts, and concerned individuals submitted written comments during the 45-day comment period:

American Lung Association of California; California League of Conservation Voters; California League of Conservation Voters Education Fund; Coalition for Clean Air; Environmental Health Coalition; Natural Resources Defense Council; Sierra Club of California; Union of Concerned Scientists (ENVIRONMENTAL GROUP JOINT LETTER)
ARCO Products (ARCO)

California Natural Gas Vehicle Coalition (CNGVC)
Children's Health Environmental Coalition (CHEC)
City of Fresno
Mike Cluster
Cummins Engine Company (Cummins)
John Dunlap
Engine Manufacturers Association (EMA)
The Honorable Tom Hayden, Senator, California Legislature
Lockheed Martin
Manufacturers of Emission Controls Association (MECA)
Metropolitan Transit Development Board (MTDB)
Metropolitan Transportation Commission (MTC)
NALEO Educational Fund (NALEO)
Northern Sierra Air Quality Management District (NSAQMD)
Nova BUS
Pacific, Gas, and Electric (PG&E)
Physicians for Social Responsibility (PhSR)
Pickens Fuel Corporation (PFC)
Jeffrey M. Reid, City of Fresno
Sacramento Metropolitan Air Quality Management District (SMAQMD)
Santa Barbara Metropolitan Transit District (SBMTD)
Sempra Energy
Tosco Corporation
Western States Petroleum Association (WSPA)
Amanda Westervelt

Twelve members of the concerned public submitted form-type letters urging the Board to strengthen the proposed regulation to achieve more reductions in diesel bus emissions. These letters, referred to in total as "FL1," came from the following individuals:

Amanda Johnson
Brian J. Johnson
Edward Mainland
Hannah Nielsen
Malcolm Ponder
Zack Sarconi
Gerald Scherba
Owen Siegel
M. Ruth Viswander
Joe Weichman
Stacy A. Wolf
Letter from unidentifiable individual

In addition, 245 more members of the concerned public submitted, through

e-mail to the ARB, the same type of form letter identified above. These comments are also referred to in total as FL1. A complete list of these individuals is incorporated herein as Attachment A. In total, the ARB received 257 comment letters urging the Board to strengthen the proposed regulation.

An additional 5,634 members of the concerned public submitted form-type letters urging the Board to replace diesel transit buses with cleaner alternatives. These comments are referred to in total as "FL2." Of these letters, 5,624 were submitted by a service company, Working Assets®, on behalf of its clients. A complete list of these 5,624 individuals is incorporated herein as Attachment B. The remaining ten letters referred to as FL2 came from the following individuals:

Charles Cirino
Carla Dimondstein
K. Dosif
Pattie Gardiner
Jan Kalyani
Craig Markson
Beth Olson
Linda M. Robertshaw
Earle Spanger
Letter from unidentifiable individual

Finally, nine additional members of the concerned public, listed below, submitted comments to the ARB through e-mail. While each expressed an individual opinion, these commenters generally expressed the need for the ARB to do more to reduce emissions from diesel buses.

Jeanne and Lou Aceto
Jane Enrietto
Nancy Koke
Mary Matvy
Jon McHugh
F. Michael Montgomery
Jill North
James H. Prescott
Megan Ritchie

Oral Testimony at the January Hearing

Representatives of the following forty transit-related organizations, industry groups, environmental organizations, local air districts, and concerned members of the public presented oral testimony at the hearing on January 27, 2000. Organizations identified with an asterisk (*) also submitted written comments during the 45-day comment period, as indicated above.

AC Transit
American Lung Association* (ALA)
ARCO Products* (ARCO)
Bay Area Air Quality Management District (BAAQMD)
California Chamber of Commerce (CCC)
California Electric Transportation Coalition (CETC)
California Natural Gas Vehicle Coalition* (CNGVC)
California Transit Association (CTranA)
California Trucking Association (CTA)
City of Fresno
Clean Air Now (CAN)
Coalition for Clean Air* (CCA)
Communities for a Better Environment (CBE)
Cummins Engine Company (Cummins)
dbb Fuel Cell Engines
Detroit Diesel Corporation (DDC)
Engine Manufacturers Association (EMA)
Judy Fogel
Goal Line Environmental Technologies
Golden Bear Oil Specialties
Labor/Community Strategy Center
Manufacturers of Emission Controls Association* (MECA)
Metropolitan Transportation Commission* (MTC)
Natural Resources Defense Council* (NRDC)
Neisi Farmers League and CAGI
Nova Bus*
Pickens Fuel Corporation*
San Mateo County Transit District (SMCTD)
San Joaquin Valley Air Pollution Air Pollution Control District (SJVAPCD)
Santa Barbara Electric Transportation Institute (SBETI)
Santa Clara Valley Transportation Authority (SCVTA)
Santa Clarita Transit District (SCTD)
Sempra Energy*
Sierra Club*
South Coast Air Quality Management District (SCAQMD)
Sunline Transit Agency
SUVA/LA CAUSA – Maggie Perales
SUVA/LA CAUSA – Joseph Perales
Union of Concerned Scientists* (UCS)
Western States Petroleum Association* (WSPA)

15-day Comment Submittals

The three organizations identified below submitted written comments during the supplemental 15-day comment period. Only the Santa Barbara Metropolitan Transit

District perceived all the modifications as favorable and did not provide any additional objections or recommendations; hence, its comments are not summarized.

California Transit Association (CTranA)
Engine Manufacturers Association (EMA)
Santa Barbara Metropolitan Transit District (SBMTD)

Comment Summary and Agency Responses

Set forth below is a summary of each objection or recommendation made regarding the specific regulatory actions proposed, together with an explanation of how the proposed action was changed to accommodate each objection or recommendation or the reasons for making no change. To the extent possible, the comments have been grouped by issue. In cases where a specific comment applies to multiple but related issues, the comment is only discussed in one issue category. Comments not involving objections or recommendations specifically directed towards the rulemaking or to the procedures followed by the ARB in this rulemaking are not summarized below.

1. 45-DAY COMMENT SUMMARY AND AGENCY RESPONSES

A. 2004 through 2006 Emission Standards for Diesel-Fueled Engines

1. Comment: The future availability of NOx emission control technology under the diesel path is uncertain. (SCAQMD, CTranA)

   Agency Response: The ARB believes the technology to meet the 2004 through 2006 emission standards for diesel-fueled urban bus engines will be available. Compliance with these standards could be achieved through engine modifications, or through the use of aftertreatment devices to reduce emissions. As proposed by staff, the 2004 through 2006 emission standards originally required significant reductions in both NOx and PM. However, EMA committed to producing diesel-fueled urban bus engines meeting the proposed 2004 PM standard (0.01 g/bhp-hr) in October 2002; therefore, the engine manufacturers' challenge for 2004 is to further reduce NOx while maintaining low PM levels. The regulation provides flexibility to engine manufacturers by providing two methods for compliance with the 2004 through 2006 emission standards for diesel-fueled urban bus engines. In conjunction with low-sulfur diesel fuel, engine manufacturers may rely on engine modifications to certify a new engine to the standards, or they may certify a new engine by reducing the emissions from an engine meeting existing 2002 requirements with the use of aftertreatment devices.

   If engine manufacturers choose to use aftertreatment devices, NOx adsorbers and selective catalytic reduction systems are expected to be commercially available to reduce NOx emissions. For PM control and compliance with the 0.01 g/bhp-hr PM standard to take effect for 2002 model year urban bus engines produced on or after

October 1, 2002, aftertreatment devices – particulate traps—are already commercially available and will soon be undergoing certification for use in California.

2. Comment: It is uncertain whether transit fleets will want to meet their 2004 through 2006 engine needs with technology that is unproven, costly, possibly unavailable, and which may be orphaned; that is, which may not have the long-term future applicability that the staff is assuming. (EMA)

   Agency Response: As indicated in response to Comment 1, the ARB expects that the technology to meet the 2004 through 2006 emission standards will be available. In some cases, this technology is a refinement of current technologies; in other cases, it is new (e.g., NOx adsorbers). In either case, certified engines are warranted by engine manufacturers for emissions performance and durability to ensure their customers (transit agencies) of product effectiveness and reliability and to protect their own business interests. As with any new technology, there are often incremental costs. The Staff Report (page 44) contains a discussion of the expected incremental costs associated with the 2004 through 2006 emission standards. Nevertheless, transit agencies may use an alternative compliance option—an alternative NOx strategy—if they choose not to purchase buses with diesel-fueled engines meeting the 2004 through 2006 standards. There will be costs associated with this option as well, and transit agencies should evaluate these costs compared to the costs of standard compliance (i.e., purchasing engines meeting the 2004 through 2006 standards).

   Regarding the long-term applicability of the 2004 through 2006 emission standards, the ARB disagrees that the technology used to meet these standards will be "orphaned." To the contrary, the ARB expects the technologies to meet these standards will pave the way for compliance with the 2007 emission standards, and with further refinements, the 2004 technologies will enable engines to achieve near-zero-emission levels in 2007. (Please also see Agency Response to Comment 1.)

3. Comment: The ARB is now proposing to undo the heavy-duty on-highway Statement of Principles (described in response, below) by proposing separate and unique emission standards for heavy-duty on-highway transit buses and bus engines in 2004. (EMA)

   Agency Response: With the approval of the regulation in February, the Board did, in fact, approve California emission standards for diesel-fueled urban bus engines for the 2004 through 2006 model years. However, the ARB disagrees that this represents an effort to undo the on-road Statement of Principles (SOP; see below). The ARB believes these interim standards are essential for partially mitigating excess in-use NOx emissions resulting from the engine manufacturers' illegal use of defeat devices, as well as demonstrating the effectiveness of diesel aftertreatment systems that will be used in heavy-duty trucks and buses in the 2007 timeframe.

In June 1995, the ARB, the U.S. EPA, and the heavy-duty engine manufacturers signed an SOP calling for harmonization of ARB and U.S. EPA heavy-duty vehicle emission standards. The end result of this agreement was the U.S. EPA's adoption of new emission standards in October 1997, and the ARB's adoption of standards aligned with the new federal standards in March 1998. However, subsequent to the signing of the SOP and the adoption of the new federal and California emission standards for heavy-duty vehicles and engines, federal investigations revealed that seven of the largest heavy-duty diesel engine manufacturers had violated engine certification regulations by programming engines to turn off emission control devices, used to comply with the Federal Test Procedure (FTP), during in-use driving. These violations, in direct conflict with the intent of SOP, have resulted in significant increases of in-use NOx emissions, beyond what would be expected from heavy-duty engines that comply with emission standards during the FTP cycle. The seven heavy-duty engine manufacturers have settled with both the federal government and the ARB by signing legally enforceable federal Consent Decrees and California-specific Heavy-Duty Diesel Engine Settlement Agreements requiring the manufacturers to reduce emissions. The legal authority of the ARB to adopt urban bus standards is not in question, nor is this the proper forum for alleging violations of the SOP. The EMA comment is disingenuous given the NOx emission violations of the engine manufacturers through the use of electronic defeat devices.

4. Comment: The anticipated emission benefits from the 2004 through 2006 emission standards for diesel-fueled urban bus engines will only be realized if transit fleets purchase and operate a substantial number of buses and engines complying with the standards. (DDC, Cummins)

   Agency Response: It is true that the emission benefits of the 2004 through 2006 emission standards for diesel-fueled engines will only be realized if transit agencies that would normally purchase new diesel-fueled buses in the 2004 through 2006 timeframe do so, and do not attempt to circumvent the regulation by pre-buying buses or delaying bus purchases. To ensure that full emission benefits are realized, the regulation incorporates two strategies to achieve full compliance. First, the 2004 through 2006 emission standards are in force for engine manufacturers and will affect transit agencies purchasing buses with 2004 though 2006 model year diesel-fueled engines. New diesel-fueled buses with these model year engines will emit 75 percent less NOx than the previous model year engines. Second, transit agencies that would normally purchase new diesel-fueled buses in 2004 through 2006 may choose to implement an alternative NOx strategy, in lieu of purchasing new buses, provided that the strategy achieves greater NOx reductions than what would be achieved through the 2004 through 2006 emission standards. (Please also see Agency Response to Comment 5.)

5. Comment: The regulation should include, as a compliance option for transit agencies, an optional fleet average NOx requirement to achieve emission benefits equivalent to the 2004 through 2006 emission standards. This optional fleet average, combined with low sulfur fuel, and a pull ahead of the 0.01 g/bhp-hr PM

standard to October 2002, will provide NOx and PM reductions that are superior to those under the staff's proposal. (EMA, DDC, Cummins)

Agency Response: At the February hearing, the Board approved a modification to the originally proposed regulation that allows transit agencies to implement an optional compliance strategy for achieving the emission reductions attributable to the emission standards for 2004 though 2006 model year diesel-fueled bus engines.

At the January hearing, the EMA proposed an optional fleet average NOx provision (alternative NOx strategy) to achieve NOx emission reductions equivalent to those that would be achieved through implementation of proposed emission standards for 2004 though 2006 model year diesel-fueled engines. This optional fleet average NOx standard, which offers transit agencies compliance flexibility, would be in addition to the required 4.8 g/bhp-hr fleet average NOx standard applicable to all transit agencies in California. The staff did not support EMA's original proposal because it did not achieve NOx reductions superior to those of the staff's proposed 2004 though 2006 emission standards; in fact, it achieved less NOx reductions.

Subsequent to the January hearing, EMA revised its proposal to provide NOx reductions equivalent to the proposed 2004 though 2006 emission standards for diesel-fueled engines. In addition, EMA's revised proposal retained its original commitment to provide more PM reductions than the 2004 through 2006 standards by producing diesel-fueled engines meeting a 0.01 g/bhp-hr standard beginning in October 2002 --a full 15 months ahead of when the standard was originally proposed to take effect.

At the February hearing, the Board approved EMA's revised proposal as a regulatory modification, while directing the staff to make one significant change – any transit agency opting to conduct an alternative NOx strategy must achieve greater emission reductions, not merely equivalent emission reductions, to those achievable through implementation of the 2004 through 2006 emission standards. The Board's direction for greater NOx reductions was to account for the inherent uncertainty associated with an alternative NOx strategy and to send a clear message to the engine manufacturers to do everything feasible to accelerate development in advanced NOx control technology.

6. Comment: The regulation should include a fleet average standard as an option for transit agencies to comply with the 2004 through 2006 emission standards for diesel-fueled engines. A fleet average rule would ensure more certain emission reductions when compared to an emission standard that would only affect new bus purchases. It also ensures emission reductions even if technology cannot cost-effectively achieve the required 2004 through 2006 standards. (MTC)

   Agency Response: While the ARB believes the technology will be available to cost-effectively meet the 2004 through 2006 emission standards, the Board directed the staff to modify the regulation, in response to public comments, to include an optional

fleet average NOx requirement (alternative NOx strategy) as a compliance option for transit agencies. Transit agencies purchasing 2004 through 2006 model year diesel-fueled, dual-fuel, or bi-fuel urban buses must either purchase buses meeting the 2004 through 2006 model year standards, or, as a compliance option, they may implement an alternative NOx strategy to achieve NOx reductions greater than those that would be achieved through the 2004 through 2006 standards. As a condition of the Board approving the alternative NOx strategy option, the EMA committed to producing diesel-fueled urban bus engines meeting a 0.01 g/bhp-hr PM standard in October 2002 – over a year ahead of when required, and, in conjunction with transit agencies, to implement a demonstration program of buses equipped with control technology designed to meet the 2004 through 2006 emission standards. (Please also see Agency Response to Comment 5.)

7. Comment: The regulation should be modified to include a NOx fleet average requirement to supplement the 2004 through 2006 diesel-fueled engine emission standards in case the technology to meet the standards is not yet available. (CTranA)

   Agency Response: The ARB believes the technology to meet the 2004 through 2006 emission standards for diesel-fueled engines will be available. Nevertheless, the Board directed the staff to modify the regulation, in response to public comments, to include an optional compliance option (alternative NOx strategy) for achieving the emission reductions attributable to the emission standards for 2004 though 2006 model year diesel-fueled bus engines. Transit agencies may implement an alternative NOx strategy if they choose not to purchase diesel-fueled engines meeting the 2004 through 2006 emission standards. (Please also see Agency Responses to Comments 1, 5, and 6.)

8. Comment: For both engine manufactures and bus builders, the 2004 through 2006 emission standards for diesel-fueled engines represent a significant workload. Given the significant resources necessary for compliance with general heavy-duty emission standards, and given the small number of diesel-fueled engines that the California transit bus market represents, it's questionable as to whether or not it will be practical to carry out the regulation as proposed. (Cummins)

   Agency Response: The ARB acknowledges the significant workload posed to engine manufacturers and bus builders by the implementation of the 2004 through 2006 emission standards for diesel-fueled engines. However, NOx reductions are vital in California, and the ARB believes the standards are technologically feasible and are necessary to pave the way for advanced technology required to meet the 2007 standards for urban buses and 2007 standards to be proposed for heavy-duty trucks. As such, the ARB does not believe it prudent to relax the 2004 through 2006 emission standards for diesel-fueled engines.

9. Comment: The requirement for engine manufacturers to meet a 0.5 g/bhp-hr NOx standard in 2004 should be moved up to 2002/2003. This would speed the

introduction of low-NOx technologies into transit vehicle applications and also facilitate the availability of commercial aftertreatment technologies for other heavy-duty vehicles. (SMAQMD)

Agency Response: The ARB did not modify the regulation to accelerate the implementation of the 0.5 g/bhp-hr NOx standard because it does not believe the technology necessary to meet the standard will be sufficiently developed in the 2002/2003 timeframe. Furthermore, most engine manufacturers are required to meet a 2.5 g/bhp-hr NOx + NMHC standard in October 2002 (15 months ahead of when required by federal and state regulations) to comply with the requirements of the federal Consent Decrees and the California-specific Heavy-Duty Diesel Engine Settlement Agreements. Requiring manufacturers to meet a lower NOx standard in the 2002/2003 timeframe would violate legally-binding terms of the federal and California agreements.

B. Harmonization with U.S. EPA's 2007 Emission Standards

10. Comment: Once the federal emission standards for 2007 and subsequent model year heavy-duty engines and vehicles are finalized, California's urban bus standards should be aligned with the federal standards. (Cummins)

Agency Response: The emission standards proposed by staff and approved by the Board for 2007 and subsequent model year urban bus engines are essential to achieving crucial reductions in ozone-precursor NOx emissions and toxic PM emissions in California. Throughout the course of this rulemaking, the ARB stated its intent to harmonize, to the extent possible, California's 2007 and subsequent model year urban bus engine standards with the heavy-duty engine standards ultimately adopted by the U.S. EPA for the same timeframe. The U.S. EPA recently issued its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545). Once the U.S. EPA's rulemaking is finalized, the ARB staff will consider modifications to California's 2007 standards for urban bus engines, if necessary.

C. PM Retrofit Requirements

11. Comment: The ARB should do more to reduce PM emissions from new diesel buses, thereby limiting the emissions gap between the diesel and alternative-fuel paths. This can be achieved through a combination of more stringent PM emission standards for diesel bus engines and a more aggressive PM retrofit program for the diesel path. Specifically, the ARB should adopt a 0.005 g/bhp-hr PM standard for diesel bus engines beginning with the 2004 model year and should accelerate the PM retrofit requirements on the diesel path for 1996 through 2003 model year buses (Tier 3) and for 1991 through 1995 model year buses (Tier 2). (ENVIRONMENTAL GROUP JOINT LETTER)

Agency Response: The Board did approve modifications to the regulation as originally proposed that accelerate the PM retrofit requirements on the diesel path. Specifically, Tier 2 retrofits, applicable to buses with 1991 through 1995 model year diesel-fueled engines, must now be completed by the year 2004 – one year ahead of the schedule originally proposed in the regulation. Next, Tier 3 retrofits, applicable to buses with 1996 through 2002 model year diesel-fueled engines produced before October 1, 2002, must be completed by the year 2007 – two years ahead of the schedule originally proposed in the regulation. (The engine model year range for Tier 3 retrofits changed based on the EMA's commitment to pull ahead from 2004 to October 1, 2002, the production of diesel-fueled engines meeting a 0.01 g/bhp-hr PM standard.) Additional changes were also made to the applicability of exemptions for buses nearing retirement. Accelerating the retrofit requirements on the diesel path will reduce the PM emissions gap between the diesel and alternative-fuel paths, and will reduce the public's exposure to toxic PM emissions from buses operated by transit agencies choosing the diesel path.

The ARB did not propose a 0.005 g/bhp-hr PM standard for diesel-fueled bus engines beginning with the 2004 model year because it did not believe PM control technology would be able to achieve such low PM levels in conjunction with the stringent NOx standard for diesel-fueled engines taking effect at the same time. However, during the course of this rulemaking, the EMA agreed to start production of diesel-fueled engines meeting a 0.01 g/bhp-hr PM standard on October 1, 2002, -- fifteen months ahead of when originally proposed. This regulatory modification, approved by the Board on February 24, 2000, will limit the emissions gap between the diesel and alternative-fuel paths.

12. Comment: The regulation should accelerate the PM retrofit requirements on the diesel path, while relaxing the retrofit requirements on the alternative-fuel path. (CNGVC)

    Agency Response: As discussed in the response to Comment 11, the Board approved modifications to the regulation accelerating the PM retrofit requirements on the diesel path. The ARB did not relax the retrofit requirements on the alternative-fuel path because transit agencies choosing this path could still have a significant presence of buses in their existing fleets with diesel-fueled engines, many of these being the oldest, most-polluting model years. It is only appropriate that these fleets also implement measures to reduce toxic PM exposure for the public they serve.

D. Low-Sulfur Diesel Fuel

13. Comment: There are concerns about the availability of low-sulfur diesel fuel and whether it will be available to all transit operators. The Board should continue to monitor the availability of this fuel. (CTranA)

    Agency Response: While the ARB expects that transit operators will not experience difficulties obtaining low-sulfur diesel fuel, the ARB is committed to monitoring its

availability and reporting back to the Board, should availability issues arise. One California oil refinery is capable of producing low-sulfur diesel fuel now, and at least two more California oil refineries have committed to producing low-sulfur diesel fuel by mid-2002 --- the date the regulation requires most transit agencies with diesel-fueled buses to begin using low-sulfur diesel fuel. These three California oil refineries account for over 70 percent of California's current diesel production.

To provide compliance flexibility to small transit agencies in rural areas, areas that may experience some difficulty in obtaining low-sulfur diesel fuel due to the higher cost of securing delivery in outlying rural areas, the regulation allows transit agencies operating in federal one-hour ozone attainment areas with active fleets of less than 20 urban buses to delay using low-sulfur diesel fuel until mid-2006. The ARB expects that a national low-sulfur diesel fuel requirement will be in effect by that time, thus minimizing price and supply disruptions in California and enabling the small transit agencies in ozone attainment areas to meet their compliance deadline. To coincide with the delayed requirement to use low-sulfur diesel fuel, these smaller transit agencies are permitted to delay compliance with Tier 1 and Tier 2 PM retrofit requirements until 2007.

The U.S. EPA's Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545) includes a proposal to limit the sulfur content in diesel fuel to 15 parts per million (ppm) by weight , the same requirement contained in this rulemaking, by 2006. Board Resolution 00-2 directs the Executive Officer to work closely with the U.S. EPA in its development of a new national diesel fuel specification, and to reevaluate the low-sulfur diesel fuel requirement in this regulation, if necessary, soon after the U.S. EPA adopts its national fuel specification.

14. Comment: While we agree with the requirement to use low-sulfur diesel fuel, are we to infer that the ARB is guaranteeing the availability of such fuel by mid-2002? If not, will there be a relaxation of the diesel emission requirements that are dependent on the use of low-sulfur diesel fuel? (Nova BUS)

    Agency Response: The ARB believes that sufficient amounts of low-sulfur diesel fuel will be available for transit agencies to comply with the regulation's requirements. One California oil refinery is capable of producing low-sulfur diesel fuel now, and at least two more California oil refineries have committed to producing low-sulfur diesel fuel by mid-2002 --- the date the regulation requires most transit agencies with diesel-fueled buses to begin using low-sulfur diesel fuel. These three California oil refineries account for over 70 percent of California's current diesel production. Nonetheless, the ARB staff is committed to monitoring the availability of low-sulfur diesel fuel and reporting back to the Board, should availability issues arise.

Another consideration affecting the near-term availability of low-sulfur diesel fuel is the Board's September 28, 2000, approval of the "Diesel Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles." This comprehensive plan to significantly reduce diesel PM emissions recommends expanding the use of low-sulfur diesel fuel to other diesel-fueled vehicles and equipment. Regulations and programs resulting from this plan will increase the market penetration of low-sulfur diesel fuel, thus reducing fuel availability concerns.

15. Comment: The ARB has been overly conservative in selecting the 15 ppm by weight sulfur content for diesel fuel, particularly due to the lack of demonstration that 15 ppm is required for the urban bus technology under consideration in this rulemaking. (WSPA)

    Agency Response: During regulatory development, the ARB staff worked closely with affected stakeholders on all issues related to the urban bus regulation, including the sulfur content of diesel fuel. After discussions and workshops with interested parties, the ARB staff proposed, and the Board approved, a maximum sulfur content of 15 ppm by weight. The ARB believes a cap of 15 ppm sulfur by weight is the appropriate level to ensure that PM retrofit devices are effective and durable, and to allow engine manufacturers to consider the full range of exhaust control technologies to meet the regulation's more stringent emission standards for diesel-fueled engines.

    The U.S. EPA's Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430-35545) also includes a proposal to limit the sulfur content in diesel fuel to 15 ppm by weight. The ARB supports this nationwide sulfur standard for diesel fuel.

16. Comment: We support a national diesel fuel standard. Our members our concerned that the regulation includes a sulfur standard that may be different than what is proposed by the federal government. (CTA)

    Agency Response: The U.S. EPA had not yet proposed a sulfur requirement for diesel fuel when the ARB's proposed regulation was released to the public on December 10, 1999, or when it was presented to the Board at the January and February hearings. However, subsequent to the Board approving the regulation on February 24, 2000, the U.S. EPA released its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430-35545). The proposal includes a requirement to limit the sulfur content in diesel fuel to 15 ppm by weight, the same sulfur limit contained in the urban bus regulation. As directed in Board Resolution 00-2 , the ARB is committed to working closely with the U.S. EPA in its development of a new national diesel fuel specification, and to reevaluating its own low-sulfur diesel fuel requirement, if necessary, soon after the U.S. EPA adopts its national fuel specification.

17. Comment: The ARB supports a uniform national sulfur standard for broad statewide application in California, however, a national sulfur standard has not yet been promulgated. (WSPA)

    Agency Response: Subsequent to the Board approving the regulation on February 24, 2000, the U.S. EPA released its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430-35545). It includes a proposal to limit the sulfur content in diesel fuel to 15 ppm by weight, the same sulfur limit contained in the urban bus regulation. (Please also see Agency Response to Comment 16.)

18. Comment: The requirement for transit agencies to use low-sulfur diesel fuel should be strengthened to include a fuel specification similar to the EC-Diesel currently being demonstrated by ARCO. This fuel has the added benefit of reducing NOx emissions. (SMAQMD)

    Agency Response: The ARB acknowledges the air quality challenges facing this commenter, the Sacramento Air Quality Management District, and its specific need to reduce NOx emissions in order to comply with its federal ozone attainment and transportation conformity deadlines. The fuel formula that the SMAQMD recommends for inclusion in the regulation contains changes to ARB's diesel fuel specifications other than just the sulfur content. When developing its regulation, the ARB had to weigh the impact that creating a California "fuel island" would have on the price and availability of diesel fuel, and balance this with the need to achieve significant emission reductions. Ultimately, the staff proposed, and the Board approved, the use of a diesel fuel that differs from the ARB's existing diesel fuel specifications only in its sulfur content. This was done with the expectation that the U.S. EPA would soon propose a nationwide diesel fuel specification with the same sulfur content as contained in the urban bus regulation. Subsequent to the regulation's approval by the Board, the U.S. EPA released its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430-35545). This proposal includes a requirement to limit the sulfur content in diesel fuel to 15 ppm by weight, the same sulfur limit contained in the urban bus regulation. This nationwide fuel specification, when adopted, will eliminate any price and supply disruptions throughout California.

E. Hybrid-Electric Urban Bus Technology

19. Comment: The regulation makes no provision for the consideration of the actual emissions of a transit bus with a diesel hybrid-electric powertrain, and instead only considers the certification emissions of the diesel internal combustion engine. The Board should direct the ARB staff to investigate certifying hybrid transit buses on the basis of their per-mile emissions. (SBMTD, SMCTD, Fresno Area Express)

Agency Response: The Board recognizes that diesel hybrid-electric buses offer the potential for significant emission benefits, and did acknowledge at the January and February hearings the lack of a test procedure to adequately characterize the true emission benefits of this technology. Current California and federal certification test procedures are engine-based and therefore are not able to adequately represent the emissions benefits of the hybrid technology. To help resolve this, the Board, in Resolution 00-2, directed the staff to develop a test procedure to accurately evaluate hybrid-electric bus emissions and to report back to the Board by mid-2001 on the status of its development. As a member of the Northeast Advanced Vehicle Consortium's Heavy-Duty Hybrid Bus Certification Working Group, a cooperative effort involving the hybrid bus industry, the U.S. EPA, and other governmental organizations, the ARB is actively working to develop an appropriate certification test procedure for hybrid-electric buses.

20. Comment: The exclusion of diesel hybrid-electric buses from the alternative-fuel path, in the absence of any substantive or credible technical rationale, flies in the face of federal law as provided for in the Transportation Equity Act for the 21st Century (TEA-21), Federal Transit Administration (FTA) grant rules, and much of the research and development work of the Department of Energy and the FTA. The ARB should allow diesel-fueled hybrid-electric buses to qualify for the alternative-fuel path, provided that the correlated emissions performance on the Central Business District chassis test cycle meets the grams per brake horsepower-hour requirements of that path. (Nova BUS)

    Agency Response: Diesel hybrid-electric buses are not excluded from the alternative-fuel path, as the commenter states. Diesel hybrid-electric buses are allowed to participate on the alternative-fuel path through a provision that allows up to 15 percent of new bus purchases on that path to be diesel-fueled (this is in addition to full participation on the diesel path). This provision was included in the regulation to provide transit agencies with compliance flexibility.

    Regarding the commenter's specific recommendation, emissions testing performed on the Central Business District, New York Bus, and Manhattan Drive Cycles for the Northeast Advanced Vehicle Consortium's Hybrid-Electric Drive Heavy-Duty Vehicle Testing Project (final report dated February 15, 2000; Agreement No.: NAVC1098-PG009837) indicate that state-of-the-art diesel hybrid buses with a particulate filter and low-sulfur fuel have PM emissions as low as compressed natural gas (CNG) buses without a particulate filter, but they still emit NOx at higher levels than CNG buses. Thus, the ARB believes it is premature to allow diesel hybrid-electric buses to fully participate on the alternative-fuel path at this time.

21. Comment: If the Board adopts the dual compliance path as the only viable regulatory option, the 'alternative fuel" path should be renamed the "clean fuel" path, and the regulation should incorporate a definition of clean fuel consistent with current federal regulations in the TEA-21. This modification would allow diesel

hybrid electric buses to qualify for the clean fuel path based on reduced fuel consumption and significantly lower emissions than a diesel transit bus. (Lockheed Martin)

Agency Response: Renaming the alternative-fuel path to the clean fuel path to allow diesel hybrid technology to fully participate on that path contradicts the intent of the regulation – to encourage public agencies to voluntarily purchase low-emission, alternative-fuel urban buses to achieve emission reductions and reduce the public's exposure risk to particulate matter. The Board adopted a dual-path approach to encourage further alternative-fuel use, yet still provide transit agencies with compliance flexibility by allowing them to choose between one of two distinct strategies for reducing emissions. Allowing diesel hybrids to qualify for the 85 percent alternative-fuel bus purchase requirement on the alternative-fuel path would effectively meld the dual-path compliance approach into just one path – a diesel path. Furthermore, state-of-the-art diesel hybrid buses are not yet able to achieve low NOx emission levels comparable to CNG buses. (Please also see Agency Response to Comment 20.)

22. Comment: The diesel path should be renamed the standard path, thus requiring compliance from all transit agencies. The alternative-fuel path should then be renamed the low-emissions path. This path could then provide for additional funding incentives for any technology and/or fuel combination meeting the required emission levels in g/bhp-hr or equivalent g/mi. (Nova BUS)

Agency Response: Taken out of context, this is a general comment. However, this commenter, a leading proponent of diesel hybrid-bus technology, has provided other comments (to which the Agency has responded) seeking recognition for the emission reducing potential of diesel hybrid technology. Therefore, the ARB believes this is the impetus for this comment as well and will respond accordingly. While the Board recognizes that diesel hybrid-electric buses offer the potential for significant emission benefits, renaming the regulation's compliance paths as this commenter recommends would still not enable diesel hybrid-electric buses to fully participate on the "low-emissions path." Current California and federal certification test procedures are engine-based and therefore are not yet able to adequately represent the emissions benefits of the hybrid technology. Emissions testing performed on the Central Business District, New York Bus, and Manhattan Drive Cycles (which are not certification test procedures) for the Northeast Advanced Vehicle Consortium's Hybrid-Electric Drive Heavy-Duty Vehicle Testing Project (final report dated February 15, 2000; Agreement No.: NAVC1098-PG009837) indicate that state-of-the-art diesel hybrid buses with a particulate filter and low-sulfur fuel have PM emissions as low as CNG buses without a particulate filter, but they still emit NOx at higher levels than CNG buses. Thus, the ARB believes it is premature to allow diesel hybrid-electric buses to fully participate on a "low-emissions path" at this time. (Please also see Agency Responses to Comments 19, 20, and 21.)

23. Comment: The regulation could delay the introduction of low emission, diesel hybrid-electric buses in California. (Lockheed Martin)

    Agency Response: The regulation was designed to promote competition and innovative technology development through its dual-path approach, not hinder it. Opportunities for diesel hybrid technology exist on both the diesel and the alternative-fuel paths (up to 15 percent of new bus purchases on the alternative-fuel path may be diesel-fueled purchases). Together, this combined market could account for about 400 bus purchases each year in California. The ARB believes this market is significant enough to encourage further development of diesel hybrid-electric buses, thus reducing costs and enabling them to cost-effectively compete with conventional diesel buses.

24. Comment: If the regulation's intent is to test the feasibility and cost-effectiveness of low-emission vehicles, the staff should consider incorporating a percentage of hybrid-electric buses into the required zero-emission bus demonstration. This would allow a side-by-side comparison of both technologies and allow the staff to make an informed decision about hybrid vehicles versus zero-emission vehicles. (SMCTD)

    Agency Response: One of the regulation's goals is to advance heavy-duty technology development to achieve near-zero, and ultimately, zero-emissions. Hybrid bus technology has the potential to be a significant contributor in achieving the near-zero goal. The ARB acknowledges the potential value of a side-by-side comparison of hybrid and zero-emission technology. However, the ARB believes that such an approach could prematurely preclude one technology over the other, and could unduly burden transit agencies by requiring them to demonstrate two new technologies simultaneously. Neither is the regulation's intent.

    The regulation seeks to foster innovative technology development in both hybrid and zero-emission bus technology; both are critical to achieving California's long-term emission reduction goals. The result of the regulation's zero-emission bus demonstration requirements, independent of the status of hybrid technology development, will determine the feasibility of implementing zero-emission bus purchase requirements. It is important to note that significant hybrid technology demonstrations are already underway. For example, the Northeast Advanced Vehicle Consortium's Hybrid-Electric Drive Heavy-Duty Vehicle Testing Project final report (dated February 15, 2000; Agreement No.: NAVC1098-PG009837) demonstrates heavy-duty hybrid technology's potential to provide significant emission benefits and improved fuel economy over that of conventional diesel buses.

25. Comment: The regulation should include a partial zero-emission credit (similar to the manner in which partial credits are given in the light-duty vehicle sector) for hybrid- electric buses that run on alternative fuel and have some electric range. (CETC)

Agency Response: Under the regulation, a hybrid-electric bus that uses an alternative-fuel to power its internal combustion engine could be eligible for incentive funding (e.g., Carl Moyer Program funds or other incentive funds) if the engine is certified to one of the optional, low-emission standards specified in section 1956.1, title 13, CCR. This incentive mechanism, albeit different than a partial zero-emission credit, could encourage further market penetration of alternative-fuel hybrid buses. Because the ARB currently lacks a test procedure to accurately characterize the true emission benefits of hybrid urban buses, including the emission benefits associated with electric range, it is not possible at this time to include the concept of partial zero-emission credit for alternative-fuel hybrids with some electric range in the regulation. As the staff works to develop a heavy-duty hybrid test procedure, it is possible that partial credit applicable to the zero-emission bus purchase requirements could be allowed in the future.

F. Zero-Emission Urban Bus Technology

26. Comment: The exclusion of reformer-based fuel cell buses from the regulation's zero-emission bus requirements is clearly an exclusionary and anti-competitive practice. Instead, the regulation should establish scientifically derived emission requirements for zero-emission buses based on "vehicle system emissions" so that a broad range of fuel cell technology is included under the zero-emission bus definition for the purpose of stimulating competition and innovation. (Nova BUS)

    Agency Response: The ARB disagrees that excluding reformer-based fuel cell buses from the regulation's zero-emission bus requirements is exclusionary and anti-competitive. Fuel cell technologies that reform fuels such as natural gas, methanol, diesel, or gasoline onboard a bus to produce hydrogen for the fuel cell produce some emissions, although at lower levels than produced by internal combustion engines. Hence, they do not have truly zero-emission exhaust levels. The regulation's intent is to foster significant advances in zero-emission technology, as well as near zero-emission technologies. The 2007 emission standards will require the use of technologies able to achieve these near zero-emission levels; we expect that reformer-based fuel cell buses will be able to meet that challenge and will have a role on both the diesel and alternative-fuel paths in the 2007 and beyond timeframe.

27. Comment: Hybrid technology is an enabling technology for fuel cell buses to be commercialized for the future. If diesel hybrid-elective drive technologies are eliminated from the alternative-fuel path, the future viability of fuel cell transit buses will be harmed. (Nova Bus)

    Agency Response: The ARB recognizes the role of hybrid technology in developing fuel cell bus technology. However, diesel hybrid-electric buses are not excluded from the alternative-fuel path. The alternative-fuel path provides flexibility to transit agencies by allowing up to 15 percent of annual new bus purchases to be diesel-fueled – this would include diesel hybrid-electric buses. Furthermore, diesel hybrid

technology can have a significant role on the diesel path. As such, the ARB believes the regulation provides sufficient opportunities for hybrid technology as a "stand alone" technology and as an enabling technology for fuel cell buses.

G. Zero-Emission Bus Demonstration/Purchase Requirements

28. Comment: The ARB should increase the zero-emission bus requirements on the diesel path either by increasing the size and duration of the demonstration program, accelerating the date of the new purchase requirements, or increasing the required new purchase percentage on the diesel path beginning in 2008. The ARB should also consider increasing the required new purchase percentage on the alternative-fuel path beginning in 2010, when the zero-emission purchase requirement on this path will help increase sales volume and ensure lower zero-emission bus costs. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: The ARB did not modify the regulation as this commenter recommended. The regulation requires transit agencies that continue to purchase primarily diesel-fueled buses to be the first to implement future aggressive emission standards and the first to introduce zero-emission bus technology. This is a "tradeoff" of sorts for those transit agencies. That said, it is not the Board's intent to force transit agencies onto a compliance path, in this case, the alternative-fuel path, by including unrealistic or extremely onerous requirements on the diesel path. The regulation was truly designed to provide transit agencies with compliance flexibility to best meet their service requirements. In proposing the regulation, the ARB staff had to balance the need to "push" transit agencies to achieve significant emission reductions with the need to design a workable, effective regulation. Therefore, the ARB believes it is not prudent, at this time, to increase or accelerate zero-emission bus demonstration/purchase requirements on either path. The results of the regulation's 2006 feasibility review for zero-emission bus technology will assist the staff and the Board in determining whether modifications are necessary for the zero-emission bus purchase requirements beginning in 2008 and 2010.

29. Comment: The zero-emission bus demonstration projects should require more zero-emission buses than currently included in the regulation. The demonstration requirement should be tied to fleet size. For example, one demonstration should be required for every 200 diesel buses in a fleet in 2003, followed by one demonstration for every 100 diesel buses in 2004, and then one demonstration for every 50 diesel buses in 2005. (PG&E)

    Agency Response: The ARB did not modify the regulation as this commenter recommended. It is not the Board's intent to force transit agencies onto a compliance path, in this case, the alternative-fuel path, by including unrealistic or extremely onerous requirements on the diesel path. The regulation was truly designed to provide transit agencies with compliance flexibility to best meet their service requirements. In proposing the regulation, the ARB staff had to balance the need to "push" transit agencies to achieve significant emission reductions with the

need to design a workable, effective regulation. Thus, the ARB believes it is not prudent, at this time, to increase zero-emission bus demonstration requirements. (Please also see Agency Response to Comment 28.)

30. Comment: It would be more equitable to implement the zero-emission purchase requirements for the alternative-fuel path seven years after their implementation on the diesel path (since they are first required on the diesel path seven years after initial regulation implementation). (PG&E)

    Agency Response: The ARB did not modify the regulation as this commenter recommended. Zero-emission bus purchase requirements begin on the diesel path in 2008. The fact that it is seven years after initial regulation implementation is irrelevant and should not bear significance on when the purchase requirements begin on the alternative-fuel path. The ARB approved the 2008 date because it allows for completion of the zero-emission bus demonstration projects, the 2006 technical feasibility review, and any resulting regulatory modifications to the zero-emission bus purchase requirements that may be warranted. The ARB believes that the 2010 date for implementing the zero-emission bus purchase requirements on the alternative-fuel path is justified in order to advance further technological improvements and increase market penetration. As a result of increased market penetration, the incremental cost of a zero-emission bus over the cost of an advanced diesel bus will decrease; in fact, the incremental cost of a zero-emission bus in 2010 is expected to be nominal.

31. Comment: The ARB could more effectively reduce PM emissions simply by specifying that the zero-emission bus purchase requirements would not apply to bus fleets on the alternative-fuel path that purchase exclusively CNG buses after January 2010. (PG&E)

    Agency Response: The ARB did not modify the regulation as this commenter recommended. One of the goals of the zero-emission bus purchase requirements is to stimulate advances in zero-emission bus technology. The ARB believes that eliminating one of the markets for this technology would only serve to hinder its development.

32. Comment: It is unnecessary at this time for the ARB to establish a calendar date for alternative-fuel path fleets to introduce zero-emission buses. It is unreasonable to expect bus fleets to shift to 100 percent CNG in 2000 when they will be expected to face a second shift to zero-emission technology in 2010. (PG&E)

    Agency Response: The ARB believes that it is necessary to include an introduction date for zero-emission bus technology on the alternative-fuel path. The Board adopted the 2010 introduction date to create a larger market demand for zero-emission bus technology, which, in turn, will foster innovative technological advances. The Board will use the results of the 2006 zero-emission bus technology review to determine the feasibility of retaining this requirement as is, or modifying it.

It appears that the commenter's second concern is based on the belief that CNG technology will be an "orphaned" technology as fleets begin zero-emission bus purchases. The ARB encourages and supports the purchase of clean, natural gas buses and believes this technology has long-term viability for zero-emission hydrogen fuel cell buses. One option for producing hydrogen is to reform CNG on site at a fueling facility. In this case, existing natural gas infrastructure will be transferable to the operation of fuel cell buses and could substantially reduce the associated infrastructure costs. Finally, it is important to correct the commenter's misconception that fleets are expected to shift to 100 percent CNG (or other alternative-fuel) in 2000. The ARB believes that many fleets will ultimately purchase exclusively alternative-fuel fleets; the regulation, however, provides flexibility to transit fleets by allowing up to 15 percent of annual new bus purchases to be diesel-fueled

33. Comment: The regulation should allow for light-rail extensions to be applicable to the zero-emission bus purchase requirement if, in fact, they are replacing diesel urban buses. (CETC)

    Agency Response: The ARB recognizes the significant air quality and congestion mitigation benefits light rail provides, and acknowledges that, in some cases, light rail extensions can replace urban bus service. However, the ARB chose to focus its efforts, at this time, on urban bus fleets, as they are the backbone of the public transportation system in the vast majority of the state. The zero-emission bus purchase requirements are intended to stimulate advanced technology development for urban bus fleets that, with the exception of electric trolley buses, are an uncharted transportation sector for electrification.

H. Incentives for Low-Emission/Zero-Emission Technologies

34. Comment: Market-based incentives are critical to offsetting the costs of converting from diesel to alternative-fuel fleets. We support the Carl Moyer Program in helping to defray the incremental capital costs associated with alternative-fuel and recommend adding additional funds to the program. (CCC)

    Agency Response: The ARB agrees that monetary incentive programs, such as the Carl Moyer Program, are critical to encouraging the shift to alternative-fuel urban bus fleets. While the ARB and the Carl Moyer Program Advisory Board can develop recommendations for the Governor and the Legislature regarding appropriate funding levels for the Carl Moyer Program, including increases in funding, funds for the program are allocated to the ARB's budget through the state budget process. Historically, Carl Moyer Program funds have been allocated on an annual basis. For the 2000/2001 fiscal year, $50 million dollars is available to fund the program. Of this amount, the California Energy Commission (CEC) receives $5 million dollars to fund the Advanced Technology and the Infrastructure Demonstration portions of the program. Previously, $25 million in ARB's 1998/1999 fiscal year budget and

$19 million in ARB's 1999/2000 fiscal year budget were allotted for Carl Moyer Program incentive grants.

For clarification, it must be pointed out that Carl Moyer Program grant funds are only available to cover the incremental cost of an urban bus if the engine is certified to one of the ARB's optional, reduced-emission standards (section 1956.1, title 13, CCR). The grant funds cannot be used to purchase an alternative-fuel urban bus with an engine that is certified to existing, mandatory standards. From a practical standpoint, however, this is not an issue since engine manufacturers already certify their alternative-fuel urban bus engines to the optional, reduced-emission standards.

35. Comment: The ARB should use the regulation to provide regulatory incentives for the early introduction of zero-emission buses, thereby helping to build the market in preparation for the 2008 requirement and achieving critical early emission benefits. Regulatory incentives could include the use of multiple credits for the early introduction of zero-emission buses that could be applied against the 15 percent new purchase requirement in later years. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: The ARB did modify the regulation to provide transit agencies multiple credits for placing zero-emission buses into service prior to the regulatory purchase requirements. Credits earned for early introduction can be applied to the 15 percent zero-emission bus purchase requirements that begin in 2008 for transit agencies on the diesel path and in 2010 for transit agencies on the alternative-fuel path. Because the regulation also requires zero-emission bus demonstration projects, buses placed in service in the 2003 timeframe to satisfy demonstration requirements are not permitted to earn credits applicable to the future purchase requirements.

36. Comment: The regulation embodies market disincentives for natural gas buses. Most notable among these is the lack of recognition and credit for PM reductions based on certification levels and in-use levels, which the Staff Report acknowledges are substantial. (PFC)

    Agency Response: The ARB disagrees with this comment. In proposing the regulation, the ARB staff had to balance the need to "push" transit agencies to achieve significant emission reductions with the need to design a workable, effective regulation. The Board acknowledged that natural gas buses have inherently lower PM emissions than their diesel counterparts and approved modifications to the originally proposed regulation to help address this inequity in PM emissions. First, the Board approved an accelerated PM retrofit schedule for transit agencies on the diesel path that will help limit the PM emissions gap between the diesel and alternative-fuel paths. Next, during the course of this rulemaking, the EMA agreed to start production of diesel-fueled engines meeting a 0.01 g/bhp-hr PM standard on October 1, 2002, -- fifteen months ahead of when originally proposed by the ARB staff, and over four hears ahead of when alternative-fuel engines are required to

meet the same PM standard. The ARB believes the regulation is designed to encourage transit agencies to shift to alternative-fuels while providing compliance flexibility so transit agencies can best meet the needs of their respective regions.

37. Comment: The Board should consider postponing adoption of the regulation until either meaningful incentives for natural gas buses can be incorporated into the regulation, or until the loss of in-use PM reductions from pursuit of the diesel path can be accounted for and quantified. (PFC, CNGVC, PG&E)

    Agency Response: The Board did not postpone adoption of the regulation; it was approved by the Board on February 24, 2000. The ARB staff and the Board acknowledged that diesel-fueled buses have inherently greater in-use PM emissions than natural gas buses; hence the regulation's PM retrofit requirements for diesel-fueled buses. To reduce the PM emissions gap between the diesel and alternative-fuel paths, the Board approved an accelerated PM retrofit schedule for transit agencies on the diesel path. Furthermore, during the course of this rulemaking, the EMA agreed to start production of diesel-fueled engines meeting a 0.01 g/bhp-hr PM standard on October 1, 2002, -- fifteen months ahead of when originally proposed by the ARB staff, and over four hears ahead of when alternative-fuel engines are required to meet the same PM standard. This regulatory modification approved by the Board will also limit the emissions gap between the regulation's two compliance paths.

38. Comment: To meet the emission standards in the regulation, diesel engine manufacturers must make a significant investment in diesel engine research and development in the next few years. Conversely, the regulation does not encourage a corresponding investment in natural gas engine technology development that would further reduce its emissions and improve its efficiency and performance. (CNGVC)

    Agency Response: Natural gas heavy-duty engines for on-road applications are already capable of certifying to the ARB's existing optional, reduced-emission NOx standards, which start at approximately 40 percent below the current mandatory NOx standard. Diesel engines are not yet able to achieve these low emission levels, thus the ARB's focus on stimulating development in conventional diesel technology. Nonetheless, the advanced engine and aftertreatment technologies that will enable diesel engines to emit at significantly lower levels in the future can generally be used in natural gas engines to reduce emissions as well. Because natural gas engines operate at higher temperatures, which can improve aftertreatment efficiency, aftertreatment technologies may be able to achieve an even higher level of emission reductions in natural gas engines than in comparable diesel engines.

39. Comment: The regulation should be modified to shift the burden of PM retrofits and zero-emission bus purchase requirements from the alternative-fuel path to the diesel path. For example, a better strategy for the commercialization of zero-emission

buses is to accelerate their introduction on the diesel path, while eliminating the purchase requirement on the alternative-fuel path. (CNGVC)

Agency Response: The regulation includes PM retrofit requirements for diesel-fueled buses and purchase requirements for zero-emission buses for all transit agencies, regardless of whether they participate on the diesel path or the alternative-fuel path. In response to public comment, however, the ARB did modify the regulation to accelerate the PM retrofit requirements on the diesel path thereby reducing the PM emissions gap between the diesel and alternative-fuel paths. The ARB did not eliminate PM retrofit requirements on the alternative-fuel path because transit agencies choosing this path could still have a significant presence of buses with diesel-fueled engines in their existing fleets, many of these being the oldest, most-polluting model years. It is only appropriate that these fleets also implement measures to reduce toxic PM exposure for the public they serve.

The ARB did not modify the zero-emission bus purchase requirements as this commenter recommended. The ARB approved 2008 as the start date for implementation of the zero-emission bus purchase requirements on the diesel path because it allows for completion of the zero-emission bus demonstration projects, the 2006 technical feasibility review, and any resulting regulatory modifications to the zero-emission bus purchase requirements that may be warranted. Furthermore, the regulation was truly designed to provide transit agencies with compliance flexibility to best meet their service requirements. In proposing the regulation, the ARB staff had to balance the need to "push" transit agencies to achieve significant emission reductions with the need to design a workable, effective regulation. Therefore, the ARB believes it is not prudent, at this time, to accelerate zero-emission bus purchase requirements. The results of the regulation's 2006 feasibility review for zero-emission bus technology will assist the staff and the Board in determining whether modifications are necessary for the zero-emission bus purchase requirements beginning in 2008 and 2010. Finally, the ARB did not eliminate the zero-emission bus purchase requirements on the alternative-fuel path because it believes that eliminating one of the markets for this technology would only serve to hinder its development.

40. Comment: To encourage the shift to the alternative-fuel path, the ARB should relax the PM retrofit requirements for fleets choosing that path. One way to accomplish this would be to exempt alternative-fuel path fleets from all retrofit requirements. Another way would be to accelerate Tier 3 retrofits for fleets selecting the diesel path. The optimal approach would be to tie all retrofit requirements to mileage weighted fleet average in-use PM emission targets that decline annually. (PG&E)

Agency Response: The ARB did modify the regulation to accelerate the schedule for PM retrofit requirements on the diesel path. The accelerated schedule applies to Tier 2 retrofits (applicable to buses with 1991 through 1995 model year diesel-fueled engines) and Tier 3 retrofits (applicable to buses with 1996 through 2002 model year diesel-fueled engines produced before October 1, 2002). However, the ARB did not

exempt transit fleets on the alternative-fuel path from any of the PM retrofit requirements for buses with diesel-fueled engines. Transit agencies on the alternative-fuel path may still have a significant presence of buses with diesel-fueled engines in their existing fleets, many of these being the oldest, most-polluting model years. It is only appropriate that these fleets also implement measures to reduce toxic PM exposure for the public that they serve.

I. Dual-Path Compliance Approach

41. Comment: The ARB's approach to the regulation is fundamentally flawed. A sound regulation sets performance requirements and then fosters innovation and competition inherent within the free-market system to determine how to best accomplish the given requirement. As such, the ARB's regulation should set common fuel and technology neutral emission standards that foster innovation and competition, and refrain from specifying or directing fuel type and technology. (Nova BUS)

    Agency Response: Innovation and competition are important elements within the free market system and within this regulation; the regulation's focus on lower emission standards recognizes this element. The regulation provides many opportunities for development of new technology, particularly zero-emission engine technology. However, emission reductions leading to air quality improvements are the primary goal of the ARB. Thus, the regulation contains two components to reduce emissions from urban buses: 1) a multi-component transit bus fleet rule applicable to transit agencies; and 2) more stringent emission standards for engines used in urban buses applicable to engine manufacturers. The regulation is structured to encourage transit agencies to voluntarily purchase cleaner alternative fuel buses in order to reduce emissions of NOx and PM. However, to provide transit agencies with flexibility in determining their optimal fleet mix, the regulation allows transit agencies to choose between two compliance paths, either the diesel path or the alternative-fuel path.

42. Comment: The regulation should not mandate the method by which the proposed emission standards for transit buses are met (i.e., separate emission standards for different fuel types and/or technologies). Instead, the regulation should allow transit agencies to purchase buses that meet a single emission standard, regardless of fuel type or technology. The dual path compliance approach penalizes transit agencies that choose the diesel path despite the air quality improvements they are providing. (Lockheed Martin)

    Agency Response: The regulation does not prescribe the technology to meet the regulation's emission standards. It does, however, include a flexible dual path-approach that allows transit agencies to choose the fuel and buses that best meet the needs of their respective regions. Engine manufacturers have the flexibility to design engines operating on one or more different fuels. Over the life of the regulation, the engine standards on both paths will provide nearly comparable NOx

reductions, although the alternative-path will provide greater PM emission benefits due to inherently low in-use PM emissions from alternative-fuel buses.

43. Comment: The regulation should be modified to eliminate the diesel path. (SUVA/La Causa, Joe Perales, Labor/Community Strategy Center)

    Agency Response: During regulatory development, the staff's initial proposal did require transit agencies to purchase only alternative-fuel buses. However, the staff discovered that some transit agencies would face significant barriers to using alternative fuels, either due to the demands of their service needs or due to the difficulties in securing alternative fuel in some regions. In its efforts to develop an effective and workable regulation, the staff ultimately proposed, and the Board adopted, a dual path approach that will reduce emissions from urban bus fleets, yet provide compliance flexibility to transit agencies. The regulation is designed to encourage transit agencies to voluntarily purchase cleaner alternative-fuel buses in order to reduce emissions of NOx and toxic PM. Funding from air district and state air quality incentive programs is available throughout the state for transit agencies that purchase urban buses with engines certified to the ARB's optional, reduced-emission standards. Alternative-fuel urban bus engines are all currently certified to these reduced-emission standards; diesel-fueled engines are yet unable to achieve these low-emission levels. The ability to access this incentive money has encouraged some transit agencies to switch to alternative-fuel transit systems.

44. Comment: California's diesel transit buses should be replaced with cleaner alternatives like natural gas or electric-powered buses. (FL2, Enrietto, Koke)

    Agency Response: The regulation encourages transit agencies to purchase new alternative-fuel buses, thus initiating the process of replacing diesel bus fleets with alternative-fuel fleets. In addition, the regulation requires the demonstration and commercialization of zero-emission urban buses, powered by electricity or by hydrogen fuel cells. (Please also see Agency Response to Comment 45.)

45. Comment: The number of diesel buses on the road of California should be reduced. The ARB should not let diesel engine manufacturers keep California from a cleaner, healthier future. (Westervelt, Montgomery)

    Agency Response: The number of diesel buses on the road will be reduced as a result of this regulation. The regulation is designed to encourage transit agencies to purchase new alternative-fuel buses, and some large transit agencies have already committed to purchasing primarily alternative-fuel buses in lieu of diesel buses. Other transit agencies are in the process of choosing either the diesel path or alternative-fuel path; the regulation's deadline for choosing a compliance path is January 31, 2001. Each transit agency must weigh the pros and cons of a particular compliance path, and thus fuel choice, in a public forum. Transit agencies not yet committed to a compliance path are currently making that effort, and there are indications that several more large transit agencies will choose the alternative-fuel

path. Those transit agencies choosing the diesel path will also be purchasing lower-emitting buses as a result of the regulation's more stringent emission standards for diesel-fueled urban bus engines that take effect in the 2002 model year, the 2004 model year, and again in the 2007 model year.

46. Comment: The ARB should take strong action against diesel and outlaw diesel buses. (Aceto)

    Agency Response: It would be inappropriate for the ARB to retroactively and arbitrarily remove existing diesel buses from service. Diesel technology still has a vital role in California's economy and public transportation system. One of the ARB's goals, however, is to significantly reduce emissions from existing and new diesel vehicles, and encourage the use of alternative-fuel technology whenever appropriate. The regulation encourages the use of alternative-fuel buses and includes other strategies to reduce emissions from diesel buses. These strategies include: 1) a requirement for each transit agency, regardless of compliance path, to attain and maintain a 4.8 g/bhp-hr NOx fleet average standard; 2) requirements for transit agencies on both compliance paths to retrofit their existing diesel buses to reduce PM emissions, with an accelerated compliance schedule on the diesel path, and 3) requirements for zero-emission bus demonstration projects (diesel path only) and zero-emission bus purchases (diesel and alternative-fuel paths). Most importantly, the regulation requires engine manufacturers to produce lower-emitting diesel-fueled urban bus engines beginning in 2002, and then requires further emission reductions from diesel-fueled urban bus engines in 2004 and 2007.

47. Comment: There is no excuse for transit agencies to continue to buy and run dirty diesel buses. (FL1)

    Agency Response: Please see Agency Response to Comments 45 and 46.

48. Comment: The ARB should strengthen the transit bus regulation by: 1) requiring more stringent emission standards for transit bus engines; and 2) providing strong incentives for transit fleets to choose cleaner alternatives to diesel transit buses. (FL1, NALEO, CHEC, PhSR)

    Agency Response: The regulation already requires engine manufacturers to produce urban bus engines meeting more stringent emission standards for both NOx and PM. By prior legal agreement (the federal Consent Decrees and the California-specific Heavy-Duty Diesel Engine Settlement Agreements), most engine manufacturers are required to produce heavy-duty engines, including urban bus engines, that reduce NOx by 50 percent from the current NOx standard beginning October 1, 2002. However, the regulation further reduces the NOx emission standard for diesel-fueled engines in 2004 and again in 2007. The regulation also reduces the PM emission standard for urban bus engines in 2002 and 2007. The 2002 PM standard approved by the Board is a regulatory modification that requires diesel-fueled engines to meet a 0.01 g/bhp-hr PM standard 15 months ahead of

when originally proposed in the Staff Report. While the 2002 emission standards and the 2004 emission standards are only applicable to diesel-fueled engines, the 2007 emission standards also apply to alternative-fuel engines. These new standards for diesel-fueled and alternative-fuel engines are significant and technology-forcing.

Furthermore, funding from air district and state air quality incentive programs is available throughout the state for transit agencies that purchase urban buses with engines certified to the ARB's optional, reduced-emission standards. Alternative-fuel urban bus engines are all currently certified to these reduced-emission standards; diesel-fueled engines are yet unable to achieve these low-emission levels. The ability to access this incentive money has encouraged some transit agencies to switch to alternative-fuel transit systems.

49. Comment: The ARB should require transit agencies to either buy only alternative fuel buses, or instead, adopt emission standards for diesel buses at the emissions level of natural gas buses. (Matvy, North)

Agency Response: During regulatory development, the ARB staff originally considered requiring transit agencies to purchase only alternative-fuel buses. However, the staff found that this was not a practical option for some transit agencies, either based on the demands of their service needs or the difficulties in securing alternative fuel in some regions. However, beginning October 1, 2002, diesel engines must meet a PM standard that is lower than that required for alternative-fuel buses. Additionally, the regulation requires diesel-fueled engines to meet a NOx emission standard in 2004 that is lower than what will be in effect for alternative-fuel buses at that time. In 2007, all urban bus engines, regardless of fuel type, will be required to meet the same stringent emission standards.

50. Comment: The transit bus regulation is not strong enough to encourage transit agencies to shift to cleaner, alternative-fueled buses, such as natural gas or electric-powered buses. At a minimum, the final regulation should be tightened to achieve larger reductions in pollution from diesel exhaust. (FL1, NALEO, McHugh)

Agency Response: The ARB believes the regulation will be effective in encouraging transit agencies to shift to alternative-fuel urban buses. Funding from air district and state air quality incentive programs is available throughout the state for transit agencies that purchase urban buses with engines certified to the ARB's optional, reduced-emission standards. Alternative-fuel urban bus engines are all currently certified to these reduced-emission standards; diesel-fueled engines are yet unable to achieve these low-emission levels. Additionally, transit agencies on the diesel path are required to purchase buses with engines meeting lower PM and NOx standards than alternative-fuel buses in the early years of the regulation, forego access to air quality incentive funding, accelerate the PM retrofits for their diesel buses, demonstrate zero-emission buses in 2003, and purchase zero-emission buses earlier than required on the alternative-fuel path. A number of transit

agencies are buying alternative-fuel buses now, and the ARB expects other agencies to choose the alternative-fuel path as well.

51. Comment: Allowing clean diesel technology to compete is in the best interest of the environment, consumers, and the California economy, and should be state policy as well as implemented uniformly in every situation. (WSPA)

    Agency Response: The regulation does provide significant opportunities for diesel technology through the regulation's dual-path compliance approach. Even the alternative-fuel path provides opportunities for diesel technology through a provision that allows up to 15 percent of new bus purchases to be diesel-fueled purchases. The ARB staff initially considered requiring transit agencies to exclusively purchase alternative-fuel buses when making new purchases. However, in response to transit agencies concerns, the regulation proposed and ultimately adopted provides transit agencies the flexibility to choose either the diesel or alternative-fuel compliance path.

52. Comment: Diesel proponents in the transit industry indicate that they expect no appreciable impact from the alternative-fuel path on the dominance of diesel engines in the California transit market. This is bad news for the transit industry; it sets a poor precedent for at least the next 14 -15 years during which the ARB will forego 50 percent reductions in NOx and more reductions in PM. (CNGVC)

    Agency Response: The ARB disagrees with this comment. Even before the Board approved this regulation, at least 20 medium-to-large transit agencies committed to operating alternative-fuel buses. Subsequent to regulation approval, about eight other transit agencies have stated their intent to comply with the alternative-fuel path. Governing boards of other transit agencies are now actively considering choosing the alternative-fuel path based on the availability of air quality incentive funds and a commitment to improving air quality in the regions they serve. This, in conjunction with the regulation's more stringent emission standards for diesel-fueled engines, will provide significant reduction in NOx and PM from the public transit bus sector. As a result, the ARB does not believe it will not forego significant reductions in NOx and PM.

53. Comment: The diesel path discourages an early investment in proven advanced NOx reduction technology, such as natural gas technologies. Instead, it relies on strategies that don't yet exist in the marketplace. (CNGVC)

    Agency Response: The implied assumption behind this comment made by proponents of natural gas and natural gas technologies is that the dual-path compliance approach will not have the desired result of incentivizing fleet transitions to alternative-fuels. The ARB disagrees with this comment. Instead, the ARB believes the regulation effectively in encourages transit agencies to shift to alternative-fuel urban buses. Funding from air district and state air quality incentive programs is available throughout the state for transit agencies that purchase urban

buses with engines certified to the ARB's optional, reduced-emission standards. Alternative-fuel urban bus engines are all currently certified to these reduced-emission standards; diesel-fueled engines are yet unable to achieve these low-emission levels. Additionally, transit agencies on the diesel path are required to purchase buses with engines meeting lower PM and NOx standards than alternative-fuel buses in the early years of the regulation, forego access to air quality incentive funding, accelerate the PM retrofits for their diesel buses, demonstrate zero-emission buses in 2003, and purchase zero-emission buses earlier than required on the alternative-fuel path.

J. Transit Agency Issues

54. Comment: The regulation allows for no more than three transit operators to consolidate their zero-emission bus demonstrations at one property to allow for cost savings from infrastructure sharing. Since the Bay Area transit system consists of four transit operators subject to the zero-emission bus demonstration requirement, the regulation should allow four transit operators to consolidate for purposes of meeting the requirement. (MTC)

    Agency Response: The commenter's statement that the regulation allows no more than three transit agencies in the same air basin to conduct a joint demonstration project is correct. However, the fact that a particular region has more than three transit agencies subject to the demonstration project requirements does not necessarily warrant expanding the number of agencies that may participate in a joint project.

    Under a joint demonstration, all participating agencies would be required to fund the demonstration, yet only one agency could act as the onsite "host". The purpose of a joint demonstration is to allow transit agencies opportunities for infrastructure cost savings. Still, the joint demonstration must provide each participating agency with broad-based mechanic and driver training, significant experience with and public visibility of zero-emission bus technology, revenue service over a wide area, and sufficient evaluation of passenger reaction. The ARB believes all transit agencies participating in a joint demonstration may not reap the necessary experience and knowledge to be gained through a demonstration project if too many transit agencies consolidate to conduct one.

55. Comment: The fleet rule component of the regulation should include an option for several transit fleets in a metropolitan area to combine into one regional bus fleet. (MTDB)

    Agency Response: The ARB reviewed this option and did not modify the regulation as this commenter recommended. The ARB does not believe the modification would provide the fleets in the San Diego region (the MTDB is the transit development board for the San Diego region) with any significant advantage. By its own admission, the MTDB stated that the consequences of such an option had not been

fully evaluated and further analysis was necessary to determine those consequences. While combining fleets could provide some flexibility in meeting the required NOx fleet average standard, it could also impose zero-emission bus demonstration and/or purchase requirements that might not take effect for transit agencies operating separately.

56. Comment: Districts that choose to replace a full-sized transit bus with a zero-emission shuttle-sized bus should get credit for that in the NOx fleet average requirement. (CETC)

    Agency Response: The ARB has modified the regulation to allow transit agencies to count zero-emission buses that do not qualify as standard urban buses, as defined in section 1956.2 (a)(4), title 13, CCR, in calculating an agency's NOx fleet average. (Please also see Agency Response to Comment 57.)

57. Comment: The Santa Barbara MTD is concerned that it may be penalized for using smaller zero-emission buses -- buses that don't meet the definition of an urban bus. Currently, the only zero-emission buses available are smaller than a typical urban bus. (SBMTD)

    Agency Response: It is the ARB's intent to encourage the use of zero-emission technology; not discourage its use in appropriate situations. As such, the ARB has modified the regulation to allow transit agencies to count zero-emission buses that do not qualify as standard urban buses, as defined in section 1956.2 (a)(4), title 13, CCR, in calculating an agency's NOx fleet average. This provision will benefit those transit agencies that have been proactive in efforts to reduce fleet emissions and that already service some routes with smaller, battery-electric buses. Nonetheless, the regulation is designed to foster advances in zero-emission technology for urban bus applications; therefore, zero-emission buses not meeting the definition of an urban bus cannot be used to meet the regulation's zero-emission bus demonstration requirements.

58. Comment: The zero-emission bus purchase requirements specifying that 15 percent of annual new bus purchases shall be zero-emission (beginning in 2008 for transit agencies on the diesel path and in 2010 for transit agencies on the alternative-fuel path) should allow zero-emission bus purchases to be applied over a five-year rolling period. This would allow transit operators to alternate between CNG bus purchases one year and zero-emission bus purchases the next year. (MTDB)

    Agency Response: The regulation already provides flexibility in meeting the zero-emission bus purchase requirements by allowing transit agencies to deviate from the purchase requirements on a case-by case basis, upon prior approval from the Executive Officer. This option is intended to accommodate transit agencies' bus purchase cycles; it is not intended as an option to delay compliance.

K. Technology Reviews

59. Comment: The regulation should be modified to include a technology review in 2003 to evaluate the feasibility of the 2004 through 2006 emission standards for diesel-fueled engines. If the emission standards are not technologically feasible, some other emission level, one that is technologically feasible, yet still achieves emission reductions, should be considered. (SMCTD)

    Agency Response: Technological feasibility reviews, whether specified or not within an ARB regulation, are a standard component of ongoing regulatory development. The ARB staff is committed to periodically reporting back to the Board on the status of all new technologies used to meet the emission standards set forth in the regulation, and will consider regulatory modification, if warranted. It is also important to note that while the ARB believes the 2004 through 2006 emission standards are technologically feasible, transit agencies may use an alternative compliance option (alternative NOx strategy) if they choose not to purchase urban buses with diesel-fueled engines meeting the 2004 through 2006 emission standards. This alternative compliance option ensures that the emission benefits attributable to the 2004 through 2006 standards will be realized. (Please also See Agency Response to Comment 61.)

60. Comment: The Board should give consideration in the future to technological solutions that have been fully tested and service proven. Therefore, the fuel-cell bus technology review required by January 2006 should be broadened to include a review of all the technologies required to meet the emission standards in the transit bus regulation. (MTDB)

    Agency Response: The regulation and Board Resolution 00-2 include a specific provision for the review of zero-emission bus technology by no later than January 2006. This review is not limited to fuel cell technology, as the commenter states, but could include the review of other zero-emission technologies as well. While the regulatory text limits this review to zero-emission bus technology, the ARB staff is by no means closed to reviewing new technologies that may be used to meet other requirements in the regulation. In fact, the ARB staff is committed to periodically reporting back to the Board on the status of all new technologies used to meet the emission standards set forth in the regulation, and will consider regulatory modification, if warranted.

61. Comment: WSPA does not support the inclusion of a new purchase/lease percentage requirement for zero-emission buses on either compliance path. WSPA requests that the two following revisions be made to the regulation:

    a) The regulation should include a future technical review(s) to be completed by ARB regarding the viability of zero-emission buses, including their cost-effectiveness. The review should be bracketed around the required demonstration programs in order to assist transit agencies in their bus purchase decisions.

b) The regulation should not restrict the definition of a zero-emission bus in a fashion that is not fuel neutral. The proposal should be revised to be fuel neutral and should include, for example, a diesel or distillate powered fuel cell. (WSPA)

Agency Response: Regarding the commenter's first recommendation, the regulation already includes an explicit requirement for the ARB to conduct a zero-emission bus technology review, by no later than January 2006, for the purpose of assessing the feasibility of implementing the regulation's zero-emission bus purchase/lease requirements applicable on both compliance paths. The ARB's technology review is bracketed around the demonstration programs; the 2006 date was chosen to allow transit agencies sufficient time to complete their required reports to the ARB, and to allow the ARB staff sufficient time to analyze the reports and, based on the their contents, develop recommendations for the Board's consideration.

Regarding the commenter's second concern, the ARB did not include fuel cells powered by fuels other than hydrogen in the definition of a zero-emission bus because such fuel cell technologies do not produce zero-emission exhaust levels. Fuel cell technologies that reform fuels such as natural gas, methanol, diesel, or gasoline onboard a bus to produce hydrogen for the fuel cell produce some emissions, although at lower levels than produced by internal combustion engines. The regulation's intent is to foster significant advances in zero-emission bus technology, as well as near zero-emission technologies. The 2007 emission standards will require the use of technologies able to achieve these near zero-emission levels; we expect that reformer-based fuel cell buses will be able to meet that challenge and will have a role on both the diesel and alternative-fuel paths in the 2007 and beyond timeframe.

62. Comment: Many of the technologies required for transit operators to comply with the regulation are currently experimental. The regulation should include future feasibility reviews of regulation components such as the 2004 through 2006 emission standards for diesel-fueled engines, the low-sulfur diesel fuel requirement, and the retrofit requirements to reduce PM emissions by 85 percent. (MTC)

Agency Response: Technological feasibility reviews, whether specified or not within an ARB regulation, are a standard component of ongoing regulatory development. The ARB staff is committed to periodically reporting back to the Board on the status of all new technologies used to meet the requirements set forth in the regulation, and will consider regulatory modification, if warranted. Regarding the low-sulfur diesel fuel requirement, Board Resolution 00-2 specifically directs the ARB to work closely with the U.S. EPA in its development of a new national diesel fuel specification, and to reevaluate its own low-sulfur diesel fuel requirement, if necessary, soon after the U.S. EPA adopts its national fuel specification.

L. Funding Sources

63. Comment: WSPA supports fuel neutral existing programs that encourage the accelerated replacement or retrofit of old diesel engine technology with new modern low emission technologies. To that end, we recommend that existing incentive programs be modified, as necessary, to help underwrite the diesel retrofit requirements in the rule. (WSPA)

    Agency Response: The Carl Moyer Program is a voluntary incentive program specifically charged with providing grants for the purchase of new, low-emission heavy-duty engines and equipment, or for the retrofit or repower of existing heavy-duty engines to lower-emitting configurations. However, Health and Safety Code section 44281(b), as part of the legislative authority for the Carl Moyer Program, specifically states that "no new purchase, retrofit, repower, or add-on equipment shall be funded under this chapter if it is required by any local, state, or federal statute, rule, regulation, memoranda of agreement or understanding, or other legally binding document." Thus, California statute prohibits the ARB from modifying its Carl Moyer Program Guidelines to allow grants to be used for compliance with the regulation's retrofit requirements. It is general ARB policy that regulatory compliance cannot be funded through state incentive programs.

64. Comment: The federal funding highlighted as the basis for complying with the regulation is extremely limited; further stretching of these funds directly impacts service on the street. (AC Transit)

    Agency Response: The ARB acknowledges in the Staff Report that some transit agencies could experience service cut-backs or fare increases if transportation planning agencies do not allocate federal transportation funding to public transit projects. Multiple transportation projects affecting streets and highways, bridges, pedestrian and bicycle facilities, and ferries, just to name a few, compete for federal funding; it is the responsibility of transportation planning agencies to prioritize the allocation of that available funding. In general, the ARB has identified adequate funds from transportation, air quality, and energy-related sources available to subsidize the incremental cost of alternative-fuel buses in urban areas, assuming a normal bus turnover rate. Unfortunately, adequate funds to cover the entire cost of infrastructure necessary for alternative-fuel bus purchases have not yet been identified. Therefore, Board Resolution 00-2 directs the ARB to work with transit agencies to identify potential sources of funding for the capital costs and infrastructure for future lower-emission bus technology, as well as encourage transportation planning agencies to provide more funding for transit agencies to cover retrofit costs, infrastructure costs, and new bus purchase costs not already funded by federal funds or state incentive program funds.

65. Comment: The regulation should be strengthened so that areas classified as extreme or severe nonattainment for the federal one-hour ozone standard receive TEA-21 funding for air quality goals, and not for roads or stop signs. (Neisi Farmers League and CAGI)

Agency Response: The United States Congress is responsible for allocating TEA-21 funds to various transportation-related programs. In turn, local transportation planning agencies receiving TEA-21 funding are responsible for prioritizing transportation project categories in their respective regions and allocating funding to each category. This means that multiple transportation-related projects compete for available funding. The ARB does not have the authority to regulate how the TEA-21 funds may be used. However, Board Resolution 00-2 directs the ARB to encourage transportation planning agencies to make funding for urban bus projects a priority in order to assist them in meeting the regulation's air quality goals.

66. Comment: The regulation will increase the cost of public transportation. If sufficient government funding is not available to defray the increased costs, fleet sizes may be reduced and/or fares will be increased, thus negatively impacting transit bus ridership and the ARB's goal to achieve emission reductions. (Lockheed Martin)

    Agency Response: Please see Agency Response to Comment 64.

67. Comment: Additional funding should be provided for the incremental cost of alternative-fuel buses and the associated fueling station infrastructure, or the ARB's Carl Moyer Program Guidelines should be amended to provide for 100 percent of the incremental costs. (MTDB)

    Agency Response: The ARB is committed to working with transportation planning agencies and transit agencies to identify and secure additional funding from federal, state, and local sources for the incremental capital and infrastructure costs associated with alternative-fuel technology. Regarding the Carl Moyer Program, the ARB's current guidelines allow funding for the full incremental cost of alternative-fuel bus projects, provided the bus projects are cost-effective, meet the guidelines' criteria, and include documentation clearly indicating that federal funding is not available to purchase the alternative-fuel buses. Additional infrastructure funding is available from the Advanced Technology Development and Infrastructure Demonstration Program, which is administered by the CEC. (Please also see Agency Response to Comment 64.)

68. Comment: The ARB and air districts should allow existing funding sources (i.e., Carl Moyer and AB 434 programs) to be used for any and all technology and equipment purchased to comply with the regulation, including PM retrofits, diesel engine re-powers, zero-emission bus demonstrations and purchases and supporting infrastructure, and diesel hybrid-electric bus purchases. (MTC)

    Agency Response: As discussed in the response to Comment 63, Health and Safety Code section 44281(b) specifically prohibits Carl Moyer funds to be used in complying with state, federal, or local regulatory requirements. Therefore, these funds cannot be use to meet the requirements of the urban bus regulation. They can, however, be used to purchase urban buses certified to the ARB's optional, reduced-emission standards (section 1956.1, title 13, CCR). The regulation does

not require transit agencies to purchase urban buses certified to the optional standards. Thus, Carl Moyer funds can be used by transit agencies purchasing alternative-fuel urban buses with engines certified to the optional emission standards (only alternative-fuel engines are currently able to certify to these low levels). Regarding infrastructure funding, Carl Moyer funding for alternative-fuel infrastructure is already available from the CEC, which administers the advanced technology development and infrastructure portions of the program.

The urban bus regulation does not contain requirements for diesel hybrid-electric bus purchases, nor can Carl Moyer funds be used for these purchases at this time. Current California and federal certification test procedures are engine-based and therefore are not able to adequately represent the emission benefits of diesel hybrid-electric technology. Additionally, current data indicate that state-of-the-art diesel hybrid buses with a particulate filter and low-sulfur fuel have PM emissions as low as CNG buses without a particulate filter, but they still emit NOx at higher levels than CNG buses. The ARB, in conjunction with the Northeast Advanced Vehicle Consortium, the U.S. EPA, and the engine and hybrid bus manufacturers, is working to develop a certification procedure for heavy-duty vehicle hybrids. Until that occurs, however, the reduced emission levels of diesel hybrids cannot be easily validated. The ARB staff is scheduled to propose modifications to the Carl Moyer Program Guidelines for the Board's consideration in November 2000. One of the proposed modifications is to allow diesel hybrids to qualify for program funding on a case-by-case basis until a heavy-duty hybrid vehicle certification procedure is developed. It is important to note that alternative-fuel hybrid-electric buses with engines certified to one of the ARB's optional, reduced-emission standards are already eligible for Carl Moyer Program funding.

Regarding Assembly Bill 434 (AB 434; Stats. 1990, Ch. 1705, Sec.1) programs, funds for these programs are generated by a surcharge levied within the Bay Area Air Quality Management District (BAAQMD) on all motor vehicle registrations in that area. Health and Safety Code section 44241, the provision of the legislation that determines the allocation of fee revenues within the BAAQMD, specifically limits the transportation and congestion management programs that can be funded with these fees [see Health and Safety Code section 44241(b)]. While clean fuel buses may be purchased with AB 434 funds (i.e., alternative-fuel buses certified to one of the ARB's optional, reduced-emission standards specified in section 1956.1, title 13, CCR), the fees cannot be used to fund compliance with mandatory emission standards or other mandatory requirements in the regulation.

69. Comment: The best way to meet the goals of regulation is to request funds from the Governor and Legislature to meet some of the additional costs that transit agencies may incur as a result of the regulation. (CTranA)

Agency Response: The ARB is committed to working with this commenter, the California Transit Association, in securing additional funds from the Legislature and

the Governor to assist transit agencies with low-emission bus purchases and associated alternative-fuel infrastructure.

It is important to point out, however, that the existing Carl Moyer Program, funded each year through the state budget process, is a significant source for funding the incremental cost of urban buses certified to the ARB's optional, reduced-emission standards (which only alternative-fuel buses can currently meet) and associated alternative-fuel infrastructure. The $50 million funding level for the 2000/2001 fiscal year is the highest in the Carl Moyer Program's three year history.

Additionally, the recent enactment of Assembly Bill 2511 (Steinberg; Stats. 2000, Ch. 532) provides $50 million to the Sacramento region and $25 million to the San Joaquin Valley region to fund incentive programs for reducing emissions from heavy-duty diesel vehicles. These funds could be used by transit agencies in these regions to purchase low-emission urban buses certified to the ARB's optional, reduced-emission standards. The recent enactment of Senate Bill 1662 (Burton; Stats. 2000, Chapter 656) also provides additional funds to select transit agencies throughout the state to purchase low-emission urban buses.

M. Articulated Buses

70. Comment: It is unclear how the regulation applies to articulated buses since there are currently limited options for alternative-fuel technologies and other emission-reducing technologies for articulated buses. (MTC)

Agency Response: The engines used in articulated buses must meet the regulation's applicable emission standards, specified in section 1956.1, title 13, CCR, and must comply with the fleet rule components specified in section 1956.2, title 13, CCR. However, the ARB acknowledges the unique operating parameters of articulated buses that can now only be met with diesel-fueled urban bus engines, and that some transit agencies on the alternative-fuel path have service needs best met through the use of articulated buses. Therefore, the regulation was designed to provide flexibility to these transit agencies by allowing up to15 percent of new bus purchases on the alternative-fuel path to be diesel buses.

N. Compliance and Enforcement

71. Comment: The ARB should expand its in-use compliance program to ensure compliance with the new emission standards for urban bus engines and the retrofit requirements set forth in the regulation. The provisions outlined by the Consent Decree offer a template for including on-board diagnostics and not-to-exceed provisions that should be formally adopted by the ARB in the transit bus regulation. (ENVIRONMENTAL GROUP JOINT LETTER)

Agency Response: Board Resolution 00-2 directs the Executive Officer to evaluate the viability of test procedures to measure in-use emissions from urban buses for the

purpose of determining compliance with all the regulation's requirements. As discussed at the February hearing, evaluating the feasibility of an expanded in-use compliance program is a complex task that could take two to three years to complete. After an extensive evaluation, the staff will report its findings to the Board and present any recommendations for addressing compliance concerns, should they exist.

72. Comment: The ARB should establish strong noncompliance penalties, whether in the form of sanctions, fines, loss of funding, or other mechanisms, to send a clear signal to transit agencies that compliance with the ARB's fleet rule requirements is a priority. Additionally, the ARB must establish a program by which transit agencies make up for lost emission benefits if they fail to comply with the regulation. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: The ARB is committed to ensuring compliance with the regulation's fleet rule requirements and will actively work with transit agencies to monitor the status of its implementation. The Health and Safety Code, commencing with section 42400, specifies legal procedures and penalties for addressing criminal and civil noncompliance with the ARB's regulations and for administering noncompliance penalties. In addition to fines and penalties up to $50,000 per day for intentional noncompliance with regulatory requirements, injunctive orders to enable the ARB to recoup lost emission benefits and other appropriate equitable relief are available through a court order directed to any transit agency that fails to comply with the regulation.

73. Comment: The ARB should undertake a research effort to develop a more representative test cycle so that future standards and in-use compliance programs will be more representative of real-world gains. Such a program might appropriately be part of a larger effort to develop more representative test cycles for all diesel-cycle engines, including those certified as on-road heavy-duty and non-road engines. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: The ARB is evaluating the feasibility of in-use testing and compliance as part of its efforts to expand the current Heavy-Duty Vehicle Inspection Program and to develop measure M-17, Additional Reductions from Heavy-Duty Vehicles, in the 1994 State Implementation Plan for Ozone. This effort could include developing a compliance test procedure more representative of urban bus drive cycles. Additionally, such efforts may ultimately be the basis for developing new test cycles for other categories of diesel engines.

O. Regulatory Compliance Costs

74. Comment: The regulation should include a cost cap on the PM retrofit requirements because the Tier 2 and Tier 3 PM requirements are very aggressive and may cost more than estimated in the Staff Report. (CTranA)

    Agency Response: The costs to comply with the PM retrofit requirements, as presented in the Staff Report, are based on information obtained from industry and trade groups. However, as a matter of course, some level of uncertainty is inherent in all cost projections. Nevertheless, the ARB believes that the level of uncertainty for PM retrofit technology is not as great as what would be expected for undeveloped or unproven technologies. Particulate trap technology has been well demonstrated and the manufacturing process is relatively straightforward and well established. The per unit cost of PM trap technology is expected to be reduced from the cost projected for Tier 1 requirements due to increased manufacturing efficiency and economy of scale associated with mass production. As such, the ARB believes that it is not necessary to include a cost cap in the regulation.

75. Comment: The regulation should include cost caps on the PM retrofit requirements. The U.S. EPA, in its urban bus retrofit/rebuild regulation, has an excellent protocol that establishes how to implement a cost cap. The concept is to set a cap on what that technology is worth, and then let industry compete for that technology. (SMCTD)

    Agency Response: The cost caps contained in U.S. EPA's urban bus retrofit/rebuild regulation (sections 85.1401 - 85.1415, title 40, CFR) were established to provide maximum costs levels that the U.S. EPA considered to be reasonable in requiring transit agencies to comply with provisions of its regulation. At the time the U.S. EPA's regulation was promulgated, the technologies that could be used to reduce PM emissions from urban buses were still relatively immature and there was limited knowledge regarding what technologies would be effective and would ultimately prevail in the market place. Because of this uncertainty, the costs of these technologies remained largely unknown. The situation is now different; particulate traps are expected to be the technology used for compliance with the ARB's PM retrofit requirements. Since PM traps have been installed in buses for a number of years, the expected costs are much better understood. With increased production and market competition from various PM trap manufacturers, the ARB expects the cost of PM traps to decline over time from the current price. Therefore, the ARB believes that it is unnecessary to specify a cost cap in the regulation. In fact, including a cost cap in the regulation could prevent the expected cost reduction associated with economy of scale production as a cost cap could alter the competitive market pricing of the technology. A cost cap provision could interfere with the equilibrium pricing that would result from free-market forces and could artificially inflate PM trap costs.

76. Comment: As with the U.S. EPA's urban bus retrofit/rebuild regulation, lower outyear emission levels should only be triggered if technology is available at or below responsible dollar thresholds established by the ARB, corrected to calendar year 2000 dollars. For example, the ARB should only require transit agencies to place into service three zero-emission buses by mid-2003, if the fuel cell bus incremental cost of $275,000, as estimated by the ARB, is accurate. Without such limits, the requirement could become overly burdensome. (Nova BUS)

    Agency Response: The primary goal of the regulation is to reduce emissions from both existing and new buses. Another goal of the regulation is to promote the development of advanced technology, such as zero-emission buses. It is to be expected that the cost of any new, advanced technology is likely high, particularly when first introduced. It is also as likely that the cost of advanced technology will decrease, substantially in most cases, as the technology becomes more mature and its use becomes more prevalent. The regulation requires larger transit agencies on the diesel path to participate in a zero-emission bus demonstration program. However, a transit agency has the choice of electing which compliance path to follow; either the diesel path or alternative-fuel path. If a transit agency elects to follow the alternative-fuel path, it will not be required to purchase zero-emission buses as part of the zero-emission bus demonstration program. By electing to go with the diesel path, a transit agency has chosen not to expend current capital resources to purchase alternative-fuel buses, but, in so doing, will not be contributing to any immediate emission reductions. To preserve financial equity and to ensure that emission reduction obligations are equally distributed between both compliance paths, the regulation requires larger transit agencies on the diesel path to participate in a zero-emission bus demonstration program, as well as being the first to purchase zero-emission buses. The ARB believes that zero-emission technology will play a vital role in reducing emissions from urban buses. As such, that ARB believes that the emission benefits of zero-emission buses justify the efforts and costs in promoting its development and commercialization.

77. Comment: With the federal urban bus retrofit/rebuild regulation as a precedent, the ARB's urban bus regulation should include incremental cost caps for each regulation requirement, based on the ARB's estimates of those costs. If the cost per bus, including infrastructure and fuel, should exceed the cost caps, the ARB should redefine the requirements in order to allow transit operators the ability to comply within the cost caps. (MTC)

    Agency Response: The ARB's regulations typically do not include cost caps as a way to control costs. Rather, ARB's regulations make use of cost-effectiveness criteria as a means to gauge the economic feasibility of the regulations. A regulation is deemed economically reasonable if the cost-effectiveness of the proposed requirements is below a certain threshold, typically less than $6.00 per pound of NOx reduced for mobile source regulations. For the urban bus regulation, ARB estimated that the cost-effectiveness of the NOx requirements to range from $1.50

to $1.80 per pound of NOx reduced. This cost-effectiveness level is well below the $6.00 per pound cost-effectiveness threshold.

Because PM reductions are much more expensive to achieve than NOx reductions and because they involve health benefits associated with a reduction in exposure to a toxic air contaminant, it is not possible to base the feasibility of the regulation's PM control requirements on straight cost-effectiveness criteria. The cost-effectiveness of the regulation's PM retrofit requirements averages $17.90 per pound of PM reduced annually from 2003 to 2009. This cost-effectiveness includes the cost associated with the requirement to purchase low-sulfur diesel fuel. However, the cost-effectiveness of the PM retrofit requirements does not include the value of health benefits associated with a reduction in exposure to a toxic air contaminant (which PM is). The risk management process for the control of toxic PM emissions from diesel-fueled engines is ongoing. Any PM control measures resulting from the risk management process will produce additional PM reductions and health benefits that are not part of this cost-effectiveness determination.

78. Comment: The regulation balances the necessary research and development on the backs of a small market segment. Instead, the regulation should be modified to focus on a larger heavy-duty engine market segment, which would allow technology to advance that can then be applied to urban buses. (CTranA)

    Agency Response: The regulation focuses on diesel buses for several reasons. First, diesel urban buses are ideally suited for improved controls due to relatively high NOx and PM emissions on a per bus basis. Many of these buses operate in the most heavily congested urban areas where air quality is critical and direct exposure to toxic diesel particulates occurs for a large number of people, thus making toxic particulate emissions an even greater public health concern. In addition, they are centrally-fueled with known, fixed routes, which allow for alternative-fuel or low-sulfur diesel fuel to be utilized more effectively. Next, the entire cost of a new bus is not borne by the local transit agency, but is funded with government subsidies. Furthermore, cost-effective emission reductions can be immediately achieved as cleaner alternative-fuel engine technology is already available. Finally, technologies to reduce PM emissions have already been demonstrated on urban buses and are expected to become more widely available at lower costs in the near future. The technologies used to meet the requirements of this regulation will pave the way for more stringent federal and California emission standards for other classes of heavy-duty vehicles to take effect in the 2007 timeframe.

79. Comment: The regulation's impact on the state's business community and economy has not been fully explored. While the proposed regulation will provide substantial economic benefits to some energy providers, no effort has been made to assess the impact on petroleum-based fuel producers. (Lockheed Martin)

Agency Response: The ARB has evaluated the potential impacts of the regulation on California businesses and individuals. The potential economic impact on petroleum-based producers is expected to be modest since the regulation does not require the elimination of diesel fuel for urban bus applications. Although the regulation does require that the diesel fuel used must not exceed a 15 ppm by weight sulfur content, diesel fuel will continue to be in demand from transit agencies that operate diesel buses. Most, if not all, of the additional costs associated with producing low-sulfur diesel fuel are expected to be passed onto the end users. While ARB expects that some transit agencies will be switching to alternative-fuel buses, the ARB estimated the overall effect on petroleum-based producers to be small.

80. Comment: The regulation is biased against diesel fuel by understating the costs to implement the regulation while overstating the funding available for its implementation. Prior to making a decision on the proposed regulation, the Board should have at its disposal a complete benefits analysis that includes the true unsubsidized costs of compliance, including the infrastructure costs for all fuel types, safety issues associated with alternative fuels, transit agencies' experiences with alternative fuels, and all actual funding sources available to transit agencies. (Lockheed Martin)

Agency Response: The ARB does not believe the regulation to be biased against diesel fuel. The goal of the bus regulation is to reduce emissions from both new and existing buses. Regulatory requirements were designed to cost-effectively achieve that goal and to provide equity between the two compliance paths. The ARB's primary method for estimating the cost of a regulation is by determining the cost-effectiveness of the various requirements of the regulation. Using this approach, the ARB estimates the cost for complying with the various requirements and divides that cost by the emission reductions expected from implementation of the requirements. As such, the ARB calculated the cost-effectiveness for complying with the PM retrofit requirements and the new engine emission standards, including the low-sulfur diesel fuel and zero-emission bus purchase requirements. All new urban bus purchases, both diesel and alternative fuel, are subsidized by public funds, regardless of the ARB regulation. A large portion of these funds comes from the FTA. Thus, in determining the cost-effectiveness of the regulation, the ARB believes that it is appropriate to include the FTA contribution toward the cost of new bus purchases in the cost-effectiveness calculation.

Because the alternative-fuel path is an optional path and because the ARB expects that incentive funding will be available from existing programs to offset most of the incremental cost of alternative-fuel buses, the cost of purchasing alternative-fuel buses is not included as part of the cost of the regulation. Nevertheless, the ARB estimated that the total incremental alternative-fuel bus purchase cost to transit agencies is about $2,200,000 per year. This cost is based on current purchasing trends from transit agencies that already have a significant number of alternative-

fuel buses in their fleets. These transit agencies would be expected to continue to purchase alternative-fuel buses even in the absence of this proposed regulation. Since the regulation requires transit agencies choosing the alternative-fuel path to have at least 85 percent of their new bus purchases be alternative-fuel buses, some transit agencies could be required to buy more alternative-fuel buses than they were planning to buy in absence of the regulation. However, the additional costs for alternative-fuel bus purchases are expected to be offset through incentive programs available for the purchase of low-emission buses. The ARB is currently administering the Carl Moyer program, in conjunction with local air districts statewide, that provides grants for the purchase of low-emission technologies, such as alternative-fuel urban buses certified to the ARB's optional, reduced-emission standards. Some local air districts also have additional incentive-based programs to encourage fleet operators to switch to cleaner alternatives to diesel.

81. Comment: The Board should not adopt a regulation that suggests it is "cheaper to be dirtier." The ARB has underestimated the zero-emission bus costs. The ARB should either correct its cost estimates, or shift zero-emission bus and PM retrofit requirements as needed to better equalize costs under both paths. At a minimum, the regulation should ensure that the path with higher emissions [the diesel path] is not perceived as the path with the lowest cost. (PG&E)

    Agency Response: The ARB's policy is to adopt regulations that provide the most cost-effective emission reductions. With the urban bus regulation, that policy was coupled with the desire to provide compliance flexibility through the dual-path approach. The ARB addressed equity issues in proposing the two compliance paths. Transit agencies electing to be on the alternative-fuel path will provide early and immediate emission benefits through their purchase and operation of alternative-fuel buses. In so doing, these transit agencies could potentially incur some additional capital costs associated with alternative-fuel bus purchases and infrastructure installations. To balance this situation, the regulation requires transit agencies that choose the diesel path to comply with more stringent requirements such as an accelerated PM retrofit schedule, more stringent emission standards for diesel-fueled engines in the 2004 to 2006 timeframe, and, for larger transit agencies, zero-emission bus demonstration programs, and early phase-in of zero-emission bus purchases. These additional requirements are intended to provide equity, in both emission benefits and financial considerations, such that the diesel path will not be perceived as the path with the lowest cost. The true cost of zero-emission bus requirements cannot be resolved at this time with existing information. If the cost of zero-emission buses are higher than that estimated by the ARB, transit agencies on the diesel path would have to absorb the higher cost as a result of the zero-emission bus demonstration program and the early purchase requirement. Because of the uncertainty associated with zero-emission buses and the more stringent requirement for transit agencies on the diesel path to incorporate zero-emission buses into their fleets, it is not necessarily true that the diesel path will be the lower cost path.

82. Comment: The costs of compliance with the 2004 through 2006 emission standards for diesel-fueled urban engines, the PM retrofit requirements, and the zero-emission bus demonstration requirements are significantly understated. (Nova BUS)

Agency Response: The ARB disagrees with this comment. The costs of the regulation's requirements were derived from the ARB's evaluation of information provided by industry and the public, both privately and through a number of public forums. For the 2004 through 2006 emission standards for diesel-fueled urban bus engines, the costs are based on the cost of aftertreatment technology applied to a base engine manufactured on or after October 1, 2002. For the PM retrofit requirements, the ARB projected that the actual compliance costs will likely be lower than the initial costs estimated for Tier 1 retrofits due to economy of scale and increased competition among PM trap manufacturers. There is more uncertainty associated with estimating the cost of zero-emission buses than for PM traps since the technology for zero-emission buses is much less mature than that of PM trap technology. However, based on the ARB's experiences with other technological innovations, the ARB expects that the cost of zero-emission buses will ultimately be less than current projections once the technology is fully developed and commercialized. It should be pointed out that the regulation also allows transit agencies the option of complying with the 2004 through 2006 emission standards for diesel-fueled urban bus engines by implementing an alternative NOx strategy in lieu of purchasing bus with engines certified to the 2004 through 2006 emission standards. The ARB anticipates that this alternative compliance option will drive down compliance costs since transit agencies will be able to choose a potentially lower cost option.

83. Comment: The ARB completely ignores the significant operating costs and infrastructure increases associated with the use of CNG. (Nova BUS)

Agency Response: The ARB disagrees with this comment. During regulatory development, the ARB extensively investigated the costs associated with operating a fleet of alternative-fuel buses. In fact, prior to proposing the regulation, ARB staff conducted site visits to a number of transit agencies throughout the country to obtain information on capital and operating costs, including infrastructure costs, associated with alternative-fuel urban bus fleets. The ARB staff visited the following transit agencies: the Los Angeles County Metropolitan Transit Authority; Sacramento Regional Transit District; Pierce Transit in Tacoma, Washington; Greater Cleveland Regional Transit District; New York City Metropolitan Transit Authority; Dallas Rapid Transit District; and Houston Metropolitan Transit Authority. These transit agencies, which vary in size, have significant experience operating CNG and/or liquefied natural gas urban buses. In addition to these site visits, the ARB conducted telephone surveys with other transit agencies, fuel providers, and equipment suppliers to obtain additional information on costs associated with alternative-fuel buses and its associated infrastructure. Through these efforts, the ARB found that the combined capital costs of alternative-fuel buses, fueling infrastructure, and

maintenance facilities could be significant if these costs were not offset with incentive funding.

However, the situation is different when comparing operating costs between diesel and alternative-fuel fleets. While several transit agencies have indicated that CNG bus operating costs are higher than diesel bus operating costs, some transit agencies have reported lower operating costs for CNG buses than for diesel buses. Operating costs include both maintenance and fuel costs. While, in some cases, maintaining diesel fleets can currently cost less than maintaining CNG fleets, the requirements for diesel engines to meet more stringent emission standards, along with the availability of more reliable natural gas engines, should equalize the cost gap. Fuel costs per mile for natural gas buses, including compression or liquefaction, is less than for diesel buses. The increased price of low-sulfur diesel fuel needed in the future should increase this difference. After considering all the available information, not just information from one or two specific transit agencies, the ARB expects future operating costs for natural gas fleets and diesel fleets to be comparable.

84. Comment: The incremental costs of zero-emission buses are likely to be extremely high due to low production volumes, high development costs, and uncertain infrastructure requirements. Given the cost uncertainty, it is unrealistic that bus manufacturers and transit agencies will be more likely to embrace zero-emission buses in 2007 than they are to accept low-emission, alternative-fuel buses today. (CNGVC)

    Agency Response: The requirements in the ARB's regulation are intended to reduce emissions from urban transit buses as expeditiously as possible, and to push the development of advanced urban bus technologies toward zero or near zero-emission levels. The ARB acknowledges that there will be research, development, and commercialization costs associated with bringing zero-emission buses into the market. It is normal to anticipate that there will be higher costs associated with the introduction of new products, especially if the product results in a shift away from established technologies. The ARB believes that the emission benefits warrant the continued focus on developing and commercializing zero-emission urban bus technology. The ARB is working with several technology providers toward this end and believes that zero-emission buses will be available in the timeframe specified in the regulation. Thus, ARB believes that the zero-emission bus demonstration program and purchase requirements are an effective way to introduce zero-emission buses into the public transit sector.

85. Comment: Public transit is a solution to pollution and other environmental problems, rather than a problem itself. Therefore, public transit should not suffer undue burden that could reduce existing service, or prevent improvements in service necessary to reduce automobile traffic. The regulation should provide more flexibility based on the availability of reasonably priced fuel and engines. (Cluster)

Agency Response: The ARB concurs that public transit provides vital services to the community it serves, including transportation to transit-dependent users and traffic congestion relief. In certain situations, transit buses could also reduce emissions compared to passenger car trips. But because emissions from passenger cars have been reduced to very low levels, the previous statement is true only if the emissions from buses are much lower than required by existing emission standards. Currently, only natural gas buses have been certified to a level that is about one-half of the existing mandatory NOx emission standard. In order to fully realize the societal benefits that could be provided by transit buses, emissions from these buses must be further reduced. The ARB believes that the regulation strikes a balance between the need to achieve that goal and the desire to provide flexibility to transit agencies. As such, the regulation does not force any transit agency to use a specific fuel or engine type. The regulation only specifies emission requirements and allows transit agencies to choose between two distinct compliance paths -- the alternative-fuel path or the diesel path. Each transit agency is allowed to choose the path that best meets its needs, yet, at the same time, provides direct air quality benefits to bus riders and the community it serves.

P. Legal and Procedural Issues

86. Comment: The ARB's Staff Report singles out only one of many fuel cell manufacturers and specifies its basic fuel cell system. The Notice of Public Hearing similarly singles out only one fuel cell manufacturer. It is improper and exclusionary for government to endorse a specific manufacturer of any good or service; hence, the laws which provide for free and open competition and anti-trust. (Nova BUS)

    Agency Response: The reference to the fuel cell manufacturer and, in the case of the Staff Report, a description of the specific fuel cell system, was included as an example of fuel cell development for transit applications. The ARB's regulations are highly technical and dependent upon the underpinning of sound science and the availability of required control technology. The Staff Report, released to the public on December 10, 1999, clearly states on its cover that its contents do not necessarily reflect the views and policies of the ARB, nor does the mention of trade names or commercial products constitute an endorsement or recommendation for use. The ARB acknowledges that other manufacturers may meet the regulatory performance standards and would welcome robust and open competition to provide low-emission technology.

87. Comment: The ARB would not accept oral comments, only written comments, during the 45-day comment period prior to adoption of the proposed regulation. (Individual comment within an FL2 letter)

    Agency Response: The California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 of the Government Code, sections 11340 through 11356, prescribes the requirements and procedures to which public agencies must adhere during the public rulemaking process. In accordance with sections 11346.5(a)(9)

and 11346.8(a) of the Government Code, the ARB specified in the Notice of Public Hearing the date by which written comments on the proposed regulation had to be submitted in order to be considered by the ARB prior to regulation adoption. In addition to this written comment period, the ARB invited oral testimony at the January hearing in the same Notice of Public Hearing. The hearing was conducted in accordance with the requirements of section 11346.8(a) of the Government Code, and both written and oral statements were permitted. All comments, oral and written, were considered, and the ARB is responding, in writing, to each comment in the public record through this Final Statement of Reasons. This process benefits the public by providing full and accessible disclosure of all issues raised by the public during the formal comment period, as well as the manner in which they were addressed by the public agency.

Q. Local Air Quality Management and Air Pollution Control District Issues

88. Comment: The regulation should not permit exceptions for individual air districts to require transit agencies to implement the alternative-fuel path. A statewide rule should remain in force to provide uniformity. (CCC, WSPA)

    Agency Response: The Health and Safety Code, not the ARB regulation, provides local air quality management and air pollution control districts the authority to require transit agencies to implement the alternative-fuel path. Thus, the ARB's legal counsel has concluded that the South Coast Air Quality Management District, the Sacramento Metropolitan Air Quality Management District, and the Mojave Desert Air Quality Management District all have specific legislative authority to implement measures requiring transit operators to purchase and operate low-emission vehicles. This authority is provided in sections 40447.5(a), 41011, and 41231 of the Health and Safety Code. Furthermore, the ARB's legal counsel has also concluded that other air districts with "serious," "severe," or "extreme" air pollution have the legal authority to regulate vehicle fleets (see sections 40919(a)(4), 40920(a), and 40920.5(a) of the Health and Safety Code), and thus can require transit agencies to implement only the alternative-fuel path. As such, the ARB cannot modify the regulation to include a provision that would directly conflict with these statutes, nor as a policy matter, does the ARB believe this would be beneficial to air quality.

89. Comment: The regulation should allow air districts the flexibility to protect the health of their communities by requiring transit agencies in their respective regions to follow a single path – the alternative-fuel path. (CBE, PFC, SJVAPCD)

    Agency Response: Just as the regulation does not explicitly provide air districts the authority to require transit agencies to implement the alternative-fuel path, it does not explicitly prohibit them from exercising their existing legal authority to do so. The ARB's legal counsel has concluded that the South Coast Air Quality Management District, the Sacramento Metropolitan Air Quality Management District, and the Mojave Desert Air Quality Management District have specific legal authority to implement measures requiring transit operators to purchase and operate low-

emission vehicles. This authority is provided in sections 40447.5(a), 41011, and 41231 of the California Health and Safety Code. The ARB's legal counsel has also concluded that other air districts with "serious," "severe," or "extreme" air pollution have the legal authority to regulate vehicle fleets (see sections 40919(a)(4), 40920(a), and 40920.5(a) of the Health and Safety Code), and thus can require transit agencies to implement the alternative-fuel path. As such, the ARB believes that modifying the regulation to provide air districts with a mechanism to require transit agencies to implement the alternative-fuel path is both redundant and unnecessary.

90. Comment: The ARB should specify in the regulation that a local air district designated (at a minimum) as a serious PM10 nonattainment area may adopt a resolution that would limit transit agencies in that region to the alternative-fuel path. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: Please see Agency Response to Comment 89.

91. Comment: The ARB should modify the regulation to enable air districts with an extreme ozone air quality designation to have the authority to opt out of the diesel path. The ARB should also consider providing "opt out" authority to all air districts in the state, regardless of their air quality designations. (Sempra Energy)

    Agency Response: The ARB did not modify the regulation as this commenter recommended. The ARB's legal counsel has concluded that the South Coast Air Quality Management District, the Sacramento Metropolitan Air Quality Management District, and the Mojave Desert Air Quality Management District already have the specific legal authority to implement measures requiring transit operators to purchase and operate low-emission vehicles. This authority is provided in sections 40447.5(a), 41011, and 41231 of the California Health and Safety Code. Only the South Coast region has the distinction of being classified as an "extreme" federal ozone nonattainment area. The ARB's legal counsel has also concluded that other air districts with "serious," "severe," or "extreme" air pollution have the legal authority to regulate vehicle fleets (see sections 40919(a)(4), 40920(a), and 40920.5(a) of the Health and Safety Code), and thus can require transit agencies to implement the alternative-fuel path. As such, the ARB believes that modifying the regulation to provide air districts with a mechanism to require transit agencies to implement the alternative-fuel path is both redundant and unnecessary.

    It is important to note that air districts that exercise their authority to require that transit agencies comply with the alternative-fuel path would gain little or no overall NOx emission benefits (NOx contributes to ozone formation) for their respective regions because the ARB designed both compliance paths to provide equivalent NOx benefits over the lifetime of the regulation. On the other hand, air districts that choose to require that transit agencies adhere to the alternative-fuel path would reduce toxic exposure from diesel PM earlier than transit agencies on the diesel path due to the inherently low in-use PM emissions of alternative-fuel buses.

92. Comment: The diesel path is not in the best interest of the residents in the South Coast region because the particulate emission reductions are not the same for the diesel and alternative-fuel paths. Therefore, the regulation should be modified to allow the South Coast Air Quality Management District to eliminate, either partially or completely, the diesel path compliance option for new urban bus purchases. (SCAQMD, Senator Hayden)

    Agency Response: As discussed in the agency responses to Comments 89 and 91, section 40447.5(a) of the Health and Safety Code provides the South Coast Air Quality Management District with the legal authority to regulate fleets and to require transit agencies to purchase and operate low-emission vehicles. Therefore, the ARB believes it is unnecessary and redundant to modify the regulation to include a specific mechanism to allow the SCAQMD to partially or completely eliminate the diesel path. Subsequent to the Board's approval of this regulation, the South Coast Board approved Rule 1192 on June 16, 2000, requiring transit agencies to purchase only low-emission, alternative-fuel buses when making new bus purchases. Other provisions of the ARB's regulation that are not diesel path-dependent are not superceded by Rule 1192 and still apply in the South Coast region (i.e., PM retrofit requirements, NOx fleet average standard requirement, and zero-emission bus purchases).

93. Comment: The regulation should include special allowances for rural areas that have no choice but to comply with the diesel path due to the unavailability of natural gas. For example, the regulation could define a rural county as having less than 100,000 people, and then exempt rural counties that are in attainment with the California Ambient Air Quality Standards (CAAQS) for ozone and exempt rural public transit agencies with fewer than 25 buses. Another option for modifying the regulation would be to allow rural counties on the diesel path to be exempt from regulation's requirements until January 1, 2007. (NSAQMD)

    Agency Response: The ARB did not modify the regulation as this commenter recommended because the regulation already provides compliance flexibility to small transit agencies operating in federal one-hour ozone attainment areas. The ARB is aware that pipeline natural gas is not available in some rural counties. Therefore, the ARB expects that transit agencies in these areas will continue to purchase and/or lease diesel buses, thus participating in the diesel path. Diesel purchases or leases will be required to meet applicable the emission standards for diesel-fueled engines, as specified in section 1956.1 title 13, CCR.

    However, transit agencies with an active fleet consisting of less than 20 urban buses operating in federal one-hour ozone attainment areas are permitted to delay compliance with the Tier 1 (applicable to urban buses with 1990 and earlier model year diesel-fueled engines) and Tier 2 (applicable to urban buses with 1991 through 1995 model year diesel-fueled engines) PM retrofit requirements until 2007. This delay is necessary due to the difficulties that these regions, most likely rural areas,

may experience in obtaining the low-sulfur diesel fuel (due to price and the logistics of fuel distribution) necessary to comply with the PM retrofit requirements. The ARB expects that the U.S. EPA's low-sulfur diesel fuel requirement will be in effect by 2006, thus minimizing price and supply disruptions in California and enabling the smaller transit agencies in federal one-hour ozone attainment areas to meet their compliance deadlines.

R. Emissions from Other Heavy-Duty Vehicles

94. Comment: The ARB needs to address emissions from school buses and other heavy-duty vehicles. When will the ARB promulgate these regulations? (SCVTA)

Agency Response: During the course of this rulemaking, the ARB stated its intent to address emissions from school buses and other heavy-duty vehicles. In December 2000, the Board is scheduled to consider guidelines for the implementation of the Lower Emission School Bus Program. Governor Davis recently allocated $50 million in the 2000/2001 state budget to fund this voluntary program for the purpose of reducing school children's exposure to harmful diesel exhaust emissions. These guidelines, once approved by the Board, will be used to assist school districts with funding new school bus purchases and/or retrofits for existing buses.

Additionally, the ARB will be considering new emission standards for the 2007 timeframe for other on-road heavy-duty engines and vehicles. This proposal will be subject to notice and comment rulemaking procedures pursuant to the Administrative Procedure Act and will address engines used in school buses and smaller transit buses, which have historically been regulated through emission standards for heavy-duty truck engines. The U.S. EPA has already proposed new emission standards for heavy-duty trucks and buses, to take effect in the 2007 timeframe, in its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545). In consultation with the U.S. EPA, the ARB is committed to harmonizing its 2007 standards with those ultimately adopted by the U.S. EPA.

Finally, on September 28, 2000, the Board approved the "Diesel Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles," a comprehensive plan to significantly reduce diesel PM emissions from diesel-fueled engines used in all heavy-duty applications. Regulations to be developed over the next few years will affect off-road mobile source and stationary source diesel-fueled engines, in addition to the on-road mobile sources discussed above.

95. Comment: The regulation should be modified to include school buses. (Judy Fogel, BAAQMD, SUVA/La Causa, CBE)

Agency Response: While developing this regulation, the ARB staff encountered barriers to including school buses in the fleet rule portion of the regulation. Specifically, the lack of funding available to school districts to purchase new school buses, install alternative-fuel infrastructure, and/or fund retrofits for existing school buses made it impractical to address this transportation sector in this regulation. However, the ARB committed to specifically address school bus emissions in the immediate future. Consequently, the ARB staff is now proposing guidelines for the implementation of the Lower Emission School Bus Program, which will be considered by the Board at its December 2000 public hearing. Governor Davis recently allocated $50 million in the 2000/2001 state budget to fund this voluntary program for the purpose of reducing school children's exposure to harmful diesel exhaust emissions. These guidelines, once approved by the Board, will be used to assist school districts with funding new school bus purchases and/or retrofits for existing buses. Additionally, the ARB will be proposing new emission standards for the 2007 timeframe for other on-road heavy-duty engines and vehicles. This proposal will include emission standards for engines used in school buses and smaller transit buses, which have historically been regulated as heavy-duty truck engines. (Please Also See Agency Responses to Comments 94 and 96.)

96. Comment: Despite the fact that the state's school buses log far fewer miles than transit buses, their total PM emissions are projected to be over four times higher in 2010. Considerable time has elapsed since the ARB identified both transit and school buses as a priority for regulation. The ARB should develop a draft school bus regulation in the year 2000. (ENVIRONMENTAL GROUP JOINT LETTER)

Agency Response: The ARB, in consultation with the CEC, is developing guidelines for the implementation of the Lower Emission School Bus Program, to which Governor Davis has allocated $50 million for the 2000/2001 fiscal year. The purpose of this voluntary program is to reduce school children's exposure to harmful diesel exhaust emissions. The guidelines, scheduled to be considered by the Board in December 2000, will be used to assist school districts with funding new school bus purchases and/or retrofits for existing buses.

New, mandatory emission standards for engines used in school buses will be included in emission standards that the ARB will soon be proposing to take effect in the 2007 timeframe. (Please Also See Agency Responses to Comments 94 and 95.)

97. Comment: We are concerned that the fleet rule does not capture the smaller 30 to 40 foot transit buses that do not meet a 33,000 Gross Vehicle Weight Rating. The ARB should evaluate actual Gross Vehicle Weight data for 30-foot transit buses and establish a means by which these vehicles can be included in the fleet rule. (ENVIRONMENTAL GROUP JOINT LETTER)

    Agency Response: The ARB did not modify the regulation to include smaller transit buses in the fleet rule portion of the regulation. The regulation only affects full-size transit buses meeting the federal definition of an urban bus as defined in section 86.094-2, subpart N, part 86, title 40, CFR. Historically, smaller transit buses have been regulated through emission standards for heavy-duty truck engines, not through emission standards for urban bus engines. The ARB has continued this regulatory precedent. The ARB will be considering new emission standards for the 2007 timeframe for other heavy-duty engines and vehicles, including engines used in smaller transit buses. The U.S. EPA has already proposed new emission standards for heavy-duty trucks and buses, to take effect in the 2007 timeframe, in its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545). In consultation with the U.S. EPA, the ARB is committed to harmonizing its 2007 standards with those ultimately adopted by the U.S. EPA.

S. Miscellaneous Comments

98. Comment: The regulation should allow diesel fleets to switch to biodiesel as an interim solution while gradually phasing out diesel buses. Biodiesel, coupled with a gradual phase out of diesel buses, should provide an economically viable interim solution, thus easing the transition to alternative fuels. (Dunlap)

    Agency Response: The urban bus regulation does not explicitly prohibit the use of biodiesel as an alternative to diesel fuel use. Biodiesel, made from natural, renewable sources such as vegetable oils, can be substituted in diesel engines with essentially no engine modifications. Depending on the test methods used, biodiesel has demonstrated both increases and decreases in NOx emissions, and decreases in unburned hydrocarbons, carbon monoxide, and particulate matter. However, biodiesel's use in widespread commercial markets in California (and in the rest of the United States) is relatively unknown, and it is marketed at a premium compared to petroleum diesel. Thus, fuel costs are greater than petroleum diesel for fleet managers that use biodiesel or biodiesel blends.

99. Comment: There is a method for converting frying oil into a fuel that could be used instead of diesel fuel, thus lowering diesel exhaust emissions. (Individual comment within an FL2 letter)

Agency Response: Used frying oil is one potential feedstock in producing biodiesel, a diesel fuel substitute. However, biodiesel's use in widespread commercial markets in California (and in the rest of the United States) is relatively unknown, and it is marketed at a premium compared to petroleum diesel. Thus, fuel costs are greater than petroleum diesel for fleet managers that use biodiesel or biodiesel blends. The ARB is unaware of any other viable method for converting frying oil into motor vehicle fuel for commercial use. (Please also see Agency Response to Comment 98.)

100. Comment: The safety issues regarding CNG fueling and gaseous hydrogen are grossly understated and clearly not understood by the ARB. (Nova BUS)

Agency Response: The ARB disagrees with this comment and acknowledges the safety concerns associated with natural gas and gaseous hydrogen. However, safety concerns are not limited to these specific fuels; diesel, too, has safety issues associated with its use. All fuels pose potential hazards; these hazards, however, do not preclude their viability as motor vehicle fuels. Proper training for personnel who handle fuels, strict adherence to rigorous safety, handling, and manufacturing procedures, and familiarization with specific fuel properties will reduce the potential for accidents and help ensure public safety. This tenet holds true for all motor vehicle fuels.

101. Comment: The ARB should require all urban buses, regardless of fuel type, to eventually meet a lower NOx emission standard than what is contained in the proposed regulation. Specifically, the ARB should adopt a 0.1 g/bhp-hr NOx standard for 2008 and subsequent model year bus engines. There are at least three potential technical pathways for achieving this level assuming five or more years of additional aftertreatment development and several years for ramp up to full production: 1) 2.0 g/bhp-hr NOx engines with 95 percent control; 2) 1.0 g/bhp-hr NOx engines with 90 percent control; or 3) 0.5 g/bhp-hr engines NOx engines with 80 percent control. (ENVIRONMENTAL GROUP JOINT LETTER)

Agency Response: The ARB did not modify the regulation as this commenter recommended. The ARB expects that NOx aftertreatment technologies, such as NOx adsorbers or selective catalytic reduction systems, will be able to reduce NOx emissions by more than 70 percent from existing standards in the 2004 timeframe. With additional advances, the ARB expects that perfected aftertreatment technologies will be able to achieve even more reductions in the future. As such, the regulation already includes a requirement for a more stringent NOx standard -- a 0.2 g/bhp-hr standard -- for 2007 and subsequent model year urban bus engines. In addition, the ARB stated its intent during this rulemaking to harmonize, to the extent possible, California's heavy-duty vehicle emission standards with federal emission standards proposed for the 2007 timeframe. The U.S. EPA's Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545) includes a proposed 0.2 g/bhp-hr NOx standard for 2007 and

subsequent model year heavy-duty engines, including urban bus engines. Thus, the ARB believes the NOx emission standards contained in this regulation are the most appropriate level at this time.

102. Comment: The current requirement for transit fleets to meet a 4.8 g/bhp-hr NOx fleet average standard should be strengthened to provide a more aggressive strategy incorporating a declining fleet average standard (e.g., requirements to meet 4.8 g/bhp-hr in 2002, 3.0 g/bhp-hr in 2003, 2.0 g/bhp-hr in 2004, etc.). This would not only provide additional emission benefits from existing transit fleets, but would also drive the creation of aftertreatment devices for the much larger non-transit heavy-duty vehicle population. (MTDB)

Agency Response: The ARB did not modify the regulation as the commenter recommended. During regulatory development, the ARB evaluated NOx fleet average emissions from numerous transit agencies throughout California to determine the most appropriate NOx fleet average requirement to impose on transit agencies. While the intent behind the 4.8 g/bhp-hr NOx fleet average standard is to require transit agencies to reduce emissions from their oldest, most polluting urban buses, it is not meant to subject transit agencies to an overly onerous requirement. The ARB determined that most transit agencies could comply with the 4.8 g/bhp-hr NOx standard by retiring their 1987 and earlier buses and replacing them with new urban buses meeting more stringent emission standards. Depending on a transit agency's actual fleet composition, this could be the most cost-effective way for a transit agency to comply with the requirement. Transit agencies could also repower or retrofit existing buses to lower-emitting configurations. While the ARB recognizes that a more aggressive NOx fleet average standard could result in additional emission reductions, it also believes such a requirement could be a financial burden to many transit fleets and jeopardize their ability to comply.

103. Comment: Buses are an integral component in an effective transportation system for the masses. The ARB should ensure that the regulation promotes both clean air and the use of public transportation. (Ritchie)

Agency Response: The ARB agrees wholeheartedly that urban buses are an integral component of an effective public transportation system, and believes that the regulation promotes clean air through the implementation of multiple strategies to reduce emissions from urban bus fleets. While the ARB encourages the use of alternative modes of transportation, including public transportation, to reduce vehicular emissions, it does not have the authority to require the public to use any form of public transportation.

T. Alternative NOx Strategies

104. Comment: In approving the EMA's recommendation for an alternative NOx strategy in section 1956.2, title 13, CCR, the Board directed that any transit fleet conducting such a strategy must demonstrate NOx emission reductions "greater than" the base requirement (i.e., the 2004 through 2006 emission standards for diesel-fueled engines), rather than "equivalent" to the base requirement. The Board provided no justification for why a demonstration of "greater than" must be made, especially considering that EMA's recommendation linked the NOx equivalency option to a clear and demonstrable PM benefit. Nevertheless, if the final regulation includes the "greater than" requirement, the language in paragraph (d)(7)(B) in section 1956.2 should be modified by changing "through 2015" to "an average over the period from adoption of this rule through 2015" in order to avoid ambiguity in the duration of time over which the demonstration must be made. (EMA)

Agency Response: The ARB did not modify the regulation as this commenter recommended. With regard to the commenter's first point, the ARB believes that the Board provided ample justification at the February hearing for this requirement. The Board directed that the optional, alternative NOx strategies must achieve NOx emission reductions greater than the 2004 through 2006 standards to account for the inherent uncertainty associated with an alternative strategy and to send a clear signal to the engine manufacturers to do everything possible to accelerate the development of advanced NOx control technology. The Board was clear in directing the staff to make this change to the EMA recommendation in keeping with the Board's intent to provide compliance flexibility, while at the same time demonstrating the Board's unwavering commitment to achieving critical NOx reductions.

Regarding the commenter's recommendation for modifying the regulatory language to allow NOx reductions to be averaged over the life of the regulation, the ARB believes that such a modification would explicitly allow for NOx increases over a potentially long period of time from regulation adoption through 2015. This was not the Board's intent; rather, it expects appreciable benefits in NOx reductions throughout the life of the regulation. Nonetheless, the Board will work with transit agencies to ensure that they are afforded the compliance flexibility needed to meet their emission reduction goals in consideration of available technology and cost. (Please also see Agency Response to Comment 105.)

105. Comment: One of the key elements of the modified regulation is the provision incorporating the EMA's proposal to provide significant emission reductions by implementing the 0.01 g/bhp-hr PM standard 15 months ahead of when originally proposed, in conjunction with providing the Executive Officer discretionary authority to approve fleet specific, optional, alternative NOx strategies that provide emission reductions equivalent to the 2004 through 2006 emission standards for diesel-fueled

engines. In approving the EMA's recommendation, the Board also directed the Executive Officer to present the application of the first transit fleet requesting an exemption to conduct an optional NOx strategy to the Board for consideration. Such a process is likely to delay granting any such exemption and to discourage a transit fleet from being the first to apply. The Board should not impose an unnecessary and burdensome process and should not unduly constrain the Executive Officer's discretion. (EMA)

Agency Response: The ARB declines to change this provision. At the February 24, 2000, hearing, the Board clearly directed the Executive Officer to present the application of the first transit fleet requesting an exemption to conduct an optional NOx strategy to the Board for consideration. This direction is not contained in the regulation itself, but in Board Resolution 00-2. The purpose of this provision is to provide a full public forum in which to discuss the status of advanced NOx control technology and to determine, at that time, a definition of what "greater than" means in terms of achieving NOx reductions from an alternative NOx strategy, rather than through the purchase of diesel-fueled engines meeting the 2004 through 2006 standards.

Aftertreatment technology is rapidly developing and the Board did not want to limit the NOx reductions that could be achieved with an alternative strategy by constraining the reductions to "equivalent to" what could be achieved through the 2004 through 2006 standards, or by defining "greater than" in the context of current expectations for advanced technology.

The ARB believes this process could, in fact, encourage, rather than discourage, transit agencies to be the first to apply because the first to apply will have a more active role in defining "greater than," rather than being subject to a precedent, as subsequent transit agencies to apply may be. (Please also see Agency Response to Comment 104.)

106. Comment: Paragraph (d)(7)(A) in section 1956.2, title 13, CCR, requires transit agencies to apply to the Executive Officer by June 30, 2001, for an exemption from purchasing diesel-fueled engines meeting the 2004 through 2006 emission standards. This deadline does not provide transit agencies with sufficient time to evaluate all their options, including whether diesel-fueled engines meeting the standards would be available. The deadline for applying to the Executive Officer should be extended to June 30, 2003. Furthermore, the regulation should require the Executive Officer to respond to the application within a reasonable timeframe, for example, within 30 days. (CTranA)

Agency Response: The June 30, 2001, deadline for transit agencies to exercise the alternative NOx strategy compliance option is derived from two factors. First, the entire process for a transit agency to purchase an urban transit bus takes approximately 12 to 18 months from the time of order to actual bus delivery.

Purchasing decisions for buses to be delivered in 2004 would need to be made as early as mid-2002.

Second, the ARB staff needs sufficient time to evaluate applications to conduct an alternative NOx strategy for effectiveness in achieving claimed NOx reductions. Because each transit agency's application will be based on its individual fleet composition and could include a variety of emission reduction strategies, each application will require an extensive case-by-case review. If the ARB determines that an alternative NOx strategy would not achieve NOx emission benefits greater than what would be achieved through the implementation of the 2004 through 2006 emission standards, it wants to ensure that transit agencies will have adequate time to revise their alternative NOx strategies and resubmit to the ARB for further evaluation. Changing the application deadline to June 30, 2003, could severely constrain both the ARB's review time and transit agencies' abilities to make purchasing decisions based on the outcome of the review of their respective applications.

Finally, the Executive Officer will not impede transit agencies' compliance with the regulation and will therefore respond to all applications as expeditiously as is possible, whether or not specific regulatory language exists directing him to do so, given the extensive application review that will be required by the ARB.

107. Comment: The requirement that transit agencies apply to the Executive Officer by June 30, 2001, for an exemption to conduct an alternative NOx reduction strategy was never considered as part of the rulemaking, nor discussed with interested and affected parties. Fleets seeking the option to conduct an alternative NOx reduction strategy should not have an arbitrarily imposed deadline on when they can seek and obtain the available exemption. The June 30, 2001, deadline should be deleted from the regulation. (EMA)

Agency Response: This requirement was included in the regulatory language presented to the Board at the February 24, 2000, hearing, and was made available to the public for a supplemental 15-day comment period from August 16, 2000, through August 31, 2000, pursuant to Government Code section 11346.8(c). Due to the complexity of strategies that may be submitted, the ARB believes this deadline is necessary to ensure that transit agencies have adequate time to resubmit an appropriate alternative NOx strategy and make informed purchasing decisions, should the ARB, after a thorough review, determine that a transit agency's first submission for an alternative strategy does not achieve sufficient NOx reductions. (Please also see Agency Response to Comment 106.)

108. Comment: Paragraph (c)(5) in section 1956.2, title 13, CCR, appears to have been included as a modification to the regulation without any explicit direction by the Board. We believe the intent of this paragraph is to conform the sales of diesel-fueled engines to transit agencies on the alternative-fuel path to the same emission standards for 2004 through 2006 model year diesel-fueled engines as sold to transit

agencies on the diesel path. If that is the intent, the paragraph should be modified to include the same alternative NOx strategy option available to transit agencies on the diesel path. (CTranA).

Agency Response: It is correct that the intent of paragraph (c)(5) in section 1956.2 is to conform the sales of diesel-fueled engines to transit agencies on the alternative-fuel path to the emission standards for 2004 through 2006 model year diesel-fueled engines sold to transit agencies on the diesel path. This language was negotiated at the January 24, 2000, hearing and included in modifications presented to the Board at that time. Thus, it was clearly approved by the Board.

Regarding the commenter's recommendation for regulatory modification, the ARB agrees with the recommendation and has clarified its intent by adding language to the regulatory text to provide transit fleets on the alternative-fuel path the same flexibility as transit fleets on the diesel path by allowing such fleets to conduct an alternative NOx strategy in lieu of purchasing diesel-fueled urban buses with engines meeting the emission standards for 2004 through 2006 model year diesel-fueled engines. It was the ARB's intent to make the alternative NOx strategy provision equally available to transit agencies on both the diesel and alternative-fuel paths; the regulation now makes this clear. (Please also see Agency Response to Comment 109.)

109. Comment: While the modified regulation includes the EMA's recommendation for an alternative NOx strategy that may be used by transit agencies on the diesel path in lieu of purchasing diesel-fueled engines meeting the 2004 through 2006 model year standards, it still includes a provision that engine manufacturers produce diesel-fueled engines meeting those standards for an incredibly small market — transit agencies on the alternative-fuel path. If engine manufacturers did not or could not produce such a specialized engine, the regulation penalizes transit agencies on the alternative-fuel path that need to purchase diesel-fueled engines for articulated buses or other specialty applications not served by alternative-fuel engines. The ARB should modify paragraph (c)(5) in section 1956.2, title 13, CCR, to eliminate the reference to the more stringent emission standards applicable to 2004 through 2006 diesel-fueled engines, thus allowing transit agencies on the alternative-fuel path to purchase diesel-fueled engines meeting the existing 2.5 g/bhp-hr NOx + NMHC emission standard. (EMA)

Agency Response: The Board made it clear that the 2004 through 2006 standards for diesel-fueled engines are a crucial element of this regulation and are intended to stimulate technology advances that, with further refinements, will enable other heavy-duty vehicles to meet lower emission standards proposed for 2007. When the Board approved the inclusion of an alternative NOx strategy for transit agencies as a compliance *option* at the request of the EMA and the California Transit Association, it was not the Board's intent to entirely eliminate the emission standards for 2004 through 2006 model year diesel-fueled engines. These emission standards are still in force.

However, the ARB has always agreed that compliance flexibility is necessary for transit fleets on the alternative-fuel path that would normally purchase only a small percentage of diesel-fueled urban buses in the 2004 through 2006 timeframe to meet special service needs. Therefore, the ARB has explicitly clarified the regulation to allow transit fleets on the alternative-fuel path to utilize an alternative NOx strategy, just as transit fleets on the diesel path are allowed to do. Because this amendment more clearly effectuates the Board's intent, it is a nonsubstantive change. (Please also see Agency Response to Comment 108.)

110. Comment: Paragraph (d)(7)(C) in section 1956.2, title 13, CCR, states that the Executive Officer can only approve a transit agency's application for the alternative NOx strategy if transit agencies "have demonstrated, or are contractually committed to demonstrate, advanced NOx aftertreatment technology." This is a totally new concept, and to our recollection, was never discussed by interested parties and the staff, and certainly not at the Board level. The alternative NOx strategy option should remain as flexible as possible and should not limit the program to specific technologies or approaches. This provision should be eliminated. (CTranA)

Agency Response: The provision to require a NOx aftertreatment technology demonstration as a component of an alternative NOx strategy was a commitment made by the EMA as a condition of including the alternative NOx strategy in the regulation. The technology demonstration is a criterion for Executive Officer approval of a transit agency's alternative NOx strategy; it is not a prescribed method for achieving reductions through an alternative NOx strategy. The technology demonstration concept was included in the staff's presentation to the Board on February 24, 2000. The full regulatory text of this specific condition for receiving approval to conduct an alternative NOx strategy states, "The Executive Officer finds that transit agencies, after consulting with the EMA, have demonstrated, or are contractually committed to demonstrate, advanced NOx aftertreatment technology. It is interesting to note that the EMA did not comment negatively regarding this specific provision during the supplemental 15-day comment period.

The purpose of this provision is to have transit agencies demonstrate the advanced NOx aftertreatment devices that are necessary for meeting the 2004 emission standards for diesel-fueled urban bus engines, and for establishing a technical basis for more stringent emission standards to be proposed for the 2007 timeframe for heavy-duty diesel trucks. While the demonstrations are limited to advanced NOx aftertreatment technology, the alternative NOx strategies that may be implemented by transit agencies are not limited to a specific technology or approach, such as the use of aftertreatment. The regulation does not prescribe the technology or approach that a transit agency must use when implementing an alternative NOx strategy, only specific criteria that must be met should any transit agency opt to conduct one.

111. Comment: Paragraph (d)(7)(B) in section 1956.2, title 13, CCR, states that the alternative NOx strategy option must demonstrate "NOx emissions benefits through

2015." The Board's clear direction was that any optional program must not result in one more ounce of emissions than the 2004 through 2006 model year emission standards would otherwise allow, over the entire life of the rule. Therefore, the paragraph should properly read "NOx emissions benefits by 2015." (CTranA)

Agency Response: The ARB believes the regulatory language specifying NOx emission benefits through 2015 is correct. The provisions of the fleet rule contained in section 1956.2 extend from the effective date of the regulation through 2015, as stated on page 16 of the Staff Report. Modifying the regulatory language to read "NOx emissions benefits by 2015" would only provide emission benefits through the year 2014.

U. PM Retrofit Requirements

112. Comment: The regulation provides an exemption from the PM retrofit requirements for transit agencies with fewer than 20 buses. However, the exemption applies only if the fleet is located in an ozone (not PM) attainment area. Since this provision relates to a potential exemption from a PM retrofit requirement, the requirement relating to ozone attainment makes no sense and should be deleted. Small fleets should be afforded PM retrofit flexibility irrespective of whether they are located in an ozone attainment area. (EMA)

Agency Response: The concept of a compliance delay for small transit agencies in ozone attainment areas was in the regulation as originally proposed in the Staff Report on December 10, 1999. This particular comment relates to language that was added to further clarify the ARB's intent. The ARB certainly understands the difference between ozone and PM; the ARB provided PM retrofit flexibility to small transit agencies in federal one-hour ozone attainment areas because these are most likely rural regions that may have difficulty obtaining the low-sulfur diesel fuel (due to price and the logistics of fuel distribution) necessary to comply with the PM retrofit requirements. It is also important to note that these small transit agencies are not given an exemption, as the commenter states, but a delay in complying with the requirements until January 1, 2007. The ARB expects that a national low-sulfur diesel fuel requirement will be in effect by January 2007, thus minimizing price and supply disruptions in California and enabling the small transit agencies in ozone attainment areas to meet their compliance deadlines.

The U.S. EPA's Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545) includes a proposal to limit the sulfur content in diesel fuel to 15 ppm by weight, which is the same requirement contained in this rulemaking. Board Resolution 00-2 directs the Executive Officer to work closely with the U.S. EPA in its development of a new national diesel fuel specification, and to reevaluate the low-sulfur diesel fuel requirement in this regulation, if necessary, soon after the U.S. EPA adopts its national fuel specification.

113. Comment: The regulation specifies the procedures transit agencies must use to obtain a one-year delay in complying with the PM retrofit requirements when a retrofit device for a particular engine is not available to perform the retrofit within six months of the compliance deadlines. If the conditions leading to approval of the one-year delay should continue beyond the initial year, the Executive Officer should have the discretion to extend or renew the delay. Paragraph (f)(6) in section 1956.2, title 13, CCR, should be modified accordingly. (EMA)

Agency Response: The ARB agrees that if the conditions leading to approval of the one-year delay continue beyond the initial year, the Executive Officer should have the discretion to extend or renew the delay. The current regulatory language does not contain any provision that limits the Executive Officer's authority to perform such an action; hence, no change to the regulation is necessary.

V. PM Retrofit Certification Procedures

114. Comment: The modified regulation includes a procedure for certifying PM retrofit devices, incorporated by reference in title 13, section 1956.2 (f)(7), for use in meeting the regulation's PM retrofit requirements. However, there has been no dialogue, workshops, public hearing, or meaningful opportunity to review and comment on the procedures by engine manufacturers, aftertreatment device manufacturers, and other interested parties. Indeed, the proposed procedures are not even limited to transit buses and appear to apply to all on-road heavy-duty diesel engines. (EMA)

Agency Response: The ARB disagrees with this comment. The Notice of Public Hearing made available to the public on December 10, 1999, clearly stated that the proposal required the use of PM retrofit devices with an efficiency of at least 85 percent. The public was clearly on notice that retrofit device certification procedures would be subject to discussion during the hearing process. The specific procedures for certifying PM retrofit devices were incorporated into the regulation after the original proposal contained in the Staff Report was released and made available to the public on December 10, 1999. Representatives of the EMA, along with representatives of the aftertreatment industry who will be manufacturing and certifying the devices, received and discussed the proposed certification procedures with the ARB staff prior to the January 27, 2000, hearing. At that hearing, the ARB staff presented the certification procedures to the Board as a regulatory modification that amplified the previously noticed PM retrofit device requirement. This action was supported by the EMA, who urged the Board to accept the procedures as part of the staff's regulatory modifications. (For EMA's support testimony, see page 317 of Hearing Transcript.)

In accordance with section 11346.8(c) of the Government Code, the regulatory modifications presented to the Board at the January and February public hearings,

and subsequently approved at the February hearing, including the PM retrofit certification procedures, were made available to the public for a supplemental 15-day public comment period beginning August 16, 2000. With the exception of the EMA's comments, the ARB did not receive any negative comments concerning the procedures, and may assume that those who will be manufacturing the devices are comfortable with the requirement.

Regarding the commenter's concern that the PM retrofit certification procedures are not limited to urban buses, the only California regulatory requirements to perform PM retrofits are those contained in this rulemaking for urban bus engines. Other classes of heavy-duty diesel engines are not required by any regulation to undergo retrofits for PM control; therefore, the PM retrofit certification procedures are limited to urban bus engines. Regulatory retrofit requirements for other heavy-duty engines will be addressed through the traditional rulemaking process in the future and will be subject to full public comment. (Please also see Agency Responses to Comment 115 and 116.)

115. Comment: The proposed PM retrofit certification procedures are brand new; are not sufficiently related to the originally proposed rule so as to provide adequate notice for public comment; were not explicitly directed to be a part of the 15-day Notice by the Board's action on February 24, 2000; and, if adopted, would impose significant costs, create unnecessary hardships, and would likely stifle the use of effective retrofit technologies. The ARB should revise and re-propose for public comment an appropriate certification procedure for PM retrofits. (EMA)

Agency Response: The ARB disagrees with this comment. The Notice of Public Hearing made available to the public on December 10, 1999, clearly stated that the proposal required the use of PM retrofit devices with an efficiency of at least 85 percent. The proposed PM retrofit certification procedures included in the 15-day Notice were presented to the Board as a regulatory modification to the originally proposed text as early as the January hearing, at which time the commenter provided support testimony urging the Board to adopt the certification procedures. (For EMA's support testimony, see page 317 of Hearing Transcript.) In response to public comments received at the January hearing, the Board Chairman asked the staff to provide further information at the continuation of the hearing on those issues that had generated extensive discussion at the January hearing. The PM retrofit certification procedures were not among the issues that had engendered substantial comment and on which the Board sought further staff analysis, although EMA and all of the others who participated in the hearing had been given ample opportunity to comment and raise their concerns.

The Board's approval of the regulation at the February hearing included the modifications that had been previously discussed at the January hearing; among them were the PM retrofit certification procedures. Pursuant to section 11346.8(c) of the Government Code, the regulatory modifications, including the PM retrofit certification procedures, were made available to the public for a supplemental

15-day public comment period beginning August 16, 2000. With the exception of the EMA's comments, the ARB did not receive any negative comments concerning the certification procedures. The EMA had sufficient opportunity during the rule adoption process to address the PM retrofit certification procedures had it chosen to do so.

Regarding the commenter's second concern that the retrofit certification procedures would impose significant costs, create unnecessary hardships, and would likely stifle the use of effective retrofit technologies, it must be pointed out that the commenter is not the party that would suffer alleged hardships imposed by the certification procedures. The aftertreatment industry would develop, manufacturer, and certify the retrofit devices for sale in California. The leading diesel particulate trap manufacturers have already stated their intent to certify retrofit devices under the ARB's proposed certification procedures. The ARB takes particular exception to the comment that the proposed procedures would stifle the use of effective PM retrofit technologies. Effective retrofit technologies are currently available for commercial use; the ability to use these technologies will be facilitated and enhanced by the imposition of certification procedures that will ensure that the retrofit devices are durable, achieve claimed emission reductions, and are warranted for emissions and mechanical performance. The ARB believes the adoption of the certification procedures will encourage the use of effective retrofit technologies.

116. Comment: The scope of appropriate PM retrofit device certification procedures must be addressed. If the scope is limited to urban buses, the provisions that require a 0.01 g/bhp-hr or 85 percent reduction performance criteria are acceptable. If, however, the procedures apply to all heavy-duty on-road diesel engines, the ARB should not require the 0.01 or 85 percent acceptability criteria. There may be robust retrofit technologies that, while unable to achieve an 85 percent reduction, still achieve significant reductions in PM. These retrofit technologies should not automatically be precluded. (EMA)

Agency Response: The only California regulatory requirements, at this time, to perform PM retrofits are those contained in this rulemaking for urban bus engines. Therefore, the procedures are currently limited to urban bus engines.

Retrofit devices for use on other heavy-duty vehicle duty applications could be subject to the retrofit procedures in the future as part of non-regulatory incentive programs (e.g., the Lower Emission School Bus Program) that provide public monies to achieve necessary emission reductions. Regulatory retrofit requirements for other classes of heavy-duty engines will be addressed through the traditional rulemaking process in the future, and if other heavy-duty engines are made subject to PM retrofit requirements after full public discussion, appropriate changes could be incorporated into the procedures at that time. (Please also see Agency Response to Comment 114.)

117. Comment: The use of a chassis test should not be included in PM retrofit certification procedures until there are acceptable, accurate, and repeatable chassis test procedures that can be correlated with the Federal Test Procedure. (EMA)

Agency Response: The Federal Test Procedure (FTP) is a prescribed set of engine operation test points conducted in the laboratory intended to represent the typical operation of a heavy-duty vehicle in-use, and is the standard test cycle for engine certification. In practice, however, the FTP is not, in all instances, representative of actual operating parameters, which may vary significantly between different heavy-duty vehicle applications (e.g., a line-haul haul truck versus an urban transit bus). Because a vehicle's operating parameters (e.g., vehicle speed, engine load, exhaust temperature) are critical to demonstrating the emissions performance and system durability for retrofit devices, the aftertreatment manufacturers sought the flexibility to use a chassis test cycle that may better represent the operating parameters of an urban transit bus. Hence, the ARB believes it is appropriate for the PM retrofit procedures to include the *option* to use a chassis test cycle in lieu of the FTP, if approved by the Executive Officer.

118. Comment: The PM retrofit certification procedures should not include a requirement for two emission tests. There is no need for two tests, nor do the proposed procedures explain what happens if the two tests produce different results. (EMA)

Agency Response: The purpose of the requirement to perform at least two emission tests is to demonstrate repeatability in emissions performance. The ARB will evaluate all test data, and if significant test-to-test variability occurs, may request that the applicant for retrofit device certification perform additional emission tests.

W. Compliance Issues

119. Comment: Since the Board approval of the regulation in February 2000, several transit agencies have expressed uncertainty in evaluating the two compliance paths without the benefit of the final regulatory language that includes all the modifications made subsequent to the regulation as originally proposed on December 10, 1999. While the content of the modified regulation is now known and it is acknowledged that most transit agencies had a fair idea about the contents of the modified regulation, based on the previously published staff report and the actions of the Board on February 24, 2000, there is still uncertainty on how the modified regulation would reflect the Board's decision to include an alternative NOx strategy provision. Therefore, the ARB should allow transit agencies a six month delay in the requirement to choose a compliance path by January 31, 2001. (CTranA, EMA)

Agency Response: The ARB is fully committed to working with the California Transit Association and its individual member agencies in achieving successful regulation implementation and compliance. As such, the ARB staff is available to meet with individual transit agencies to discuss regulation requirements and how their

respective fleets may be affected. That said, the ARB does not believe there is sufficient cause to approve the request for a delay. The regulation's reporting requirements, including the requirement to choose a compliance path by January 31, 2001, were approved by the Board at the February 24, 2000, public hearing. The ARB staff is required to implement the decisions of the Board; it cannot modify them at its own discretion. Furthermore, the alternative NOx strategy provision was added, at the request of the EMA and the California Transit Association, as a compliance *option*, not as a *requirement*, designed to provide flexibility to transit agencies that purchase diesel-fueled buses in the 2004 through 2006 timeframe. The regulation does not prescribe the strategies that a transit agency may use when exercising this option, only specific criteria that must be met should any transit agency opt to conduct an alternative NOx strategy. It is somewhat ironic that the commenters are basing their request for a delay in choosing a compliance path on a provision that was included in the modified regulation at their request.

120. Comment: Paragraph (a)(2) in section 1956.4, title 13, CCR, specifies the procedures transit agencies on the alternative fuel path must use in requesting a deviation from the 85 percent purchase requirement. The regulation should also require the Executive Officer to respond to the request within a reasonable timeframe, for example, within 30 days. (CTranA, EMA)

Agency Response: The Executive Officer will not impede transit agencies' compliance with the regulation and will therefore respond to all requests in a timely manner, whether or not specific regulatory language exists directing him to do so.

121. Comment: Paragraph (f)(2) in section 1956.4, title 13, CCR, specifies the procedures transit agencies must use in requesting a deviation from the 15 percent zero-emission bus purchase requirement. The regulation should also require the Executive Officer to respond to the request within a reasonable timeframe, for example, within 30 days. (CTranA, EMA)

Agency Response: The Executive Officer will not impede transit agencies' compliance with the regulation and will therefore respond to all requests in a timely manner, whether or not specific regulatory language exists directing him to do so.

122. Comment: Paragraphs (d)(2)(A) and (d)(2)(B) in section 1956.4, title 13, CCR set dates for transit agencies to submit reports on compliance with the regulation's PM retrofit requirements. As provided for in paragraphs (f)(1) and (f)(2) of section 1956.2, some small transit agencies are allowed a delay in complying with the PM retrofit requirements. The reporting dates specified in section 1956.4 do not account for those transit agencies that are allowed to delay compliance. (EMA)

Agency Response: It is correct that the reporting deadlines to demonstrate compliance with the PM retrofit requirements are based on a "conventional" retrofit schedule. The ARB will coordinate with the small transit agencies in ozone

attainment areas that are allowed a delay in compliance to determine appropriate reporting deadlines commensurate with the approved delays.

123. Comment: Paragraph (d)(4) in section 1956.2, title 13, CCR, states that "transit agencies on the diesel path shall not purchase any diesel-fueled, dual-fuel, bi-fuel, or alternative-fuel buses with 2004 – 2006 model year engines certified to emissions levels in excess of those specified in (a)(11) of section 1956.1, title 13, CCR." For clarity, the words "unless exempted under the provisions of paragraph (d)(7) of this section" should be appended to this paragraph. (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification as a change without regulatory effect.

124. Comment: Paragraph (f)(2) in section 1956.2, title 13, CCR, pertains to PM retrofit requirements for 1991 through 1995 urban bus engines. To improve clarity, the reference to "interim requirements" should be modified to state "the interim requirements described in subsections (A) and (B) below." (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification as a change without regulatory effect.

125. Comment: In paragraph (c)(4)(B) in section 1956.3, title 13, CCR, it appears the words "in service" have been omitted from the language describing requirements for earning credits for the early introduction of zero-emission buses. The words "in service" should be included. (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification as a change without regulatory effect.

X. Articulated Urban Buses

126. Comment: During rule development, the California Transit Association believed that articulated buses, having extraordinary engine horsepower requirements, would be exempted from the requirements of the regulation. The ARB should confirm this. (CTranA)

Agency Response: The regulation does not exempt articulated buses from the requirements of the regulation, but does provide flexibility to those transit agencies that have service needs best met through the use of articulated buses. The ARB acknowledges the unique operating parameters of articulated buses that can now only be met with diesel-fueled urban bus engines. For this reason, the regulation was specifically crafted to accommodate transit agencies on the alternative-fuel path by allowing up to15 percent of new bus purchases on the alternative-fuel path to be diesel buses. The diesel-fueled engines in those buses, however, must still meet the applicable emission standards, specified in section 1956.1, title 13, CCR, and must comply with the fleet rule components specified in section 1956.2.

Y. Harmonization with U.S. EPA's 2007 Emission Standards

127. Comment: The ARB's regulation sets emission standards for 2007 and subsequent model year urban bus engines. There are some significant differences between the ARB's 2007 emission standards and the heavy-duty engine and vehicle standards proposed by the U.S. EPA for the same timeframe. (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 – 35545.) Specifically, the standards for NMHC, CO, and formaldehyde are different. In addition, the U.S. EPA is proposing to phase in its standards, while the ARB's standards take full effect in 2007. The ARB should officially indicate that it will attempt to harmonize its standards with those in the U.S. EPA's proposal. (CTranA)

Agency Response: While this comment is not germane to the modifications contained in the Notice of Public Availability of Modified Text and Supporting Documents, the ARB will respond.

The emission standards proposed by staff and adopted by the Board for 2007 and subsequent model year urban bus engines are essential to achieving crucial reductions in ozone-precursor NOx emissions and toxic PM emissions in California. Throughout the course of this rulemaking, the ARB stated its intent to harmonize, to the extent possible, California's 2007 and subsequent model year urban bus engine standards with the heavy-duty engine standards ultimately adopted by the U.S. EPA for the same timeframe. The U.S. EPA only recently issued its Notice of Proposed Rulemaking for Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (Federal Register, Vol. 65, No. 107, June 2, 2000, pp. 35430 - 35545). Once the U.S. EPA's rulemaking is finalized, the ARB staff will consider modifications to California's 2007 standards for urban bus engines, if necessary.

128. Comment: Throughout development of this regulation, the EMA stressed the need for the ARB's regulation to harmonize with the U.S. EPA's emission standards for 2007 and subsequent model year engines used in trucks and buses. The U.S. EPA has now published its Notice of Proposed Rulemaking, and its proposed standards for NMHC, CO, and formaldehyde are somewhat different that the ARB's emission standards for 2007 and subsequent model year bus engines. The ARB must modify the provisions in paragraph (a)(12) of section 1956.1, title 13, CCR, to assure harmonization with the standards U.S. EPA ultimately finalizes. The ARB should delete the numerical limits in paragraph (a)(12) and insert a provision incorporating by reference whatever standards the U.S. EPA ultimately finalizes in the Code of Federal Regulations. (EMA)

Agency Response: Again, while this comment is not germane to the modifications contained in the Notice of Public Availability of Modified Text and Supporting Documents, the ARB will respond.

In response to the commenter's specific suggestion for modifying the ARB's regulation, the ARB is required by law to include the title and date of issuance of the document containing another agency's rule or test procedure referenced within an ARB regulation; the ARB cannot include an open-ended provision incorporating a standard not yet adopted by the U.S. EPA. (See title 1, section 20(c)(4), CCR.) Once the U.S. EPA finalizes its rulemaking for emission standards for 2007 and subsequent model year heavy-duty vehicles and engines, the ARB staff will consider modifications to California's 2007 standards for urban bus engines, if necessary. (Please also see Agency Response to Comment 127.)

Z. Miscellaneous Comments

129. Comment: To clarify the ARB's intent and provide consistency with language in the remainder of the paragraph, paragraph (e) in section 1956.2, title 13, CCR, should be changed to refer to engines in the "active fleet", rather than "engines in use." (CTranA)

Agency Response: The ARB agrees that this comment represents the Board's intent and has modified language in paragraph (e) of section 1956.2, title 13, CCR, regarding the fleet NOx average requirement to read, "beginning October 1, 2002, no transit agency shall own, operate, or lease an active fleet of urban buses with average NOx emissions in excess of 4.8 g/bhp-hr, based on the engine certification standards of the engines in the active fleet." This is a change without regulatory effect.

130. Comment: Since paragraph (b)(2) in section 1956.2, title 13, CCR, defines "active fleet", it is redundant to include the language "of the engines in use" in paragraph (e) referring to the NOx fleet average requirements. This language should be deleted. In addition, it is likely that the active fleet will contain engines with improved emission performance from their original certified configuration. Those upgraded engine emission performance characteristics should also be included in the fleet average. (EMA)

Agency Response: The ARB has modified the regulatory language to refer to certification standards of engines in the active fleet, rather than the certification standards "of the engines in use." This is a change without regulatory effect. The ARB intends for the NOx fleet average to be calculated based on either an engine's original certification standard, the certification standard of a new engine placed in an older bus chassis (i.e., a bus repower), or the certification standard of an engine retrofitted with an ARB-approved NOx retrofit system, whichever is applicable. This methodology will account for those engines that have improved their emission performance characteristics from their original certified configuration. (Please also see Agency Response to Comment 129.)

THE FOLLOWING COMMENTS ARE NOT GERMANE TO THE MODIFICATIONS CONTAINED IN THE NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT AND SUPPORTING DOCUMENTS. THE ARB IS RESPONDING IN ORDER TO PROVIDE CLARITY AND IMPROVE UNDERSTANDING OF THE REGULATION

131. Comment: Paragraph (e)(2) in section 1956.2, title 13, CCR, states that transit agencies may use ARB-certified NOx retrofit systems to comply with the NOx fleet average requirement. There are currently no ARB procedures for certifying NOx retrofit systems. Therefore, the ARB should propose a procedure and allow transit agencies and industry to comment. (CTranA, EMA)

Agency Response: The ARB does have retrofit certification procedures applicable to heavy-duty vehicles, including urban buses, that could be used to certify NOx retrofit systems. These procedures are contained in the document entitled "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years," adopted March 11, 1993, and last amended on April 26, 1995. This document is incorporated by reference in sections 2030 and 2031, title 13, CCR,. The ARB intends to develop additional procedures more specifically designed for the certification of NOx aftertreatment devices, a technology relatively new in mobile source applications. At that time, the procedures for notice and hearing in the Administrative Procedure Act will be utilized and full public participation will be encouraged.

132. Comment: Paragraph (f) in section 1956.2, title 13, CCR, includes the requirement that agencies operate their diesel buses on diesel fuel with a maximum sulfur content of 15 ppm by weight. We support this requirement and believe it to be so important that we request the regulation to specifically require the Executive Officer to report regularly to the Board on the availability and cost of low-sulfur diesel fuel. (CTranA)

Agency Response: The ARB staff agrees that it is important to regularly update the Board on implementation issues associated with the regulation's requirement for low-sulfur diesel fuel. While the regulation contains no specific provision requiring updates to the Board on low-sulfur diesel fuel issues, Board Resolution 00-2 directs the Executive Officer to work with transit agencies during implementation of the regulation and to report back to the Board on the status of implementation. It is reasonable to expect that any issues concerning low-sulfur diesel fuel would be reported to the Board through this process.

133. Comment: Paragraph (a) in section 1956.3, title 13, CCR, defines a zero-emission bus as one that the Executive Officer has certified as a zero-emission bus based on its ability to meet specific criteria described in the regulatory language. We are unaware of any procedure for the Executive Officer to certify an urban bus, as opposed to an urban bus engine. Therefore, the ARB should specify the details of such a procedure and allow transit agencies and industry to comment; or,

alternatively, clarify that section 1956.3 applies to a certified engine in a bus. (CTranA, EMA)

Agency Response: The commenters are correct that conventional certification procedures apply to urban bus engines, and not the entire bus. The ARB will be working closely with affected industries, organizations, and individuals to develop an appropriate certification procedure for zero-emission urban buses in time for the regulation's zero-emission purchase requirements beginning in 2008. Any proposed certification procedure will be subject to the ARB's traditional rulemaking process involving full public comment, pursuant to the Administrative Procedure Act.

134. Comment: Paragraph (a) in section 1956.3, title 13, CCR, defines a zero-emission bus as an Executive Officer certified urban bus that produces zero exhaust emissions of "any" criteria pollutant. To improve clarity, the word "any" should be replaced by the word "all." (EMA)

Agency Response: For clarification, the ARB interprets "any" to mean "all" criteria pollutants.

135. Comment: Paragraph (a) in section 1956.1, title 13, CCR, includes a general reference that the numerical exhaust emission standards are expressed in units of g/bhp-hr. However, in some cases the regulatory text includes the units with the numerical standards, while in other cases it does not. The general reference to g/bhp-hr should be deleted and the numerical exhaust emission standards should always be expressed with a specific unit of measurement (g/bhp-hr) attached. (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification for clarity and specificity. This is a change without regulatory effect.

136. Comment: Paragraph (b)(3) in section 1956.2, title 13, CCR, defines "transit agency." Given that section 1956.2 applies to transit agencies, it would add clarity to retitle it "Fleet Rule for Transit Agencies." (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification as a change without regulatory effect.

137. Comment: To be consistent with the regulation's intent, paragraph (c)(1) regarding alternative-fuel path requirements in section 1956.2, title 13, CCR, should state "upon approval of the regulation, and through model year 2015, at least 85 percent of all urban buses purchased or leased each year must be alternative-fuel buses." (EMA)

Agency Response: The ARB agrees with this comment and has incorporated the recommended modification as a change without regulatory effect.

138. Comment: Paragraph (c)(3) in section 1956.2, title 13, CCR, applies to transit agencies on the alternative-fuel path and states "beginning October 1, 2000, only engines certified to an optional PM standard of 0.03 g/bhp-hr or lower shall be purchased when making new bus purchases." Paragraph (a)(8) in section 1956.1, title 13, CCR, outlines the optional, reduced-emission standards applicable for alternative-fuel engines during the period of October 2002 to 2006. According to section 1956.1, certification to an optional, reduced-emission PM standard must be done in conjunction with certification to an optional, reduced-emission NOx + NMHC standard, while paragraph (c)(3) in section 1956.2 only explicitly imposes a requirement to certify to a low PM standard (0.03 g/bhp-hr or lower). The ARB should clarify its intent. (EMA)

Agency Response: Section 1956.1, title 13, CCR, specifies emission standards for urban bus engines and is applicable to the manufacturers of those engines. This section includes optional, reduced-emission NOx + NMHC standards to which engine manufacturers may choose to certify their engines. As part of this rulemaking, the ARB staff proposed, and the Board approved, that when certifying to one of the optional, reduced-emission NOx + NMHC standards, an alternative-fuel engine must also certify to an optional, reduced-emission PM standard of 0.03 g/bhp-hr or lower, beginning with the 2002 model year produced on or after October 1, 2002. The optional NOx + NMHC standards were existing standards; only the optional PM standards were proposed in the regulation as contained in the Staff Report made available to the public on December 10,1999.

Section 1956.2, title 13, CCR, contains fleet rule components and is applicable to transit agencies. Paragraph (c)(3) in this section specifies, as one of the requirements of the alternative-fuel path, that transit agencies shall only purchase urban buses with alternative-fuel engines meeting a 0.03 g/bhp-hr or lower PM standard when making new bus purchases beginning October 1, 2002. For such transit agencies, the 0.03 g/bhp-hr PM standard is not optional; it is a requirement. However, the alternative-fuel path does not require transit agencies to purchase buses certified to any NOx + NMHC standard other than the base standard in effect in October 2002 (2.5 g/bhp-hr). In theory, this means that beginning October 1, 2002, a transit agency could purchase a bus with an alternative-fuel engine certified to a 2.5 g/bhp-hr NOx + NMHC standard (the existing mandatory NOx + NMHC standard) and a 0.03 g/bhp-hr PM standard. In practice, however, the ARB expects that transit agencies will purchase alternative-fuel engines certified to an optional, reduced-emission NOx + NMHC standard (beginning at 1.8 g/bhp-hr as specified in paragraph (a)(8) of section 1956.1) and the 0.03 g/bhp-hr or lower PM standard in order to obtain state incentive funding to pay for the incremental cost of more expensive alternative-fuel engines.

Attachment A: Form Letter 1 (FL1) E-Mail Commenters
Attachment B: Form Letter 2 (FL2) Commenters